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### Non-Performing Loans Indicators in Emerging Markets: Evidence from MENA Region

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#### ABSTRACT

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*This study aims to investigate the financial determinants of nonperforming loans of 36 conventional banks listed in the Middle East and North Africa (MENA) region. The research covers the period from 2013 to 2023 and includes selected countries namely, Jordan, Egypt, United Arab Emirates, Qatar, Kuwait, Bahrain, Lebanon, Morocco, Saudi Arabia and Tunisia. By utilizing dynamic panel data estimation techniques, the study scrutinized the relationship between four bank-specific determinant variables (Profitability, Operating Efficiency, Bank Size, and Loan growth) and nonperforming loans. Various analytical techniques, including ordinary least squares (OLS), fixed effects, random effects, and generalized method of moments (GMM) were employed in the data analysis phase. Results highlighted that except for loan growth, all variables had a significant positive impact on nonperforming loans. The findings of the study are beneficial to policy makers along with other stakeholders in establishing and reinforcing regulations that would ensure stability and soundness in the banking sector in MENA countries.*

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#### INTRODUCTION

Challenges facing the banking sector were extensively examined in several studies. Nonperforming loans (NPLs) are a key challenge that received significant attention in the banking sector. Deterioration in asset quality has negative implications. A possible result is a decline in profitability, as NPLs limit lending activity and impair banks' capital. Also, in the event of default blocking collateral harms the credit history of borrowers. Macro-level effects include hampering economic growth and aggravating financial instability.

The Middle East and North Africa (MENA) region accounts for a considerable level of NPLs. As of 2019, global average for NPLs was 4.2% as reported by Banker database; versus 5% in global banking system NPLs merely from MENA region (Alnabulsi et al., 2022). Weakness in banks' asset quality in MENA region countries was addressed over the years. Moving back to period from 2002 till 2010, NPLs in Tunisia and Egypt was above 20% from total loan portfolio. Other countries in the same period had a better asset

quality, namely Saudi Arabia and Kuwait. Prior to the COVID-19 pandemic in 2019, Lebanon, Algeria and Tunisia had NPLs in double digits; while Saudi Arabia and Qatar reported much lower figures (IMF, 2020).

Several countries in the MENA region undertook institutional measures in correspondence to high NPL levels that could threaten financial stability. To illustrate, bankruptcy laws were legalized in Kuwait in 2020. This implies avoidance of high-risk loans, along with hindering invalid decisions that involves premature liquidation of a going concern company—Reduced risk appetite, lower cost of borrowing and significant improvement in credit quality accompanied bankruptcy reforms both within and across MENA countries.

The focus on MENA region in addressed topic is useful for several other important reasons. On the digital transformation side, financial inclusion (FI) supports United Nations sustainable development goals. This includes promoting financial stability, enhancing economic growth, reducing income inequality and poverty. Level of financial inclusion in the MENA countries is merely 20% versus 76% in global financial inclusion rate (Hakimi et al., 2022). This is despite recognizable enhancement in digital transformation efforts that surpassed global averages; including internet use which recorded 66% and mobile cellular penetration rate reaching 97.5% in 2021 (Al-Smadi, 2023). Barriers for financial inclusion in the MENA region result from high level of regulations and financial literacy. Given considerable attention to financial inclusion that was stimulated recently, enhancement in FI levels in MENA region is inevitable. The impact of FI on bank stability is a double-edged sword. On the one hand, FI improves banks' stability through risk diversification. On the other hand, FI might cause deterioration in asset quality by lending more individuals or businesses with insufficient collateral (Hakimi et al., 2022). The threat of NPLs lessens attempts to accelerate financial inclusion levels.

Over the last 33 years, examining indicators for NPLs was rarely addressed for emerging markets with only 7% coverage ratio (Naili and Lahrichi, 2022). The results of this study will provide insightful implications for bank managers, regulators, investors and policymakers. This will allow better design for credit policy, along with reinforcing regulations that would ensure stability and soundness in the MENA region banking sector. This will further allow acceleration of financial inclusion as a significant part of digital transformation. Our study focuses on listed conventional banks in MENA region covering period (2013-2022) in 10 MENA countries namely, Lebanon, Bahrain, Egypt, UAE, Morocco, Tunisia, Jordan, Qatar, Kuwait, and Saudi Arabia.

## 1. LITERATURE REVIEW

Level of NPLs reflect the credit quality of loans within bank's loan portfolio, which in turn reflects level of credit risk that needs to be managed within banking sector. The role of banks as liquidity transformers makes NPLs monitoring a crucial role for central banks; as the banking sector could be severely impaired by balance sheet problems due to increase in NPLs. As non-performing loans increase, banks profitability decreases and banks are forced to raise additional capital to cover potential losses. In addition, banks failure and crises are triggered by higher NPLs due to instability and insolvency. Hence, equating excessive NPLs with "financial pollution". This study has been conducted in the context of theories of risk, such as Portfolio Theory of Markowitz (1991); Sharp (1963) and Leverage theories (1972). Loans account for the majority of assets of conventional banks. In order to reduce the risk of default, banks tend to diversify portfolios in compliance to theories of risk.

