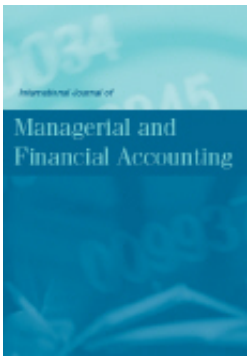

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Banking dynamics in MENA: a study on profit catalysts

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Abstract: This study aims to investigate the managerial determinants of publicly listed banks' performance in the Middle East and North Africa (MENA) region, specifically focusing on the distinction between oil-exporting and oil-importing countries. The research covers the period from 2011 to 2021 and includes selected countries such as Kuwait, Saudi Arabia, United Arab Emirates (oil-exporting), Egypt, Lebanon, and Morocco (oil-importing). By utilising dynamic panel data estimation techniques, two models are developed with return on assets (ROA) and net interest margin (NIM) as dependent variables. Bank-specific independent variables, including size, liquidity, credit risk, and capital adequacy, are analysed along with macroeconomic variables such as GDP and inflation. Data from Thomson Reuters Data Stream for 97 publicly listed banks in the MENA region are employed, and the pooled least squares (OLS), fixed effects (FEM), and random effects (REM) methods are used for data analysis. The empirical findings reveal significant variations in the relationship between selected variables and banks' profitability, indicating the importance of understanding the determinants of banks' performance for stakeholders and bank executives to make informed decisions.

Keywords: performance; credit risk; capital adequacy; banks; Middle East and North Africa; MENA; return on assets; ROA; net interest margin; NIM.

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1 Introduction

Banks stand as pivotal elements within any financial system. Their performance and stability are crucial to both economic growth and the overarching stability of the financial system. This translates into the efficient utilisation of resources through cost containment, alongside effective delivery of products and services, culminating in optimal profitability. As Xu et al. (2019) point out, the stability of the financial sector hinges largely on bank profitability.

Given their role as intermediaries between lenders and borrowers, banks inherently contribute to economic advancement. Consequently, risk evaluation becomes paramount. Ensuring the safety and stability of these institutions is critical for both lenders and borrowers. Averting bank insolvency is paramount. Such an eventuality not only compromises depositors, who stand to lose their money but also affects bank owners via capital losses. The significance of understanding the determinants of bank profitability thus cannot be overstated, especially when failure could lead to a systemic collapse. As Rwechungura et al. (2020) elucidate, bank stability encompasses the institution's ability to operate consistently across varying economic landscapes without external interventions. This is especially relevant as disruptions in the banking sector invariably spill over to other economic sectors due to their interconnectedness.

The dominance of banks, especially in the Middle East and North Africa (MENA) region, is evident. As Budagaga (2020) observes, banks are at the helm of financial services within MENA, accounting for a significant portion, over 60%, of the GDP across these countries (as highlighted by Ghosh, 2020). A defining characteristic of the MENA region vis-a-vis other global regions is its profound reliance on oil. Numerous studies, including those by Kazemian et al. (2022), Xiao et al. (2022), among others, have underscored the profound impact of oil prices on both economic activity and the broader financial market. Yet, a comprehensive exploration delineating the performance metrics of banks in oil-exporting versus oil-importing MENA nations remains conspicuously absent. Fluctuations in oil prices bear direct ramifications for the MENA region, both from an economic and financial lens (Abdelsalam, 2020; Hussain et al., 2023). Sudden oil price shifts, for instance, can precipitate a liquidity crisis, imperilling the region's banking sector. Such vulnerabilities were laid bare in events like the 2008 global financial downturn, the COVID-19 pandemic, and more recently, the Russia-Ukraine conflict – all of which triggered volatile shifts in oil prices.

The determinants driving profitability in the MENA banking sector remain a contentious research topic. Historical analysis often juxtaposes commercial and Islamic banks, analysing facets ranging from profitability and stability to capital structures and operational models. Findings, however, often diverge. For instance, while some studies, like Khasawneh (2016) and Zarrouk et al. (2016), indicate that Islamic banks often outpace their commercial counterparts in profitability, others offer contrasting views on stability and operational efficacy.

Venturing beyond past empirical research, this study casts a broader net, probing not just the drivers of profitability among commercial and Islamic banks but also drawing distinctions between banks in oil-exporting and oil-importing MENA nations. Given the pronounced volatility in oil prices, such an analysis becomes even more pertinent. The banking sector's monumental role in the economic tapestry of MENA underscores the necessity of ensuring bank profitability to safeguard economic stability. The significance of this sector is further elevated by the region's bountiful economic resources and strategic geographical placement. With each country in the sample offering a unique milieu – be it in terms of oil dependencies, political stability, or other distinguishing traits – the study offers a rich, multi-faceted exploration. There's a pronounced academic void when it comes to understanding the determinants of banking profitability in the MENA region, particularly when segmented by oil dependencies. This study seeks to bridge this gap, offering a comprehensive examination, while also spotlighting the nuances between commercial and Islamic banking frameworks.

2 Literature review

In this section, literature is covered based on previous research that examines banks performance.

Two approaches were implemented in examining bank performance. First, banks profitability was measured based on accounting ratios (Mai et al., 2022; Al-Homaidi et al., 2020; Vanichchinchai, 2023). Second, economic based data analysis and stochastic frontier analysis (SFA) (Musa et al., 2020; Anagnostopoulos et al., 2020; Anwar, 2019; Sakouvogui, 2020; Ali and Abdullah, 2022). Al-Homaidi et al. (2020) examine determinants of profitability for 37 commercial banks in India listed on Bombay Stock Exchange (BSE) in the period 2008–2017. His major findings show a negative significant influence on return on assets (ROA) from capital adequacy, deposits, operation efficiency, gross domestic product and inflation rate.

Anagnostopoulos et al. (2020) conduct comparative analysis between conventional and Islamic banks by examining the impact of bank-type attributes on the level of cost and revenue efficiency for nine MENA countries from 2010 till 2017. The author findings indicate that commercial banks outperform Islamic banks in both efficiency measures on a selected period represents pre and post-crisis period in the Gulf region.

