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Banking Crises and the Potential Use of (Camels) Model Indicators for Forecasting Them (An Empirical Study)

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Abstract

The research aims to highlight the importance of the (Camels) model in predicting banking crises, understanding the model's elements, and identifying banking crises, and their causes. The research assumed a positive impact on banks following early warning models to limit or reduce the risks of future banking crises that banks might face in the research sample. The research methodology relied on quarterly data extracted from the financial statements of the research sample banks for the period (2018-2022). These data were analyzed, and then the Vector Error Correction Model (VECM) was used to predict banking crises for the research sample banks. The results of the standard test showed the presence of cointegration among the research variables, confirming the existence of long-term equilibrium relationships. The error correction model results indicated that if the research sample banks were to experience funding gaps and non-performing loan crises, they would not require a long time to return to equilibrium and exit the crisis. However, banks would relatively need more time to recover from a capital adequacy crisis. The prediction results for the research sample banks for the period (2023-2027) showed that the research sample banks would not experience capital adequacy and funding gap crises except in some quarters of the prediction period. It was also observed that Al-Ahli Bank of Iraq and Ashur Bank did not experience non-performing loan crises during the prediction period, unlike Baghdad Bank, as the prediction results showed an increase in the ratio of non-performing loans to assets, reaching up to (13%).

Keywords: *Crises, Camels Model, Banks, Forecasting, VECM.*

INTRODUCTION

Many banks in the 1980s were affected by multiple banking crises in various advanced and developing countries, with different and diverse nature depending on the circumstances of each country and each bank. This created a state of economic imbalance, necessitating attention to these banking crises and attempting to develop early warning indicators for these crises in order to anticipate and predict before the scenario occurs. Early warning is a means to address the emergency events that affect financial stability and the economy in general.

The First Requirement: Understanding and Elements of the Banking Early Warning System (CAMELS)

The (CAMELS) system is essential for evaluating the performance of financial institutions, especially banks, due to their importance in the financial sector [(1)].

The (CAMELS) system is expressed through its six elements: Capital Adequacy (C), Asset Quality (A), Management Efficiency (M), Earnings Quality and Level (E), Liquidity (L), and Sensitivity to Market Risks (S). It operates through a number of financial indicators, and central banks have developed this system to align with the circumstances, with each indicator containing detailed indicators based on the conditions of each country and the banking system it follows, as well as the abundance and quality of published data about the banking sector [(2)] [(3)].

It is known as a system used to evaluate the safety of financial institutions and relies on financial data, budget forecasts, cash flows, employment, and ongoing operations. It assesses the overall condition of the bank and highlights its strengths and weaknesses.

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Elements of the CAMELS banking early warning system [5] [6]

Capital Adequacy, Assets Quality, Management, Profitability, Liquidity, Sensitivity to market risk.

The Second Requirement: Banking Crises

The concept of a banking crisis is complex and characterized by mystery because banking crises vary in nature and evolution depending on the economic system. There are two approaches to defining the concept of banking crises. The first describes banking crises as financial and cash crises, including all types of instability related to financial and cash systems [7]. The second approach describes banking crises as purely financial crises, as the banking sector represents the financial intermediaries and therefore this sector is the most affected in the event of financial crises [8].

It can also be defined as an event that includes three criteria: the first is the presence of a banking mention and banking failure rings, the second is bank suspensions, and the third is the spread of this failure state to include the entire banking system [9].

Banking Crises and Banking Contagion Transmission

Banking crises can spread within and outside the banking sector due to a number of factors, including:

Systemic Risk: It is a sudden unexpected event that disrupts the financial market, It makes it difficult to direct funds to those who have the most profitable investment opportunities, and it has implications for the banking and financial systems as a whole, rather than just one institution, which involves financial pressures that have harmful effects on the real economy [10]. Systemic risks pose a threat to the stability of the financial system, and systemic risks can evolve as a result of a general negative shock that affects all system institutions such as unemployment, inflation, or exposure to changes in interest rates, exchange rates, and market prices [11].