Previous research classified drivers of NPLs into internal bank-specific versus external macro-economic factors. Capital, profitability, efficiency, bank size, income diversification, concentration and lending activity are examples of bank-specific indicators. Macro-economic factors, on the other hand, could affect borrower's ability to service debt being influenced by business cycle conditions. NPLs could be realized in case of economic downturns. Other studies addressed relationship between government stability, institutional quality and NPLs (Hakimi et al., 2022). Institutional environment directly affects activities in banking sector. The soundness of banking industry is influenced by political stability and quality of institutional context. This in turn affects borrower's repayment capacity and level of NPLs, in case of negative impact on various economic sectors.

The relevance of banks' asset quality to aggregate NPLs was discussed in previous studies. In aggregate terms, level of NPLs identify the asset quality of banks in a certain country. Definition of NPLs might vary among countries. Impact of economic crisis is well recognized on level of NPLs. This includes 2008

financial crisis, COVID-19 pandemic, Russia-Ukraine war. The quality of a loan is a sign of strong economic status, as such NPLs during crisis was as a key concern to policy makers and bank supervisors. This is due to NPLs negative consequence on financial institutions survival.

Behavior of NPLs in several regions was discussed. In a study conducted by Tatarici et al. (2020) in the CESEE region, macroeconomic factors influenced NPLs to a greater extent than bank-specific factors. Adu (2022) examined how loan loss provision is a function of NPLs in Sub-Saharan Africa countries. Carvalho et al. (2022) study confirmed significance of macroeconomic information in determining level of NPLs of non-financial companies in Eurozone. Fell et al. (2021) addressed Asian region, showing how Asian financial crisis in 1990's was worsened by excessive NPLs from banking sector. Mdaghri (2022) findings indicated that banks in MENA region with higher deposits and that are well capitalized; experience better performance and lower NPLs. Ozili (2020) study on African region showed significant effect of institutional quality, foreign bank presence, banking concentration and bank efficiency; as determinants of NPLs. Significance of addressing NPLs from the scope of bank-specific level indicators was reflected in some consensus by regulators; in an attempt to reduce NPLs level for each individual bank. This further validates the focus of this study, as internal bank factors are key drivers for the size of NPLs.

## 2. BANK-SPECIFIC VARIABLES AND HYPOTHESIS DEVELOPMENT

### 2.1 Profitability

The relationship between profitability and NPLs has been studied by many scholars; yet no consensus was reached. Do and Phung (2020) investigated the impact of non-performing loans on profit generating ability of Vietnamese commercial banks and found a negative relationship in the period between 2008 and 2017. In a study conducted by Skorburg and Shenai (2021) on the effect of US smaller banks' profitability on asset quality, findings showed a significant negative impact of NPLs on bank profitability and market value. These findings illustrate that proper management of loan portfolios and more focus on lending practices is required to reduce level of NPLs. In a study conducted by Rachman et al. (2018) various banking factors affecting NPLs were examined in Indonesia and results showed an inverse relationship between profitability and NPLs. This resulted from having a more effective credit supervision system and advanced lending activity.

However, an opposing view in study conducted by Ozili (2020), argues that more profitable European banks have higher NPLs. It was suggested that bank supervisors should improve risk management systems, examine credit policies and stress European banks' earning powers relative to the level of NPLs. This evidence coincides with results reported by Thornton and Di Tommaso (2021) in a study covering 521 banks in 28 European countries between 2007 and 2017. The positive significant relationship between NPL and profitability affects the supply of bank credit. This was particularly witnessed after the 2008 financial crisis; whereby lending capacity of banks was impaired affecting economic activity in Europe. Therefore, we propose the following hypothesis:

*H1: Profitability has a positive effect on NPLs.*

### 2.2 Operating efficiency

Bank operating efficiency is about reducing cost at all levels of output. Quality and efficiency of management affects the extent to which banks are cost-efficient. Several studies examined the relationship between bank efficiency and NPLs, yet no consensus was reached. In a study conducted by Onyango and Olando (2020) on commercial banks in Kenya, results reflected that low efficiency reduced NPLs. This was realized due to cutting expenses related to credit loan screening and credit assessment, thus a higher level of NPLs was realized. Similar results were obtained by Ersoy (2022) in a study conducted on Turkey banking sector for the period 2010 – 2019.