Romdhane (2021) examines impact of information technology investment on bank's profitability of 15 Tunisian banks for 19 years from 2001 to 2019. Results show that high profitability is associated with bank size and public banks are more profitable than private banks. Profitability is enhanced by IT investments in Tunisian banks. According to 'productivity paradox' better performance is not affected by IT investments which contradict findings of the study. Banks stability was covered by another set of previous

studies. Analysing banks stability is important as it influences stability of the whole economy. Evaluating determinants of banks stability was conducted using firm-specific variables, macroeconomic variables and Z-score as proxy for banks stability (Mohammad and Aliyu, 2022; Fadoua and Brahim, 2020).

In a study by Mohammad and Aliyu (2022) banks stability in MENA oil producing states responds to shocks in oil prices. Z-score used to measure banking stability for a sample of 43 Islamic banks and 70 conventional banks from 2008 till 2016. Results suggest that both types of banks respond similarly to oil price shocks. They found that bank capitalisation affected by bank stability. Conventional banks reflected a slightly better level of stability in MENA region. Al-Wesabi and Yusof (2020) investigate conventional and Islamic banks financial stability in light of global financial crisis and decline in oil prices during period (2000–2017). They find that Islamic banks were more capitalised and less exposed to liquidity risk, as such justifying higher stability and better performance during the crisis.

Al Khouri and Arouri (2019) findings show that asset diversification adds value to Islamic banks and enhances banks' stability on a sample of Islamic banks in Gulf Cooperation Council (GCC) in a covered period of 2003–2015. Another study by Hussien et al. (2019) investigates performance of 30 Islamic banks during 2008 global financial crisis. Study covered period 2005–2011. They find that banks performance was not affected during crisis based on internal financial records and consistency in behaviour prevailed during the crisis.

Several authors were interested to study performance of Islamic banks and conventional banks from different angles with different conclusions. There is low dependence on capital markets in MENA region and it is classified as a predominantly bank-based economy. Conventional banks constitute 73% from total MENA banks; while Islamic banks account for 27% (Albaity et al., 2019). With respect to business model, there are two core differences between Islamic banks and conventional banks. First, interest payment and investment in highly risky financial products are prohibited in Islamic finance practices. Second, investment under Islamic finance is either asset-backed or asset-based to allow risk-sharing which is highly encouraged. As such, investor has a claim on the underlying assets (Ghosh, 2020).

As mentioned, the MENA countries are composed of oil exporters and oil importers. Theoretically, bank credit risk exposure along with profitability is affected by oil price fluctuation whether in oil exporting countries or oil importing countries. According to the risk-taking channel theory of monetary policy (Wang and Luo, 2020) under loose monetary policy, risk-taking levels of banks will increase. This implies that increase in oil prices leads to inflation which drives implementation of a contractionary monetary policy and reduction in bank risk-taking will be realised. Abdelsalam (2020) conclude that oil price fluctuation varies in degree of significance among MENA countries. Other studies conducted by Mahmood and Zamil (2019) reflect considerable effect of oil prices changes on Saudi Arabia GDP through budget deficit. Similarly, ElSeoud and Kreishan (2020) and Vohra (2017) concluded that oil price shocks impact the GCC economies.

It is noticed that examining MENA banks performance determinants of oil exporting countries versus oil importing countries is almost inexistent, despite significance of banking sector for economic growth and financial stability. Hence, this study aims to pursue this direction to fill this gap. Significance of MENA region stems from the fact that it includes around 21 countries with special geographic location and huge economic resources. This study includes sample of six countries for both oil importing and oil

exporting countries that depend heavily on oil production and exports. Outcome of this study would add value to different stakeholders including shareholders, investors, management and financial analysts.

3 Hypothesis development

3.1 Size and liquidity

Size measured by natural logarithm of total assets, is important profitability parameter accounting for economies of scale effect. Based on typical U shape of total cost function, cost of funding can be rationalised leading to operational efficiency. As such, decrease in costs results in higher profitability (Fidanoski et al., 2018). However, inconsistency in results of research conducted on effect of bank size on banks profitability prevail. Several studies supported the positive effect (Ali and Puah, 2018; Al-Harbi, 2019; Haryanto et al., 2019). Other studies supported the negative effect (Batten and Vo, 2019; Nguyen and Anh, 2023). Asymmetric information problems are highly encountered by large sized banks. This impacts policy strategies and decision-making for banks leading to higher level of non-performing loans with negative impact on bank's profitability. Afonso et al. (2015) finds that moral hazard might be exhibited by large banks they act in accordance to 'too big to fail' or 'too important to fail'. Failure of large banks negatively influences entire financial system. Actions undertaken by government and authorities to bail out large banks in difficulty, affects banks risk-taking decisions knowing that supportive actions will be taken in case trouble occurs (Tan and Floros, 2019). However, large banks tend to be more stable, due to diversification in financial activities and products leading to mitigation of their asset portfolio risk.

Liquidity measured by share of loans in total assets (loans/total assets), accounting for loan portfolio effects on profitability. Improving risk management practices increase profitability (Fidanoski et al., 2018; Graziano and Magni, 2022). Banks undertaking excessive lending activity face higher financial stress which signifies effective risk management practices. Strong positive impact of loans on profitability is expected given that loans account for highest productive banks' assets. A higher liquidity ratio implies higher share of total assets invested in financing by granting excessive loans which results in higher profit income accompanied by more risk (Zarrouk et al., 2016). On the contrary, a lower liquidity ratio reflects higher banks' liquidity level resulting in lower profitability (Ali and Puah, 2018). Therefore, we propose the following hypothesis:

H1 Size has a negative effect on performance.

H2 Liquidity has a positive effect on performance.

3.2 Credit risk and capital adequacy

Credit risk measured by loan-loss provisions to net loan ratio (LLNL), considered the most important risk affecting banks financial stability and profitability. The higher LLNL ratio, the higher is risk of default in loan repayment resulting in lower bank stability (Fidanoski et al., 2018). Credit risk has negative significant effect on bank profitability as a consequence of lending to low credit worthy clients. Increase in doubtful loans with accumulated unsettlement for outstanding debt reduces bank profitability. In addition,

reputation of banks is negatively affected with increase in credit risk that causes ample liquidity problems resulting in lower profitability (Boussaada and Hakimi, 2020).

