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The Impact of Cash Liquidity and Financial Leverage on The Performance of Iraqi Banks: A Comparative Study Between Islamic and Conventional Banks

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Abstract:

Degree of financial leverage refers to the percentage of bank assets financed through debt, which banks must employ to achieve returns and cover costs, as well as the availability of cash at maturity. Therefore, the problem of the study arises in how the indicators of leverage and cash liquidity affect the indicators of financial performance in the Iraqi banking sector. That is why the study aims to use econometrics to demonstrate the impact of leverage and cash liquidity on the financial performance indicators represented by return on assets (ROA) and net profit margin (NPM) for a sample of 38 conventional and Islamic banks for the period 2010-2022. The Dynamic Panel Data methodology was used to determine the relationship between variables, which combines time series and cross-sectional, precisely the generalized moment method (GMM). Results show that financial leverage negatively and significantly impacts ROA and NPM indicators in the total sample and Islamic and conventional banks, except for the positive relationship with ROA in conventional banks. The results also showed the positive impact of cash liquidity on ROA and NPM indicators in the total sample and Islamic and conventional banks, except for its negative impact on ROA indicators in conventional banks. The results also showed the negative impact of the cash credit (cash credit to total assets ratio) on ROA and NPM indicators in the total sample and Islamic and conventional banks.

Paper type: Research paper

Keywords: Financial leverage, Cash Liquidity, Banking Performance, Profitability, Panel Data, GMM.

1. Introduction:

Financial leverage is a source of external financing and the basis of banking, on which banks rely to finance their assets, which is costly and, at the same time, of great importance to the banking sector. Therefore, bank assets are a mixture of debt and equity, and debt may account for some banks' most significant percentage of total assets. Leverage costs are represented by the debit interest paid by conventional banks to the owners of these funds, called investment returns in Islamic banks. On the other hand, high debt indicates financial obligations over different deadlines that require cash liquidity. Although cash liquidity represents banking security in paying obligations in a limited time, an increase or decrease in liquidity compared with the bank's obligations leads to a financial situation that has an unfavorable impact on banking returns and depositor confidence.

The absence of a globally agreed-upon regulation in determining leverage levels has led some banks to raise leverage levels and reduce bank capital to a minimum. Increases in leverage increase the risk for financial intermediaries (banks) because they are obligated to repay the money they borrow regardless of its actual performance. Therefore, bank management must balance expected profits and risks to maximize the return on assets through borrowed funds.

Literature review:

Many studies have discussed leverage and cash liquidity and their impact on banking performance, we will discuss some of these studies as follows:

Ferrouhi (2014) studied the impact of bank liquidity risks on financial performance of the banking sector in Morocco from 2001 to 2012. Liquidity risk included 6 indicators (Liquidity on Assets, Liquidity on short term liabilities, Liquidity on deposits, Loans on Assets, Loans on deposits and short-term liabilities, Financing gap on Assets, while four indicators of financial performance were used (Return on Assets, Return on Equity, Return on Average Total Assets, Net Interest Margin). The estimation results proved the significant and negative impact of both liquid assets to deposits and loans to deposits on the return on assets index.

Onyenwe and Glory (2017) examined the impact of financial leverage on the performance of 13 Nigerian banks during 2006–2015. The financial leverage measures were the debt ratio (liabilities to total assets), Debt on equity and Interest coverage rate, while the performance indicators were return on assets, size (the natural logarithm of total assets) and liquidity (current assets on current liabilities). The results showed that financial leverage had a positive effect on profitability, whereas there were no significant effects on liquidity and size.

Majumder (2018) investigated the impact of capital requirements on banking performance in Bangladesh. The sample included 30 banks from 2000 to 2015. Used two types of capital measures: conventional capital and capital adequacy. The pre-tax return on assets index was adopted for banking performance. The results of estimating unbalanced panel data revealed the positive effect of capital on the banking performance index. The study also found a positive impact of the control variable represented by the liquidity ratio (loans to total assets) on bank performance.

Maduwanthi and Morawakage (2019) Showed the impact of liquidity risk on financial performance using panel data for six systemically important banks in the Sri-Lankan financial system for the period 2006-2016. The estimation results reveal that liquidity risk represented by the ratio of deposits to total assets, cash reserves to total assets, and the liquidity gap has a negative and significant effect on the return on average assets and the return on average equity, whereas the ratio of deposits to total assets positively affects the net interest margin for commercial banks.

Al-Imam and Hassan (2019) measured and analysed the impact of liquidity in the Industrial Bank of Iraq on the bank's financial performance (Return on Assets) for the period 2008-2016. The most important findings of the study are the lack of relationship between Return

on Assets index and the liquidity index measured by the bank's cash balance and its reliance on incidental revenues (investments and remittances).

Al-Waeli and Al-Zubaidi (2019) discussed the effect of financial leverage indicators on the profitability indicators of the Iraqi Islamic Cooperation Bank for the period 2015-2018. The study found a positive relationship between the financial leverage ratio and profitability indicators.