An alternative validation for the negative relationship between bank operating efficiency and NPLs is explained by the "bad management" hypothesis. The level of NPLs is reduced in efficient banks as risks are managed wisely. Inefficient banks, on the other hand, face the problem of high NPLs as inadequate loan underwriting and monitoring is realized. Addressed hypothesis was supported by Partovi and

Matousek (2019) and others. To provide new insights on the nature of relationship between bank efficiency and NPLs particularly with contradicting results of previous studies, we propose the following hypothesis:

*H2: Bank efficiency has a positive effect on NPLs.*

## 2.3 Loan Growth

Loan growth represents the growth in bank loans in consecutive years. Loan growth increases during good economic conditions, while NPLs are realized during economic downturn. In a study conducted by Alihodzic and Ekşi (2018) a positive relationship prevailed between loan growth and loan loss for the period from 2007 till 2017 in Turkey. Similarly, in a study conducted by Wu et al. (2022) loan growth leads to higher NPLs in case of poor management for loan portfolio; whereas NPLs can be reduced in case of good debt management based on examining 29 banks listed on Vietnam stock exchange from 2010 to 2020. Fast loan growth is associated with higher NPLs; in case a bank adopts poor borrower screening activity. This involves approving credit facilities for clients with low credit worthiness or without in-depth analysis for debt repayment capacity. NPL concern faced by banks, could be a challenge with the increase in SMEs lending. Banks consider SMEs riskier in lending activity due to the common feature of limited information provided in business plans and financial projections; along with liquidity risk that might be faced. Financial inclusion provides a catalyst for SMEs lending. This sets a challenge for MENA region while attempting to enhance FI levels. Therefore, we propose the following hypothesis:

*H3: Loan growth has a positive effect on NPLs.*

## 2.4 Bank size

Similar to profitability, the relationship between bank size and NPLs has been studied by many scholars; yet no consensus was reached. Studies validating that large sized banks exhibit low NPLs; argue that large banks have stronger risk management practices, advanced credit risk analysis tools that reduce NPLs level (Naili and Lahrichi, 2022). Small-sized banks, on the other hand, have limited resources for credit risk assessment. Moreover, reducing information asymmetries and preventing moral hazard is more feasible within large banks. This further explains negative relationship between banks size and NPLs level.

However, an opposing view in study conducted by Koju et al. (2018), argues that NPLs level are positively related to bank size in a study conducted on Nepalese banking system. This study-based analysis on “too big to fail” hypothesis as large banks undertake excessive risk without proper in-depth loan assessment. Other study supporting same hypothesis was conducted by Ghenimi et al. (2021)-

Given the contradicting empirical evidence, it worth investigating the relationship further. This is particularly important given that bank size matters when it comes to lending to SMEs; as loans to most SMEs have higher default risk. Similar to loan growth variable, this sets a challenge for MENA region while attempting to enhance FI levels. Therefore, we propose the following hypothesis:

*H4: Bank size has a negative effect on NPLs.*

## 3. DATA AND METHODOLOGY

### 3.1 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 countries covering a total of ten countries over the period 2013-2022. Countries in the sample include Lebanon, Bahrain, Egypt, UAE, Morocco, Tunisia, Jordan, Qatar, Kuwait, Saudi Arabia. As such, a total sample of **36** banks from ten 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.** Number of commercial banks used in our study by country

Country	No. of Commercial banks	Present (%)
Jordan	9	25
Egypt	6	17

United Arab Emirates	6	17
Qatar	4	11
Kuwait	3	8
Bahrain	2	6
Lebanon	2	6
Morocco	2	6
Saudi Arabia	1	3
Tunisia	1	3
Total	36	100

Source: own

Table 1 presents a breakdown of commercial banks included in a study across 10 countries. Jordan leads with the highest representation, contributing 9 banks or 25% of the total sample. Egypt and the United Arab Emirates follow with 6 banks each (17% each), while Qatar and Kuwait contribute 4 and 3 banks respectively. Bahrain, Lebanon, and Morocco each have 2 banks in the study, with Saudi Arabia and Tunisia having the lowest representation at 1 bank each. The study encompasses a total of 36 commercial banks, with a notable disparity in representation across countries. This uneven distribution, particularly Jordan's prominence, suggests potential variations in data availability, which should be considered when interpreting the study's findings.

### 3.2 Variables

In this study and as presented in literature, the dependent variable is nonperforming loans reflected by overdue loans measured by the ratio of NPLs to total loans. This is the most popular measure of nonperforming loans used in many studies such as Apergis (2022). The relationship between selected banks NPLs level and bank-specific determinants both theoretically and empirically, is reflected in Table 2.

