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**-RESEARCH ARTICLE-**

# THE IMPACT OF BANK LIQUIDITY ON THE VALUE FOR A SAMPLE OF IRAQI PRIVATE BANKS

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**─Abstract─**

The present study investigates the impact of bank liquidity on bank value based on 15 private banks in Iraq for the period (2010-2024). The Dynamic Panel Autoregressive Distributed Lag (PMG-ARDL) model is used for the analysis, which is based on data from The Iraqi Equity Market and the official websites of the banks sample. The results indicate a stable long run cointegration relationship between bank value and bank liquidity and the control variables (market value, profitability, and bank size). But there is not a statistically significant relationship between bank age and bank value.

**Keywords:** Bank Value, Bank Liquidity, Cointegration, Profitability.

## INTRODUCTION

Bank value is an important measure of financial performance, and it will serve to indicate a bank's ability to create and maintain shareholder value via efficient operations, effective risk management, and the proper financial structure. It is a combination of both internal financial performance and market expectations of future

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profitability and is thus an important indicator in contemporary banking research, especially in an environment of competition and economic instability like the private banking sector of Iraq. A higher bank value is shown by higher share prices, which is a sign of good performance, helps build investor confidence, and encourages further investment, while poor performance leads to lower share prices and lower bank value, and thus lowers investor confidence and discourages further investment (Meini & Chotimah, 2022; Selly, 2024).

The importance of the bank valuation in the measurement of financial performance for Iraqi banks in the specific economic and institutional environment has increased and led to rising interest in the valuation of banks. One of the main factors that influence the worth of a bank is liquidity, meaning the capability of the bank to meet short-term obligations with liquid resources (Dewi & Fachrurrozie, 2021). Insufficient liquidity restricts access to external financing, weakens investor and creditor confidence, and may ultimately lead to solvency concerns that threaten long-term sustainability and reduce bank value (Bhaskara Rao, 2007; Laili & Dalimunthe, 2022). Thus, banks must find a right balance between liquidity and investments in profitable assets. The relationship between liquidity management, business efficiency and bank value is a delicate one, where liquidity shortage and excess liquidity have both negative impacts on bank value, especially in the Iraqi private banks.

## LITERATURE REVIEW

The impact of bank liquidity on bank value is a subject of much debate. One view is that increased liquidity helps to increase investor confidence, increase money-making investment opportunities, and in the end, improve bank value. For instance, (Dewi and Fachrurrozie ,2021) found that liquidity leads to an increase in share prices, thus improving bank value. Likewise, certain studies argue that highly liquid banks even use more of internal resources than external funding, which helps them better pay short-term obligations, and thus, increases investors' confidence in the banks. In the signalling theory approach, good liquidity and financial performance provide positive signals of a bank's financial strength and efficiency and stimulate investors' interest in purchasing shares and, consequently, bank value (Digdowiseiso et al., 2024; Fahmi, 2020). In contrast, other studies argue that excessive liquidity may reduce bank value because idle funds that could otherwise be invested in profitable activities remain underutilised (Selly, 2024). Meanwhile, (Putri & Miftah,2021) found no significant relationship between liquidity and bank value.

The present study fills in some of the gaps in literature. It covers the period 2004 to 2024 and looks at key events that impacted the Iraqi banking sector such as the COVID-19 pandemic, the 2020 exchange-rate adjustment of the Iraqi dinar and the application of the electronic compliance platform during 2023–2024 that added further restrictions to cross-border financial transactions and liquidity management. Furthermore, this

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study is different from the previous ones as it uses dynamic PMG-ARDL model which separates the long-run equilibrium effects of liquidity on the value of banks from the short run adjustments.

## METHODOLOGY

The cross-sectional dependence (CD) test assesses whether cross-sectional units are correlated. Ignoring such dependence can produce biased estimates and weaken statistical inference, making its detection essential for selecting an appropriate estimation approach (Pesaran, 2004). Under this test, the null hypothesis assumes cross-sectional independence, whereas the alternative hypothesis indicates the presence of cross-sectional dependence. Among the available methods, the M. H. Pesaran (2004) CD test is widely applied, particularly when the number of cross-sectional units exceeds the time dimension, making it well suited to the present study. The Pesaran test statistic is expressed as follows (Pesaran, 2004; Sakyi, 2011):

$$CD_{Pesaran} = \sqrt{\frac{2T}{N(N-1)}\left(\sum_{i=1}^{N-1}\sum_{j=i+1}^{N}\hat{p}_{ij}\right)} \qquad (1)$$

