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**| RESEARCH ARTICLE**

## **Asset Quality and Lending Growth of the Top UAE Banks (2019 – 2023): An Empirical Investigation**

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**| ABSTRACT**

This study aims to thoroughly analyse the intricate relationship between asset quality and lending growth among the major national banks in the UAE from 2019 to 2023. Utilizing the pooled EGLS method and reviewing annual panel data collected from the financial statements of 10 UAE banks during this timeframe, the findings reveal that return on assets (ROA) positively influences loan growth, while non-performing loans negatively affect it, as expected. Interestingly, the capital adequacy ratio seems to have an unexpected negative impact on loan growth. Regarding the factors influencing non-performing loans, the study confirms that, as anticipated, the capital adequacy ratio (CAR), return on assets (ROA), return on equity (ROE), and the ratio of liquid assets to total assets (LIQ) negatively affect the non-performing loans (NPL) of banks in the UAE. These insights are valuable for policymakers, highlighting the importance of asset quality, addressing Non-Performing Loans (NPLs), and reevaluating capital adequacy requirements.

**| KEYWORDS**

Asset Quality, Lending Growth, Non-performing Loans, Bank Capital

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### **1. Introduction**

The banking sector is a critical part of a country's development, stability, and growth. Banking is considered one of the largest industries directly connected to various segments of society, maintaining long-term business relations. The main function of the bank is to bridge people who require funds with those who have sufficient funds to give (Pratama, 2019). The bank collects funds from third parties in the form of deposits and provides them to people who need credit or loans (Rivai, Basir, Sudarto, & Veithzal, 2013).

Over the past decades, various financial crises have been witnessed globally, causing all sectors of the economy including banking sector issues. A few notable ones are the 2007-2008 financial crisis of US subprime mortgages facing financial credit crunch resulting in financial market instability, and the 1997 Asian financial crisis, where East Asian countries suffered due to significant outflow of foreign investment (Soedarmono, Machrouh, & Tarazi, 2011).

The COVID-19 outbreak has brought a decline in the economy and global productivity (Baldwin & Di Mauro 2020). The pandemic has impacted enterprises (Lestari et al., 2021) and made markets highly volatile and unpredictable, leading to higher loan risk (Wu et al., 2020). The GDP growth is reported to fall by 3 to 5 percent (Fernandes 2020) and banks would supply funds to absorb the pandemic shock (Borro, 2020). COVID-19 can be a major setback for the banking sector, it is deemed as having a contagious

impact (Caballero and Simsek 2009) and threatens banks' stability (Aldasoro et al. 2020). The banking sector has faced various challenges due to the pandemic which impacted all global markets worldwide (Vives, Fatás, Carletti, & Claessens, 2020).

According to (Central Bank of The U.A.E, 2020), the nation is continuously pushing itself to become a global financial hub to attract clientele and businesses to base themselves in this country. The United Arab Emirates banking sector, a vital component of the country's economic framework, has undergone significant fluctuations in lending activity that fuels the economy's growth by providing capital and asset quality that impacts financial stability. Understanding these changes is crucial for policymakers, financial institutions, and stakeholders to navigate uncertainties and contribute to the sector's stability and resilience. During the pandemic crisis, the UAE faced various severe challenges. Since then, authorities have been implementing measures to contain and mitigate the effects in all sectors of the economy.

The banks in UAE were prompted to take a risk-averse approach, cleaning up their balance sheets, and taking precautionary provisions. NPLs proved more muted by the impact of the pandemic than expected, leaving them with sizable buffers. Apart from natural worries from high interest rates, there aren't major setbacks or concerns for UAE banks (Smith & Ramos, 2023). The challenges of the past caused by COVID-19 are fading rapidly, as the country is tackling the issue. The operating environment and performance of leading banks are the strongest seen during the second half of 2022 and the entire 2023, considered as very favourable and successful (King, 2023).

A brief by (Dhanguard, 2022) and (Policy Bazaar, 2016) looks into the history and reveals that the UAE banking sector was already well established before the union. A UK-based banker known as Frank Johnson founded Imperial Bank in Dubai (currently a subsidiary of HSBC) on October 14, 1946. In 1971 the United Arab Emirates was established. During that period, the Imperial Bank was renamed to "The British Bank of Iran and the Middle East" and then again to "The British Bank of Middle East". Since 1999, it has been operating under HSBC. The first national bank of UAE, "The National Bank of Dubai" was established in 1963 by His Highness Sheikh Rashid bin Saeed Al Maktoum. In 2007, the bank merged with Emirates Bank International to become Emirates NBD. Similarly, another important bank is "The National Bank of Abu Dhabi" now known as First Abu Dhabi Bank, founded in 1968 by His Highness Sheikh Zayed Bin Sultan Al Nahyan. In 1973, "The Currency Board", established Dirham replacing the Bahraini Dinar, Qatar Riyal, and Dubai Riyal, to be distributed as the national currency. Now the Central Bank has replaced the "Currency Board" maintaining currency reserves in gold and multiple currencies, as well as acting as an entity overseeing and regulating the financial ecosystem.