Capital adequacy measured by total equity to total assets ratio (Eq/TA), considered one of the most important banks profitability indicators with inconsistent findings. According to banking literature, a better-capitalised bank implies financial stability, high deposit inflows allowing broader scale of lending activities with credit worthy clients and lower costs of funding (Saif-Alyousfi, 2020; Boussaada and Hakimi, 2020; Hussien et al., 2019). Other findings indicate a negative correlation of capital adequacy ratio with banks profitability. Banks with strong capital base can extend credit with low inadequate guarantees. Addressed risk-taking behaviour implies trading between financial stability and profitability. This result in negative relationship between capital adequacy and profitability (Bhattarai, 2020; Dao, 2020; Nguyen, 2020). Therefore, we propose the following hypothesis:

H3 Credit risk has a negative effect on performance.

H4 Capital adequacy has a positive effect on performance.

3.3 GDP growth and inflation

GDP growth is measured by percentage change in annual GDP. Economic conditions tend to influence banks performance (Al-Harbi, 2019). Considerable evidence shows that supply and demand for loans and deposits are influenced by economic growth. Higher GDP growth increases banks profitability by boosting demand level for bank loans (Derbali, 2021; De Leon, 2020; Al-Harbi, 2019). Loan quality improves with higher economic growth and less credit losses is realised. This is referred to as 'cyclical of bank stability', as improvement of borrowers' financial health accompanies strong economic growth (Wang and Luo, 2020). Regarding inflation, it is measured by the percentage change in annual price index (CPI). Increase in inflation results in lower spending and borrowing from individuals and companies. Higher interest rates on loans accompany high inflation rates. Hence, increasing banks profitability (Saif-Alyousfi, 2020; Jadah et al., 2020; Stebunovs and Coleman, 2019). Therefore, we propose the following hypothesis:

H5 GDP growth has a positive effect on performance.

H6 Inflation has a positive effect on performance.

4 Data and methodology

4.1 Source of data

Panel data are collected from Thomson Reuters DataStream for publicly listed banks operating in the MENA region for a selected sample of oil-exporting and oil-importing countries covering a total of six countries over the period 2011–2021. Oil importing countries in the sample include Lebanon, Egypt, and Morocco. Oil exporting countries include Saudi Arabia, UAE, and Kuwait. As such, total sample of 59 banks from six countries used in this study, as shown in Table 1. Only banks with an available complete dataset over the studied period are included.

Table 1 Classification of banks

	Country	*No. of commercial banks*		*No. of Islamic banks*	
		Total	*Available*	*Total*	*Available*
1	Oil-exporting countries	37	37	30	30
2	Oil-importing countries	22	22	8	8

4.2 Variables

In this study and as presented in literature, the dependent variable is banks performance reflected by profitability measures namely, ROA and net interest margin (NIM). Both are most popular measures of bank performance. ROA is measured by Net income to total assets ratio and was used in many studies such as Amalia (2021), Lim and Rokhim (2020) and Almaqtari et al. (2019). NIM, on the other hand, is measured by dividing net interest revenue by total assets and studies that used NIM included but not limited to (Derbali, 2021; Katusiime, 2021; Budhathoki et al., 2020). The relationship between selected banks performance measures, bank-specific determinants, and macroeconomic determinants, both theoretically and empirically, is reflected in Table 2.

Table 2 Variables measurement scales

Proxy (abbreviation)	*Definitions*	*Theoretical predicted signs*	*Major empirical studies' results*
Bank-specific variables			
Size	Natural logarithm of total assets	+/-	-
Liquidity	Loans/total assets	+/-	+
Credit risk	Loan-loss provisions/net loans	+/-	-
Capital adequacy	Total equity/total assets	-	+
Macroeconomic variables			
GDP growth	Percent change in the annual real GDP	+/-	+
Inflation	Percentage change in annual consumer price index (CPI)	+/-	+

4.3 Empirical model of estimation

This study uses a balanced panel data. For robustness check, three regression models are applied, namely the pooled least squares (OLS), the fixed effects (FEM), and the random effects (REM). The panel regression model follows the equation:

$$Y_{it} = \alpha_i + \beta_t + \gamma X_{it} + \varepsilon_{it}$$

where Y_{it} represents the dependent variables observed for each bank i at time t, α_i is the bank fixed effect, β_t represents is the year fixed effect, X_{it} is the vector of independent variables for each bank i at time t, and ε_{it} denotes the random error term.

5 Empirical results

5.1 Descriptive statistics and correlation matrix

The total number of observations for the period 2011–2021 is 649. Table 3 illustrates the mean, and standard deviation of the variables broken by oil importing/exporting countries and by commercial/Islamic banking. It is noteworthy that there are no Islamic banks in Lebanon's subsample, while there are no commercial banks in Saudi Arabia's subsample.

There is no clear statistical evidence that the ROA of banks in oil importing countries (Mean = 0.011457, Std. dev. = 0.011270) was significantly different than that of banks in oil exporting countries (Mean = 0.011976, Std. dev. = 0.012423), $t(647) = -0.532710$, $p = 0.5944$. Moreover, Islamic banks had higher ROA (Mean = 0.012859, Std. dev. = 0.010700) than commercial banks (Mean = 0.009835, Std. dev. = 0.013864), $t(647) = 3.094680$, $p = 0.00105$.

On another note, oil importing countries had higher NIM (Mean = 0.031203, Std. dev. = 0.010916) than oil exporting countries (Mean = 0.026613, Std. dev. = 0.008973), $t(647) = 5.804063$, $p < 0.01$. Furthermore, there is no clear statistical evidence that the NIM of commercial banks (Mean = 0.027870, Std. dev. = 0.011204) was significantly different than that of Islamic banks (Mean = 0.028576, Std. dev. = 0.009247), $t(647) = -0.862882$ and $p = 0.3885$.

Table 4 reports the pairwise correlations between the variables. It is important to mention that either weak or no correlation exist among the independent variables. For instance, credit risk and inflation were positively correlated, $r(649) = 0.557191$, $p < 0.01$. The latter is the higher correlation between pairs of independent variables and indicates that credit risk and inflation share circa 31% of their variance, which is weak enough to assume the absence of a potential multicollinearity problem.

5.2 Panel data regression models

5.2.1 The drivers of ROA

The empirical findings on the drivers of ROA for the full sample, oil importing/exporting countries, and commercial/Islamic banks are presented in Table 5. For all the reported model, the Hausman test was statistically significant ($p < 0.05$), which indicates that the fixed effect model is better than the random effect model. Moreover, a pooled OLS was computed to examine the robustness of the results and the signs of the coefficients, and their significance was found in concomitance with the FEM, hence their robustness.