$\hat{p}_{ij}$: These are the correlation coefficients between the residuals, and can be expressed in the following form:

$$\hat{p}_{ij} = \hat{p}_{ij} = \hat{p}_{ji} = \frac{\sum_{t=1}^{T} e_{it}e_{jt}}{\left(\sum_{t=1}^{T} e_{it}^2\right)^{1/2}\left(\sum_{t=1}^{T} e_{it}^2\right)^{1/2}} \qquad (2)$$

The null hypothesis is:

$$H_0 = \rho_{ij=}\rho_{ji\ =}\mathrm{COrr}\left(\varepsilon_{jt,}\varepsilon_{it}\right)=0$$
$$\text{For } i \neq j$$

In contrast to the alternative hypothesis, and it is

$$H_0 = \rho_{ij\neq}\rho_{ji\ \neq C\neq 0}$$
$$\text{For } i \neq j$$

Following the CD test, the appropriate unit root procedure is selected based on the presence or absence of cross-sectional dependence. First-generation unit root tests are suitable when cross-sectional independence exists, whereas second-generation tests are required when cross-sectional dependence is detected (M. H. Pesaran, 2004). Unit root testing determines whether the variables are stationary at level, I(0), or become stationary after first differencing, I(1), representing a fundamental prerequisite for cointegration analysis and long-run modelling (B. H. Baltagi,2008). Because first-generation tests produce biased results in the presence of cross-sectional dependence,

second-generation methods provide more reliable estimates (Pesaran, 2004). Among the most widely used second-generation unit root tests are the Cross-sectionally Augmented IPS (CIPS) test proposed by Pesaran (M. H. Pesaran, 2004) and the PANIC (Panel Analysis of Nonstationarity in Idiosyncratic and Common Factors) approach developed by Ng (2004). The CIPS statistic is calculated as the average of the Cross-sectionally Augmented Dickey–Fuller (CADF) statistics and is expressed as follows:

$$\mathrm{CIPS} = \mathrm{N}^{-1} \sum_{\mathrm{i}=1}^{\mathrm{N}} \mathrm{CADF}_{\mathrm{i}} \qquad (3)$$

The Bai and Ng (PANIC) approach evaluates both common and idiosyncratic components of panel data, and its test statistic is expressed as follows:

$$x_{it} = Dit + \lambda_i' F_t + e_{it} \qquad (4)$$

Here, $D_{it}$ denotes a deterministic trend function of order (p), $F_t$ represents a vector of (r) common factors, and $X_{it}$ denotes the observed variable for each cross-sectional unit. Accordingly, the series $X_{it}$ is decomposed into three components: the deterministic component ($D_{it}$), the common factor component ($\lambda_i' F_t$), and the idiosyncratic error component ($e_{it}$), which captures unit-specific effects. Within the factor model framework, panel data comprise numerous idiosyncratic components and a limited number of common factors. A series is considered non-stationary when one or more common factors, the idiosyncratic component, or both exhibit non-stationarity. The common factors ($F_t$) are not necessarily integrated of the same order as the idiosyncratic components ($e_{it}$), as each may follow either I(0) or I(1) processes independently. To examine long-run relationships in heterogeneous panel data, Pedroni (1999, 2000, 2004) introduced several panel cointegration tests. Accordingly, this study employs both the Pedroni and Kao cointegration tests, which account for cross-sectional heterogeneity (Pesaran, 2004).

The regression equation can be expressed as follows (Kasperowicz et al., 2020):

$$= \beta_i \acute{x}_{it} + y_i \acute{z}_{it} + e_{it} \;\; y_{it} \qquad (5)$$

where $y_{jt}$ it is the dependent variable, i = 1, ..., N represents the cross-sections, t represents time, $X_{it}'$ represents the first-order integrated or stable independent variables, $B_i$ represents the cointegration coefficients, ($z_{it}'$) it represents the variables that represent the constant effects of the cross-sections and time, $y_{jt}$ it represents the ($z_{it}'$) coefficients, and $e_{it}$ it represents the random error.