Interbank lending: Bank failures can spread through banks being exposed to risks in the interbank lending market, as the failure of individual banks affects the entire banking system through interbank lending, and factors such as the size of financial institutions and the operation of financial markets between banks and other financial markets determine the likelihood of contagion.[12]

Bank panic: Bank panic is used as a condition to explain the occurrence of systemic banking crises, as the failure of one bank may lead to a reassessment of the viability of other banks, making them susceptible to a run by depositors to withdraw their deposits simply due to the clear similarity between sound banks and failed banks[13].

Causes of Banking Crises

Poor management: The quality of management is one of the most important elements in determining a bank's ability to operate effectively and its financial stability [14]. In contrast, poor management is described as inefficient behavior by bank executives and senior management, manifested in low asset quality, weak control over operating expenses, and profit generation. [15]

Non-performing loans: They are a common factor in banking crises, and the Non-Performing Loans ratio (NPLs) is a measure of credit risk and asset quality in the banking sector, as high credit risks and the conversion of assets into non-performing loans are indicators of banking crises. [16]

Credit concentration: Credit concentration refers to the concentration of lending to one borrower or industry, sector, or geographic concentration, and also includes concentration by type of facility, reserve requirements, investment in corporate bonds, and concentration of lending on the same type of collateral, and concentration of loans with the same maturity. [17]

Mismatch of maturity dates: Banks typically manage mismatch of maturity dates by financing themselves through deposits and other short-term liabilities and investing in assets with longer maturity dates, a process referred to as maturity transformation. [18]

Weak banking regulation and supervision: Some banking crises arise from weak banking regulation and supervision, and due to poor regulation, banks may be vulnerable to shocks that erode their capital, leading to financial crises. (19)

Second demand: Section Three - Measuring and analyzing the impact of (CAMELS) model indicators on banking crisis indicators and **predicting them.**

First: Testing the Stability of Time Series

The test results for the time series of banks in the research sample are as follows:

Table 1. Testing the stability of time series for research variables.

Test (Levin, Lin and Chu)			
Variable	**Test t**	**p-value**	**Integration level**
X1	**-2.34941**	**0.0094**	**I(1)**
X2	**-3.68137**	**0.0001**	**I(1)**
X3	**-3.04320**	**0.0012**	**I(1)**
X4	**-5.65829**	**0.0000**	**I(1)**
X5	**-3.34303**	**0.0004**	**I(1)**
X6	**-3.34908**	**0.0004**	**I(1)**
Y1	**-5.81854**	**0.0000**	**I(1)**
Y2	**-3.79349**	**0.0001**	**I(1)**
Y3	**-4.09679**	**0.0000**	**I(1)**

Source: The researchers prepared the outputs based on Eviews12 program.

Through Table (1), we notice that the time series test according to the (Levin, Lin, and Chu) test for (Camels) model indicators and banking crisis indicators, the test results showed that the time series for all variables are unstable at their original levels. After taking the first difference of these series, we notice their stability whether with a break or no break and direction with a significance level of 1%, 5%, 10%.

Table 2. Common integration test results.

Date: 12/03/23 Time: 09:27
Sample (adjusted): 2018Q4 2022Q4
Included observations: 51 after adjustments
Trend assumption: Quadratic deterministic trend
Series: X1 X2 X3 X4 X5 X6 Y1 Y2 Y3
Lags interval (in first differences): 1 to 2
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	**Eigenvalue**	**Trace Statistic**	**0.05 Critical Value**	**Prob.****
None *	0.955870	474.5762	215.1232	0.0000
At most 1 *	0.858265	315.4244	175.1715	0.0000
At most 2 *	0.790379	215.7808	139.2753	0.0000
At most 3 *	0.687872	136.0957	107.3466	0.0002
At most 4	0.454614	76.71420	79.34145	0.0776

Source: The researchers prepared the outputs based on Eviews12 program.

Secondly: Testing the Common Integration of Research Variables

Looking at Table (2) and after conducting the (Johansen Cointegration Test), we notice that there are (4) common integration vectors as the value of the Trace Statistic is greater than the Critical Value at a significance level less than (5%), indicating the presence of a long-term equilibrium relationship between the study variables.

Table 3. Results of the Error Correction Model.

