

Comparing the performance of Algerian public banks using multi-criteria decision-making methods

مقارنة أداء البنوك العمومية الجزائرية باستخدام طرق المساعدة على اتخاذ القرار متعددة المعايير

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Abstract:

Economic investors are constantly interested in analyzing banks' financial performance, which is essential for guiding their investment decisions. In this paper, we employ Multi-Criteria Decision Making (MCDM) techniques—specifically the Analytic Hierarchy Process (AHP) and the Combined Compromise Solution (CoCoSo) method—to evaluate the financial performance of Algerian public banks based on multiple criteria derived from financial ratios. The AHP method is applied to determine the relative importance (weights) of the evaluation criteria, whereas the CoCoSo method is employed to rank the banks based on their overall performance. To our knowledge, this study is the first to combine AHP and CoCoSo for a comparative analysis of banking performance, as well as to apply these methods to the evaluation of Algerian public banks based on financial ratio criteria. Experimental results showed that the best-performing bank was BADR, followed by CPA, while BEA came last.

Keywords: Bank financial performance analysis; Multi-Criteria Decision-Making (MCDM) methods; AHP (Analytic Hierarchy Process); CoCoSo (Combined Compromise Solution); Algerian Public Banks.

Jel Classification Codes : C61 ; G21 ; P43.

مستخلص:

يهتم المستثمرون الاقتصاديون باستمرار بتحليل الأداء المالي للبنوك، وهو أمر ضروري لتوجيه قراراتهم الاستثمارية. في هذه الورقة، نقوم باستخدام طرق المساعدة على اتخاذ القرار متعددة المعايير (MCDM)، وبالتحديد عملية التسلسل الهرمي التحليلي (AHP) وطريقة الحل التوافقي

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المشترك (CoCoSo) لتقييم الأداء المالي للبنوك العمومية الجزائرية وفقاً لعدة معايير تستند إلى النسب المالية. بحيث تُستخدم طريقة AHP لتحديد الأوزان النسبية للمعايير، في حين تُستخدم طريقة CoCoSo لترتيب البنوك حسب أدائها. على حد علمنا، هذه الدراسة هي الأولى من نوعها التي تجمع بين طريقتي AHP و CoCoSo لإجراء تحليل مقارنة لأداء البنوك، وكذلك لتطبيق هاتين الطريقتين على تقييم البنوك العامة الجزائرية بناءً على معايير النسب المالية. وقد أظهرت النتائج التجريبية أن البنك الأفضل أداءً كان بنك الفلاحة والتنمية الريفية، يليه القرض الشعبي الجزائري، بينما جاء بنك الجزائر الخارجي في المرتبة الأخيرة.

الكلمات المفتاحية: تحليل الأداء المالي للبنوك؛ طرق اتخاذ القرار متعدد المعايير (MCDM)؛ عملية التسلسل الهرمي التحليلي (AHP)؛ الحل التوافقي المشترك (CoCoSo)؛ البنوك العمومية الجزائرية.

تصنيف Jel: C61؛ G21؛ P43.

Introduction

Evaluating the financial performance of banks is a very important issue to different categories of economic investors and directly impacts the investment decisions. Banks are a quintessential part of the economy. They serve as major intermediaries in the financial system; therefore, banking sector soundness is critical for economic stability because it helps to ensure efficient mobilization and allocation of resources. Nevertheless, evaluating the performance of a bank is not a straightforward endeavor. This is difficult due to the many different aspects that need to be analyzed at the same time. It is necessary to evaluate multiple indicators: profitability in the form of return on assets or equity, solvency through capital adequacy, qualitative metrics such as the bank's loan portfolio, level of liquidity, operational efficiency, among others. Many of these indicators are interrelated, making prioritization complicated, leading to different assessments of the same bank depending on the criteria used.

Multi-criteria decision making (MCDM) is a branch of operations research which concerns itself with formulating and solving problems using strict algorithms when multiple, usually conflicting, criteria must be considered simultaneously. One of the main goals of MCDM methods is to arrange a given finite set of options in order of preference: ranking them based on how well each option meets the specified criteria (Yazdani and others, 2019; Alinezhad, Khalili, 2019). MCDM has been applied in various fields such as finance (Mohamed, Elsayed, 2024), economics (Jana and others, 2024), and in management (Garcia-Garcia, 2022).