Given the cross-sectional dependence and dynamic interactions among the variables, this study employs the Pooled Mean Group Autoregressive Distributed Lag (PMG-ARDL) model developed by Pesaran (1995), Pesaran and Smith (1997), and further discussed by Gligorić et al. (2018). The PMG-ARDL approach efficiently estimates

both short-run and long-run relationships in panel datasets with relatively large cross-sectional and time dimensions. This model assumes that the underlying series exhibit integration of order zero I(0) or I(1), but not I(2). Compared with conventional linear panel regression models, the PMG-ARDL estimator accommodates heterogeneity in short-run dynamics while imposing homogeneity on the long-run coefficients, thereby providing more reliable long-run estimates. The dynamic PMG-ARDL model is specified as follows (Gligoric et al., 2018), (H. Lee et al., 2024) :

$$y_{it} = \sum_{j=1}^{p} \lambda_{ij}\, y_{i,t-j} + \sum_{j=0}^{q} \delta_{ij}' X_{i,t-j} + \omega_i + \varepsilon_{it} \qquad (6)$$

## DESCRIPTION OF SAMPLE AND VARIABLES

The PMG-ARDL model was employed to examine the effect of bank liquidity on bank value using panel data from 15 Iraqi private banks listed on the Iraq Stock Exchange (see Appendix 1). In addition to the main explanatory variable, four control variables were incorporated based on prior literature, as presented in Table 2. Bank liquidity was measured using the current ratio, a widely adopted proxy in banking research. The natural log of the current ratio was used to increase the homogeneity of data and to decrease skewness. This is the ratio of current assets to current liabilities, and it is intended to show the ability to pay current liabilities from current assets. It reveals the short term liquidity position rather than the overall financial health of the bank and depends largely on the ability of the liquid assets of the bank to be converted to cash (Farag et al., 2013; Loredana, 2012).

Bank value was calculated using Tobin's Q, a widely cited measure of the market's valuation of banks which had good explanatory power for differences in the operational efficiency, managerial performance, risk management, and ability to raise capital among banks. It also reflects a bank's capacity to add value to the markets, beyond book value, which is a suitable proxy in bank valuation (Hejazi,et al, 2016).

The following equation presents the calculation of Tobin's Q ():

$$Tobin's\ Q = \frac{(Market\ value\ of\ total\ assets)}{the\ book\ value\ of\ total\ assets}$$

Where:

Tobin's Ratio Q = Q to Tobin's Ratio

**Table 1: Variables used in the Standard Model**

| Variable Name | Symbol | Semantics | Relationship Type | Reference |
|---|---|---|---|---|
| Bank Liquidity | X1 | Independent Variable | Direct | (Digdowiseiso et al., 2024; Fahmi, 2020; M. Jihadi, 2021) |

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| | | | | |
|---|---|---|---|---|
| Profitability | X2 | control variable | Direct | Bon, S. F., & Hartoko, S. (2022) |
| Bank Size | X3 | control variable | Direct | (Sadaa et al., 2023; Shijie Wu, 2023) |
| Bank Age | X4 | control variable | Direct | (Abdi et al., 2022; D'Amato & Falivena, 2019) |
| Market Capitalization | X5 | control variable | Direct | (Sareewiwatthana & Wanidwaranan, 2019) |
| Bank Value | Y | Dependent Variable | | (Jesús de la Fuente et al., 2022; Hejazi,et al, 2016) |

**Source:** Prepared by the researchers.

## RESULTS

The PMG-ARDL model was used to analyze the impact of bank liquidity on bank value for the sampled banks, as shown in Appendix 1 and 2, using annual panel data for the 14 years 2010-2024. This analysis started by testing the cross-sectional independence of variables adopted from the Pesaran (2004) CD test which shows the presence of cross-sectional dependence. The results of the tests are reported in Table 2.

**Table 2: Pesaran's (CD) Test for the Independence of Cross-Sectional Time Series**

| Null Hypothesis: No Cross-Section Dependence | | | |
|---|---|---|---|
| Sample: 2010 to 2024 | | | |
| Periods: 15 | | | |
| Cross-Sections :15 | | | |
| Total Panel Observations: 225 | | | |
| Test | Stat. | d.f. | Prob. |
| Breusch-Pagan LM test | 175.8702 | 105 | 0.0000 |
| Pesaran Scaled LM test | 3.855412 | | 0.0001 |
| Bias-Corrected Scaled LM test | 3.319698 | | 0.0009 |
| Pesaran CD test | 1.433882 | | 0.1516 |

**Source:** Compiled by the researchers based on the data in Appendices (1, 2) using Eviews 12 software.

Table 2 reports the results of the Pesaran CD test. The LM statistics are statistically significant ($p < 0.01$), indicating the presence of cross-sectional dependence. Accordingly, the null hypothesis of cross-sectional independence is rejected in favour of the alternative hypothesis. Although the Pesaran CD statistic is not statistically significant ($p > 0.05$), the significant LM test results provide sufficient evidence of cross-sectional dependence. Consequently, second-generation panel unit root tests are adopted in the subsequent analysis.