Sathyamoorthi et al. (2020) revealed the impact of liquidity management on the financial performance of 9 commercial banks in Botswana for period 2011-2019. Using indicators of return on assets and return on equity to measure financial performance, while using the loan on deposit, loan on assets, liquidity on assets, and liquid assets-to-deposits to measure liquidity management. The estimation results showed a positive and significant relationship between the Loans on Assets and Liquidity on Assets with the revenue on assets and the revenue on equity. The results also showed a negative and significant relationship between the ratio of loans to deposits and the ratio of liquid assets to deposits with the revenue on assets and the revenue on equity.

Mennawi (2020) researched the impact of liquidity risks, credit, and leverage on the financial performance (Return on assets and net profit margin) of 13 Islamic banks in Sudan for the period 2008 - 2018. The independent variables included credit risk, which is measured by the ratio of non-performing loans (non-performing financing) to total loans (financing) and the provision for loan losses (financing) to total loans (financing), liquidity risk includes cash to total deposits, liquid assets to total assets, and total loans (financing) to total deposits. In addition to financial leverage (total debt to equity). The estimation results showed that credit risk and financial leverage have a negative and significant effect on financial performance indicators, whereas liquidity risk indicators have an insignificant effect, except for the positive impact of liquidity on assets index on financial performance indicators.

Shaik (2021) discussed impact of financial leverage and capital on profitability of five Saudi banks selected based on their size for total assets during 2014–2019. Profitability included three indicators, namely earnings per share, return on assets, and return on equity, as dependent variables. The independent variables included the total debt ratio, capital adequacy, the debt-to-equity ratio, and bank size as control variables. The results showed a positive relationship between various profitability indicators and debt on equity ratio index. The total debt index is positively associated with the return on assets, whereas it is associated with a negative, non-significant relationship with earnings per share and the return on equity. The capital adequacy ratio is positively correlated with returns on asset and equity.

Khasawneh (2021) discussed the impact of the leverage index measured by capital structure (equity on assets) on the performance of the banking system (return on assets, return on equity, and net interest margin) in the Gulf Cooperation Council countries (GCC). The study sample included 67 banks from the GCC countries (Saudi Arabia, the United Arab Emirates, Bahrain, Kuwait, Oman, and Qatar) for the period 1996-2016, including 46 conventional banks and 21 Islamic banks. With unbalanced panel data methodology, the study found that there is a positive and significant relationship between the capital structure index and performance measured by return on assets and return on equity. This positive relationship indicates that a higher equity ratio or lower financial leverage enhances the performance of banks in GCC countries.

Uddin (2022) studied the impact of financial leverage (debt-to-equity ratio), non-performing loans, and capital adequacy ratio on the profitability of ten commercial banks in Bangladesh from 2017 to 2020. The results of the study showed that financial leverage has a negative and insignificant impact on profitability. Regarding the capital adequacy ratio, the results demonstrated a positive and significant impact on profitability.

Omar and Ali (2022) analysed the effect of leverage on the banking profitability of five Iraqi banks during the period 2014-2020. The independent variables were the debt ratio and loan-to-equity ratio, whereas the dependent variables were the return on assets and the return on

equity. According to the estimation results included in the research, the relationship between financial leverage and profitability is not proven.

The problem of the study revolves around the question: "What is the impact of financial leverage and cash liquidity on the financial performance in conventional and Islamic Iraqi banks?" Therefore, the study aims to use econometrics to explain the impact of financial leverage and cash liquidity on financial performance in conventional and Islamic banks for a sample that included all banks whose annual reports were available for the period 2010-2022 in the Iraqi banking sector.

1. Material and Methods:

The spatial boundaries of the study are limited to the Iraqi banking sector for a sample of 38 conventional and Islamic banks for the period 2010-2022, and to test the hypothesis that indicates that high financial leverage and low cash liquidity in the asset portfolio lead to decreased banking financial performance indicators, the descriptive approach was used to analyse the conceptual framework of the study variables, and the econometrics approach, specifically the generalized moments method (GMM) for panel data was used to determine the relationship between the variables.

1.1 Financial Leverage:

1.1.1 Concept of Financial Leverage:

Financial leverage can be defined as the proportion of banks' assets that are financed by debt (Oyinloye et al., 2020). It is also the degree to which the bank relies on financing its assets from external financing sources (loans and deposits) as well as the banks' use of other people's funds to achieve returns, which represents the ratio of total liabilities to total assets. The level of efficiency of financial leverage is determined by financial returns (AL-Habashneh, 2022). Although there are tax advantages to using financial leverage to deduct the cost of interest from the pool of taxable profits, and if the cost of this debt is less than the cost of equity, it will make it a preferred source of financing over other sources, However, highly leveraged banks can collapse if they are unable to pay their interest and principal payments. (Arhinful and Radmehr, 2023).