Vector Error Correction Estimates
Date: 12/03/23 Time: 09:27
Sample (adjusted): 2018Q4 2022Q4
Included observations: 51 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Error Correction:	D(Y1)	D(Y2)	D(Y3)
CointEq1	-0.078	-0.8460	-0.171
	(0.007)	(0.025)	(0.003)

	[-2.986]	[-3.300]	[-5.464]
D(X1(-1))	-0.0012	-1.4877	-0.0145
	(0.036)	(1.176)	(0.014)
	[-0.032]	[-1.265]	[-1.006]
D(X1(-2))	0.0008	-1.4301	-0.0242
	(0.027)	(0.892)	(0.010)
	[0.029]	[-1.603]	[-2.218]
D(X2(-1))	0.0164	-8.5951	0.0655
	(0.105)	(3.377)	(0.041)
	[0.15697]	[-2.54514]	[1.58320]
D(X2(-2))	0.116792	-8.337801	-0.099262
	(0.10864)	(3.49077)	(0.04279)
	[1.07508]	[-2.38853]	[-2.31959]
D(X3(-1))	-0.032654	0.759586	0.019078
	(0.08085)	(2.59785)	(0.03185)
	[-0.40390]	[0.29239]	[0.59906]
D(X3(-2))	-0.117247	3.171051	0.051785
	(0.10704)	(3.43952)	(0.04216)
	[-1.09535]	[0.92195]	[1.22816]
D(X4(-1))	-0.174233	15.74567	0.399516
	(0.30406)	(9.77035)	(0.11977)
	[-0.57302]	[1.61158]	[3.33559]
D(X4(-2))	-0.20109	4.876743	0.174894
	(0.29675)	(9.53544)	(0.11689)
	[-0.67764]	[0.51143]	[1.49618]
D(X5(-1))	-0.034752	1.062652	0.009926
	(0.02907)	(0.93396)	(0.01145)
	[-1.19564]	[1.13779]	[0.86697]
D(X5(-2))	-0.03684	0.819409	0.010856
	(0.02992)	(0.96129)	(0.01178)
	[-1.23145]	[0.85240]	[0.92120]
D(X6(-1))	2.826265	-12.58564	-0.142395
	(1.21284)	(38.9721)	(0.47776)
	[2.33028]	[-0.32294]	[-0.29805]
D(X6(-2))	0.953100	-8.354468	-0.18346
	(1.04039)	(33.4307)	(0.40982)
	[0.91610]	[-0.24990]	[-0.44766]
C	-0.01532	0.594452	0.001108
	(0.01615)	(0.51885)	(0.00636)
	[-0.94880]	[1.14571]	[0.17418]
R-squared	0.428750	0.526833	0.612039
Adj. R-squared	0.047916	0.211388	0.353399

Source: Researcher's calculations based on Eviews12 outputs.

Third: Estimation of Vector Error Correction Model

Referring to Table (3), we notice the following:

1- The impact of the model indicators (Camels) on the sufficiency crisis of capital:

A- The capital adequacy indicator has a negative impact on the sufficiency crisis of capital, where the estimated parameter was (0.0012-) as banks strengthening their capital will protect them from crises.

B- The asset quality indicator has a positive impact on the sufficiency crisis of capital, with the estimated parameter being (0.0164) as an increase in the ratio of non-performing loans to total loans exposes banks to difficulties in recovering a large part of their financial resources granted as loans, negatively affecting the banks' assets, which means erosion of a portion of the bank's capital, which may lead to crises in banks.

T - The management quality index negatively affects the capital adequacy crisis, as the estimated indicator (0.032-) is exceeded, as the increase in the loan-to-deposit ratio works to improve management quality and thus increase the interest rates and profits obtained from the lending process, leading to an increase in bank equity, which prevents banks from being exposed to crises.

H - The bank profitability index negatively affects the capital adequacy crisis, as the estimated indicator (0.17-) is exceeded, where the bank's success in achieving one of its goals, which is maximizing profitability, and with most Iraqi banks opting to retain all or part of their profits rather than distribute them to shareholders, this will

lead to an increase in retained profits, resulting in an increase in equity size, bolstering the bank's financial position and avoiding the possibility of crises, especially those related to capital.