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### Testing the Stability of the First Differences

Because most study variables exhibit cross-sectional dependence, first-generation panel unit root tests, such as the Levin–Lin–Chu (LLC) and Im–Pesaran–Shin (IPS) tests, are inappropriate, as they may produce biased results. Consequently, this study employs second-generation unit root tests. Table 3 presents the results of the two widely used second-generation tests, namely the PANIC and CIPS tests. After first differencing, all variables become stationary, confirming that they are integrated of order one, I(1), and satisfying the prerequisite for the subsequent estimation procedures.

**Table 3: Results of the Second Generation of Stability Tests**

| | **Stat.** | **T-Stat** | **P-Value** |
|---|---|---|---|
| X1 | CIPS | -3.4905 | <0.01 |
| | Truncated CIPS | -3.09464 | <0.01 |
| X2 | CIPS | -4.49774 | <0.01 |
| | Truncated CIPS | -2.88633 | <0.01 |
| X3 | CIPS | -25.8044 | <0.01 |
| | Truncated CIPS | -3.30932 | <0.01 |
| X4 | Bai and Ng - PANIC | -3.72129 | <0.01 |
| | CIPS | 0.011241 | >=0.10 |
| X5 | CIPS | -3.73651 | <0.01 |
| | Truncated CIPS | -2.73616 | <0.01 |
| Y | CIPS | -2.1904 | <0.10 |
| | Truncated CIPS | -1.72524 | >=0.10 |
| Critical Values: | Level | CIPS | Trunc. CIPS |
| | 1% | -2.568 | -2.548 |
| | 5% | -2.304 | -2.294 |
| | 10% | -2.172 | -2.168 |

**Source:** Compiled by the researchers based on the data in Appendices (1, 2) using EViews software.

### Cointegration Testing of Cross-Sectional Data

Given the mixed order of integration among the variables, the next step is to conduct panel cointegration tests using the Pedroni and Kao approaches, which are widely applied when variables are stationary at both levels and first differences (Akinlo & Olayiwola, 2021; Rahman, 2023). Table 4 reports the Pedroni cointegration results. There is statistical significance at the 5% level for most within- and between-dimension statistics, including the Panel PP, Panel ADF, Group PP, and Group ADF tests.. These findings reject the null hypothesis of no cointegration and confirm the existence of a long-run relationship among the study variables.

**Table 4: Results of the Pedroni Cointegration Test**

| Pedroni Residual Cointegration Test | | |
|---|---|---|

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| | | | | |
|---|---|---|---|---|
| Series: Y X1 X2 X3 X4 X5 | | | | |
| Date: 10/16/25 Time: 23:01 | | | | |
| Sample: 2010 2024 | | | | |
| Automatic Lag Length Selection Based on SIC with a Max Lag of 2 | | | | |
| Newey-West Automatic Bandwidth Selection and Bartlett Kernel | | | | |
| Alternative Hypothesis: Common AR Coefs. (Within-Dimension) | | | | |
| | | | Weighted | |
| | Stat. | Prob. | Stat. | Prob. |
| Panel v-Stat. | -1.642640 | 0.9498 | -3.427979 | 0.9997 |
| Panel rho-Stat. | 2.236950 | 0.9874 | 2.856295 | 0.9979 |
| Panel PP-Stat. | -3.030623 | 0.0012 | -4.862238 | 0.0000 |
| Panel ADF-Stat. | -2.789431 | 0.0026 | -4.680362 | 0.0000 |
| Alternative Hypothesis: Individual AR Coefs. (Between-Dimension) | | | | |
| | Stat. | Prob. | | |
| Group rho-Stat. | 4.218409 | 1.0000 | | |
| Group PP-Stat. | -6.348270 | 0.0000 | | |
| Group ADF-Stat. | -4.034148 | 0.0000 | | |

**Source:** Compiled by the researchers based on the data in Appendices 1 and 2 using EViews software.

To enhance the robustness of the cointegration analysis, the Kao test was also performed. As reported in Table 5, the Kao ADF statistic is significant at the 1% level ($p = 0.0076$), confirming the existence of a long run cointegration relationship among the variables. Therefore, the findings from both the Pedroni and Kao tests consistently support the presence of cointegration among the variables under investigation.