In the report by (Mohamed & Al Fahaam, 2024), the banking sector has made record levels of growth in assets, credits, deposits, and investments in the past year. Capital ratios remained above capital requirements, standing at 17.9% for capital adequacy ratio, slightly higher than 2023, due to improved profitability and high retained earnings. The liquidity and funding ratios are well above minimum regulatory requirements, as the liquidity coverage ratio is at 160.2%. The asset quality ratios improved as well, having the NPL ratio at 5.9%. During 2024, the banks will continue to grow and conclude strong results. According to the report of CB UAE, the total assets of UAE banks reached 4.075 trillion, showcasing an increase of 11.1% from 2022 to 2023. The gross credit reached 1.992 trillion in December 2023, an increase of 6% on an annual basis. While the total deposits increased by 13.5% reaching 2.522 trillion. Liquid assets of the banking sector rose to 742 billion, which is an increase of 29% from the previous year. All these statistics show a positive sign for the banking industry in UAE, indicating that sufficient resources can meet the obligations and maintain financial stability. By the third quarter of 2023, the value of net loans reached 506 billion U.S. dollars.

The interest rates remain high, despite the expected trend of reduction (Aamir & Nashar, 2024). Therefore, a comprehensive analysis is required to explore the intricate relationship between bank capital, lending growth, asset quality, profitability indicators, and liquidity within the UAE banking sector.

An article by (Statista Research Department, 2024) about large banks in the UAE in 2023 showed they are set for more loan growth and higher profits due to a buoyant domestic economy and robust oil prices. The loan growth in Emirates NBD Bank, Dubai Islamic Bank, and Abu Dhabi Commercial Bank is expected to have increased, while First Abu Dhabi Bank declines. 2024 will show a slowdown in loan growth and a decline in profits within these banks. These four major banks are set to record higher year over year profits. Emirates NBD is expected to perform most strongly with 64% growth to 21.26 billion dirhams. Asset quality will have a minor decline in certain sectors of the country, but the economy will help contain the non-performing loans (NPLs).

There is an emergence of private credit providers due to the attractive financial market of the UAE. Private credit is expected to grow within UAE as banks and financial institutions continue to dominate the lending markets (Watson, Kirton, & Booth, 2024). According to (Tuli & Damak, 2024), the UAE banking system is in a strong net asset position and will be able to withstand any stressed outflow scenario in 2024. Expected to report a slightly lower credit growth than 7% reported in 2023. New lending will ease during the first half of 2024 as borrowing costs remain high and growth in non oil sectors slows. Dubai's government has been deleveraging for the past few years, owing to higher revenue and lower financing needs. Retail borrowing will remain strong as banks continue to expand.

(King, 2023) states, that banks in UAE have been among the biggest beneficiaries of the country's oil prices and thriving local economy. Profits are increasing, asset quality is sound, and lenders enjoy strong capital and liquidity levels. In the first half of 2023, the largest banks in UAE by total assets - First Abu Dhabi Bank (FAB), Emirates NBD, Abu Dhabi Commercial Bank (ADCB) and Dubai Islamic Bank (DIB) all had combined net profits of \$7.4bn, a 77% increase from previous year. According to the CEO of Emirates NBD, Shayne Nelson, "All business units have delivered significantly higher income and profit in the first half of 2023, helped by the buoyant regional economy". Mashreq is the oldest private bank in the country and the fifth largest, whose net profits jumped 150% in 2023 to 3.5 billion DHS and its annual return on equity (ROE) was more than 30%. The rising interest rate environment is deemed to boost the fortunes of the UAE banking sector, as they benefit a greater degree than other markets. Most bank lending is typically floating, as higher interest rates translate quickly to the cost of customer borrowing. Total deposits in the first quarter of 2023, have grown 14%. In the second quarter of 2023, asset quality remains solid as NPL stands at 5.2%, a bit lower than that of 5.6% last year. The capital adequacy ratio stood at 18.2%, and loan to deposit ratio was nearly 80%. Rising interest rate causes debt servicing costs to increase, yet that hasn't happened. The main reason behind it might be the real estate prices staying buoyant, thus collateral value staying strong. Interbank interest rates are at about 5% considered as still manageable in UAE. 2024 is also predicted to not have a high pace of growth, but overall, a good place for the banking system. In 2022, the six lenders' Emirates NBD, Mashreq, FAB, ADCB, DIB, and ADIB, had more than Dh190bn in green financing. Even though 2023 is considered a good year for the banking sector, 2024 might not have similar conditions. UAE banks are likely to maintain their performance in 2024. The combined net profit was 57 billion AED in 9M23, accounting for 99% of UAE banking sector assets (Fitch Ratings, 2024).

