

The Liquidity-Profitability Nexus in Commercial Banks: A Panel Data Study of Selected GCC Countries

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Abstract

This study will investigate the liquidity–profitability dynamics in 20 commercial banks across the Gulf Cooperation Council (GCC) over the period 2014–2023 using random effect analysis from panel data models. The analysis evaluates whether liquidity measured by liquid assets to deposits, liquid assets to total assets, and loan to deposit ratios significantly affect profitability, which is captured by return on assets (ROA). Control variables such as bank size, Inflation and Annual GDP growth are also included in the analysis to ensure that the estimated impact of liquidity and bank specific variables is not biased by broader economic conditions. Growth rate of GDP was found to have a positive and significant effect on profitability of banks at the 5% level, and loans-to-assets (LTA) and deposits-to-assets (DTA) have a positive influence on profitability at the 10% level.

Keywords: Banks, Liquidity, Panel Data, Profitability.

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1. Introduction

The financial stability of banking institutions together with their profit generation has remained a primary focus of research since liquidity management serves as the essential factor in this investigation. The primary function of the banks is to convert short-term deposits into long-term loans and investments. This arrangement puts them at risk to run out of cash, but it also allows them to use cash to generate income. Banks maintain high cash reserves to ensure stability, prevent financial difficulties, and instill confidence in their customers about their savings. However excessive cash can lead to complacency resulting in missed opportunities and reduced profits. The “liquidity–profitability trade-off” remains a recurring concern for regulators and managers and scholars who attempt to achieve both financial stability and sustainable profitability (Bourke 1989; Demirgüç and Huizinga, 1999).

The global financial crisis of 2008 together with the 2014–2016 oil price decline and the COVID-19 pandemic have brought worldwide evaluates the nexus between liquidity and profitability. Banks faced instability because of liquidity shortages which forced experts to analyze how banks allocate their capital for liquidity protection and profitability generation. The Basel III framework established both liquidity coverage and net stable funding ratios which generated more intense discussions about banking liquidity. The banking sector received two different responses to these reforms. The measures aimed to stabilize the financial system. However, banks grew concerned about their ability to lend shrinking profit margins, and higher market competition (Bitar et al, 2018; Moyo et al, 2014).

The discussion becomes more important when viewed through the perspective of GCC. The banking systems in these economies operate with concentrated market structures that combine state control with dual banking systems which consist of conventional banks and Islamic banks. The companies face two main challenges because their business operates under GCC oil price cycles and Jordanian structural changes that affect their operating environment. The area produces liquidity and profitability through environmental elements which researchers analyze to understand the connection between these two factors. Banks function as essential financial institutions which support economic diversification and fiscal adjustments but research into liquidity buffer and profitability relationships within these economies produces conflicting findings (Al Tamimi and Obeidat, 2013; Khan, 2022).

This paper contributes to the existing academic literature by extending prior studies through an analysis of the

liquidity- profitability nexus in GCC banks It offers practical value for regulatory authorities and banking executives by presenting policy-oriented recommendations that highlight how effective liquidity management practices can enhance both financial stability and profitability through various optimization strategies.

2. Literature Review

Kosmidou (2008) analysed 23 Greek banks between 1990 and 2002 to identify the determinants of bank profitability. The results concluded that the use of short-term funding, which reflects liquidity pressure, led to lower profits during the period of European integration.

Dietrich and Wanzenried (2011) studied 372 Swiss banks between 1999 and 2009 to investigate the factors effecting bank profitability. The study incorporated a broad set of bank-specific, macroeconomic, and industry variables, among which liquidity played a key role. The results indicating that liquidity management had a limited role under stable conditions. The findings demonstrate that banks which kept larger liquidity reserves and saw fast deposit increases experienced profit challenges because their interest earnings decreased and their liquid asset holding costs increased. The authors determined that liquidity did not affect bank profits during regular periods, but it became essential during financial stress which supported the idea that profitability follows a cyclical pattern based on liquidity management.

Arif and Anees (2012) examined 22 Pakistani banks from 2004 to 2009 showed that liquidity risk indicators based on funding imbalances and withdrawal pressures led to decreased ROA and ROE which demonstrated the negative effects of precautionary liquidity during financial stress. The study by Haris and his team in 2024 demonstrated that liquidity risk created stronger negative effects on profitability during the COVID-19 pandemic between 2018 and 2021 because the restricted access to funding markets caused major decreases in both ROA and ROE.

Alshatti (2014) performed a study on 13 commercial banks between 2005 and 2012 which revealed that liquidity ratios including liquid assets to deposits and quick ratios produced positive effects on profitability only when they stayed within certain limits while ROA and ROE showed improvement through effective liquidity management.