**Table 5: Cao Cointegration Test Results**

| | | | | |
|---|---|---|---|---|
| Kao Residual Cointegration Test | | | | |
| Series: Y X1 X2 X3 X4 X5 | | | | |
| Sample: 2010 to 2024 | | | | |
| Observations: 225 | | | | |
| Trend Assumption : No Deterministic Trend | | | | |
| Automatic Lag Length Selection Based on SIC with a Max Lag of 2 | | | | |
| Newey-West Automatic Bandwidth Selection and Bartlett Kernel | | | | |
| | | | t-Stat. | Prob. |
| ADF | | | -2.429894 | 0.0076 |
| Residual Variance | | | 0.024408 | |
| HAC Variance | | | 0.009620 | |

**Source:** Prepared by the researchers based on data from Appendix (1,2) using Eviews software.

Table 6 presents the estimated long-run and short-run coefficients obtained from the PMG-ARDL model.

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**Table 6: Long-Term and Short-Term Response Estimation According to ARDL**

| Dependent Variable: D(Y) | | | | |
|---|---|---|---|---|
| Method: ARDL | | | | |
| Sample: 2012 to 2024 | | | | |
| Observations: 195 | | | | |
| Maximum Dependent Lags: 2 (Automatic Selection) | | | | |
| Dynamic Regressors (1 Lag, Automatic): X1 X2 X3 X4 X5 | | | | |
| Selected Model: ARDL(2, 1, 1, 1, 1, 1) | | | | |
| Variable | Coefficient | Std. Error | t-Stat. | Prob.* |
| | Long Run Equation | | | |
| X1 | 0.457652 | 0.049280 | 9.286831 | 0.0000 |
| X2 | 0.000541 | 0.000171 | 3.159910 | 0.0020 |
| X3 | -0.004347 | 0.002126 | -2.044395 | 0.0432 |
| X4 | 0.002842 | 0.001870 | 1.519582 | 0.1314 |
| X5 | 0.331194 | 0.044458 | 7.449635 | 0.0000 |
| | Short Run Equation | | | |
| COINTEQ01 | -0.633823 | 0.135809 | -4.667032 | 0.0000 |
| D(Y(-1)) | 0.088033 | 0.110134 | 0.799327 | 0.4257 |
| D(X1) | 0.017642 | 0.294199 | 0.059966 | 0.9523 |
| D(X2) | 0.005803 | 0.005995 | 0.967980 | 0.3351 |
| D(X3) | 0.038648 | 0.018271 | 2.115288 | 0.0366 |
| D(X4) | 0.082239 | 0.049559 | 1.659416 | 0.0998 |
| D(X5) | -0.023479 | 0.128593 | -0.182584 | 0.8554 |
| Mean Dependent Var | 0.000641 | S.D. Dependent Var | | 0.166329 |
| S.E. of Regression | 0.104748 | Akaike Info Criterion | | -1.308502 |
| Sum Squared Resid | 1.261794 | Schwarz Criterion | | 0.361591 |
| Log Likelihood | 257.2065 | Hannan-Quinn Criter. | | -0.634446 |

**Source:** The researchers compiled the table using the data in Appendices 1 and 2 and the EViews software.

The long-run estimates indicate the following:

- Bank liquidity (X1) has a positive and statistically significant effect on bank value (Y). Specifically, a one-unit increase in liquidity raises bank value by 0.45 ($p < 0.01$). This finding is consistent with earlier studies (Digdowiseiso et al., 2024; Fahmi, 2020) and embraces the signaling theory, which suggests that the greater the liquidity, the higher the financial stability and the greater the ability to pay short-term debts. This will, therefore, boost investor confidence, drive up demand for bank stocks and positively affect bank value.
- Profitability (X2) also exerts a positive and significant influence on bank value. A one-unit increase in profitability increases bank value by 0.0005 ($p < 0.01$), consistent with previous evidence(Bon, S. F., & Hartoko, S. (2022)). Higher profitability strengthens investor confidence, attracts investment, and supports higher share prices, thereby increasing market value.
- Bank size (X3) has a negative and statistically significant effect on bank value. The bank value decreases by 0.004 for each additional unit of bank size ($p < 0.05$). It is a result

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that goes against the results of other studies that have shown that assets utilization seems to be positively related with bank size, possibly due to the fact that there is an increase of the volume of underutilized assets, an increase in the administrative costs of the bank in its expansion and staffing, and a decrease in the operational efficiency of the larger banks. Smaller banks, on the other hand, might be more efficient and have lower costs and risk to engage in currency auctions.