The adjusted R-squared of the full sample model indicates that 55.1% of the variations in ROA are explained by the independent variables. For this model, all the estimated parameters are statistically significant. Size has a positive and significant parameter of 7.386×10^{-3}, $p < 0.01$. This means that when total assets increase by one percentage point, ROA goes up by 7.386×10^{-3} point. Liquidity has a negative and significant parameter of -1.056×10^{-2}, $p < 0.05$. This means that when the ratio of loans to total assets increases by one point, ROA goes down by 1.056×10^{-2} point. Credit risk has a negative and significant parameter of -1.787×10^{-1}, $p < 0.01$. This means that when the ratio of loan-loss provisions to net loans increases by one point, ROA goes down by 1.787×10^{-1} point. Capital adequacy has a positive and significant parameter of 4.562×10^{-2}, $p < 0.01$. This means that when the ratio of total equity to total assets

increases by one point, ROA goes up by 4.562×10^{-2} point. GDP growth has a positive and significant parameter of 8.770×10^{-4}, $p < 0.01$. This means that when GDP increases by one percentage point, ROA goes up by 8.770×10^{-4} point. Inflation has a positive and significant parameter of 2.040×10^{-4}, $p < 0.01$. This means that when CPI increases by one percentage point, ROA goes up by 2.040×10^{-4} point.

For the oil importing countries, the adjusted R-squared indicates that 68.4% of the variations in ROA are explained by the independent variables. For this model, all the estimated parameters are statistically significant to the exemption of size, which parameter is 4.010×10^{-4}, $p = 0.8843$. This means that in oil importing countries, changes in total assets do not necessarily influence ROA. Liquidity has a negative and significant parameter of -2.371×10^{-2}, $p < 0.01$. This means that when the ratio of loans to total assets increases by one point, ROA goes down by 2.371×10^{-2} point. Liquidity ratio reflects impact of composition of bank's assets on profitability. A low loan/total asset implies lower credit volume and less credit risk. This enables banks to withstand unanticipated external shocks like changes in interest rate which was reinforced by Basel III framework after 2008 financial crisis (Papadamou et al., 2021). Credit risk has a negative and significant parameter of -8.034×10^{-2}, $p < 0.01$. This means that when the ratio of loan-loss provisions to net loans increases by one point, ROA goes down by 8.034×10^{-2} point. The ratio of loan loss provisions to net loans measures bank's asset quality. Similar to findings of Nguyen et al. (2021), higher loan loss provisions reduces profits as it implies lower quality of loans. Capital adequacy has a positive and significant parameter of 1.801×10^{-1}, $p < 0.01$. This means that when the ratio of total equity to total assets increases by one point, ROA goes up by 1.801×10^{-1} point. Higher equity/total assets reduce need for external funding and thus increase profitability. This is similar to findings by Saif-Alyousfi (2022). GDP growth has a positive and significant parameter of 1.238×10^{-3}, $p < 0.01$. This means that when GDP increases by one percentage point, ROA goes up by 1.238×10^{-3} point. Literature validates the relationship between economic conditions and banks performance whereby, demand for bank loans is stimulated by GDP growth which increases profitability (Ledhem and Mekidiche, 2020). Inflation has a positive and significant parameter of 1.050×10^{-4}, $p < 0.01$. This means that when CPI by one percentage point, ROA goes up by 1.050×10^{-4} point. Similar to findings of Yakubu and Bunyaminu (2022), higher annual inflation rates result in higher interest rates on loans which positively affects bank's profitability.

For the oil exporting countries, the adjusted R-squared indicates that 84% of the variations in ROA are explained by the independent variables. For this model, only the estimated parameters for size and credit risk are statistically significant. This means that any changes in liquidity, capital adequacy, GDP, and CPI would not necessarily influence ROA. Size a positive and significant parameter of 1.049×10^{-2}, $p < 0.01$. This means that when total assets increase by one percentage point, ROA increases by 1.049×10^{-2} point. Scale efficiency affects banks' performance as such asset size is a key factor in profitability determinants. Agglomerating banks' functions through branches network expansion or via mergers and acquisitions can enhance profitability. Similar to oil importing countries, credit risk has a negative and significant parameter of -7.404×10^{-1}, $p < 0.01$. This means that when the ratio of loan-loss provisions to net loans increases by one point, ROA goes down by 7.404×10^{-1} point.

Table 3 Summary statistics of the variables by oil importing/exporting countries and commercial/Islamic banking

Panel A: Oil importing countries							
		Commercial banking			*Islamic banking*		
Country	*Variable*	*Observations*	*Mean*	*Std. dev.*	*Observations*	*Mean*	*Std. dev.*
Egypt	ROA	55	0.021389	0.010832	66	0.011600	0.013971
	NIM	55	0.039509	0.012717	66	0.032883	0.007571
	Size	55	15.70601	0.804204	66	15.02776	0.440705
	Liquidity	55	0.501725	0.118390	66	0.489861	0.164577
	Credit risk	55	0.009004	0.009185	66	0.011586	0.019140
	Capital adequacy	55	0.105047	0.023978	66	0.079415	0.031097
	GDP growth	121	Mean = 3.614568, Std. dev. = 1.213340				
	Inflation	121	Mean = 11.50873, Std. dev. = 6.502507				
Lebanon	ROA	55	0.005994	0.007413	NA	NA	NA
	NIM	55	0.020900	0.009926	NA	NA	NA
	Size	55	16.44542	1.121001	NA	NA	NA
	Liquidity	55	0.434036	0.149424	NA	NA	NA
	Credit risk	55	0.033173	0.080077	NA	NA	NA
	Capital adequacy	55	0.086604	0.011461	NA	NA	NA
	GDP growth	55	Mean = -2.960253, Std. dev. = 8.435165				
	Inflation	55	Mean = 29.99545, Std. dev. = 57.39163				
Morocco	ROA	44	0.007863	0.003175	22	0.007039	0.002397
	NIM	44	0.030201	0.003904	22	0.033161	0.003998
	Size	44	16.52311	0.990021	22	16.62918	0.850318
	Liquidity	44	0.766929	0.087472	22	0.778403	0.103506
	Credit risk	44	0.008118	0.004750	22	0.012458	0.005016
	Capital adequacy	44	0.082494	0.017953	22	0.100231	0.022292
	GDP growth	66	Mean = 2.922484, Std. dev. = 3.339327				
	Inflation	66	Mean = 1.064727, Std. dev. = 1.095351				