According to (BUSTANJI, 2024) the return on equity (ROE) for 61 banks in UAE soared 41%, reaching the highest in more than a decade at 14% in the year 2023. The significant increase is mainly due to the 56% growth in total net income from 47.5 billion AED to 74 billion AED. The rise in ROE and net income is attributed to the availability of low-cost liquidity, from an increase in bank deposits by over 300 billion dhs. All this led to an increase in loan demands and credit facilities, causing expansion in bank financing operations by 112 billion dhs during last year. NPL balance of banks operating decreased by 17.5 billion DHS to 116.6 billion DHS, marking a 13% decline from 2022. The performance of banks during the past year is confirmed to have succeeded in improving financial solvency, and capital adequacy ratios, and increasing bank strength and stability in the banking sector.

The UAE economy must support the growth of large banks by encouraging lending. Gaining insights into the interplay between bank capital, asset quality, profitability, and liquidity can be crucial for policymakers. By pinpointing the factors that affect lending growth and financial stability, they can create regulations and policies that foster a robust banking environment, ensuring the financial system's resilience. Therefore, this paper will explore the connection between lending growth and asset quality, as well as the factors that contribute to non-performing loans in UAE banks.

## **2. Literature Review**

In this section, we review and conduct preliminary research on existing material on the topic. It provides us with an overview of data that helps us to understand the ways of other researchers. It would help us to develop a sense of perspective and refine the objectives as well as the questions of the undergoing research. The main purpose is to recap the literature, highlight some of the earlier work that is relevant, and write a critical overview of existing material. We begin the literature review through a deductive approach by identifying existing theories and accessing articles via Google Scholar. By evaluating the abstract, we will further narrow it down to the most relevant material. The literature review will identify the trends, themes, debates, arguments, and gaps. The structure of the review would be in a thematic manner, where recurring central themes would be discussed and compared in an organized manner. First, the articles would summarize and synthesize information by providing an overview and combining similar sources. The next step is to analyze and assess the material, concluding the literature review with a summary of key findings. It will establish a relationship between our research topic and the outcome of existing materials. An evaluation is essential as it forms the foundation for our research.

The banking sector has undergone significant transformations with the emergence of the pandemic. The banking sector, being a major part of any economy, plays a crucial role in navigating through these challenges. This literature review aims to explore the dynamics of lending growth and asset quality in the UAE banking sector. The crisis has put banks all over the world in difficult conditions on the threat of fallout. There have been many crises throughout the world that affect all sectors of the economy including the banking sector. Some of these studies highlight how crisis usually affects the banking sector. Many studies have been conducted on various crises before the COVID-19 pandemic, the most notable being the 2007-2009 financial crisis. The number of studies done on UAE banking sector is comparably limited and hardly any has been done to measure the impact of recent years. Previous studies on asset quality and lending growth are quite limited as well.

Banks have three criteria for operating, profitability, growth of assets, and customer base (Lucky & Nwosi, 2015). Banks must ensure the availability of capital and no shortage of funds as they are crucial concerns that affect daily activities and long-term viability and bank capital adequacy is an important concern because it will affect the operational activities of a bank (Pratama, 2019) (Berger & Bouwman, 2013) (Berrospide & Edge, 2010) (Carlson, Shan, & Warusawitharana, 2013) (Cornett, McNutt, Strahan, & Tehranian, 2011) (Gambacorta & Marques-Ibanez, 2011) (Kim & Sohn, 2017).

Loan and bank capital are major sources of income for a bank and its operations (Berger & Bouwman, 2013) (Pratama, 2019) (Melander & Bayoumi, 2008) (Moussa & Chedia, 2016). Asset quality is the evaluation of existing and potential credit risk that is associated with loans and investment portfolio (Federal Reserve, 2023). It also focuses on granting loans by carefully examining and in compliance with banking rules (Lucky & Nwosi, 2015) (Abata, 2014). All these determinants of profitability affect the financial performance of the bank. One of the main threats to the UAE banking sector is the heightened risk of asset quality deterioration. Asset quality weakens as borrowers face pressure from pandemic related disruptions, lower oil prices, etc. Liquidity will remain sound and capital buffers adequate for risks (Fitch Ratings, 2024).

The studies of (Xiao, 2009), (Wang, 2009), (Berger & Bouwman, 2010), and (Dietrich & Wanzenried, 2010) test how certain conditions affect bank performance and profitability during crises. All these studies provided enough evidence to suggest a significant impact of the crisis on bank's profitability. Before the crisis, liquidity creation used to be higher (Berger & Bouwman, 2010), which forced banks to adapt to the situation by increasing their liquid assets and decreasing lending. Lending growth is the increase or decrease in the volume of loans that are extended by the financial institutions.