- Bank age (X4) has no statistically significant effect on bank value (Y).
- Market capitalisation (X5) positively influences bank value. The results are like previous studies, with a unit rise in the market capitalization resulting in an increase in bank value by 0.33 ($p < 0.05$). The greater the market capitalisation, the more investors believe in the bank and its share prices increase, which will help to improve the value of the bank.

The short-run estimates reveal the following:

- The error correction term is negative and statistically significant ($p < 0.05$), with a coefficient of −0.63, indicating that approximately 63% of short-run disequilibrium is corrected within each adjustment period, confirming convergence towards the long-run equilibrium.
- Bank size (X3) and bank age (X4) have significant short-run effects on bank value.
- Bank liquidity (X1), profitability (X2), The results further reveal that the value of banks in the short-term is not statistically significantly affected by the number of employees (X1) or market capitalisation (X5), which implies that the impact of these factors on bank value is likely to be felt in the long-term, just as banking practices work on the long-term.

## CONCLUSION

The aim of this study was to examine the influence of bank liquidity on bank value, and the PMG-ARDL model was used in this study to analyze the data of the 15 private banks in Iraq for the period of 2010 to 2024. The result shows that bank value can be related to bank liquidity in positive long-run manner which means the banks with better liquidity can easily meet the short-term debt obligations of banks, investors' confidence increases in banks and share value increases. Profitability also works positively by enhancing the returns and attracting investors to the bank. On the other hand, the bank size has a negative long-run effect, which may be attributed to the high cost of operating a bank, inefficiencies, and the less investment opportunities in the Iraqi banking sector. The market capitalisation positively affects bank value, while bank age has no significant effect in the long term. The study proposes to expand the analysis of this research to other sectors in Iraq and to banks in other countries, especially in the Arab region, to be able to do comparisons and more comprehensive evidence.

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## Appendix (1): Liquidity ratios of banks in the research sample