Table 3 Summary statistics of the variables by oil importing/exporting countries and commercial/Islamic banking (continued)

Panel B: Oil exporting countries							
		Commercial banking			*Islamic banking*		
Country	*Variable*	*N*	*Mean*	*Std. dev.*	*N*	*Mean*	*Std. dev.*
Kuwait	ROA	55	0.008426	0.005469	55	0.006763	0.006547
	NIM	55	0.023056	0.002630	55	0.023527	0.004884
	Size	55	16.95433	0.662792	55	16.23174	1.103020
	Liquidity	55	0.765732	0.041529	55	0.769533	0.128155
	Credit risk	55	0.014140	0.007626	55	0.010054	0.006356
	Capital adequacy	55	0.121054	0.027739	55	0.127846	0.106024
	GDP growth	110	Mean = 1.004175, Std. dev. = 1.213340				
	Inflation	110	Mean = 2.600273, Std. dev. = 1.180404				
Saudi Arabia	ROA	NA	NA	NA	110	0.017081	0.006280
	NIM	NA	NA	NA	110	0.026520	0.004819
	Size	NA	NA	NA	110	17.51350	0.721682
	Liquidity	NA	NA	NA	110	0.685634	0.087647
	Credit risk	NA	NA	NA	110	0.006633	0.004202
	Capital adequacy	NA	NA	NA	110	0.148205	0.042031
	GDP growth	110	Mean = 2.623345, Std. dev. = 3.439945				
	Inflation	110	Mean = 1.815818, Std. dev. = 1.675092				
United Arab Emirates	ROA	22	-0.001987	0.031882	165	0.013356	0.011951
	NIM	22	0.023569	0.009115	165	0.029296	0.012131
	Size	22	15.44048	0.447389	165	16.65359	1.241574
	Liquidity	22	0.850166	0.196470	165	0.707558	0.102240
	Credit risk	22	0.029812	0.036001	165	0.015329	0.013413
	Capital adequacy	22	0.144556	0.052153	165	0.134084	0.057360
	GDP growth	187	Mean = 3.050951, Std. dev. = 3.255708				
	Inflation	187	Mean = 1.066091, Std. dev. = 1.827542				

Table 4 Correlation matrix of the variables

	ROA	*NIM*	*Size*	*Liquidity*	*Credit risk*	*Capital adequacy*	*GDP growth*	*Inflation*
ROA	1							
NIM	0.468827***	1						
Size	0.157659***	–0.183146***	1					
Liquidity	–0.134122***	–0.036192	0.014917	1				
Credit risk	–0.387409***	0.071882*	–0.088488**	–0.153796***	1			
Capital adequacy	0.209978***	0.126129***	–0.078023**	0.261917***	–0.063557	1		
GDP growth	0.308811***	0.141671***	–0.121942***	0.169415***	–0.369402***	0.139819***	1	
Inflation	–0.109421***	0.149326***	–0.109752***	–0.366251***	0.557191***	–0.101890***	–0.519749***	1

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.

Table 5 FEM regression models for the drivers of ROA

Variables	*Full sample*	*Oil importing countries*	*Oil exporting countries*	*Commercial banking*	*Islamic banking*
Size	7.386×10^{-3}***	4.010×10^{-4}	1.049×10^{-2}***	1.042×10^{-3}	3.564×10^{-3}**
	(1.870×10^{-3})	(2.753×10^{-3})	(1.507×10^{-3})	(3.590×10^{-3})	(1.461×10^{-3})
Liquidity	-1.056×10^{-2}**	-2.371×10^{-2}***	-4.207×10^{-3}	-2.780×10^{-2}***	1.094×10^{-2}***
	(4.843×10^{-3})	(6.536×10^{-3})	(3.854×10^{-3})	(8.137×10^{-3})	(3.715×10^{-3})
Credit risk	-1.787×10^{-1}***	-8.034×10^{-2}***	-7.404×10^{-1}***	-9.443×10^{-2}***	-6.079×10^{-1}***
	(1.596×10^{-2})	(1.406×10^{-2})	(2.549×10^{-2})	(1.629×10^{-2})	(2.564×10^{-2})
Capital adequacy	4.526×10^{-2}***	1.801×10^{-1}***	1.061×10^{-2}	2.980×10^{-1}***	-1.336×10^{-2}*
	(1.087×10^{-2})	(2.842×10^{-2})	(7.756×10^{-3})	(2.598×10^{-2})	(7.847×10^{-3})
GDP growth	8.770×10^{-4}***	1.238×10^{-3}***	-1.610×10^{-3}	6.780×10^{-4}***	5.620×10^{-4}***
	(1.420×10^{-4})	(1.780×10^{-4})	(1.920×10^{-4})	(1.900×10^{-4})	(1.360×10^{-4})
Inflation	2.040×10^{-4}***	1.050×10^{-4}***	2.430×10^{-4}	3.640×10^{-5}	1.570×10^{-6}
	(2.750×10^{-5})	(2.940×10^{-5})	(1.940×10^{-4})	(3.270×10^{-5})	(9.350×10^{-5})
Constant	-1.089×10^{-1}***	-3.250×10^{-4}	-1.533×10^{-1}***	-2.012×10^{-2}	-4.641×10^{-2}*
	(3.266×10^{-2})	(4.585×10^{-2})	(2.693×10^{-2})	(6.175×10^{-2})	(2.539×10^{-2})
Adjusted R-squared	0.551	0.684	0.840	0.721	0.782
F statistic	11.760***	15.082***	41.983***	17.520***	29.304***
Hausman test (*p*-value)	0.0045	0.0877	< 0.01	0.0279	< 0.01

Notes: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are reported in parenthesis.

For the commercial banks subsample, the adjusted R-squared indicates that 72.1% of the variations in ROA are explained by the independent variables. For this model, all the estimated parameters are statistically significant to the exemption of size and inflation, which parameters are 1.042×10^{-3} ($p = 0.7719$), and 3.640×10^{-5} ($p = 0.2669$), respectively. This means in the context of commercial banking, changes in total assets and CPI do not necessarily influence ROA. Similar to aggregate empirical findings for oil importing countries, liquidity and credit risk reflect significant negative relationship to profitability of banks, while capital adequacy and GDP growth have a positive significant impact on performance. Specifically, liquidity has a negative and significant parameter of -2.780×10^{-2}, $p < 0.01$. This means that when the ratio of loans to total assets increases by one point, ROA goes down by 2.780×10^{-2} point. Regarding credit risk, there is a negative and significant parameter of -9.443×10^{-2}, $p < 0.01$. This means that when the ratio of loan-loss provisions to net loans increases by one point, ROA goes down by 9.443×10^{-2} point. As for capital adequacy, there is a positive and significant parameter of 2.980×10^{-1}, $p < 0.01$. This means that when the ratio of total equity to total assets increases by one point, ROA goes up by 2.980×10^{-1} point. Finally, GDP growth has a positive and significant parameter of 6.780×10^{-4}, $p < 0.01$. This means that when GDP increases by one percentage point, ROA goes up by 6.780×10^{-4} point.