Various studies found that the relationship between capital ratios and bank lending was significant, during and shortly after the financial crisis, but not at other times (Carlson, Shan, & Warusawitharana, 2013). The effect of bank capital on lending growth is positive under the risk absorption theory (Pratama, 2019) because bank capital enhances the bank's risk-bearing capacities. (Berrospide & Edge, 2010), (Kim & Sohn, 2017), (Pratama, 2019), and (Gambacorta & Mistrulli, 2004) all tested the relationship between bank capital ratio and lending capacity in their past studies, proving that the value of bank capital has an immense positive effect on lending growth (Pratama, 2019). In this hypothesis, we will test the same thing, if bank capital has a positive effect on lending growth in UAE banking sector. (Berrospide & Edge, 2010) focused their study on bank capital and its impact on lending behaviour, measured by loan growth. The results showed that capital indeed does have a small effect on lending. In a similar study by (Bridges, et al., 2015), the effects of change in bank capital requirements on lending behaviour were tested. Enough evidence confirmed that changes in capital requirements did affect capital and lending.

Non-performing loans (NPLs) are related to the failure and crisis of the banking system financial crises are highly marked by the rise of NPLs in banking advances (Ghosh, 2015). High NPL could be due to weak credit procedures, low capable credit specialists, high markup spreads, low credit principles and lack of monitoring policy of borrowers. According to (Handley, 2010), NPL are an indicator to measure credit risk, because it affect economic growth by decreasing credit development (Ivanović, 2016). NPL first affects the commercial banks and then the financial position of the economy (Souza & Feijó, 2011). NPL causes bankruptcy and a weak economy by blocking interest revenue, reducing investment openings, and creating liquidity crises in the financial system (Stijepović, 2014). This increasing drift of NPLs affects banking efficiency, overall routine, and financial performance (Vouldis & Louzis, 2017) (Michael, 2006) (Berger & DeYoung, 1997). The leading cause of economic distress in some developing countries is due to extremely high levels of NPL in banks (Fofack, 2005). In Pakistan, the NPL ratio is rapidly increasing over time, leading to dividend payments, high interest rates, and low levels of investments resulting in the lower economic development of the country (Khan, Siddique, & Sarwar, 2020). Non-performing loans (NPL) reflect the bank's credit quality relating to the risk. Banks that have high capital tend to lower their loans due to high bad asset quality, indicated by increased NPL value. The more the NPL increases in a bank, the worse the loan quality, thus banks start to reduce lending. NPL also decreases the value of assets and leads to depleting the bank capital. Banks become more likely to withhold credit to decrease the credit risk of loans if the NPL is high. Those who have a great number of high loans tend to maintain their capital adequacy ratio, to try to cover the declining value of assets due to investment in risk assets, causing bank losses. It is crucial to understand that NPL shows the health of the bank through the amount of bad loans (Pratama, 2019). They prove in their research that bad asset quality mitigates the positive effect of bank capital on lending growth.

(Hou, 2005), (Berger & DeYoung, 1997) and (Lis, Pagés, & Saurina, 2001) all studied the impact of non-performing loans on bank lending behavior. Hou provided the result that NPL has a negative effect on lending behaviour. (Lis, Pagés, & Saurina, 2001) and (Das & Ghosh, 2007) used indicators such as GDP growth, debt equity, loan growth, bank size, collateral loans, net interest margin, capital-asset ratio, asset size, credit growth, and macroeconomic condition to establish a relationship with NPL. It was founded that GDP growth, bank size, and capital-asset ratio, had a negative effect, and loan growth, collateral loans, net-interest margin, and debt-equity, had a positive effect on the problem loans (Lis, Pagés, & Saurina, 2001). (Berger & DeYoung, 1997) highlights the importance of management capability in maintaining NPL. (Tomak, 2013) studied the determinants of bank lending behaviour in Turkish banks, proving there is a significant negative relationship between NPL and bank lending.

Studies assessing asset quality and bank performance showed a negative relation between bad asset ratio and bank performance, thus confirming that a high-quality loan approving process leads to better performance in the bank (Lucky & Nwosi, 2015). The findings stated a statistical relationship and influence of asset quality on bank performance (Abata, 2014). (Swamy, 2017) studied the relationship between asset quality and profitability, where credit did not significantly affect non-performing assets, while capital adequacy did indeed significantly affect profitability. In the study, assets and other variables did not have much or no impact on profitability. (Rajan, 1994) tested the association between profitability and NPLs, concluding that there is a positive association between NPLs and profitability. (Berger & DeYoung, 1997), (Khan, Siddique, & Sarwar, 2020), and (Zaidanin, 2021) tested the association between ROA and NPLs, stating that there is a negative association between the two variables.