| banks | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | Mean | StDev.P | MIN | MAX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b1 | 56 | 54 | 77 | 71 | 57 | 57 | 55 | 55 | 59 | 145 | 13 | 111 | 99 | 117 | 46 | 71 | 32 | 13 | 145 |
| b2 | 102 | 126 | 123 | 101 | 117 | 132 | 12 | 14 | 104 | 107 | 111 | 109 | 157 | 115 | 116 | 103 | 38 | 12 | 157 |
| b3 | 108 | 116 | 124 | 150 | 174 | 176 | 129 | 104 | 272 | 236 | 176 | 223 | 260 | 255 | 319 | 188 | 66 | 104 | 319 |
| b4 | 105 | 113 | 118 | 120 | 157 | 146 | 134 | 127 | 133 | 138 | 128 | 71 | 223 | 168 | 162 | 136 | 33 | 71 | 223 |
| b5 | 81 | 104 | 181 | 115 | 107 | 104 | 101 | 102 | 98 | 104 | 107 | 105 | 95 | 80 | 86 | 105 | 23 | 80 | 181 |
| b6 | 18 | 25 | 41 | 20 | 4 | 29 | 11 | 12 | 4 | 4 | 19 | 10 | 16 | 13 | 45 | 18 | 12 | 4 | 45 |
| b7 | 211 | 184 | 257 | 265 | 248 | 233 | 284 | 315 | 220 | 254 | 268 | 294 | 93 | 82 | 97 | 220 | 72 | 82 | 315 |
| b8 | 45 | 62 | 54 | 58 | 95 | 96 | 117 | 106 | 70 | 90 | 88 | 258 | 49 | 74 | 46 | 87 | 51 | 45 | 258 |
| b9 | 75 | 89 | 56 | 77 | 75 | 77 | 56 | 65 | 77 | 85 | 99 | 111 | 99 | 93 | 144 | 85 | 22 | 56 | 144 |
| b10 | 51 | 56 | 69 | 79 | 50 | 75 | 97 | 93 | 98 | 51 | 82 | 54 | 74 | 36 | 48 | 68 | 19 | 36 | 98 |
| b11 | 41 | 49 | 44 | 75 | 52 | 43 | 45 | 33 | 20 | 12 | 205 | 32 | 14 | 20 | 27 | 47 | 45 | 12 | 205 |
| b12 | 96 | 101 | 55 | 129 | 152 | 153 | 178 | 175 | 277 | 201 | 208 | 92 | 126 | 218 | 80 | 149 | 59 | 55 | 277 |
| b13 | 160 | 170 | 170 | 175 | 184 | 168 | 210 | 198 | 191 | 169 | 324 | 284 | 420 | 470 | 222 | 234 | 94 | 160 | 470 |
| b14 | 102 | 108 | 121 | 112 | 125 | 137 | 164 | 169 | 199 | 195 | 198 | 177 | 354 | 164 | 283 | 174 | 66 | 102 | 354 |
| b15 | 47 | 53 | 58 | 58 | 59 | 46 | 25 | 31 | 2 | 1 | 12 | 27 | 27 | 2 | 2 | 30 | 22 | 1 | 59 |
| Max | 211 | 184 | 257 | 265 | 248 | 233 | 284 | 315 | 277 | 254 | 324 | 294 | 420 | 470 | 319 | 290 | 72 | 184 | 470 |
| Min | 18 | 25 | 41 | 20 | 4 | 29 | 11 | 12 | 2 | 1 | 12 | 10 | 14 | 2 | 2 | 14 | 11 | 1 | 41 |
| StDev.P | 48 | 44 | 60 | 57 | 62 | 56 | 76 | 79 | 88 | 79 | 90 | 91 | 118 | 116 | 92 | 77 | 22 | 44 | 118 |
| Mean | 87 | 94 | 103 | 107 | 110 | 111 | 108 | 107 | 122 | 120 | 136 | 131 | 140 | 127 | 115 | 114 | 14 | 87 | 140 |

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## Appendix (2): Banking value of the banks in the research sample