For the Islamic banks subsample, the adjusted R-squared indicates that 78.2% of the variations in ROA are explained by the independent variables. For this model, all the estimated parameters are statistically significant to the exemption of inflation. This means that in the context of Islamic banking, changes in CPI do not necessarily influence ROA. Similar to aggregate empirical findings for oil exporting countries, size has a positive and significant parameter of 3.564×10^{-3}, $p < 0.05$. This means that when total assets increase by one percentage point, ROA goes up by 3.564×10^{-3} point. In contrast to empirical results for oil importing countries on aggregate level and commercial banks subsample, liquidity has a positive and significant parameter of 1.094×10^{-2}, $p < 0.01$. This means that when the ratio of loans to total assets increases by one point, ROA goes up by 1.094×10^{-2} point. Higher Loans/Total Assets implies excessive lending activity which implies higher interest income and profitability. This is similar to findings by Saif-Alyousfi and Saha (2021). Similar to aggregate findings for both oil importing and oil exporting countries, along with subsample of commercial banks; credit risk has a negative and significant parameter of -6.079×10^{-1}, $p < 0.01$. This means that when the ratio of loan-loss provisions to net loans increases by one point, ROA goes down by 6.079×10^{-1} point. In contrast to results obtained on aggregate level for oil importing countries and commercial banks subsample, capital adequacy has a negative and significant parameter of 1.336×10^{-2}, $p < 0.1$. This means that when the ratio of total equity to total assets increases by one point, ROA goes down by 1.336×10^{-2} point. Higher capital adequacy ratio implies lower risk-weighted assets which reflect trade-off between financial stability and profitability. This is similar to findings by Ratnasari et al. (2021). Similar to aggregate results for oil importing countries and commercial banks subsample, GDP growth has a positive and significant parameter of 5.620×10^{-4}, $p < 0.01$. This means that when GDP increases by one percentage point, ROA goes up by 5.620×10^{-4} point.

Table 6 FEM regression models for the drivers of NIM

Variables	*Full sample*	*Oil importing countries*	*Oil exporting countries*	*Commercial banking*	*Islamic banking*
Size	-1.245×10^{-3}	-5.241×10^{-3}**	3.162×10^{-3}**	-5.609×10^{-3}**	-5.550×10^{-4}
	(1.200×10^{-3})	(2.319×10^{-3})	(1.263×10^{-3})	(2.529×10^{-3})	(1.373×10^{-3})
Liquidity	2.386×10^{-3}	-7.639×10^{-3}	4.204×10^{-3}	-5.403×10^{-3}	9.857×10^{-3}***
	(3.107×10^{-3})	(5.506×10^{-3})	(3.230×10^{-3})	(5.732×10^{-3})	(3.492×10^{-3})
Credit risk	-1.467×10^{-2}	-2.069×10^{-2}*	-2.897×10^{-2}	-3.470×10^{-3}	-1.023×10^{-1}***
	(1.024×10^{-2})	(1.185×10^{-2})	(2.136×10^{-2})	(1.148×10^{-2})	(2.410×10^{-2})
Capital adequacy	3.384×10^{-2}***	1.466×10^{-1}***	2.994×10^{-2}***	1.276×10^{-1}***	1.844×10^{-2}**
	(6.975×10^{-3})	(2.395×10^{-2})	(6.499×10^{-3})	(1.830×10^{-2})	(7.377×10^{-3})
GDP growth	4.610×10^{-4}***	4.720×10^{-4}***	-3.820×10^{-4}**	4.950×10^{-4}***	3.670×10^{-4}***
	(9.140×10^{-5})	(1.500×10^{-4})	(1.610×10^{-4})	(1.340×10^{-4})	(1.280×10^{-4})
Inflation	1.780×10^{-4}***	1.380×10^{-4}***	3.310×10^{-4}**	1.390×10^{-4}***	-2.840×10^{-5}
	(1.770×10^{-5})	(2.480×10^{-5})	(1.630×10^{-4})	(2.300×10^{-5})	(8.790×10^{-5})
Constant	4.138×10^{-2}**	1.034×10^{-1}***	-3.291×10^{-2}	1.074×10^{-1}**	2.901×10^{-2}
	(2.095×10^{-2})	(3.863×10^{-2})	(2.257×10^{-2})	(4.350×10^{-2})	(2.386×10^{-2})
Adjusted R-squared	0.733	0.761	0.785	0.788	0.743
F statistic	25.08113***	21.707***	29.43***	24.758***	23.707***
Hausman test (*p*-value)	< 0.01	< 0.01	0.0303	< 0.01	0.0003

Notes: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively. Robust standard errors are reported in parenthesis.

5.2.2 The drivers of NIM

The empirical findings on the drivers of NIM for the full sample, oil importing/exporting countries, and commercial/Islamic banks are presented in Table 6. For all the reported model, the Hausman test was statistically significant ($p < 0.05$), which indicates that the fixed effect model is better than the random effect model. Moreover, a pooled OLS was computed to examine the robustness of the results and the signs of the coefficients, and their significance was found in concomitance with the FEM, hence their robustness.

The adjusted R-squared of the full sample model indicates that 73.3% of the variations in NIM are explained by the independent variables. For this model, all the estimated parameters are statistically significant to the exemption of size, liquidity, and credit risk. Capital adequacy has a positive and significant parameter of 3.384×10^{-2}, $p < 0.01$. This means that when the ratio of total equity to total assets increases by one point, NIM goes up by 3.384×10^{-2} point. GDP growth has a positive and significant parameter of 4.610×10^{-4}, $p < 0.01$. This means that when GDP increases by one percentage point, NIM goes up by 4.610×10^{-4} point. Inflation has a positive and significant parameter of 1.780×10^{-4}, $p < 0.01$. This means that when CPI increases by one percentage point, NIM goes up by 1.780×10^{-4} point.