J- The bank liquidity ratio negatively affects the capital adequacy crisis, as the estimated indicator reached (0.034-) because the increase in the volume of liquidity held by banks, whether in the form of cash or liquid assets, is characterized by the ability to convert it into liquidity quickly, meaning raising the protection rate for depositors through the availability of cash resources for cash withdrawal cases on one hand, and also not investing the majority of deposit resources in high-risk assets or long-term loans. Moreover, the availability of a high volume of liquidity protects capital from the possibility of exposure to high risks and significant losses, which reflects a lower likelihood of banks facing a capital adequacy crisis.

H- The market risk sensitivity indicator has a positive impact on the capital adequacy crisis, and the estimated coefficient reached (2.826) because the higher sensitivity of banks to market risks means an increase in the investment volume of these banks in tradable securities (stocks and bonds) or an increase in the risks of the securities themselves that the banks have previously purchased. In both cases, it means an increase in the likelihood of the bank being exposed to capital losses, the severity of which depends on the crisis facing the Iraqi stock market or the company issuing the securities. This will lead to the erosion of part of the bank's capital and thus exposing it to a financial crisis.

It is also noted that the error correction teacher, or what is known as the structural adjustment speed, reached (0.078), which means that errors in the long term can be corrected in the short term by (0.078) and that it needs (3.2) years to return to equilibrium. And because the decision to adjust or increase capital requires the approval of bank boards of directors, banks exposed to this type of crisis require time to get out of the crisis. As for the determination coefficient (R2), it reached (0.42), which explains that (42%) of the changes in the dependent variable are caused by the independent variables, and that (58%) are caused by other variables not included in the model.

2- The impact of the (Camels) model indicators on the financing gap crisis:

A- The capital adequacy indicator has a negative impact on the financing gap crisis, as the estimated indicator reached (1.48-). Increasing the bank's capital will provide flexibility for bank management and diversify sources of financing in granting loans and credit facilities, especially when the majority of the bank's deposits are current deposits, which restrict the bank's management from operating in long-term loans for fear of sudden withdrawals by customers, leading to using part of its capital in the lending process.

B- The asset quality indicator has a negative impact on the financing gap crisis, as the estimated indicator reached (8.595-) when the ratio of non-performing loans increases, bank management will reduce the interest rates and credit facilities granted, fearing a further increase in non-performing loans. This will result in a decrease in the amount of loans compared to deposits, leading to an increase in the size of the gap.

C- The management quality index has a positive impact on the financing gap crisis, as the estimated coefficient reached (0.759). The increase in the ratio of loans to total deposits will reflect in reducing the gap between the size of loans and deposits, thereby reducing the financing gap.

D- The bank profitability index has a positive impact on the financing gap crisis, with the estimated coefficient reaching (15.74). Increasing profits and retaining the majority of them means providing internal financial resources, which can be utilized Re-lending them as loans with different terms means increasing the rate of loans granted by banks compared to their deposits, thus reducing the size of the financing gap.

Bank liquidity index has a positive impact on the financing gap crisis, and the estimated coefficient reached (1.062) which means that when banks have liquidity exceeding the required reserves, bank management seeks opportunities to invest this idle liquidity, leading to lending it with different terms based on the sources of this liquidity, resulting in a decrease in the gap between loans and deposits.

E- The market risk sensitivity index has a negative impact on the financing gap crisis, as the estimated indicator reached (12.585-). The increase in the volume of securities held by banks means directing their resources towards investing in the financial market, especially when stock profits and bond interests are high, leading to a decrease in the volume of loans granted by these banks, which in turn leads to an increase in the gap between loans and deposits. It is also noted that the error correction coefficient, or what is known as structural adjustment speed, reached (0.84), meaning that errors in the long term can be corrected in the short term by a rate of (0.84). It only requires one cycle to return to equilibrium. Such crises can be quickly addressed, as banks' management can use a portion of their capital or borrow from the central bank or other banks to finance the increase in demand for loans if deposits are insufficient to meet loan requests. Therefore, exposure of banks to this type of crisis does not require a long time to overcome the crisis. The coefficient of determination (R2) reached 0.52, which explains that 52% of the changes in the dependent variable are caused by the independent variables, while 48% are caused by other variables not included in the model.