**Table 2.** Variables measurement scales

<i>Variables</i>	<i>Definitions</i>	<i>Theoretical predicted signs</i>	<i>Major empirical studies' results</i>
Profitability (ROA)	Net Income / Total Assets	+/-	+
Operating Efficiency	Operating Expense/ Operating Income	+/-	+
Bank Size	Natural logarithm of total assets	+/-	-
Loan growth	Current year's gross loans as percentage of previous year	+/-	+

Source: own

### 3.3 Empirical Model of Estimation

Based on the literature mentioned above, the relationship between nonperforming loans and its determinants can be estimated by the following equation:

$$NPLS_{it} = \alpha + \beta_1 ROA_{it} + \beta_2 OPERATING EFFICIENCY_{it} + \beta_3 BANK SIZE_{it} + \beta_4 LOAN GROWTH_{it} + \varepsilon_{it}; i = 1, \dots, 36; t = 2013, \dots, 2023,$$

where  $\alpha$  is the intercept,  $\beta_1$  to  $\beta_4$  are the regression coefficients, and  $\varepsilon_{it}$  is the error term. To estimate this model, we will perform the following three-stage analysis: First, a descriptive analysis of all variables. Second: conducting pre-estimation diagnostic tests. Third, estimating different panel data models (static and dynamic models), and then choosing the best fit estimation model for the data based on specification tests. See Abonazel and Shalaby (2020).