The Algerian banking sector is predominantly public, with state-owned banks playing a central role in financial intermediation and resource

allocation. As of 2023, seven public banks manage nearly 86% of total deposits and more than 78% of credit to the economy (Bank of Algeria, 2023). They also dominate the distribution network, operating 1,249 of the 1,746 branches nationwide, which corresponds to a density of one branch for every 26,690 inhabitants. Public banks are the main providers of long-term financing, particularly for infrastructure, industrial development, and government-related projects, thereby positioning themselves as the backbone of Algeria's economic and financial system. Despite progress in bancarization—over 12.8 million active accounts in local currency and 4.6 million in foreign currency—financial inclusion remains below international benchmarks, and the efficiency of public banks continues to be questioned. These characteristics underscore the importance of evaluating and comparing the performance of Algerian public banks, which remain not only the dominant actors in the sector but also critical instruments of national economic policy.

Given the importance of bank performance analysis and the advantages of multi-criteria decision methods (MCDM), there is a gap in the literature that examines the application of these approaches to analyze bank performance. As an example, (Hunjak, Jakovčević, 2001) developed a multicriteria evaluation model using the AHP methodology for assessing banking productivity. (Ho, Wu, 2006) have constructed an evaluation of bank performance taking into account the stock market, using the Grey Relation Analysis (GRA) method. (Wu and others, 2009) proposed a fuzzy multi-criteria decision-making approach for evaluating bank performance, employing the Simple Additive Weighting (SAW), Technique for Order Preference by Similarity to Ideal Solution (TOPSIS), and Vlse Kriterijumska Optimizacija I Kompromisno Resenje (VIKOR) methods. (Fukuyama, Matousek, 2017) developed a bank network income function to evaluate bank performance, employing the Data Envelopment Analysis (DEA) method. (Beheshtinia, Omid, 2017) introduces a hybrid MCDM approach to evaluate and rank banks using Balanced Scorecard (BSC) criteria and corporate social responsibility (CSR) perspectives. (Marjanović, Popović, 2020) proposed an integrated model that combines the CRITIC and TOPSIS method model to assess the financial performance of banks in Serbia from 2012 to 2017. (Abdel-Basset and others, 2021) proposed a plithogenic based model to evaluate Egyptian commercial banks' performance employing the Analytic Hierarchy Process (AHP), Preference by Similarity to Ideal Solution (TOPSIS), Vlse Kriterijumska Optimizacija Kompro-misno Resenje (VIKOR), and COMplex PROportional ASsessment (COPRAS). (Gupta and others, 2021) proposed a hybrid CRITIC–TOPSIS

approach for evaluating the financial performance of public sector banks in India. (Ic and others, 2021) developed a financial performance evaluation model for banks with the aim of measuring and comparing the performance of Turkish banks based on their financial ratios, they combined between AHP and VIKOR methods to rank Turkish banks. (Özçalıcı and others, 2022) employed five different MCDM techniques—Additive Ratio Assessment (ARAS), Evaluation Based on Distance from Average Solution (EDAS), Multi-Objective Optimization by Ratio Analysis (MOORA), Operational Competitiveness Ratings Analysis (OCRA), and TOPSIS—to assess the long-term performance of Turkish banks. (Jamali and others, 2023) proposed a hybrid empirical approach to measure the performance of Islamic banks in the MENA region by combining four techniques, namely CAMEL, Grey Relation, fuzzy ANP, and FARAS, over two three-year periods (from 2014 to 2019). (Onne and others, 2024) adopted a structured approach based on the AHP method to evaluate the performance of Nigerian commercial banks. (Işık and others, 2025) proposed a combination of the fuzzy level-based weighted average method (F-LBWA), the fuzzy logarithmic additive weighting methodology (F-LMAW), and the compromise solution measurement and ranking alternatives (MARCOS) as a practical and robust decision-making tool for evaluating the performance of publicly listed banks in Pakistan.