Elnahass et al (2021) used panel data analysis to identify the impact of pandemic on the stability of global banking using 1,090 banks from 116 countries over the period 2019–2020. The findings showed that funding difficulties and unstable deposits created higher liquidity risk which combined with increasing asset risk to produce a steep drop in profitability. The banks faced a direct conflict between stability and profitability because their precautionary liquidity buffers protected them from systemic shocks but reduced their earnings margins. The study reveals that liquidity risk has an opposite relationship with profitability. This highlights the need to handle liquidity well to maintain financial success.

Dang and Dang (2022) conducted a study on 31 Vietnamese commercial banks between 2007-2019 to investigate how uncertainty including liquidity affects the profitability of the bank. The findings showed that banks facing greater uncertainty tend to hold onto more liquidity. This lowers both net interest margins and ROA unless they compensate for it through fee income. This highlights how liquidity management follows economic cycles.

Al-Matari et al. (2023) conducted research on 70 GCC banks operating between 2000 and 2018 to capture the influence of liquidity management on bank characteristics and profitability. Banks achieve better profitability through proper liquidity management because it allows capital adequacy and asset quality to generate their maximum value. The research shows that liquidity functions as a vital element which protects banking profit margins across the GCC region.

Haris et al. (2024) conducted a study on 37 commercial and microfinance banks to investigate the nexus between liquidity risk and profitability. Profitability, which was represented as return on assets and return on equity, deteriorated when liquidity risk, measured through funding pressure indicators, and credit risk intensified. These findings confirmed that precautionary liquidity during systemic stress can stabilize banks but at the cost of compressed earnings margins.

Al Ghazali and Samour (2024) used fixed effect model to identify the relationship between liquidity and performance using 62 publicly listed banks in the GCC, covering the period from 2007 to 2021. The results indicated that profitability was positively linked with liquidity risk in bank-based financial systems but insignificant in market-based ones.

Alsharif (2024) conducted a study to identify the factors contributing to bank profitability in the GCC region by comparing 38 conventional and 23 Islamic banks over the period 2013–2022. The findings revealed that profitability differences across governance models became sharper in 2020, when liquidity pressures interacted with institutional type to shape returns.

Radovanov et al. (2023) conducted a research study which analysed West Balkan banks from 2007 until 2022 to study how liquidity and profitability interact under different macroeconomic environments. The research demonstrated that economic shocks strengthened the link between liquidity and earnings which shows banks must concentrate on liquidity management during economic downturns to reach better performance.

3. Research Methodology and Empirical Model

3.1 Sample of the Study

The research investigates how liquidity affects profitability by analysing 20 commercial banks, as shown in Table 2, operating in the United Arab Emirates, Bahrain, Oman, Qatar, and Saudi Arabia during the 2014–2023 period.

Table 1. Sample of the Banks

Country / Bank Name	Bank Code
<i>Bahrain</i>	
1- Al Ahli United Bank	AUB
2- Arab Banking Corporation	ABC
3- Gulf International Bank	GIB
4- Bank of Bahrain and Kuwait	BBK
<i>United Arab Emirates</i>	
5- First Abu Dhabi Bank	FAB
6- Emirates NBD Bank	EB
7- Mashreq Bank	Mashreq
8- Commercial Bank of Dubai	CBD
9- United Arab Bank	UAB
<i>Oman</i>	
10- Bank Muscat	BM
11- Bank Dhofar	BD
12- National Bank of Oman	NBO
13- Oman Arab Bank	OAB
<i>Qatar</i>	
14- Qatar National Bank	QNB
15- Doha Bank	DOB
16- Ahli Bank	AHB
<i>Saudia Arabia</i>	
17- National Commercial Bank	NCB
18- Banque Saudi Fransi	BSF
19- Saudi British Bank	SAAB
20- Saudi Investment Bank	SIB

3.2 Data and Methodology

The financial ratios presented in Table 2 were used as dependent and independent variables in the analysis. These ratios were calculated using each bank's annual reports and balance sheets. The macroeconomic variables data

were collected from the International Monetary Fund (IMF) and World Bank websites.

Return on assets (ROA) was the dependent variable indicating the profitability of the banks. Deposits to total assets (DTA) measured banks' reliance on deposit funding, which functions as a cost-effective funding source that stabilizes banks by reducing funding expenses and improving liquidity (Djalilov & Piesse, 2016). Loans to total assets (LTA) function as a measurement tool which shows how banks allocate their resources toward interest-earning assets for lending operations. Banks that lend more money generate higher interest income, but they also face increased credit risk and must set aside larger loan loss reserves. (Bal & Sönmezer, 2021; Flamini et al., 2009).