1.1.2 Financial Leverage Indicators :

Financial leverage indicators are financial measures that show the percentage of debts (loans, deposits, etc.) that banks use to finance their assets. The importance of financial leverage emerges from banks reliance on a mixture of equity and debt to finance their operations. Therefore, knowing the size of the debts shows the extent of the bank's ability to repay them at maturity, as the degree of financial leverage is calculated as follows (AL-Habashneh, 2022):

- Debt-to-equity ratio: used to measure the proportion of debt covered by equity. It is considered a measure of financing risks and the bank's ability to repay in the long term. A decrease in this indicator indicates increased security for lenders and depositors.

$$\text{Debt on equity} = \text{Total Debt} / \text{Total equity} * 100$$

- Debt Ratio on total assets: This indicator is considered one of the most important indicators used to measure the percentage of assets that are financed with debt, that is, knowing the amount of debt in banks, and knowing the extent of their ability to repay debts.

$$\text{Debt on total assets} = \text{Total Debt} / \text{Total Assets} * 100$$

- Earnings to Interest Coverage Ratio: This indicator expresses the debt and profitability ratio used to determine the bank's ability to pay interest on its outstanding debts. That is, it is one of the debt ratios that can be used to evaluate the bank's financial position.

$$\text{Coverage Ratio} = \text{Earnings before interest and taxes} / \text{interest expense} * 100$$

1.1.3 Impact of Financial Leverage on Banking Financial Performance:

The concept of leverage and equity plays an important role in the financing decisions of banks. These two financial factors affect banking performance in different ways, which means that the optimal mix between leverage and equity should enhance financial performance (Shaik,

2021). Financial leverage may positively impact banking performance because it can be treated as a tool to discipline banking management (Evgeny, 2015).

While some studies have found a negative relationship, the higher the debt-to-equity ratio, the lower the bank's ability to achieve profitability (Uddin, 2022). Meaning, the higher the ratio of equity to total assets, the greater the stability of the bank (Ayadi, 2019). leverage achieves returns that may be greater than, equal to, or less than the cost of debt, which can be classified as follows: (AL-Habashneh, 2022).

- Good Leverage: The situation in which the return on borrowed funds is greater than the cost of borrowing, which leads to a higher return on assets and return on equity.
- Medium Leverage: The situation in which the return on borrowed funds is equal to the cost of borrowing, which leads to the return on assets and return on equity not changing.
- Reverse leverage: This is a situation in which the return on borrowed funds is less than the cost of borrowing, which leads to a lower return on assets and return on equity.

1.2 Cash Liquidity:

1.2.1 Concept of Cash Liquidity:

The concept of liquidity refers to measuring a bank's ability to meet its outstanding obligations, and banks usually face such obligations by maintaining liquid assets and assets that can be easily liquidated without loss in the value of the asset (Chorafas, 2002). It is considered a qualitative element of financial strength in the banking institution, which is represented by the ability to meet financial obligations when they fall due, and if the bank lacks this ability, it will be in a state of illiquidity (Wieser, 2022). Therefore, liquidity can be defined as the bank's ability to meet its financial obligations when they fall due through the ease of converting assets into cash or its equivalent. (Dolgun and Mirakhor, 2021). In contrast to the above, liquidity risks refer to the difficulty in covering financial obligations, which causes banks' collapse and instability, this appeared in the 2008 global financial crisis (Bouwman, 2013). Liquidity risk refers to an unfavourable financial position resulting from either a decrease or increase in liquidity. Banks must carefully manage these risks to meet liquidity withdrawal requirements (Mennawi, 2020). Liquidity risk also indicates that the bank does not have enough funds to meet obligations when they fall due, even if financial solvency is available. Short-term liabilities usually include demand deposits, which need to be converted into cash on demand, and any failure to do so, or even a rumour that the bank may be having difficulty doing so, will be enough for it to be closed, because the rumors will lead to everyone trying to withdraw money at once, which leads to banks being unable to meet this demand (Howells and Bain, 2008). Liquidity risks in banks often arise because of financing long-term assets through short-term liabilities. Therefore, effective management of liquidity through the balance between cash inflows and outflows is one of the main components of a strong and stable banking system (Sathyamoorthi et al., 2020).

1.2.2 Cash Liquidity Indicators:

Cash liquidity indicators vary according to the literature, as the most important of them can be clarified according to the following ratios (IMF, 2010; Ferrouhi, 2014):

- Liquid assets (cash + balances with the central bank + deposits with banks) to total assets indicates the bank's ability to withstand shocks to its balance sheet.

$$L1 = \text{Liquid assets} / \text{Total assets} * 100$$

- Liquid assets to short-term liabilities (current deposits): refers to the extent of the bank's ability to meet short-term withdrawal requests without facing liquidity problems.

$$L2 = \text{Liquid assets} / \text{Short term Liabilities} * 100$$

- Liquid assets to deposits: The amount of liquid assets that the bank maintains relative to deposits, A high index indicates the bank's ability to confront sudden withdrawals of deposits.

$$L3 = \text{Liquid assets} / \text{Deposits} * 100$$

- Deposits to loans: A low ratio indicates the possibility of liquidity problems in the bank, and perhaps a loss of confidence of depositors in the continuity of its work in the long term.

$$L4 = \text{Deposits}/\text{Loans} * 100$$

- Loans to deposits refers to the ratio of deposits that have been lent to others, meaning the bank's ability to employ deposits, but a high ratio may lead to liquidity risks.

$$L5 = \text{Loans}/\text{Deposits} * 100$$

- Loans to Total Assets: Measures the share of loans in total assets, and when this ratio is high, it means that the bank's liquidity is low.