| banks | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 | Mean | StDev.P | MIN | MAX |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| b1 | 0.924 | 0.94 | 0.955 | 0.967 | 0.956 | 0.949 | 0.764 | 0.746 | 0.76 | 0.758 | 0.893 | 0.894 | 0.833 | 0.805 | 0.866 | 0.867 | 0.077 | 0.746 | 0.967 |
| b2 | 0.665 | 0.71 | 0.985 | 0.999 | 0.963 | 0.963 | 0.861 | 0.857 | 0.742 | 0.678 | 0.674 | 0.882 | 0.898 | 0.869 | 0.897 | 0.843 | 0.111 | 0.665 | 0.999 |
| b3 | 0.494 | 0.546 | 0.442 | 0.496 | 0.493 | 0.485 | 0.316 | 0.341 | 0.405 | 0.395 | 0.937 | 0.94 | 0.804 | 0.783 | 0.751 | 0.575 | 0.197 | 0.316 | 0.940 |
| b4 | 0.755 | 0.761 | 0.761 | 0.784 | 0.777 | 0.955 | 0.821 | 0.805 | 0.902 | 0.938 | 0.709 | 0.807 | 0.828 | 0.847 | 0.849 | 0.820 | 0.065 | 0.709 | 0.955 |
| b4 | 0.79 | 0.809 | 0.701 | 0.709 | 0.745 | 0.788 | 0.672 | 0.596 | 0.808 | 0.809 | 0.776 | 0.599 | 0.616 | 0.725 | 0.779 | 0.728 | 0.072 | 0.596 | 0.809 |
| b5 | 0.627 | 0.566 | 0.581 | 0.651 | 0.663 | 0.513 | 0.44 | 0.466 | 0.411 | 0.498 | 0.566 | 0.631 | 0.613 | 0.425 | 0.511 | 0.544 | 0.079 | 0.411 | 0.663 |
| b6 | 0.451 | 0.501 | 0.699 | 0.28 | 0.382 | 0.402 | 0.34 | 0.301 | 0.457 | 0.369 | 0.418 | 0.379 | 0.494 | 0 | 0.503 | 0.429 | 0.095 | 0.28 | 0.699 |
| b& | 0.263 | 0.353 | 0.42 | 0.642 | 0.552 | 0.492 | 0.498 | 0.529 | 0.556 | 0.494 | 0.518 | 0.596 | 0.622 | 0.703 | 0.559 | 0.520 | 0.104 | 0.263 | 0.703 |
| b8 | 0.358 | 0.289 | 0.277 | 0.179 | 0.425 | 0.490 | 0.634 | 0.533 | 0.923 | 0.922 | 0.944 | 0.939 | 0.922 | 0.919 | 0.927 | 0.645 | 0.275 | 0.179 | 0.944 |
| b9 | 0.937 | 0.966 | 0.956 | 0.956 | 0.969 | 0.965 | 0.954 | 0.962 | 0.96 | 0.964 | 0.961 | 0.959 | 0.973 | 0.967 | 0.638 | 0.939 | 0.078 | 0.638 | 0.973 |
| b10 | 0.707 | 0.69 | 0.699 | 0.584 | 0.666 | 0.148 | 0.045 | 0.096 | 0.296 | 0.289 | 0.313 | 0.314 | 0.306 | 0.304 | 0.383 | 0.389 | 0.211 | 0.045 | 0.707 |
| b11 | 0.361 | 0.153 | 0.269 | 0.239 | 0.576 | 0.205 | 0.272 | 0.244 | 0.427 | 0.418 | 0.162 | 0.262 | 0.258 | 0.154 | 0.104 | 0.274 | 0.117 | 0.104 | 0.576 |
| b12 | 0.32 | 0.118 | 0.383 | 0.264 | 0.272 | 0.356 | 0.289 | 0.314 | 0.344 | 0.231 | 0.211 | 0.036 | 1.258 | 0.964 | 0.13 | 0.366 | 0.301 | 0.036 | 1.258 |
| b13 | 0.38 | 0.273 | 0.661 | 0.243 | 0.17 | 0.055 | 0.084 | 0.069 | 0.177 | 0.166 | 0.296 | 0.21 | 0.33 | 0.299 | 0.332 | 0.250 | 0.142 | 0.055 | 0.661 |
| b14 | 0.653 | 0.497 | 0.414 | 0.442 | 0.586 | 0.520 | 0.407 | 0.237 | 0.253 | 0.256 | 0.276 | 0.343 | 0.39 | 0.255 | 0.068 | 0.373 | 0.144 | 0.068 | 0.653 |
| b15 | 0.937 | 0.966 | 0.985 | 0.999 | 0.969 | 0.965 | 0.954 | 0.962 | 0.96 | 0.964 | 0.961 | 0.959 | 1.258 | 0.967 | 0.927 | 0.982 | 0.073 | 0.927 | 1.258 |
| MIN | 0.263 | 0.118 | 0.269 | 0.179 | 0.17 | 0.055 | 0.045 | 0.069 | 0.177 | 0.166 | 0.162 | 0.036 | 0.258 | 0.154 | 0.068 | 0.146 | 0.074 | 0.036 | 0.269 |
| StDev.P | 0.213 | 0.26 | 0.233 | 0.275 | 0.236 | 0.297 | 0.271 | 0.268 | 0.255 | 0.267 | 0.277 | 0.3 | 0.278 | 0.275 | 0.287 | 0.266 | 0.022 | 0.213 | 0.300 |
| Mean | 0.579 | 0.545 | 0.614 | 0.562 | 0.613 | 0.552 | 0.493 | 0.473 | 0.561 | 0.546 | 0.577 | 0.586 | 0.676 | 0.632 | 0.553 | 0.571 | 0.048 | 0.473 | 0.676 |

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## Appendix (3): Bank Codes

| Banks | Codes |
|---|---|
| Baghdad Bank | b1 |
| National Bank of Iraq | b2 |
| Commercial Bank of Iraq | b3 |
| Middle East Bank | b4 |
| Al-Mansour Investment Bank | b5 |
| United Investment Bank | b6 |
| Ashur International Bank | b7 |
| Investment Bank | b8 |
| Gulf Bank of Iraq | b9 |
| Mosul Investment Bank | b10 |
| Union Bank of Iraq | b11 |
| Credit Bank | b12 |
| Sumer Commercial Bank | b13 |
| Kurdistan Bank | b14 |
| North Bank for Finance and Investment | b15 |

**Source:** Prepared by researchers