The capital adequacy ratio (CAR) measures the soundness level of banks, representing the ability and strength of bank to face abnormal losses. Banks are advised to maintain a minimum CAR for their survival during a crisis. Car usually is calculated by the ratio of total equity to total assets (Makri, Tsagkanos, & Bellas, 2014). Non-performing Loans (NPL) are unpaid loans (Khan, Siddique, & Sarwar, 2020). According to IMF, If a loan doesn't generate interest and principal amount for a minimum of 90 days, it becomes a non-performing loan. (Khan, Siddique, & Sarwar, 2020) suggest that, if the full payment of principal amount and interest is not done by the due date, and is no longer expected, the loans become NPL. (Makri, Tsagkanos, & Bellas, 2014) researched the Eurozone, (Koju, Koju, & Wang, 2018) conducted a study on the banking sector of Nepal, (Khan, Siddique, & Sarwar, 2020) observed the banking sector of Pakistan, (Kumar & Kishore, 2019) conducted their study in UAE, all having results that there is a negative association between CAR and NPL. (Constant & Ngoms, 2012) and (Amuakwa & Boakye, 2015) did their studies in Africa, stating that CAR and NPL have a positive association with each other. A high NPL indicates a weak financial position and a low NPL indicates a strong monetary system.

### **3. Research Methodology:**

#### **3.1 Data and Variables**

UAE is considered the Middle East's leading financial hub, attracting investors and companies from around the globe. There are 23 domestic or national banks and 28 foreign banks, some specializing in Islamic banking, catering to all UAE citizens (Thomas, 2024).

For this study, we have chosen data from the top 10 banks over the last 5 years. The analysis focuses on the period from 2019 to 2023, which was impacted by the pandemic and has not been explored in earlier research. We aim to investigate lending growth, asset quality, and assess non-performing loans (NPLs) along with the financial performance of the UAE banking sector. Previous studies typically concentrated on the years surrounding the financial crisis of 2007-2008.

The data is organized in numerical or ordinal form, which allows for a quantitative approach in this research. Only banks with complete financial data are included, while those with incomplete data are excluded. The selection of banks is done through purposive sampling from a list provided by Wikipedia and other top-ranked websites, focusing on those with sufficient available data. The data is collected annually from the banks' official websites and financial statements

For this research, we will analyses lending growth and asset quality. There are many methods to calculate these variables, but for this study, we will refer to the research conducted by Pratama (2019), Khan, Siddique, and Sarwar (2020), and Zaidanin (2021) due to their widely accepted calculation methods in banking literature. This study focuses on bank-specific variables that influence lending and asset quality. The operational definitions of these variables are provided in the table below.

| Variable         | Operational Definition                                  | Abbreviation |
|------------------|---------------------------------------------------------|--------------|
| Lending Growth   | Real Growth Rate of Net Loans                           | LOAN         |
| Bank Capital     | Capital Adequacy Ratio (capital/risk-weighted assets)   | CAR          |
| Loan Quality     | Non-performing Loans/total loans                        | NPL          |
| Bank Performance | Return on Total Assets (net income/total assets)        | ROA          |
| Bank Performance | Return on Total Equity (net income/shareholders equity) | ROE          |
| Liquidity Level  | The ratio of liquid assets to total assets              | LIQ          |

### 3.2 Theoretical Model:

#### Model 1:

Lending growth is typically measured as the percentage increase in the total value of loans banks give over a specific period. It reflects banks' lending behavior and can indicate economic trends, such as growth, stability, or potential risks. Lending growth is assumed to be affected by bank performance which is represented by Return on Assets (ROA), bank capital proxied with Capital Adequacy Ratio (CAR), and asset quality proxied with Non-Performing Loan (NPL). ROA assesses a bank's profitability to its total assets. A higher ROA indicates effective management and profitability, which can enhance the bank's capacity to lend more. CAR measures a bank's capital against its risk-weight assets. A higher CAR signifies a strong capital base to absorb potential losses, which can favorably influence its ability to issue loans. NPLs refer to loans that are in default or nearing default. A higher NPL ratio indicates increased credit risk and potential losses, which can adversely affect the bank's ability to issue new loans. In this context, the hypotheses are stated as follows:

Hypothesis 1: ROA and CAR have a significant positive impact on loans in UAE banks.

Hypothesis 2: NPL has a significant negative impact on loans in UAE banks.

To assess the impact of Return on Assets (ROA), Capital Adequacy Ratio (CAR), and Non-Performing Loan (NPL) on the lending growth (LOAN) of banks in the UAE, the following model has been established:

$$\text{LOAN} = f(\text{ROA}, \text{CAR}, \text{NPL}) \quad (1)$$

#### Model 2

The second model focuses on the bank-specific factors that influence Non-Performing Loans (NPL) in UAE banks. We examine several key variables, including the Capital Adequacy Ratio (CAR), Return on Assets (ROA), Return on Equity (ROE), and the Liquid Assets to Total Assets Ratio (LIQ). A higher CAR signifies that a bank possesses a robust capital buffer, enabling it to absorb potential losses. This strength enhances the bank's resilience against loan defaults, thereby decreasing the chances of NPLs. An increase in ROA reflects a bank's efficiency in utilizing its assets to generate profits. Banks that operate efficiently are more adept at managing loans and minimizing defaults, so a higher ROA is typically associated with lower NPLs. A high ROE indicates that a bank successfully generates profits from its shareholders' equity. Profitable banks are better positioned to invest in effective risk management and loan monitoring, which can lead to a reduction in non-performing loans. When liquidity is high, a bank can readily meet its short-term obligations and extend more new loans, which lowers the risk of loans becoming non-performing. Conversely, low liquidity can put pressure on a bank's operations, heightening the risk of NPLs. Therefore, LIQ harms NPL.