## 4. EMPIRICAL RESULTS

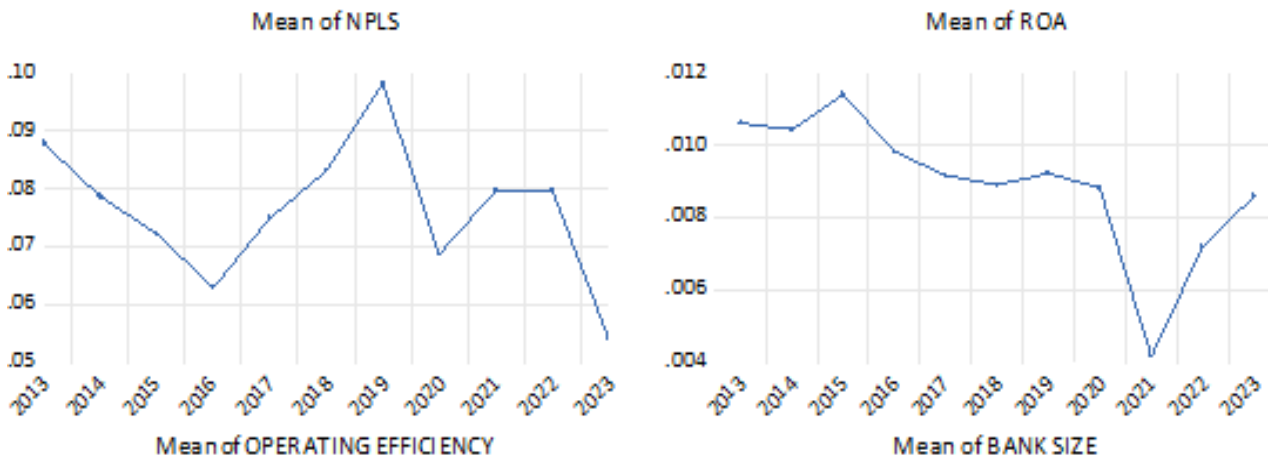
### 4.1 Descriptive Analysis

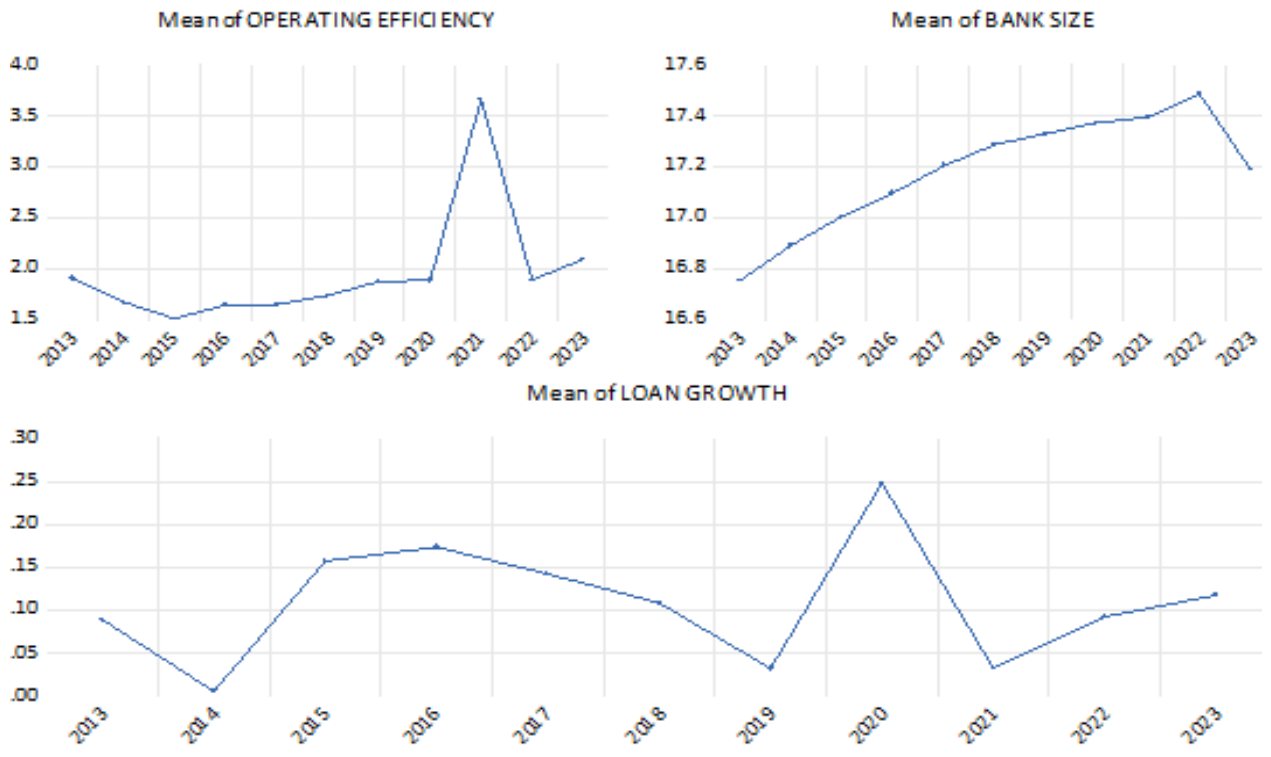
Table 3 shows the descriptive statistics for each variable (dependent and independent variables). The mean and median values of **NPLS** are 0.0764 and 0.0623, whereas the minimum value is close to zero (0.0011), and the maximum is 0.9256. In addition, the mean and median values of **ROA** are 0.0090 and 0.0044; however, the minimum value is negative 0.0286. In terms of **OPERATING EFFICIENCY**, the mean and median values are 1.9620 and 1.6297; the mean and median values of **BANK SIZE** are 17.1851 and 16.9366; the mean and median values of **LOAN GROWTH** are 0.1105 and 0.0635.

**Table 3.** Descriptive statistics of all variables

Variable	Mean	Median	Max.	Min.	Std. Dev.	Obs.
NPLS	0.0764	0.0623	0.9256	0.0011	0.0804	379
ROA	0.0090	0.0044	0.0521	-0.0286	0.0114	394
OPERATING EFFICIENCY	1.9620	1.6297	53.0731	-1.6648	2.8347	390
BANK SIZE	17.1851	16.9366	24.7376	13.4645	2.4676	394
LOAN GROWTH	0.1105	0.0635	8.2068	-0.9016	0.4591	387

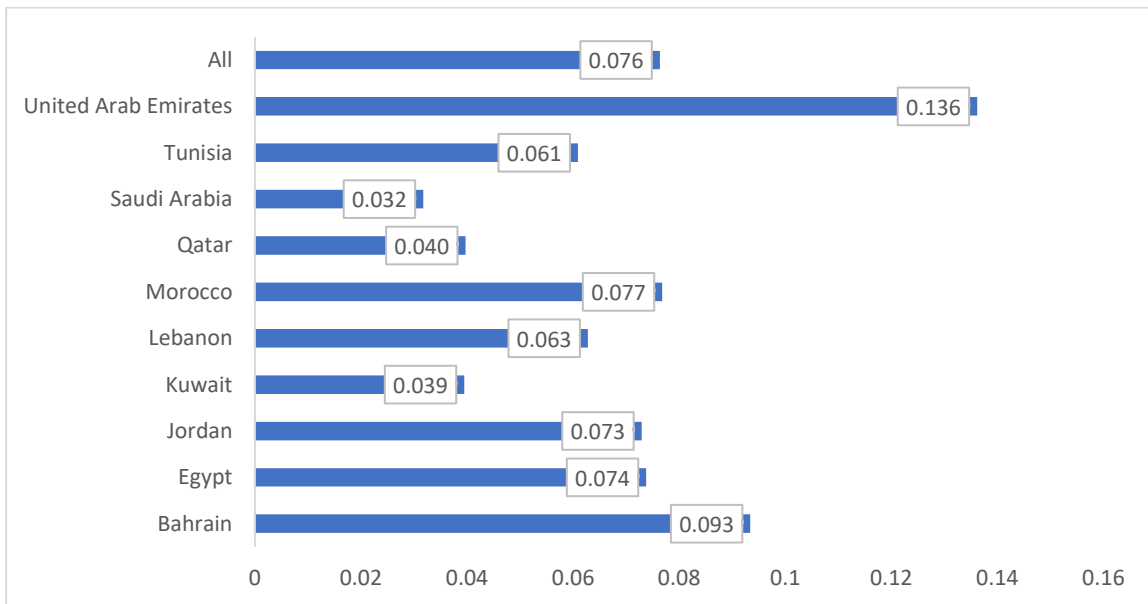
Source: Authors collected and processed from EViews 13





**Figure 1.** Mean trend of the studied variables during the period from 2013 to 2023  
Source: own

Figure 1 shows that, on average, bank size values are increased over the sample period (2013 to 2023). However, the values of NPLS, and ROA are decreased over the sample period (2013 to 2023). In addition, it can be noted that operating efficiency and loan growth values have no increasing or decreasing trend over the sample period.