$$L6 = \text{Loans}/\text{Total assets} * 100$$

1.2.3 Impact of Cash Liquidity on Banking Financial Performance

Lack of liquidity affects banking performance because it leads to failure to meet customer requests for funds on demand (Sathyamoorthi et al., 2020). To cover unexpected payments or liabilities, banks must maintain enough liquid assets on their balance sheet (BANKS, 2005). Although increasing cash liquidity reduces the risks faced by banks, it comes at the expense of profitability (Sidhu et al., 2022). Trade-off Theory explained the trade-off between liquidity and profitability in the banking sector through the conflict of the two aims of achieving good profits and maintaining liquidity, meaning that they cannot be achieved at the same time without one affecting the other. This means that banks must maintain an optimal level of liquidity to achieve a balance between the benefit and cost of holding cash, as excessive levels of liquid funds negatively affect profitability, and low levels of liquidity can negatively affect meeting obligations (Sathyamoorthi et al., 2020). Since banks must be prepared to meet depositors' requests to obtain funds, even if many depositors request their funds at the same time, therefore, bank management must diversify the asset portfolio with a focus on liquidity, but it must not ignore profitability because liquidity conflicts with profitability. For example, more liquid assets produce lower interest rates than less liquid assets (McEachern, 2009). From the above, we note that the liquidity function is a secondary function, which means that it should not be maximized, but rather it should be improved and maintained at a level sufficient to secure payment obligations in the optimal way (Duttweiler, 2009).

1.3 Banking Financial Performance

1.3.1 Concept of Banking Financial Performance

Banking performance is defined as achieving the aims set by the bank within the agreed upon time and at the lowest cost while using available resources. The performance of the banking sector is represented by the profitability achieved by the bank, as well as the competitiveness and quality of services provided to the customer (Hajer and Anis, 2018). The European Central Bank also defines banking financial performance as the ability to generate sustainable profitability that can protect against unexpected losses, enhance capital positions, and help improve future profitability through the investment of retained earnings. Since the ultimate aim of any bank is to preserve wealth and generate profits for its owners, the bank's return on equity must be greater than the cost of equity to create value for shareholders (European Central Bank, 2010). In order to improve banking performance and achieve the highest possible profit, banks require the following concerns (Mishkin and Serletis, 2020):

- Liquidity management: Ensuring that the bank has sufficient cash ready to pay when there are outflows of deposits abroad, meaning that the bank must acquire sufficient liquid assets to meet the bank's obligations to depositors.
- Asset management: Banks should seek to achieve a low level of risk through asset diversification.
- Liability Management: Get funds at a low cost.
- Capital adequacy management: Determining the amount of capital the bank should maintain.

1.3.2 Banking Financial Performance Indicators

Although net income gives us an idea of how well a bank is performing, it does not adjust for the size of the bank, making it difficult to compare the performance of one bank relative to another (Mishkin, 2004). The economic literature uses different measures of banking

performance such as return on assets, return on equity, net profit margin, and net interest margin. The literature also indicates that performance measures can be calculated in different ways, for example, return on assets can be calculated by considering profit before tax, profit after tax, total assets, or average total assets (Majumder and Li, 2018). The most important measures of banking performance, which are formed through mathematical relationships between the various components of the income statement and the balance sheet, can be explained as follows (Mishkin, 2004; European Central Bank, 2010; Hajer and Anis, 2018; Mennawi, 2020):

- Return on assets (ROA): It is the net income divided by total assets, and the ratio indicates the employability of assets and their ability to create a certain level of operational benefits.

$$ROA = \text{Net income} / \text{Total assets} * 100$$

- Return on Equity (ROE): It is one of the most used financial indicators to measure banking performance, and it reveals the amount of profit that the bank makes through the money invested by shareholders.

$$ROE = \text{net income} / \text{equity} * 100$$

- Net interest margin (NIM): It measures the gap between what the bank pays to savers (depositors) and what the bank receives from borrowers as a percentage of total assets, which means it measures the ability of financial intermediation to generate income for banks.

$$NIM = \text{Total interest income} - \text{Total interest expense} / \text{Total assets} * 100$$

- Net Profit Margin (NPM): Net profit or loss divided by total revenue.

$$NPM = \text{Net Profit (after tax)} / \text{Total Revenue} * 100$$

2. Discussion of Results

2.1 Study Methodology

The study used a panel data methodology known as cross-sectional data over time, as it combines time series and cross-sectional, meaning it includes observations on variables from the cross-sectional sample from two or more different time periods (Studenmund, 2017). Panel data is classified into two prominent types. The first is Micro panel data, which includes many individuals that may reach hundreds or thousands with a relatively small number of time periods, often between 2 and 20 observations (day, month, year, etc.) for everyone. The second type is Macro panel data, which includes an average number of individuals, often between 7 and 20, with a larger number of time periods that may extend from 20 to 60 observations per individual (Hansen, 2018). In addition, the nature of this data is either balanced (Balanced Panel Data), in which the time series is equal in all individuals, or unbalanced (Unbalanced Panel Data), in which the time series is unequal (Bjørn, 2017). Due to the nature of the study data (Micro Panel Data), in which the cross-sectional dimension (N) is greater than the time dimension (T), and to obtain unbiased and consistent results, dynamic models are used for this type of data by estimating the generalized method of moments (GMM) (BALTAGI, 2015). Where Arellano and Bond in 1991 proposed the Difference Generalized Moment Method (Difference GMM), and Arellano and Bover in 1995 and Blundell and Bond in 1998 developed the Generalized Moment Method (System GMM), and these estimates are used in the following cases (Roodman, 2009):

- T is small and N is large. This means small periods of time and many individuals.
- A linear functional relationship.
- Dependent variable is dynamic (it takes a time lag and enters it with the independent variables).
- Independent variables that are not strictly exogenous, meaning they are correlated with past and possibly current realizations of the error (Endogeneity).
- Fixed individual effects.
- Heteroskedasticity and autocorrelation within individuals but not across them.