Table 2: Variable Definitions

<i>Variable</i>	<i>Definition</i>	<i>Code</i>	<i>Expected sign</i>
<i>Dependent variables</i>			
Return on assets	Net profit after tax/Total assets	ROA	
<i>Independent variables</i>			
Loan to asset ratio	Loans/ Total assets	LTA	+
Liquid asset ratio	Liquid assets / Total assets	LIQTA	+
Deposit Ratio	Total deposits / Total asset	DTA	+
Banks Size	Natural logarithms of total assets	BS	±
Inflation	Consumer price index	INF	+
Growth rate of GDP	Annual percentage growth rate of GDP	GDPG	+

Liquid assets to total assets (LIQTA) were employed to represent the liquidity position of banks; while higher liquidity enhances an organization's capability to meet short term commitments, excessive liquidity may lead to lower investment returns compared to loans, which can harm profitability (Goddard et al., 2004; O'Connell, 2023). Bank size (BS) was added to account for potential economies of scale, access to more diversified revenue sources, and stronger negotiating power with fund providers, which can enhance profitability (Goddard et al., 2004).

At the macroeconomic level, the yearly GDP growth rate (GDPG) was used to represent a country's economic growth. This growth is likely to boost bank profits by increasing the demand for loans and financial services (Tan & Floros, 2012). The inflation rate was also included, as its relationship with bank profits depends on whether banks can predict inflationary pressures. When banks expect inflation, they can modify their interest rates to ensure that their income grows faster than their costs. However, unexpected inflation may shrink net margins or lead to higher loan defaults (Perry, 1992; Tan & Floros, 2012).

3.3 Empirical Econometric Model

Following the calculation of the variable's values, the panel regression model was specified as below.

$$ROA = \alpha + \beta_1 LTA_{it} + \beta_2 LIQTA_{it} + \beta_3 DTA_{it} + \beta_4 BS_{it} + \beta_5 INF_{it} + \beta_5 GDPG_{it} + e_{it} \quad (1)$$

Where return on asset is represented as (ROA). LTA, LIQTA and DTA are measuring the liquidity risk. BS representing bank size. INF and GDPG indicating inflation and annual percentage growth rate of GDP. e_{it} represent the error term.

4. Analysis and Findings

4.1 Descriptive Statistics

Table 3 presents descriptive statistics, which indicate that the average ROA for the selected banks stands at 1.2% while bank profitability shows wide differences between institutions with ROA values ranging from -4.5% to 3.6%. The loan-to-asset ratio (LTA) stands at 60.1%, which demonstrates banks dedicate most of their financial

resources to lending activities and the liquid assets (LIQTA) hold an average value of 22.4% which shows banks keep a moderate level of liquidity

Table 3: Descriptive Statistics

Variable	ROA	LTA	LIQTA	DTA	BS	INF	GDPG
N	200	200	200	200	200	200	200
Mean	0.012	0.601	0.224	0.669	16.963	1.649	2.441
Median	0.014	0.619	0.191	0.685	17.241	1.810	2.600
Min	-0.045	0.036	0.047	0.036	8.209	-2.540	-5.910
Max	0.036	0.833	0.537	0.835	20.931	5.000	8.000
Std. Dev.	0.008	0.124	0.121	0.096	2.570	1.520	3.189

The deposit ratio (DTA) stands at 66.9% which shows deposits function as a main funding source and bank size (BS) spans a wide range because log total assets stretch from 8.2 to 20.9 The macro level data shows inflation (INF) maintains an average value of 1.65% while GDPG reaches 2.44% yet both indicators show substantial fluctuations which produce negative numbers during certain periods thus revealing how economic instability affects bank results.

4.2 Correlation Matrix

The correlation matrix among the variables, presented in Table 4, indicates that multicollinearity is not an issue, as all the values fall within the accepted range.

Table 4: Correlation Matrix

Correlation	ROA	LTA	LIQTA	DTA	BS	INF	GDPG
ROA	1						
LTA	0.1765*	1					
LIQTA	-0.1456	-0.6710*	1				
DTA	0.2367*	0.5566*	-0.3575*	1			
BS	0.2295*	0.1631	-0.1834	-0.0478	1		
INF	0.0833	-0.0522	0.0782	-0.0422	0.2840*	1	
GDPG	0.2642*	-0.0253	0.0046	0.2631*	0.0156	0.4860*	1

* Denotes significance at 10% level

The correlation matrix shows that ROA maintains positive relationships with most explanatory variables while GDP growth shows the strongest correlation at 0.2642 and Deposits-to-Assets ranks second at 0.2367 although all correlations stay within low ranges. The independent variables reveal that Loans-to-Assets share their strongest relationship with Liquidity-to-Assets at -0.6710 although this value remains under the 0.80 threshold which typically indicates multicollinearity issues. The data shows a moderate relationship between Deposits-to-Assets and Loans-to-Assets at 0.5566 which falls inside the accepted range. The analysis indicates that multicollinearity does not create major problems for this dataset, so the regression model produces trustworthy coefficient values.