**Figure 2.** Mean of NPLs variable by country  
Source: own

Figure 2 illustrates the mean value of Non-Performing Loans (NPLs) across various countries, revealing significant variations in financial health. The United Arab Emirates stands out with the highest NPL ratio at

0.136, far exceeding the overall average of 0.076, while Saudi Arabia reports the lowest at 0.032. Most nations fall within a range of 0.04 to 0.09, with Bahrain and Morocco also above average. Kuwait and Qatar join Saudi Arabia in having the lowest ratios. These disparities likely reflect differences in economic conditions, banking practices, and regulatory environments among the countries. The overall average suggests that 7.6% of loans in this region are non-performing, offering a broad indicator of credit risk and financial stability across these economies.

## 4.2 Pre-estimation Diagnostic Tests

### 4.2.1 Unit Root Test

In the beginning, it was used panel unit root tests to ascertain that the continuous variables used in our regression model specification are stationary. Fisher type tests (Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP)) were used, which are based on combining the p-values of the test-statistic for a unit root in each cross-sectional unit. The null and alternative hypotheses of the unit root test are defined as:  $H_0$ : All panels contain unit roots, against  $H_1$ : At least one panel is stationary. The results of the panel unit root tests are reported in Table 4.

**Table 4.** Results of Panel Unit Root Tests for all variables

Variable	ADF – Fisher test		PP – Fisher test		Integration (degree)
	Chi-square	p-value	Chi-square	p-value	
NPLS	99.1400***	0.0082	140.646***	0.00001	I (0)
ROA	110.079***	0.0026	112.714***	0.0015	I (0)
OPERATING EFFICIENCY	149.314***	0.00001	198.259***	0.00001	I (0)
BANK SIZE	131.174***	0.00001	162.956***	0.00001	I (0)
LOAN GROWTH	167.256***	0.00001	243.191***	0.00001	I (0)

Note: \*\*\* significant at 0.01

Source: Authors collected and processed from EViews 13

From the results of Table 4, it can be noted that the null hypothesis of unit root tests has been rejected for all the examined variables, because the p-values are less than 0.01. This means that all variables are stationary in the level i.e., I (0).

### 4.2.2 Multicollinearity Test

In this stage, it should check the multicollinearity problem among independent variables. The term multicollinearity refers to a situation in which there is a linear relation among two or more of the independent variables. It can create inaccurate estimates of the regression coefficients, inflate the standard errors of the regression coefficients, deflate the partial t-tests for the regression coefficients, give false non-significant p-values, and degrade the predictability of the model.

**Table 5.** Pearson Correlation matrix and VIF values

Variable	ROA	Operating Efficiency	Bank Size	Loan Growth
ROA	1			
OPERATING EFFICIENCY	0.019617	1		
BANK SIZE	-0.53206	-0.13852	1	
LOAN GROWTH	-0.06305	-0.0196	0.007706	1
VIF	1.407789	1.024379	1.429175	1.005477

Source: Authors collected and processed from EViews 13

To detect multicollinearity, it can use two common methods. First, the Pearson correlation matrix among independent variables of the study. Second, the Variance Inflation Factor (VIF) for each independent variable. Practical experience indicates that if the value of VIF exceeds 5, it is an indication that the associated regression coefficients are poorly estimated. Table 5 shows that there is not a strong correlation among the independent variables (since all correlations are less than 0.8). Moreover, all VIF values are less than 5. This means that the model does not have a multicollinearity problem.

### 4.3 Estimated Panel Data Models

The outcomes of the static and dynamic panel data models are presented in Table 6. This study employs two tests to determine the optimal static panel data model. The group effect test is employed to ascertain the superiority of the fixed effects model over the pooled model. If the null hypothesis of the group effect test is rejected, it indicates that the pooled model is not appropriate for the data. Next, the Hausman test will be utilized to determine whether to use the fixed effects (FE) or random effects (RE) models. If the null hypothesis of the Hausman test is rejected, then the fixed effects (FE) model is appropriate for the data. For further details, refer to the works of Baltagi (2005) and Abonazel and Shalaby (2020). Based on the findings shown in Table 6, we may conclude that the null hypotheses for both the Group Effect and Hausman tests are rejected. This is due to the fact that the p-values obtained are lower than 0.01. Therefore, we may deduce that the fixed effects (FE) model is the most suitable model for analyzing this dataset.