2.2 Data and study sample

Data were obtained from the annual reports of each bank for the period 2010 - 2022. The study sample included 38 banks listed on the Iraq Stock Exchange, 20 of which were conventional (Sumer- United - Ashur- Iraqi Commercial - Iraqi National - Al-Mansour - Gulf -

Baghdad - Babylon - Mosul - Iraqi Credit - Iraqi Investment - Region Trade - International Development - Trans Iraq - North - Iraqi Union - Economy - Iraqi Middle East - Erbil), and 18 of them are Islamic (National - Iraqi - Kurdistan International - Elaf - Gehan- Al-Ataa - Dijlah and Furat - Trust International - International - Zain Iraq - Asia Iraq - World - Al-Qabidh - Iraq Noor - Al-Arabiya - Al-Janoub - Al-Qartas - Al-Mashreq Al-Arabi). To test the hypothesis, the study relied on five variables, three of which are independent variables that express liquidity and financial leverage, and two dependent variables that express financial performance. The variables can be included in the following equations:

$$ROA_{it} = \alpha_{it} + \beta_1 ROA_{it-1} + \beta_2 Liquidity_{it} + \beta_3 Leverage_{it} + \beta_4 LOA_{it} + \varepsilon_{it} \quad (1)$$

$$NPM_{it} = \alpha_{it} + \beta_1 NPM_{it-1} + \beta_2 Liquidity_{it} + \beta_3 Leverage_{it} + \beta_4 LOA_{it} + \varepsilon_{it} \quad (2)$$

Where:

ROA_{it} = Dependent variable of the return on assets model in bank i at time t .

NPM_{it} = Dependent variable of the Net Profit Margin model in bank i at time t .

ROA_{it-1} = Time-lagged for return on assets in bank i at time t .

NPM_{it-1} = Time-lagged for Net Profit Margin in bank i at time t .

$(\alpha_{it}, \beta_1, \beta_2, \beta_3, \beta_4)$ = Coefficients of the constant term and explanatory variables.

$Liquidity_{it}$ = Cash liquidity index (liquid assets on total assets) in bank i at time t .

$Leverage_{it}$ = Financial leverage index (total debt on total assets) in bank i at time t .

LOA_{it} = Bank credit index (cash credit on total assets) in bank i at time t .

ε_{it} = Error term.

3.3 Descriptive statistics of the variables

Table (1) below shows the statistics of unbalanced panel data for the variables used in the study for the period 2010-2022. The first part of the table included descriptive statistics for all banks in the sample, which included 38 Islamic and conventional banks, with a total of 393 observations. The second part of the table included statistics for conventional banks, which included 20 banks with a total of 245 observations. The last part of the table was the statistics of Islamic banks, which included 18 banks with a total of 148 observations.

Table 1: Summary of Descriptive Statistics

Banks Total (38 Banks)					
Variables	Number of Observations	Arithmetic mean	Standard deviation	Minimum	Maximum
NPM	393	-3.896	181.455	-2849.85	70.43
ROA	393	0.874	6.657	-122.49	12.75
Liquidity	393	46.215	22.179	0.82	97.35
Leverage	393	49.299	22.058	1.89	169.58
LOA	393	29.061	19.938	0.02	104.83
Conventional Banks (20 Banks)					
Variables	Number of Observations	Arithmetic mean	Standard deviation	Minimum	Maximum
NPM	245	8.72	118.56	-1512.54	70.43
ROA	245	1.41	1.92	-6.49	8.27
Liquidity	245	46.47	22.05	0.81	97.35
Leverage	245	53.10	16.51	16.47	87.64
LOA	245	30.08	19.15	0.18	104.83

Islamic Banks (18 Banks)					
Variables	Number of Observations	Arithmetic mean	Standard deviation	Minimum	Maximum
NPM	148	-24.79	252.52	-2849.85	66.03
ROA	148	-0.01	10.53	-122.49	12.75
Liquidity	148	45.79	22.45	3.04	93.97
Leverage	148	43.01	27.45	1.89	169.58
LOA	148	27.37	21.14	0.02	99.95

NPM, ROA and LOA denote the Net Profit Margin, Return on Assets and Cash Credit on assets respectively.

Source: Analysis results computed using STATA 17 software.