MCDM methods have only been used twice in the literature to analyze the performance of banks in Algeria. (Yahiaoui, Zirmi, 2022) applied the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method to evaluate the financial performance of the Bank of Algeria between 2015 and 2019. (Le HOCINE and others, 2024) assessed the financial performance of the Algerian banking system using a hybrid approach (PCA–TOPSIS), combining Principal Component Analysis (PCA) and the Technique for Order Preference by Similarity to Ideal Solution (TOPSIS) method, over the period 2019–2021, PCA was used to extract the most significant characteristics, trends and patterns, and its results were then integrated into the TOPSIS model, which was used to rank the banks, their study is based on a sample of eight private banks and four public banks. In both studies analyzing the performance of Algerian banks, the authors did not mention the method used to calculate the weighting of the criteria. One of the main limitations of MCDM methods is their lack of robustness in the face of slight disturbances in the initial models of the problems being addressed. Indeed, the ranking of alternatives can vary significantly when

small changes are made to the initial values of the criteria (Djeddi, 2025; Le HOCINE and others, 2024; Yazdani and others, 2019). To compensate for this weakness, sensitivity analysis is commonly used by decision makers and MCDM method designers to assess the robustness of these approaches to disturbances in the initial data (Djeddi, 2025; Yazdani and others, 2019).

In this article, we proposed a model combining two methods, the Analytic Hierarchy Process (AHP) and the Combined Compromise Solution (CoCoSo), in order to perform a comparative analysis of banks' financial performance. This model was then applied to the evaluation of Algerian public banks, using a set of financial ratios. The AHP method is used to determine the relative weights of the criteria, while the CoCoSo method is used to rank banks according to their overall financial performance. The choice of AHP is based on its widespread use in weight calculation and its proven effectiveness in various fields. CoCoSo was chosen because of its superior performance in the sensitivity analysis conducted by (Djeddi, 2025), compared to other methods applied in the literature, notably TOPSIS, used in the context of Algerian banks. To the best of our knowledge, although AHP and CoCoSo have been combined in several previous studies, their joint application for analyzing bank performance has not yet been reported in the literature.

The rest of the paper is structured as follows: Section 1 provides an overview of the financial performance criteria (C1 to C7) used in this study; Section 2 is dedicated to the proposed multi-criteria method; Section 3 addresses the model application and comparative assessment of Algerian public banks; and finally, the conclusion compiles the results obtained.

1. Financial Performance Evaluation Criteria

For the evaluation of the financial performance of Algerian public banks, we implant a multi-criteria system based on (Ic and others, 2021). This framework selects a particular set of financial ratios representing the most relevant aspects of bank performance. The criteria used in this work (study) have been chosen based on the particular features associated with the structure and functionality of public banks in Algeria and the public practices of banking performance evaluation across the world. In total, each selected ratio captures a particular dimension of financial soundness—spanning from capital to the efficiency with which income is generated. These criteria have been defined as elements of the model for multi-criteria decision-making and are referred to as C1 to C7.

Table number (01): Assessment Criteria of Financial Performance

Code	Criteria	Formula	Interprétation
C1	Total Equity to Total Assets (EQTA)	$\frac{\text{Total Equity}}{\text{Total Assets}}$	Evaluates the bank's capital adequacy. High values reveal better solvency and capacity to absorb losses
C2	Total Deposits to Total Assets (DAR)	$\frac{\text{Total Deposits}}{\text{Total Assets}}$	Measures reliance on the customer deposits. High ratio means strong deposit mobilization
C3	Total Loans to Total Assets (LAR)	$\frac{\text{Total Loans}}{\text{Total Assets}}$	Measures the share of the assets designated for lending which indicates active banking operations and exposure to credits
C4	Liquid Assets to Total Assets (LATA)	$\frac{\text{Liquid Assets}}{\text{Total Assets}}$	Indicates liquidity. High values enhance the bank's ability to meet obligations in the short run
C5	Net Profit (Loss) for the Period to Total Assets (ROA)	$\frac{\text{Net Profit}}{\text{Total Assets}}$	Measures bank's profit in relation to total assets
C6	Net Interest Income after Provisions to Total Assets	$\frac{\text{Net Interest Income after Provisions}}{\text{Total Assets}}$	Demonstrates how effectively assets are used to generate funds. Shows risk-adjusted profitability after credit losses
C7	Net Interest Income after Provisions to Total Operating Income	$\frac{\text{Net Interest Income after Provisions}}{\text{Total Operating Income}}$	Indicates how much of income the bank earns from its core activities after making provisions