3- The impact of the (Camels) model indicators on the crisis of non-performing loans to total assets:

The capital adequacy indicator has a negative impact on the crisis of non-performing loans to assets, as the estimated parameter was -0.014. Strengthening the equity of banks reflects an increase in the bank's assets and a decrease in the ratio of non-performing loans compared to the size of assets, making the ratio of non-performing loans relatively low compared to assets.

The asset quality index has a positive impact on the crisis of non-performing loans to total assets, as the estimated coefficient reached (0.0655). The increase in the ratio of non-performing loans to total loans will also reflect on the increase in the ratio of non-performing loans to total assets, leading banks to a crisis due to the higher probability of losing part of their assets.

The management quality index has a positive impact on the crisis of non-performing loans to total assets, with an estimated coefficient of (0.019). The increase in the volume of loans and credit facilities granted, along with the rising risks, will lead to a higher probability of banks not recovering their financial amounts granted, or customers delaying the full or partial repayment of the principal of the loans and their interests. This will expose the bank to crises due to the increase in the volume of non-performing loans or those expected not to be repaid.

The bank profitability indicator has a positive impact on the crisis of non-performing loans to total assets, where the estimated coefficient reached (0.399). As previously detailed, an increase in realized profits will raise the rate of granted loans. Due to the unstable economic and political conditions facing Iraqi banks, this means an increased likelihood of default on granted loans, leading to a crisis for these banks.

The bank liquidity indicator has a positive impact on the crisis of non-performing loans to total assets, as the estimated coefficient reached (0.0099). Utilizing excess liquidity in the lending process means an increased possibility of the bank failing to recover these loans, resulting in an increase in the volume of non-performing loans and thus exacerbating the crisis.

The sensitivity indicator of market risks negatively affects the crisis of non-performing loans to total assets, where the estimated coefficient reached (0.142-). This is because the increase in bank investments in securities and the decrease in the loan rate granted will reduce the volume of non-performing loans. Therefore, this will lead to a decrease in the volume of this type of loans from total assets, meaning a reduction or avoidance of such crises.

It is also noted that the error correction coefficient, or so-called structural adjustment speed, reached (0.17). This means that errors in the long term can be corrected in the short term by a rate of (0.17) and that it requires (1.47) years to return to the equilibrium state. Such crises require the bank management to reschedule the defaulted loans, review the interest due on these loans, find a suitable way to recover the defaulted loans, and thus overcome or minimize the crisis as much as possible. The determination coefficient (R2) reached 0.61, explaining that 61% of the changes in the dependent variable are caused by the independent variables, while 39% are caused by other variables not included in the model.

Table 4. Shows the results of the serial correlation test for the research sample variables.

VEC Residual Serial Correlation LM Tests
Date: 12/03/23 Time: 09:28
Sample: 2018Q1 2022Q4
Included observations: 51
Null hypothesis: No serial correlation at lag h

Lag	LRE* stat	Df	Prob.	Rao F-stat	Df	Prob.
1	121.9497	81	0.0022	1.733995	(81, 93.0)	0.0053
2	96.89928	81	0.1099	1.237485	(81, 93.0)	0.1599
3	78.28754	81	0.5647	0.924845	(81, 93.0)	0.6395

Source: Researchers' preparation based on Eviews12 outputs.

Fourth: Diagnostic Tests

1- Serial Correlation LM Tests

In Table (4), the calculated test value (F) of 0.1599 is not significant at the 5% level, so the null hypothesis (H0: b=0) is accepted, and the alternative hypothesis (H1: b≠0) is rejected, meaning that there is no issue of serial correlation between the random errors of the model.

Table 5. Shows the results of the heteroskedasticity test.

VEC Residual Heteroskedasticity Tests (Levels and Squares)
Date: 12/03/23 Time: 09:29
Sample: 2018Q1 2022Q4
Included observations: 51
Joint test:

Chi-sq	Df	Prob.
1820.920	1800	0.3600

Source: Researchers' preparation based on Eviews12 program outputs.

2- Heteroskedasticity Tests

In Table (5), the calculated test value (F) was (0.3600), which is not significant at the 5% level. Therefore, the null hypothesis (H0: b=0) is accepted, and the alternative hypothesis (H1: b≠0) is rejected, indicating no heteroscedasticity issue.