The table above shows the high value of the standard deviation compared to the arithmetic mean of the NPM and ROA indicators in Islamic and conventional banks, and this is due to the large fluctuation in revenues and then profits in the sample banks. The smallest value of NPM index in conventional banks was -1512% at the North Bank in the year 2021 because of the losses it suffered during the period 2015-2021, with a total of 71.4 billion Iraqi dinars, while the maximum value was 70% at the Erbil Bank in the year 2015. Also, due to the increase in expenses and the decrease in revenues at the Dijlah and Al-Furat Islamic Bank and the erosion of capital due to the losses it has been exposed to since 2017 to exceed the creditors' funds, this led to decline of NPM and ROA indices to the lowest value of -2849% and -122% respectively in 2017, as a result, liabilities exceeded assets and hence the increase of the leverage and LOA indices to 169% and 100% respectively in 2019, which represent the maximum values in the sample of Islamic banks. While the maximum value of the NPM index in Islamic banks reached 66% in 2011 at Elaf Islamic Bank. As for the liquidity index in conventional banks, the minimum value reached 0.8% in 2021 at the Babel Bank, while the maximum value reached 97% in 2020 at the Credit Bank. Also, the minimum value of the liquidity index in Islamic banks was 3% at Al-Ataa Bank in 2022, while the maximum value was 94% at Kurdistan Bank in 2018. As for the leverage index, the maximum value of conventional banks reached 87% at the Baghdad Bank in 2010.

3.4 Multicollinearity

Multicollinearity occurs when an independent variable is associated with one or more independent variables, which reduces the predictive ability of the dependent variable. Methods for detecting the presence of multicollinearity are to calculate correlation coefficients between any two independent variables if they are equal to 0.8 or greater, as well as the Variances Inflation Factor (VIF) if it is equal to 10 or greater (Gujarati and Porter, 2009). The results of the test of the study variables can be explained according to the following table (2):

Table 2: Multicollinearity tests of independent variables

Correlation coefficient matrix						Variances Inflation Factor (VIF)	
Banks Total (38 Banks)							
Variables	NPM	ROA	Liquidity	Leverage	LOA	$VIF = \frac{1}{1-R^2}$	Tolerance = 1/VIF
NPM	1						
ROA	0.8544	1				/	/
Liquidity	0.1639	0.1183	1			1.38	0.725709
Leverage	-0.1167	-0.1564	-0.0123	1		1.06	0.940368

LOA	-0.2004	-0.1546	-0.5139	0.2155	1	1.44	0.692097
Conventional Banks (20 Banks)							
Variables	NPM	ROA	Liquidity	Leverage	LOA	$VIF = \frac{1}{1-R^2}$	Tolerance = 1/VIF
NPM	1						
ROA	0.3852	1				/	/
Liquidity	0.1969	0.1197	1			1.41	0.708071
Leverage	0.1538	0.1955	0.1132	1		1.02	0.983805
LOA	-0.2067	-0.1848	-0.5376	-0.1099	1	1.41	0.708600
Islamic Banks (18 Banks)							
Variables	NPM	ROA	Liquidity	Leverage	LOA	$VIF = \frac{1}{1-R^2}$	Tolerance = 1/VIF
NPM	1						
ROA	0.9695	1				/	/
Liquidity	0.1570	0.1589	1			1.35	0.751241
Leverage	-0.2774	-0.2736	-0.1416	1		1.35	0.740629
LOA	-0.2269	-0.2061	-0.4854	0.4964	1	1.73	0.577682

NPM, ROA and LOA denote the Net Profit Margin, Return on Assets and Cash Credit on assets respectively.

Source: Analysis results computed using STATA 17 software.

The above table shows that the highest correlation value in the correlation coefficients matrix for independent variables was -0.5 between the loan and liquidity index, except for the correlation coefficient between the financial performance indicators (NPM and ROA) exceeded 0.8. We ignore that because they are dependent variables, in addition, they are used in two different models. The value of the variance inflation factor (VIF) for the independent variables shows no inflation in the parameters, as it ranged between 1.02 and 1.73, and the tolerance values (1/VIF) between 0.57 and 0.98. From the above, there is no problem of multicollinearity.

3.5 Dynamic Panel Data Regression Analysis

To test the study hypothesis for Unbalanced Micro Panel Data, the two-step generalized moments method system (Two-Step System GMM) was used in the STATA 17 software. Because of the short time series for the variables, a stationary test was not performed because it required performing a unit root test on panel data of medium size when N is between 10 and 250 and T is between 25 and 250 observations (Baltagi, 2021). To compare conventional and Islamic banks, the equations Return on Assets (ROA) and Net Profit Margin (NPM) were estimated three times, once for the total study sample consisting of 38 banks, once for 20 conventional banks, and once for 18 Islamic banks. The results of the dynamic estimation of the two equations are shown in Table (3):

Table 3: Dynamic Panel-Data Estimation (Two-Step System GMM)