The hypothesis for this model is as follows:

Hypothesis: CAR, ROA, ROE, and LIQ have a significant negative impact on NPL in UAE banks.

The NPL models can be expressed as:

$$\text{NPL} = f(\text{ROE}, \text{ROA}, \text{LIQ}, \text{CAR}) \quad (2)$$

### 3.2 Analytical Methods:

A typical panel data regression model can be expressed as

$$Y_{it} = a + bX_{it} + \mu_{it} \quad (3)$$

where Y represents the dependent variable, X is the explanatory variable, and a and b are the coefficients. Here, "i" indicates the cross-sectional units, while "t" refers to the time dimension of the panel data. The term " $\mu_{it}$ " represents the unobservable factors that influence the panel data modeling described above. In this study, we estimate the above models in 1 and 2 using Panel-EGLS which stands for Panel Estimated Generalized Least Squares. This method integrates the characteristics of both random effects and fixed effects panel data models while addressing heterogeneity and autocorrelation in the data. It also accounts for cross-sectional dependency, resulting in a higher level of significance.

#### 4. Empirical Results:

The descriptive statistics for Lending Growth (LOAN), Non-Performing Loan (NPL), Return on Assets (ROA), Return on Equity (ROE), Capital Adequacy Ratio (CAR), and Liquidity Ratio (LIQ) are presented in Table 1 below.

**Table 1: Descriptive Statistics**

|                         | LOAN            | NPL             | ROA            | ROE             | CAR            | LIQ           |
|-------------------------|-----------------|-----------------|----------------|-----------------|----------------|---------------|
| Mean                    | 0.097           | 0.065           | 0.016          | 0.123           | 0.164          | 0.965         |
| Medium                  | 0.075           | 0.060           | 0.010          | 0.110           | 0.160          | 0.970         |
| Maximum                 | 0.330           | 0.160           | 0.040          | 0.330           | 0.220          | 0.990         |
| Minimum                 | 0.010           | 0.020           | 0.000          | 0.020           | 0.130          | 0.930         |
| Std. Dev                | 0.076           | 0.028           | 0.009          | 0.062           | 0.020          | 0.014         |
| Skewness                | 1.188           | 1.408           | 0.905          | 1.118           | 0.690          | -0.427        |
| kurtosis                | 4.177           | 5.600           | 3.708          | 4.860           | 3.203          | 3.503         |
| Jarque-Bera probability | 13.475<br>0.001 | 28.159<br>0.000 | 7.236<br>0.027 | 15.002<br>0.001 | 3.730<br>0.154 | 1.88<br>0.390 |
| Observations            | 46              | 46              | 46             | 46              | 46             | 46            |
| Cross Sections          | 10              | 10              | 10             | 10              | 10             | 10            |

**Source:** Author's calculations.

The descriptive statistics in Table 1 reveal that UAE banks have an average loan growth of 0.097, indicating a 9.7% increase in loans over a specific period, which suggests a strong rise in lending activities. The non-performing loans (NPL) ratio of 0.065 shows that 6.5% of total loans are classified as non-performing, highlighting the portion of loans that are either in default or close to default. Additionally, the data indicates that UAE banks experience low profitability, with an average return on assets (ROA) of 1.6%, suggesting challenges in efficiently converting assets into earnings. According to Hawkins and Mihaljek (2001), an ROA below 20% is considered low. The return on equity (ROE) value of 0.123 indicates that the banks generate a return of 12.3% on shareholders' equity, reflecting their effectiveness in leveraging investments for earnings growth. Furthermore, a capital adequacy ratio (CAR) of 0.164 means the bank maintains a ratio of 16.4%, demonstrating its ability to absorb a reasonable number of losses and indicating stability and effective risk management. The average liquidity ratio of 0.965 shows that the bank has liquid assets amounting to 96.5% of its current liabilities, illustrating its capacity to meet short-term obligations. The positive skewness values (except for LIQ) suggest that more banks are experiencing higher values for all variables than the reported mean for the sample period. Notably, all variables in the study exhibited highly significant Jarque-Bera (J-B) values (again, except for LIQ), indicating that the probability distribution of the sample for all variables is not normally distributed, which suggests a heterogeneous pattern of variables during the study period.

In our study, we use pooled EGLS (cross-section weight) to estimate our above models. The estimation results of the lending model in equation (1) are reported in Table 2 below.