4.3 Selecting the Appropriate Model

Breusch-Pagan–Lagrangian multiplie test was conducted to identify whether random effects model or pooled OLS regression should be selected. The result shows that random effect regression is more appropriate for the analysis. After, Hausman test were employed to choose between random effects and fixed effects regression. The Prob of the test is 0.1845 which is above 5% threshold, which indicates that random effect model should be used in the study

Table 5: Statistical Tests

Test Name	chibar2 (01)	Prob > Chibar2
Breusch–Pagan–Lagrangian multiplier	119.9520	0.000
Hausman test	8.811116	0.1845
LR Heteroscedasticity test	186.3526	0.000
Wooldridge test	33.247	0.000

Additionally, the Cross-section LR test was conducted to determine the presence of heteroscedasticity. The test result was below the 5% significance level, indicating that heteroscedasticity existed in the model. Serial correlation was also detected, as the Wooldridge test produced a p-value of zero as shown in Table 5. To address both issues, the Panel Corrected Standard Errors (PCSE) method with cross-section SUR adjustment, proposed by Beck and Katz (1995), was applied. This approach provides robust standard errors that remain consistent in the presence of contemporaneous correlation and heteroscedasticity across panels.

5. Results and Discussion

The regression findings from Table 6 demonstrate that ROA is influenced by key factors, while other variables show no significant impact. The annual GDP growth rate (GDPG) shows a positive and statistically significant effect at the 5% level, suggesting that stronger economic growth enhances banks' profitability by stimulating loan demand and overall financial activity. These results are consistent with the findings of Petria et al. (2015), Al-Ghazali et al. (2024), and Trujillo-Ponce (2013), who reported a positive relationship between GDP growth and bank profitability.

Table 6: Regression Results

Dependent Variable: ROA				
Method: Panel EGLS (Cross-section random effects)				
Sample: 2014 2023				
Periods included: 10				
Cross sections included: 20				
Total panel (balanced) observations: 200				
Cross-section (PCSE) standard errors & covariance (d.f. corrected)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LTA	0.014016	0.008058	1.739297	0.0836
LIQTA	-0.000391	0.006605	-0.059167	0.9529
DTA	0.011571	0.006482	1.784976	0.0758
BS	0.0000253	0.000233	0.108655	0.9136
INF	-0.000416	0.000426	-0.977099	0.3297
GDPG	0.000749	0.000300	2.496046	0.0134
C	-0.005111	0.006445	-0.792974	0.4288
Effects Specification				
			S.D.	Rho
Cross-section random			0.005507	0.4349
Idiosyncratic random			0.006278	0.5651
Weighted Statistics				
Root MSE	0.006212	R-squared	0.187753	
Mean dependent var	0.004249	Adjusted R-squared	0.162502	
F-statistic	7.435408	Prob(F-statistic)	0.000000	

The loan to assets (LTA) and deposit to asset (DTA) ratios both show a positive impact on ROA at the 10% significance level. This means banks that have more loans in their asset portfolios and depend more on deposits for funding make more money. These results match what Doğan (2023) and Trujillo-Ponce (2013) found. They found that a bigger loan base and steady deposits contribute to improved financial performance.

By contrast, liquidity assets to total assets (LIQTA), bank size (BS), and inflation (INF) were found not to have

any significant impact on ROA. The model fit is moderate, as the adjusted R^2 equals 0.1625.

6. Conclusion

Commercial banking has evolved from its conventional financial intermediary position into a highly dynamic technology-based industry which serves as the fundamental base of the worldwide financial system. The operational scope of commercial banks extends beyond their base activities of deposits and credit services to include payment systems management and their position as financial stability providers alongside technological innovation drivers and regulatory compliance partners. Banking institutions face strategic adjustments due to fast digitalization and competitive pressures from fintech and BigTech firms and stricter capital and liquidity rules that require them to improve efficiency through modern technology adoption while preserving their profitability and stability.

This research presents essential information for banks when they develop their strategic plans. The research indicates banks must control their credit expansion and develop their deposit base as fundamental steps for profit growth and stability. The right balance between maintaining sufficient cash reserves and pursuing higher earnings must be established. The synchronization of lending and deposit development strategies with economic growth periods enables banks to benefit from favorable market circumstances. The research demonstrates that GCC bank profits emerge from economic expansion instead of cash holdings, inflation levels, or bank size.

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