Banks	Total		Conventional		Islamic	
Independent Variables	Dependent Variables					
	ROA	NPM	ROA	NPM	ROA	NPM
L.ROA	0.12***	/	0.67***	/	0.04***	/
L.NPM	/	0.02***	/	0.76***	/	0.32***
[Standard error]	[0.004]	[0.005]	[0.03]	[0.031]	[0.002]	[0.019]
(Probability)	(0.000)	(0.009)	(0.000)	(0.000)	(0.000)	(0.000)
Liquidity	0.02**	0.69***	-0.03***	0.23**	0.03***	0.37**
[Standard error]	[0.007]	[0.193]	[0.009]	[0.086]	[0.009]	[0.171]
(Probability)	(0.015)	(0.000)	(0.006)	(0.018)	(0.001)	(0.033)
Leverage	-0.03***	-0.71***	0.006**	-0.42***	-0.03***	-0.67**
[Standard error]	[0.007]	[0.152]	[0.003]	[12.784]	[0.008]	[0.261]
(Probability)	(0.000)	(0.000)	(0.030)	(0.004)	(0.000)	(0.011)
LOA	-0.03***	-1.20***	-0.03***	-0.69***	-0.04***	-2.24***
[Standard error]	[0.006]	[0.197]	[0.006]	[0.128]	[0.013]	[0.373]
(Probability)	(0.000)	(0.000)	(0.001)	(0.000)	(0.006)	(0.000)
Constant	1.98***	38.2***	2.10***	32.2***	1.04**	55.6***
[Standard error]	[0.510]	[9.485]	[0.662]	[8.747]	[0.489]	[8.715]
(Probability)	(0.000)	(0.000)	(0.005)	(0.002)	(0.034)	(0.000)
Number of Banks	38	38	20	20	18	18
N. Observations	393	393	245	245	148	148
N. Instruments	25	25	19	19	11	15
F-Stas / W. chi ²	424.9	147.3	280.74	2841.7	536.4	4340.4
(Probability)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Arellano-Bond AR1 (Probability)	-1.01	-1.28	-2.95	-1.06	-1.01	-0.96
	(0.311)	(0.199)	(0.003)	0.289	(0.312)	(0.336)
Arellano-Bond AR2 (Probability)	-1.01	-0.80	-1.38	1.02	-0.99	-1.00
	(0.314)	(0.423)	(0.166)	0.308	(0.320)	(0.316)
Sargan test chi ²	50.73	21.05	24.48	53.93	30.37	2.26
Probability > chi ²	(0.000)	(0.394)	0.040	(0.000)	(0.000)	(0.994)
Hansen test chi ²	27.69	25.86	16.46	12.79	7.25	10.44
Probability > chi ²	(0.117)	(0.170)	0.286	(0.543)	(0.299)	(0.402)

NPM, ROA and LOA denote the Net Profit Margin, Return on Assets and Cash Credit on assets respectively.

*, ** and ***denote the level of significance at 10%, 5% and 1%, respectively.

Source: Estimation results computed using Stata 17 software.

Table (3) shows that the time lag of Return on Assets (L.ROA) and Net Profit Margin (L.NPM) in the estimated equations has a positive and significant relationship, and that increasing ROA and NPM in a certain year leads to their improvement in the following year according to the estimation coefficients. This means that dynamic estimation of the equations is appropriate and that achieving profits in conventional and Islamic banks supports banking performance by recycling them and operating them within equity. The Constant of the equations

also proved its positive and significant impact on the two indicators of banking performance in Islamic and conventional banks.

As for independent variables of the study, the estimation results showed the positive and significant impact of the liquidity on banking performance in all equations except for its negative and significant impact on ROA equation for the sample of conventional banks. As the increase in the liquidity by 1% leads to improving and raising the banking performance indicators ROA and NPM by 0.02% and 0.69% respectively in the total sample, and by 0.03% and 0.37% respectively in Islamic banks. While the results showed the negative impact of liquidity on ROA by 0.03% and the positive impact on NPM by 0.23% in conventional banks. The explanation for the positive impact of the liquidity on banking performance is that banks depend on cash liquidity and short-term assets to achieve profits by operating them outside the balance sheet and making profits away from financial intermediation. As for the negative impact of the liquidity on ROA in conventional banks, the explanation for this is that the increase in cash liquidity as a result of the increase in assets led to an increase in profits, but it is less than the percentage of increase in total assets. Therefore, the estimation results showed a negative impact on ROA and a positive impact on NPM.

The estimation results also showed the negative and significant impact of the financial leverage index on banking performance in all equations, except for its positive and significant impact on ROA equation for the sample of conventional banks. As the increase in financial leverage by 1 percent leads to a decline in the banking performance indicators ROA and NPM by 0.03% and 0.71% respectively in the total sample, and by 0.03% and 0.67% respectively in Islamic banks. As for conventional banks, the results showed a positive impact of financial leverage on ROA index by 0.006% and a negative impact on NPM index by 0.42%. The explanation for the negative effect is that the returns of financial leverage are less than its cost, and this is called reverse leverage. While the explanation for the positive impact of financial leverage on ROA index in conventional banks is that the cost of increasing the ratio of equity to total assets is higher than the cost of financial leverage (liabilities to assets). Therefore, the results showed a positive impact of financial leverage on ROA index and negative on NPM index.

The study also showed the negative and significant impact of the cash credit index (LOA) on banking performance in all equations. As the increase in the LOA index by 1% leads to a decline in the banking performance indicators ROA and NPM by 0.03% and 1.20% respectively in the total sample, and by 0.03% and 0.69% respectively in conventional banks, and by 0.04% and 2.24% respectively in Islamic banks. The explanation for this is that the rise in the LOA index leads to a decrease in cash liquidity and thus a decrease in the ability of banks to achieve quick profits. In addition to that, the failure of borrowers to pay their financial obligations to lending banks is one of the main reasons that led to the negative impact of the LOA index on banking performance.