**Table 2. Results of the LOAN Model**

| Regressor | Coefficient | t-ratio | Prob. | R <sup>2</sup> | Adjusted R <sup>2</sup> | Calculated F | Prob. |
|-----------|-------------|---------|-------|----------------|-------------------------|--------------|-------|
| ROA       | 3.016       | 2.871   | 0.007 | 0.50           | 0.32                    | 2.68         | 0.012 |
| CAR       | -1.340      | -1.666  | 0.105 |                |                         |              |       |
| NPL       | -0.344      | -0.552  | 0.585 |                |                         |              |       |
| Constant  | 0.290       | 1.960   | 0.059 |                |                         |              |       |

**Source:** Authors' calculations.

The findings in Table 2 show that the estimated relationships are statistically significant at the 1% level, as indicated by the F-statistic value of 2.68. Furthermore, the R<sup>2</sup> value, which measures the overall goodness of fit for the estimated model, is satisfactory, demonstrating that 50% of the variations in the LOAN of selected banks in the UAE can be attributed to changes in ROA, CAR, and NPL. These results indicate that return on assets (ROA) positively influences loan growth, as expected. Specifically, ROA has a positive coefficient of 3.016, meaning that for every unit increase in ROA, loan growth increases by approximately 3.016 units. The

significant positive effect of Return on Assets (ROA) on loan growth may stem from efficient asset utilization: a higher ROA implies that a bank is effectively leveraging its assets to generate profits. This efficient asset management often enhances confidence among stakeholders, such as investors and depositors, which can improve the bank's capacity to attract more funds and subsequently boost lending.

The coefficient of CAR indicates that for every unit increase in CAR, loan growth decreases by about 1.340 units, which shows a negative relationship between CAR and loan growth, contrary to what one might expect. The Capital Adequacy Ratio (CAR) measures a bank's capital with its risk-weighted assets. A higher CAR suggests that the bank has more capital to absorb potential losses, which is typically seen as a positive for stability. However, this can negatively affect loan availability for several reasons. First, banks with higher CARs may have less capital to lend since a significant portion of their assets is allocated to capital reserves. Second, to uphold a high CAR, banks might need to impose higher interest rates on loans to offset the increased capital requirements, making borrowing more costly. Lastly, banks with elevated CARs may adopt a more risk-averse stance, opting to invest in safer, lower-yield assets instead of providing loans, particularly to risky borrowers.

The NPL (Non-Performing Loans) coefficient stands at -0.344, which means that for every unit increase in NPL, loan growth decreases by about 0.344 units. This indicates a negative correlation between NPL and loan growth, as expected. The t-ratio is -0.552, suggesting that this coefficient is probably not statistically significant. A rise in NPL levels suggests that the bank is dealing with a high volume of poor asset quality, leading banks with substantial capital to reduce their lending. It's important to recognize that a higher NPL increases the likelihood that banks will limit lending to mitigate credit risk. As the quality of loans deteriorates, banks tend to cut back on lending even further, while NPLs diminish asset values, resulting in a decline for the banks. Institutions burdened with numerous bad loans strive to maintain their capital adequacy ratio (CAR) to offset the falling asset values. To address the issue of rising bad loans and risky investments, additional capital injections are necessary (Kim & Sohn, 2017). Our findings indicate that NPL negatively impacts LOAN, aligning with the results of (Hou, 2005), (Tomak, 2013), and (Pratama, 2019), while contrasting with the research of (Berger & DeYoung, 1997) and (Lis, Pagés, & Saurina, 2001). To summarize: ROA has a positive and significant effect on loan growth, while CAR has a negative impact, though its significance is marginal. NPL also negatively affects loan growth, but it is not statistically significant.

The estimation results of the determinants of NPL are reported in Table 3 below. Both Return on Assets (ROA) and Return on Equity (ROE) are crucial metrics for evaluating a bank's performance, but they focus on different aspects. Return on Assets (ROA) indicates how effectively a bank uses its assets to generate profits, whereas Return on Equity (ROE) measures profitability with shareholders' equity. Since both metrics assess the bank's performance, we will incorporate one of them into each model.

**Table 3. Results of NPL Models**

| Model   | Regressor | Coefficient | t-ratio | Prob.  | R <sup>2</sup> | Adjusted R <sup>2</sup> | Calculated F | Prob. |
|---------|-----------|-------------|---------|--------|----------------|-------------------------|--------------|-------|
| Model 1 | ROA       | -0.456      | -3.134  | 0.003  | 0.87           | 0.82                    | 18.67        | 0.000 |
|         | CAR       | -0.134      | -1.007  | 0.321  |                |                         |              |       |
|         | LIQ       | -0.753      | -2.616  | 0.013  |                |                         |              |       |
|         | Constant  | 0.821       | 2.879   | 0.007  |                |                         |              |       |
| Model 2 | ROE       | -0.086      | -4.404  | 0.0000 | 0.87           | 0.82                    | 18.68        | 0.000 |
|         | CAR       | -0.205      | -1.482  | 0.147  |                |                         |              |       |
|         | LIQ       | -0.761      | -2.656  | 0.012  |                |                         |              |       |
|         | Constant  | 0.843       | 2/976   | 0.005  |                |                         |              |       |