For the oil importing countries, the adjusted R-squared indicates that 76.1% of the variations in NIM are explained by the independent variables. For this model, all the estimated parameters are statistically significant to the exemption of liquidity. Using NIM as a profitability indicator, size is the only independent variable deviating from obtained results under ROA as profitability measure for oil importing countries. In contrast to results of insignificance under ROA, size reflected with NIM a negative and significant parameter of -5.241×10^{-3}, $p < 0.05$. This means that when total assets increase by one percentage point, NIM goes down by 5.241×10^{-3} point. This is associated with the concept of scale inefficiency; whereby more costs ate incurred with increase in assets relative to cost savings. As such, small sized banks realise higher profits that large sized banks. This is similar to findings obtained by Sahyouni and Wang (2019). Credit risk has a negative and significant parameter of -2.069×10^{-2}, $p < 0.1$. This means that when the ratio of loan-loss provisions to net loans increases by one point, NIM goes down by 2.069×10^{-2} point. Capital adequacy has a positive and significant parameter of 1.466×10^{-1}, $p < 0.01$. This means that when the ratio of total equity to total assets increases by one point, NIM goes up by 1.466×10^{-1} point. GDP growth has a positive and significant parameter of 4.720×10^{-4}, $p < 0.01$. This means that when GDP increases by one percentage point, NIM goes up by 4.720×10^{-4} point. Inflation has a positive and significant parameter of 1.380×10^{-4}, $p < 0.01$. This means that when CPI by one percentage point, NIM goes up by 1.380×10^{-4} point.

For the oil exporting countries, the adjusted R-squared indicates that 78.5% of the variations in NIM are explained by the independent variables. For this model, all the estimated parameters are statistically significant to the exemption of liquidity and credit risk. Inconsistency in results when compared to drivers under ROA prevail. Capital adequacy, GDP and CPI reflect significant relationship with NIM; whereas an insignificant relationship under ROA was realised. Implications for positive significant relationship of capital adequacy and inflation to NIM is similar to outcome under oil importing countries under both ROA and NIM measures. Size has a positive and significant parameter of 3.162×10^{-3}, $p < 0.05$. This means that when total assets increase by one percentage point, NIM goes up by 3.162×10^{-3} point. Capital adequacy has a

positive and significant parameter of 2.994×10^{-2}, $p < 0.01$. This means that when the ratio of total equity to total assets increases by one point, NIM goes up by 2.994×10^{-2} point. Opposing to results obtained under both aggregate analysis for oil importing and oil exporting countries; along with subsamples of commercial and Islamic banks using ROA profitability measure; GDP growth reflects negative significant relationship to NIM of -3.820×10^{-4}, $p < 0.05$. This means that when GDP increases by one percentage point, NIM goes down by 3.820×10^{-4} point. This can be explained by risks built up during expansion which generates credit losses when economic conditions worsen during periods of crisis; thereby reducing bank's profitability. Similar to oil importing countries results under ROA profitability measure, inflation has a positive and significant parameter of 3.310×10^{-4}, $p < 0.05$. This means that when CPI by one percentage point, NIM goes up by 3.310×10^{-4} point.

For the commercial banks subsample, the adjusted R-squared indicates that 78.8% of the variations in NIM are explained by the independent variables. For this model, all the estimated parameters are statistically significant to the exemption of liquidity and credit risk. This implies inconsistency in terms of significance in some of selected variables (size, inflation, liquidity and credit risk) when comparing outcome under ROA and NIM for commercial banks subsample. Similar to aggregate outcome for oil importing countries using NIM, size has a negative and significant parameter of -5.609×10^{-3}, $p < 0.05$. This means that when total assets increase by one percentage point, NIM goes down by 5.609×10^{-3} point. Both capital adequacy and GDP growth comply to results obtained under ROA commercial banks subsample. Capital adequacy has a positive and significant parameter of 1.276×10^{-1}, $p < 0.01$. This means that when the ratio of total equity to total assets increases by one point, NIM goes up by 1.276×10^{-1} point. GDP growth has a positive and significant parameter of 4.950×10^{-4}, $p < 0.01$. This means that when GDP increases by one percentage point, NIM goes up by 4.950×10^{-4} point. Similar to aggregate results for oil importing countries under NIM analysis, inflation has a positive and significant parameter of 1.390×10^{-4}, $p < 0.05$. This means that when CPI by one percentage point, NIM goes up by 1.390×10^{-4} point.

For the Islamic banks subsample, the adjusted R-squared indicates that 74.3% of the variations in NIM are explained by the independent variables. For this model, all the estimated parameters are statistically significant to the exemption of size and inflation. With the exception of capital adequacy, all independent variables reflected same relationship under both ROA and NIM for Islamic banks subsample. Liquidity has a positive and significant parameter of 9.857×10^{-3}, $p < 0.05$. This means that when the ratio of loans to total assets increases by one point, NIM goes up by 9.857×10^{-3} point. Credit risk has a negative and significant parameter of -1.023×10^{-1}, $p < 0.01$. This means that when the ratio of loans-loss provisions to total loans increases by one point, NIM goes down by 1.023×10^{-1} point. Capital adequacy has a positive and significant parameter of 1.844×10^{-2}, $p < 0.05$. This means that when the ratio of total equity to total assets increases by one point, NIM goes up by 1.844×10^{-2} point. GDP growth has a positive and significant parameter of 3.670×10^{-4}, $p < 0.01$. This means that when GDP increases by one percentage point, NIM goes up by 3.670×10^{-4} point.