These criteria have been chosen given the very operational and financial features of public banks in Algeria such as:

- Strong sensitivity towards state-sponsored lending and development finance activities;
- Strong dependence on deposit financing due to the insufficiently developed financial market;
- Problems associated with liquidity control with credit risk;
- Increased scrutiny focused on profitability and cost control.

These composite measures will be used in our research to evaluate and rank banks employing a multi-criteria decision-making method (MCDM) presented in the next section.

2. Methodology

As noted in the introduction, the methodology presented in this paper is divided into two parts. The first one involves calculating the weights of the criteria using the Analytic Hierarchy Process (AHP) method. The second section is devoted to ranking the banks based on these criteria, using the Combined Compromise Solution (CoCoSo) method. In this section, the two methods and the steps involved in implementing them are elaborated in detail.

2.1 Analytic Hierarchy Process (AHP) method

The AHP method, presented by Thomas Saaty in the 1970s for solving multi-criteria decision-making problems (Khazaii, 2016). It is based on a pairwise comparison matrix where each criterion is compared in pairs to determine its relative importance. This phase is used to calculate the relative weights of the various criteria. In general, these weights are then used to rank the alternatives. In our methodology, however, we use the AHP method only to calculate the weights of the criteria; the final ranking of the banks is performed using the CoCoSo method.

To calculate the weights of the criteria, follow these steps:

Step1: Construct the comparison matrix for criteria Y based on their relative importance, using the Saaty scale presented in Table number (01).

$$Y = \begin{bmatrix} y_{11} & y_{12} & \cdots & y_{1n} \\ y_{21} & y_{22} & \cdots & y_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ y_{n1} & y_{n2} & \cdots & y_{nn} \end{bmatrix} \quad (1)$$

The values y_{ij} are assigned in accordance with Table number (02), while the values y_{ji} are calculated using the following equation:

$$y_{ji} = \frac{1}{y_{ij}} \quad (2)$$

Table number (02): Saaty's scale

Value of y_{ij}	Explanation
1 ($y_{ij} = 1$)	Both criteria contribute equally to the objective.
3	Criterion i has moderate importance compared to criterion j .
5	Criterion i has a strong importance relative to criterion j .
7	Criterion i is of very high importance compared to criterion j .
9	Criterion i has the highest or absolute importance compared to criterion j .
2, 4, 6, 8	Intermediate value between two adjacent preference levels

Step2: Calculate the matrix of relative importance T of the criteria using the following equations:

$$T = \begin{bmatrix} t_{11} & t_{12} & \cdots & t_{1n} \\ t_{21} & t_{22} & \cdots & t_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ t_{n1} & t_{n2} & \cdots & t_{nn} \end{bmatrix} \quad (3)$$

$$t_{ij} = \frac{y_{ij}}{\sum_{i=1}^n y_{ij}} \quad (4)$$

Step3: The vector of criterion weights is then calculated by applying equation (5) below:

$$w_i = \frac{\sum_{j=1}^n t_{ij}}{n} \quad (5)$$

2.2 Combined Compromise Solution (CoCoSo) method

The CoCoSo method, proposed by (Yazdani and others, 2019), was developed to solve multi-criteria decision-making (MCDM) problems. According to the comparative study conducted by the authors themselves, this method has demonstrated good performance compared to other MCDM methods, making it an effective tool for evaluating and ranking alternatives. The CoCoSo method uses weights assigned by decision-makers, which are considered input data. That is why we chose to use the AHP method to calculate criteria weights. The CoCoSo method steps are defined as follows:

Step1: Determine the initial decision matrix X

$$X = \begin{bmatrix} x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \quad (6)$$

Step2: Establish the criteria normalization matrix R based on the following normalization equation:

- For a benefit criterion (criterion to be maximized):

$$r_{ij} = \frac{x_{ij} - \min_i x_{ij}}{\max_i x_{ij} - \min_i x_{ij}} \quad (7)$$

- For a cost criterion (criterion to be minimized):

$$r_{ij} = \frac{\max_i x_{ij} - x_{ij}}{\max_i x_{ij} - \min_i x_{ij}} \quad (8)$$

Step3: Calculate, for each alternative, the weighted sum of the comparability scores (denoted S_i) and the weighted product (or power weight) of the comparability scores (denoted P_i) using the following equations:

$$S_i = \sum_{j=1}^n (w_j r_{ij}) \quad (9)$$

$$P_i = \sum_{j=1}^n (r_{ij})^{w_j} \quad (10)$$

Step4: Calculate the relative scores for each alternative using the following formulas:

$$k_{ia} = \frac{P_i + S_i}{\sum_{i=1}^m (P_i + S_i)} \quad (11)$$

$$k_{ib} = \frac{S_i}{\min_i S_i} + \frac{P_i}{\min_i P_i} \quad (12)$$

$$k_{ic} = \frac{S_i + P_i}{\max S_i + \max P_i} \quad (13)$$

Step5: The final ranking of alternatives is established based on k_i values, with alternatives having the highest values considered the best.

$$k_i = (k_{ia}k_{ib}k_{ic})^{\frac{1}{3}} + \frac{1}{3}(k_{ia} + k_{ib} + k_{ic}) \quad (14)$$

3. Application

In this section, we apply the proposed methodology to compare the performance of the six Algerian public banks, based on the criteria described in section 1.

3.1 Calculation of bank performance criteria weights using the AHP method

When developing the matrix for comparing criteria based on their relative importance, greater importance was given to profitability criteria, as they are considered more significant than the others. Table number (03) presents the pairwise comparison matrix for the criteria. Table number (04) shows the relative importance matrix for the criteria and the associated weights obtained.

Table number (03): Criteria comparison matrix

Criteria	C1	C2	C3	C4	C5	C6	C7
C1	1	2	4	4	0.1667	0.1429	0.125
C2	0.5	1	2	3	0,2	0.1667	0.1429
C3	0.25	0.5	1	2	0.125	0.125	0.1429
C4	0.25	0.3333	0.5	1	0.125	0.1667	0.1429
C5	6	5	8	8	1	0.3333	2
C6	7	6	8	6	3	1	3
C7	8	7	7	7	0.5	0.3333	1

Table number (04): The matrix of criteria relative importance and the associated weights obtained

Criteria	C1	C2	C3	C4	C5	C6	C7	Weights (W)
C1	0.0435	0.0916	0.1311	0.1290	0.0326	0.0630	0.0191	0.0728
C2	0.0217	0.0458	0.0656	0.0968	0.0391	0.0735	0.0218	0.0520
C3	0.0109	0.0229	0.0328	0.0645	0.0244	0.0551	0.0218	0.0332
C4	0.0109	0.0153	0.0164	0.0323	0.0244	0.0735	0.0218	0.0278
C5	0.2609	0.2290	0.2623	0.2581	0.1954	0.1470	0.3052	0.2368
C6	0.3043	0.2748	0.2623	0.1935	0.5863	0.4409	0.4578	0.3600
C7	0.3478	0.3206	0.2295	0.2258	0.0977	0.1470	0.1526	0.2173

3.2 Algerian public banks rankings according to the CoCoSo method

The data used to rank the six Algerian public banks relate to the year 2023. They were extracted from the database of the National Trade Register Center (CNRC). Table number (05) presents the decision matrix, i.e., the values of the various criteria (financial ratios) recorded for each bank during the year 2023. Table number (06) shows the criteria normalization matrix. Table number (07) shows the weighted sum of comparability scores (S_i), the weighted product of comparability scores (P_i), relative scores (k_{ia}, k_{ib}, k_{ic} et k_i) for each bank, and their final ranking.