However, according to the literature, *NPLS variable* is dependent on their past values. In this regard, we opted for FE dynamic panel data as our estimation methodology. Dynamic panel data model tackles the endogeneity issues in the presence of the lagged outcome variable and is therefore the right choice for our analysis. Based on Baltagi (2005) and Abonazel and Shalaby (2020), to eliminate the unobservable heterogeneity, conventionally FE estimations are used. However, this estimation is consistent only when firm characteristics are strictly exogenous. That is, they are purely random observations through time and are unrelated to the firm's history. Nevertheless, this assumption is rarely to be valid. Ordinary Least Squares (OLS) estimation of the pooled model may be biased because it neglects unobservable heterogeneity, and FE estimation may be biased since it ignores endogeneity. The problem of endogeneity can be solved by applying GMM estimator to estimate the impacts of all independent variables on *NPLS* in dynamic panel data model framework (Abonazel and Shalaby, 2020).

**Table 6.** OLS, Fixed Effects, Random Effects, and System GMM estimations

Variable	Pooled Model	Static Model		Dynamic Model
	Pooled (OLS)	Fixed Effects (FE)	Random Effects (RE)	System GMM
NPLS(-1)	0.773063***	0.571206***	0.762427***	0.341677***
ROA	-1.178864***	-1.662828**	-1.200542***	2.450719***
OPERATING EFFICIENCY	-0.000309	-0.000512	-0.000319	0.001902***
BANK SIZE	-0.003183	-0.009444	-0.003274**	0.016572***
LOAN GROWTH	-0.077752***	-0.067493***	-0.077381***	-0.054490***
Constant	0.091153***	0.217686	0.093695***	-----
Observations	339	339	339	303
Adjusted R-Squared	0.468463	0.486788	0.456162	
F-statistic/ Wald Test ( $\chi^2$ )	60.57829***	9.014935***	57.70167***	559504.2***
p-value	0.00001	0.00001	0.00001	0.00001
- Specification Tests				
Group Effect Test ( $\chi^2$ )	2.099426***			
p-value	0.0005		-----	-----
Hausman Test ( $\chi^2$ )	-----	32.511095***		-----
p-value	-----	0.00001		-----
<i>Specification (Sargan and Arellano-Bond) Tests of System GMM model</i>				
Sargan Test		-----		33.42826
p-value		-----		0.350139
Arellano-Bond Test AR (1)		-----		-7.457359***
p-value		-----		0.00001
Arellano-Bond Test AR (2)		-----		-1.091616
p-value		-----		0.2750

Note: \*\*\* significant at 0.01, \*\* significant at 0.05

Source: Authors collected and processed from EVIEWS 13

We have utilized the two-step Generalized Method of Moments (GMM) estimator. Two specification tests have been performed to verify the suitability of the GMM model for fitting the data. The first specification test for the system GMM model is the Arellano-Bond (1991) test, which examines the presence of second order serial correlation in the residuals. The result is reliable since there is no significant second-order serial correlation. This is supported by the p-value of the AR (2) test, which is 0.2750 and does not provide enough evidence to reject the null hypothesis. The second specification test is the over-identifying restriction test, which is conducted to verify the correctness of the instruments. The null hypothesis posits that there is no correlation between the instruments and the residuals. According to the data in Table 6, the p-value of the Sargan test for the system GMM model is 0.350139. Based on this finding, we cannot reject the null hypothesis. The implication here is that the validation of over-identifying limitations is justified. Therefore, we may deduce that the system GMM model is favored due to its ability to provide more reliable and uniform outcomes. The estimated regression equation for the NPLS variable is as follows:

$$NPLS_{it} = 0.341677 NPLS_{i,t-1} + 2.450719 ROA_{it} + 0.001902 OPERATING EFFICIENCY_{it} + 0.016572 BANK SIZE_{it} - 0.054490 LOAN GROWTH_{it} + \varepsilon_{it}; \text{ for } i = 1, \dots, 36; t = 2013, \dots, 2023$$

#### 4.4 Discussion and Implications

The results of “system GMM dynamic model” in Table 6 shows the following variables have significant impact on the NPLS:

- The lagged NPLS is positive and significant at (0.01) level. This indicates that the existing NPLS has an important role in attracting more NPLS. This finding implies a prolonged impact on banking system that would be realized in case of any shocks in NPL level. This is consistent with previous study by Alodayni (2016).