3-Model Stability Test

To determine if the estimated model meets the stability conditions, the following graph is used, which shows the circle of inverse roots coefficients:

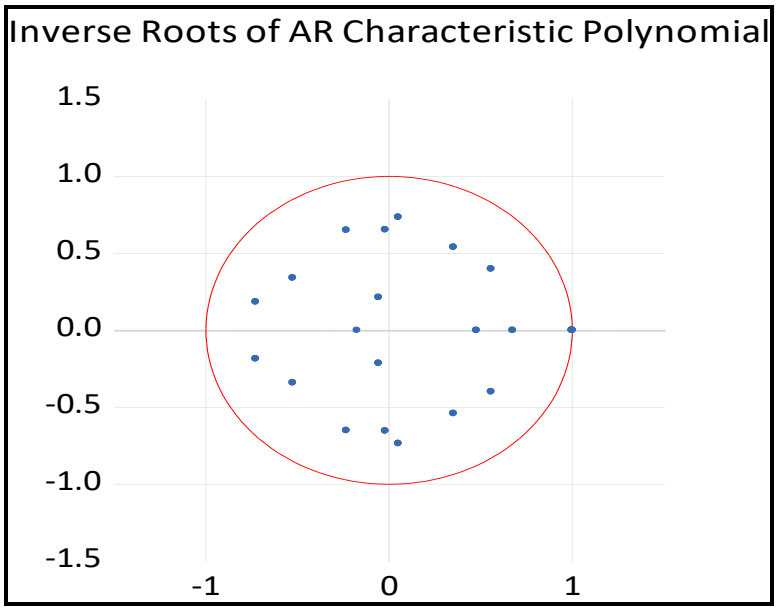

Figure 1. Model stability test.

Source: Researchers' preparation based on Eviews12 program outputs.

From the above figure, it can be observed that the coefficients are less than one, indicating that all roots fall within the unit circle.

Fifth: Predicting banking crises for the sample banks

Table 6. Prediction results for sample banks for the period (2023q1-2027q4).

Year	Iraqi Al-Ahli Bank			Assyrian Bank			Bank of Baghdad		
	Estimation of the crisis of capital adequacy	Estimating the crisis of financing gap	Estimating the crisis of non-performing loans	Estimating the crisis of capital adequacy	Estimating the crisis of financing gap	Estimating the crisis of financing gap	Estimating the crisis of capital adequacy	Estimation of the crisis of financing gap	Estimation of the crisis of non-performing loans
2023q1	0.147	-0.406	0.0113	0.372	0.334	0.0083	0.233	-6.833	0.062
2023q2	0.144	-0.254	0.0078	0.355	0.235	0.0089	0.228	-7.419	0.059
2023q3	0.139	-0.265	0.0065	0.343	0.028	0.0085	0.232	-7.430	0.061
2023q4	0.123	-0.261	0.0079	0.338	-0.135	0.0088	0.240	-3.005	0.141
2024q1	0.110	-0.221	0.0086	0.337	-0.232	0.0099	0.247	-2.906	0.143
2024q2	0.102	-0.223	0.0080	0.339	-0.310	0.0115	0.235	-3.172	0.131
2024q3	0.097	-0.244	0.0071	0.342	-0.405	0.0129	0.225	-3.530	0.126
2024q4	0.091	-0.248	0.0066	0.346	-0.525	0.0141	0.242	-3.256	0.126
2025q1	0.086	-0.238	0.0061	0.352	-0.653	0.0150	0.232	-3.627	0.121
2025q2	0.082	-0.229	0.0057	0.359	-0.774	0.0159	0.238	-3.524	0.129
2025q3	0.077	-0.224	0.0054	0.367	-0.880	0.0166	0.235	-3.794	0.120