6 Theoretical and managerial implications

The findings of the study on banks in the MENA region offer profound theoretical implications, especially when analysed through the prism of the risk-taking channel theory. Traditionally, the risk-taking channel theory underscores how variations in monetary policies, particularly interest rates, shape banks' propensity for risk. However, this research accentuates that in regions like MENA, where economies are deeply tethered to the oil sector, oil prices can play a role analogous to interest rates. In essence, fluctuations in oil prices could stimulate banks to modify their risk appetites in ways similar to shifts in monetary policy (Fidanoski et al., 2018). For oil-exporting nations, drops in oil prices might drive banks towards riskier endeavours, akin to the effects of monetary easing. This shift could be a compensatory mechanism for declining revenues and the reduced influx of foreign capital. Conversely, for oil-importing countries, elevated oil prices, translating to higher import costs, might act akin to a monetary policy tightening, prompting banks to adopt a more conservative risk stance. Moreover, the distinct findings between commercial and Islamic banks illuminate the inherent risk dynamics within different banking models. Islamic banks, operating under profit-and-loss sharing principles and being devoid of speculative ventures, exhibited a divergent risk profile, emphasising the risk-averse foundation of Islamic banking. Yet, the observed variations in capital adequacy and its relationship with profitability metrics in Islamic banks hint at the subtle nuances of the risk-taking channel even within Shariah-compliant banking structures (Saif-Alyousfi, 2020). Collectively, these insights broaden the scope of the risk-taking channel theory, underlining that beyond conventional monetary levers; macroeconomic factors like oil prices can substantially influence bank risk behaviours, especially in regions with intricate oil-linked economic frameworks.

The findings of the study on banks in the MENA region elucidate several key managerial implications. Firstly, with the pronounced variability between macroeconomic indicators like oil prices and profitability metrics such as ROA and NIM, bank leaders are prompted to refine their risk management paradigms. This is particularly salient for institutions in oil-exporting nations; the potential ebb in revenues from plummeting oil prices suggests a crucial need for a vigilant assessment of loan portfolios to prevent unwarranted risk accumulation in a bid to offset revenue deficits. Moreover, the vital role of portfolio diversification is underscored. By diminishing an over-reliance on sectors intertwined with oil, banks can fortify themselves against the often capricious swings of oil price volatilities. The disparities in the determinants of profitability between commercial and Islamic banks highlight that a one-size-fits-all approach is untenable. Islamic banks, with their intrinsic lean towards risk-aversion, demand tailored strategies, especially in areas like capital adequacy and asset allocation. Furthermore, the tumultuous nature of the oil market accentuates the importance of robust scenario planning. Bank managers, by pre-emptively charting courses for a spectrum of oil price scenarios, are better equipped to both navigate the inherent challenges and leverage emergent opportunities. Transparent communication with stakeholders, whether they be shareholders, regulators, or clients, becomes paramount. By elucidating the vulnerabilities and strengths illuminated by the study, managers can align expectations and cultivate a milieu of trust. Additionally, the study's nuanced results, especially around bank-specific variables, champion the cause for continuous monitoring. In a dynamic landscape, adaptive strategies, rooted in real-time data and insights, can be a linchpin for success. Finally, in the face of potential systemic shocks from oil price

gyrations, an investment in cutting-edge risk management tools and practices is non-negotiable. Whether it's leveraging artificial intelligence for predictive analytics, amplifying stress testing rigor, or honing internal controls, managers in both commercial and Islamic banks have their task cut out to ensure stability and growth in an oil-sensitive economic ecosystem.

7 Limitation

This study, while insightful, bears a few notable limitations. Firstly, its geographical concentration solely on the MENA region might limit the generalisability of the findings. Banks from different regions often operate under varied regulatory frameworks and face different macroeconomic challenges. Thus, conclusions drawn from the MENA banks may not necessarily apply to institutions in other parts of the world. Secondly, there's an ambiguity in the classification of banks. Specifically, it is unclear how many of the studied oil-exporting banks are also Islamic. This overlap could muddy the differentiation of effects and potentially confound the results. Lastly, the choice of the study period, spanning from 2011 to 2021, is significant. However, it is unclear how the study controlled for major global events such as the COVID-19 pandemic and the Russia-Ukraine war. These events had profound economic repercussions and could substantially influence bank profitability, potentially skewing interpretations if not adequately controlled for.

8 Conclusions

In recent years, the oil market has seen considerable price shifts. However, a significant research void exists regarding the differing profitability determinants for banks in oil-importing versus oil-exporting nations. Addressing this gap, this study undertakes a detailed analysis of a subset of commercial and Islamic banks across six countries in the MENA. It delves into the influence of bank-specific and broader macroeconomic factors on the profitability of 59 banks – 37 from oil-exporting nations such as Kuwait, Saudi Arabia, and the UAE, and 38 Islamic banks, with 8 from oil-importing countries like Egypt, Lebanon, and Morocco. Profitability is gauged via ROA and NIM. The data is dissected using pooled least squares (OLS), fixed effects (FEM), and random effects (REM) methodologies. Through this lens, the research aims to offer pivotal insights for the MENA region's policymakers, bank executives, and investors.

Empirical data reveals variable consistencies concerning ROA and NIM, both in terms of their significance and directionality. This pattern is evident in overarching classifications like oil-exporting versus oil-importing, and deeper dives such as commercial versus Islamic banks. From 2011 to 2021, only one of the six key variables demonstrated a marked impact difference on ROA and NIM for oil-importing nations, with size indicating a notable negative effect on NIM, yet an inconsequential influence on ROA. In contrast, for oil-exporting countries, half the variables showcased a significant discrepancy in their influence on ROA and NIM. For instance, while capital adequacy and inflation positively affect NIM, they do not significantly impact ROA. GDP growth, on the other hand, negatively affects NIM but is inconsequential for ROA. In the

commercial bank subset, four primary variables displayed distinct effects on ROA and NIM. Specifically, liquidity and credit risk negatively swayed ROA, with no significant influence on NIM. Size adversely impacted NIM, and inflation showed a mixed influence. Intriguingly, in the Islamic bank subset, all variables except capital adequacy maintained consistent relationships with both ROA and NIM.

The findings illuminate the intricate interplay between macro-financial connections related to oil and bank profitability in MENA. Notable disparities arise between oil-centric economies and their counterparts and between commercial and Islamic banking frameworks. Consequently, the research advises policymakers to heed the repercussions of volatile oil prices and their potential destabilising effects on banks, irrespective of their commercial or Islamic nature. This might entail diversifying financial sources and embracing progressive risk management techniques to buffer against sharp oil price downturns. The study's result diversity, especially regarding bank-specific and macroeconomic nuances, paves the way for further research. It also underscores the need for future studies to assess the repercussions of oil price swings, their volatility, and their evolving impacts on macroeconomic markers, especially in critical contexts like the COVID-19 pandemic or the Russia-Ukraine conflict. In summation, this study sheds light on the factors influencing bank profitability in the MENA region, underscoring the urgency of adaptive strategies in the face of fluctuating oil prices to ensure the region's banking sector remains resilient and robust.

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