Table (3) also shows the diagnostic tests through which the results can be accepted or rejected. It appears that the number of Instruments in all equations is less than the number of banks, which confirms the compatibility of the conditions of the Instruments used in the estimation. It also shows that the F test has a high significant value, which indicates the strength and significance of the equations. The table also shows the first-order (AR1) and second-order (AR2) autocorrelation tests, because the estimation method is Two-step GMM, we will focus on AR2, as the test is found to be non-significant in all equations and thus accepting the null hypothesis (H0), which indicates that there is no autocorrelation between the errors terms in the equations. The table also shows the Sargan and Hansen test to determine the validity and robustness of the Instruments, as the Sargan Test is relied upon when estimating with one step, and the Hansen Test when estimating with two steps. The null hypothesis (H0) for the two tests indicates that the Instruments are valid instruments uncorrelated with the error term, and that the excluded instruments are correctly excluded from the estimated equation.

The results show that the Hansen test is not significant in all equations, which means accepting the null hypothesis, which indicates the validity of the Instruments. From the above, the estimation results are accepted for all equations, which means that the dynamic estimation is suitable for the two-step generalized moments method system.

3. Conclusion

The descriptive statistics of the study showed a high value of the standard deviation of the banking financial performance indicators Return on Assets (ROA) and Net Profit Margin (NPM) compared to the arithmetic mean, due to the large fluctuation in the profits achieved by the sample banks because they are affected by external variables. The correlation matrix between the independent variables was also analyzed to prove that there is no problem with multicollinearity. Finally, the panel data methodology was used to test the study's hypothesis, which indicates that a high degree of financial leverage and low cash liquidity ratios in Islamic and conventional banks in the Iraqi banking sector led to a decline in banking financial performance. The results show that the financial leverage index (Debt on assets) has a negative impact on banking performance, and this is called inverse financial leverage, in which debt returns are less than costs. This means that high levels of financial leverage in Islamic and conventional banks lead to a decline in profits. The cash liquidity index (the ratio of cash liquidity to total assets) has a positive relationship with banking performance, while the cash credit ratio index (LOA) has a negative relationship with banking performance. This means that increasing the cash liquidity ratio and decreasing the cash credit ratio leads to increased profits thus improving the level of financial performance in the banking sector, meaning that Islamic and conventional banks rely on liquid assets and short-term banking operations to achieve their profits away from financial intermediation. Based on the above, the study hypothesis is accepted. Therefore, the study recommends discipline in managing leverage and cash liquidity in a way that supports profitability and raises banking performance.

Authors Declaration:

Conflicts of Interest: None

-We Hereby Confirm That All The Figures and Tables In The Manuscript Are Mine and Ours. Besides, The Figures and Images, Which are Not Mine, Have Been Permitted Republication and Attached to The Manuscript.

- Ethical Clearance: The Research Was Approved By The Local Ethical Committee in The University.

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أثر السيولة النقدية والرافعة المالية في أداء المصارف العراقية: دراسة مقارنة بين المصارف الإسلامية والمصارف التقليدية

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مستخلص البحث:

تُشير درجة الرافعة المالية الى نسبة الأصول المصرفية التي تم تمويلها من خلال الديون، والتي يتطلب من المصارف توظيفها لتحقيق العوائد وتغطية التكاليف، فضلاً عن توفر النقد في وقت الاستحقاق. لذلك تنبثق مشكلة الدراسة حول كيفية تأثير مؤشرات الرافعة المالية (نسبة الدين الى اجمالي الأصول) والسيولة النقدية (نسبة الأصول السائلة الى اجمالي الأصول) على مؤشرات الأداء المالي في القطاع المصرفي العراقي. تهدف الدراسة الى استخدام القياس الاقتصادي لقياس أثر الرافعة المالية والسيولة النقدية على مؤشري الأداء المالي المتمثلة بالعائد على الأصول (ROA) وهامش صافي الربح (NPM) لعينة شملت 38 مصرف من المصارف التقليدية والإسلامية للمدة 2010-2022. ومن اجل تحديد العلاقة بين المتغيرات تم استخدام منهجية البيانات المزدوجة الديناميكية (Dynamic Panel Data) والتي تجمع بين السلاسل الزمنية (Time series) والمقطعية (Cross-Sectional) تحديداً طريقة العزوم المعقدة (GMM). تظهر النتائج ان الرافعة المالية لها تأثير سلبي ومعنوي على مؤشري ROA و NPM في اجمالي العينة والمصارف الإسلامية والتقليدية باستثناء العلاقة الإيجابية مع ROA في المصارف التقليدية. كما أظهرت النتائج التأثير الإيجابي لمؤشر السيولة النقدية على مؤشري ROA و NPM في اجمالي العينة والمصارف الإسلامية والتقليدية باستثناء تأثيره السلبي على مؤشر ROA في المصارف التقليدية. أيضاً بينت النتائج التأثير السلبي لمؤشر الائتمان النقدي (نسبة الائتمان النقدي الى اجمالي الأصول) على مؤشري ROA و NPM في اجمالي العينة والمصارف الإسلامية والتقليدية.

نوع البحث: ورقة بحثية

المصطلحات الرئيسية للبحث: الرافعة المالية، السيولة النقدية، الأداء المصرفي، الربحية، البيانات المزدوجة، طريقة العزوم المعقدة