2025q4	0.072	-0.219	0.0051	0.376	-0.972	0.0172	0.196	-4.466	0.116
2026q1	0.068	-0.214	0.0049	0.384	-1.051	0.0178	0.215	-4.138	0.120
2026q2	0.064	-0.212	0.0046	0.391	-1.117	0.0181	0.220	-4.207	0.116
2026q3	0.061	-0.209	0.0044	0.398	-1.171	0.0183	0.207	-4.936	0.105
2026q4	0.057	-0.207	0.0041	0.405	-1.211	0.0184	0.201	-5.501	0.099
2027q1	0.055	-0.204	0.0039	0.411	-1.239	0.0185	0.205	-5.938	0.101
2027q2	0.052	-0.202	0.0037	0.416	-1.254	0.0184	0.211	-6.128	0.082
2027q3	0.049	-0.199	0.0035	0.419	-1.258	0.0182	0.210	-6.847	0.075
2027q4	0.047	-0.197	0.0034	0.422	-1.254	0.0180	0.203	-7.884	0.065

Source: Researchers' preparation based on Eviews12 program outputs.

The prediction results for Al-Ahli Bank of Iraq show the following:

The prediction results showed that the capital adequacy ratio indicates that the bank's capital is higher than (5.5%), meaning that the bank is not exposed to a crisis during the period (2023q1-2026q4) except for the year 2027 where there is a decrease in the capital adequacy ratio below (5.5%), indicating a possibility of the bank facing a minor crisis.

The prediction results showed that the funding gap ratio is negative, meaning that the bank is not fully utilizing its resources from deposits and providing them as loans, indicating that the bank is unlikely to face a crisis during the mentioned prediction period.

The prediction results showed that the ratio of non-performing loans to total assets decreases below (2%) during the prediction period, indicating a decrease in its proportion relative to the bank's assets size, meaning that the bank is unlikely to face a crisis.

2. The results of the forecast for Ashur Bank show the following:

The forecast results showed that the capital adequacy ratio of the bank is higher than (5.5%), which means that the bank is not exposed to a crisis.

The forecast results showed that the funding gap is positive for the period (2023q1-2023q3), indicating that the potential loans to be granted by the bank exceed the potential deposits to be received, leading to a crisis during the mentioned period. As for the period (2023q4-2027q4), the forecast results showed that the funding gap is positive, meaning that the bank is not utilizing all its resources from deposits and granting them as loans, which means that the bank is not likely to face a crisis during the mentioned forecast period.

The prediction results showed the necessity of troubled loans to total assets that the percentage of troubled loans during the prediction period decreases by (2%), which means a decrease in its proportion compared to the bank's assets, indicating the unlikelihood of the bank facing a crisis.

3. The prediction results for the Bank of Baghdad show the following:

The prediction results showed the adequacy of capital that the bank's capital is higher than (5.5%), which means the bank is not exposed to a crisis.

The prediction results showed the necessity of funding gap that the gap is negative, which means the bank is not fully utilizing its resources from deposits and granting them as loans, indicating the unlikelihood of the bank facing a crisis during the mentioned prediction period.

The prediction results showed the necessity of non-performing loans to total assets that the percentage of non-performing loans during the prediction period reaches (13%), and this percentage is considered high because it indicates the possibility of the bank losing (13%) of its assets due to customers defaulting on loans granted to them by the bank, thus exposing it to risks and crises.

CONCLUSIONS

The CAMELS system is essential for evaluating the performance of financial institutions, especially banks, due to their importance in the financial sector. This system aims to encourage improving the performance of banks and enhancing the provision of high-quality banking services, in addition to building a strong defense against financial crises. CAMELS is one of the most widely used models and is supported by the Basel Committee on Banking Supervision and the International Monetary Fund.

Banking crises result in the partial or complete depletion of the banking system's wealth, leaving institutions with insufficient capital to operate efficiently or even insolvent, yet they continue to operate.

The results of the standard test showed a common integration between research variables, confirming the existence of a long-term equilibrium relationship. The error correction model results indicate that in the event of banks facing a financial gap and non-performing loans, they will not need a long time to return to balance and exit the crisis, while banks relatively require more time to recover from a capital sufficiency crisis.

The predictive results for the sample banks in the research period (2023-2027) showed that the sample banks are not exposed to a crisis of capital adequacy and financing gap crisis except in some quarters of the prediction period, while it is noted that Al-Ahli Bank of Iraq and Ashur Bank are not exposed to a crisis of non-performing loans during the prediction period, unlike Baghdad Bank which showed an increase in the ratio of non-performing loans to assets, which may reach (13%).

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