**Source:** Authors' calculations.

The results in Table 3 indicate that the estimated relationships are statistically significant at the 1% level, as shown by the high F-statistic values of 18.67 and 18.68 for the equations of NPL with ROA and ROE as explanatory variables, respectively. The R<sup>2</sup> values, which assess the overall goodness of fit of the estimated models, are also high and identical, demonstrating that 87% of the variations in NPL for the selected banks in the UAE can be explained by the variations in the included explanatory variables. The coefficients of the most explanatory variables in both models are statistically significant, as shown by the high t-ratios. However, the coefficients for the capital adequacy ratio (CAR) in both models do not show statistical significance. As anticipated, the capital adequacy ratio (CAR), return on assets (ROA), return on equity (ROE), and the ratio of liquid assets to total assets (LIQ) hurt the non-performing loans (NPL) of banks in the UAE. This means that increases in CAR, ROA, ROE, and LIQ lead to a reduction in the non-performing loans (NPL) of banks in the UAE.



In summary, higher levels of CAR, ROA, ROE, and LIQ strengthen a bank's capacity to manage risks, boost profitability, and ensure robust liquidity. These elements collectively lead to a decrease in non-performing loans, as banks adopt more cautious lending practices and are better prepared to address any possible loan defaults.

Numerous researchers have explored the relationship between non-performing loans (NPL) and various bank-specific factors. Our findings indicate a negative correlation between profitability indicators, such as return on equity (ROE) and return on assets (ROA), and NPL, which aligns with the studies conducted by Bger & DeYoung (1997), Khan, Siddique, & Sarwar (2020), and Zaidanin (2021). Additionally, the insignificant negative impact of capital adequacy ratio (CAR) on NPL is in line with the results reported by Rahadian & Permana (2021).

## **5. Conclusion**

The analysis of the UAE banking sector reveals complex interactions between bank capital (CAR), lending growth (LOAN), asset quality (NPL), and profitability (ROE and ROA). Our study indicates that ROA positively and significantly influences loan growth, while CAR has a negative effect, although this is only marginally significant. NPL also negatively impacts loan growth, but this effect is not statistically significant. Additionally, we found that ROA, ROE, and LIQ significantly and negatively affect NPL in UAE banks. While CAR is expected to negatively influence NPL, its impact is not significant.

These findings highlight the need for UAE banks to explore alternative income sources and maintain asset quality while managing NPL risks ensuring long-term financial stability. This research aims to bridge the gap among the leading banks in the UAE and contribute to existing literature. The study focuses on the top 10 large national banks in the UAE, and further research is necessary, as this analysis covers a limited timeframe of 5 years (2019 – 2023) and a restricted set of variables. Future studies should address these limitations.

The findings of our study offer valuable insights for policymakers, especially those in the banking sector. Here are the main policy implications:

- **Emphasize Asset Quality:** Since return on assets (ROA) has a positive effect on loan growth, policymakers need to encourage banks to improve their asset quality. This can be achieved through rigorous credit appraisal processes and effective management of bank assets.
- **Tackle Non-Performing Loans (NPLs):** As NPLs have a detrimental impact on loan growth, implementing policies to reduce their occurrence is vital. This could involve enhancing risk management practices, enforcing stricter lending criteria, and streamlining loan recovery processes.
- **Reassess Capital Adequacy Requirements:** The surprising finding that the capital adequacy ratio (CAR) negatively affects loan growth indicates that current capital requirements may be too strict, potentially hindering banks' lending capabilities. Policymakers should consider revisiting these requirements to find a balance between ensuring stability and promoting growth.
- **Encourage Return on Equity (ROE):** Since ROE has a negative influence on NPLs, motivating banks to boost their return on equity through enhanced profitability and efficient capital use can aid in reducing non-performing loans.
- **Support Liquidity Management:** The negative impact of the liquid assets to total assets ratio (LIQ) on NPLs underscores the need for effective liquidity management. Policies that encourage maintaining sufficient liquidity without hindering lending activities can be advantageous.
- **Ongoing Monitoring and Adjustment:** The ever-changing nature of the relationships among these variables calls for continuous monitoring and policy adjustments. This approach helps adapt to evolving economic conditions and ensures the sustained growth and stability of the banking sector.

By focusing on these areas, policymakers can foster a more resilient and growth-oriented banking environment in the UAE.

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**Appendix**

| Banks (Ranking)                            |
|--------------------------------------------|
| (1) Emirates National Bank of Dubai (ENBD) |
| (2) Emirates Islamic Bank                  |
| (3) First Abu Dhabi Bank (FAB)             |
| (4) Abu Dhabi Commercial Bank (ADCB)       |
| (5) Mashreq Bank                           |
| (6) Dubai Islamic Bank (DIB)               |
| (7) Abu Dhabi Islamic Bank (ADIB)          |
| (8) Sharjah Islamic Bank (SIB)             |
| (9) Ajman Bank                             |
| (10) Commercial Bank of Dubai              |