- *ROA* is positive and significant at (0.01) level. This implies that managers are inclined to take excessive risk when high profitability is realized. As such, with more lenient credit policy, a higher flexibility is encountered in both screening and monitoring of loans which will lead to higher NPLs. Less profitable banks apply more rigid credit policies to avoid additional losses. This finding is consistent with study conducted by Ozili (2020) and another reported by Thornton and Di Tommaso (2021).
- *Operating Efficiency* is positive and significant at (0.01) level. The ratio of operating efficiency implies that the higher the ratio, the lower is the bank's operating efficiency. This is due to the increase in operating expenses compared to operating income. The positive relationship in our findings indicates that increase in operating efficiency (decrease in the ratio) leads to decrease in NPLs. This aligns with "bad management" hypothesis stating that bank inefficiencies lead to higher non-performing loans. Hence, improvement in bank efficiency implies good management in terms of loan monitoring. In a study conducted by Githaiga (2020), results indicate that banks experience lower NPLs when adequate capital and resources are allocated to credit risk assessment and evaluation process. This is consistent with another study by Al Zaidanin and Al Zaidanin (2021) whereby significance of allocating sufficient financial resources for risk management and credit assessment was well supported by regulatory authorities in UAE by Central Bank of UAE (CBUAE) particularly after 2008 financial crisis. Likewise, another study on Kuwait by Bioumy (2024) reflects significant change in mega size banks in an attempt to improve risk management and reduce credit risk with higher capital allocation. This is in an attempt to reduce the levels of NPLs.
- *Bank Size* is positive and significant at (0.01) level. The positive association between bank size and NPLs rejects prior findings by Naili and Lahrichi (2022). These studies address the ability of larger banks to reduce level of information asymmetry, associated adverse selection and moral hazard problems by using advanced risk management tools which leads to lower NPLs. This is aligned with better screening and monitoring that reduces loan default risk. The opposite applies to smaller sized banks due to limited resources. Given the increase in SMEs lending which sets a challenge for MENA region; banks particularly large sized banks with higher exposure to SMEs face higher default risk. This explains findings of this study which is consistent to previous research by Wang and Yang (2021). Another study conducted on Egypt by Hassouba (2023) confirms growth in SMEs financing which imposes a real challenge for banks. Central Bank of Egypt (CBE) increasing imposed percentage of loan portfolio directed to SMEs lending to be 25% instead of 20%. This would leave larger banks with higher risk associated with SMEs funding.
- *Loan Growth* is negative and significant at (0.01) level. This implies that growth in lending is accompanied by enhancement in screening standards which reduces the level of NPLs. This is aligned with the crowding-out effect resulting from growth in risk-free loans directed to government financing. Significant growth in these types of loans was witnessed lately in most of MENA countries. Increase in demand for loans from government side resulted in lower funds directed to private credit growth. To illustrate, Jordan is a good example for ample growth in government mega projects related to Syrian refugees including their accommodation. This in turn reduced private sector loans in construction sector which is one of the main sectors accountings for 24% of total private borrowing (World Bank, 2020). Hence, imposing additional challenge on both individual and corporate level with weak credit scoring to obtain loan approval. Hence, reducing level of NPLs. Banks in MENA region face a high challenge in supporting SMEs loan growth as part of financial inclusion initiative. Given that SMEs are riskier in lending activity, a prudent borrower screening activity is necessary for addressed finding to apply in case of SMEs lending.

## 5. LIMITATIONS

This study, though insightful, bears a few notable limitations. First, generalizability of findings might be limited due to geographic concentration on MENA region. Differences in macroeconomic conditions and regulatory frameworks among regions affect how banks operate. As such, results obtained from conducted study on MENA region may be inapplicable to other locations of the world. Also, duration of the study covered critical period from 2013 till 2023 whereby major global events happened and was not clear their impact on study conducted. This includes recent Hamas-Israel war, Russia-Ukraine war and Covid-19 pandemic. This study only focused on bank-specific variables. As such, it is recommended that future research should consider macroeconomic variables to understand the impact of these events that could have profound economic repercussions with substantial influence on NPLs.

## CONCLUSION

The aim of this research is to investigate core bank-specific determinants for nonperforming loans in MENA region between 2013 and 2023. Panel data analysis was used. The findings of the System GMM estimation revealed that all variables, except loan growth, had a highly significant positive impact on nonperforming loans. The negative significant impact of loan growth emphasizes improvement in risk management techniques utilized to control credit risk encountered with increase in lending activity. Hence, reducing nonperforming loans. Theories of risk were utilized in the hypothesis development to support the findings of this study. Studying the impact of bank-specific variables on the level of nonperforming loans is significant for various stakeholders including but not limited to, policymakers, regulators, investors and banks management. The outcomes of the study would support stakeholders in making sound decisions that would ensure stability and soundness of the banking industry. This could include enforcing stricter lending standards and adopting more advanced risk management techniques to allow better detection and mitigation for the risk of default. Moreover, bank management can benefit from this study by improving their lending practices to enhance profitability. Future research should consider a more comprehensive set of macroeconomic variables to understand impact of economic conditions like Ukraine-Russia war and Hamas-Israel war better. This would enrich benefits for external stakeholders like government and central bank policy makers in making sound decisions to ensure favorable economic consequences.

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