Table number (05): The decision matrix (values are in %)

	Criteria						
Banks	C1	C2	C3	C4	C5	C6	C7
BEA	8.6708	63.4909	29.5646	35.4873	0.8250	0.5778	33.6515
BNA	11.7419	84.4165	32.6906	30.2476	1.0902	0.7245	43.7609
CPA	9.9587	87.1687	40.4588	25.4705	1.1410	0.8765	43.1479
BADR	9.8771	87.3352	62.7675	12.1190	0.9856	1.6841	51.4320
CNEP	7.5882	72.1727	37.7328	7.0763	0.8299	0.9767	44.5911
BDL	8.9999	84.4645	60.8253	23.3412	1.0957	0.0846	2.5860

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Table number (06): The criteria normalization matrix

	Criteria						
Banks	C1	C2	C3	C4	C5	C6	C7
BEA	0.2606	0,0000	0,0000	1.0000	0,0000	0.3084	0.6360
BNA	1.0000	0.8776	0.0941	0.8156	0.8391	0.4001	0.8430
CPA	0.5707	0.9930	0.3281	0.6474	1.0000	0.4951	0.8304
BADR	0.5511	1.0000	1.0000	0.1775	0.5083	1.0000	1.0000
CNEP	0,0000	0.3641	0.2460	0,0000	0.0154	0.5577	0.8600
BDL	0.3399	0.8796	0.9415	0.5725	0.8566	0,0000	0,0000

Table number (07): Summary of results of steps 3-5

Banks	S_i	P_i	K_{ia}	K_{ib}	K_{ic}	K_i	Ranks
BEA	0.2960	3.4678	0.1057	2.0000	0.4958	1.3387	6
BNA	0.6702	6.5541	0.2029	4.1544	0.9518	2.6989	3
CPA	0.7176	6.6481	0.2069	4.3417	0.9704	2.7949	2
BADR	0.8280	6.7625	0.2132	4.7476	1.0000	2.9910	1
CNEP	0.4184	4.0535	0.1256	2.5825	0.5891	1.6751	5
BDL	0.3206	4.8644	0.1456	2.4858	0.6831	1.7325	4

3.3 Discussion

Comparing the financial performance of Algerian public banks through the combined AHP-CoCoSo approach allowed us to determine a clear ranking according to the adopted criteria, which primarily consist of financial ratios reflecting profitability, solvency, liquidity, and operational efficiency.

The results showed that BADR Bank ranks first in the ranking, reflecting superior financial performance across all criteria evaluated. This outcome is largely explained by its strong scores in Total Equity to Total Assets (C1) and Net Profit to Total Assets (C5), indicating robust capital adequacy, better risk absorption capacity, and high profitability. Additionally, BADR shows effective utilization of assets to generate income (C6 and C7), confirming sound operational management.

The second rank is occupied by CPA, which also performs well, albeit marginally less than BADR's. The two institutions therefore seem to emerge in the Algerian public banking sector as regards financial efficiency. Its relatively strong position is supported by high values in Total Loans to Total Assets (C3) and Net Interest Income after Provisions to Total Assets (C6),

suggesting active lending operations and efficient use of assets to generate risk-adjusted revenue

On the other hand, BEA ranks last, reflecting relatively poor performance compared to the other banks considered. Its weak performance is attributable to low liquidity (Liquid Assets to Total Assets, C4) and less efficient core income generation (C7), which may limit its capacity to respond to short-term obligations and affect overall profitability. CNEP, BDL, and BNA fall in intermediate positions, reflecting mixed performance across the different criteria.

The final ranking of banks, from worst to best, is as follows:

$$BEA < CNEP < BDL < BNA < CPA < BADR$$

This ranking not only provides a clear summary of comparative performance for investors and bank managers but also highlights specific performance gaps within the sector. The analysis indicates that variations in capital adequacy, profitability, liquidity, and operational efficiency are the main drivers of overall performance differences.

The results offer actionable insights for both bank managers and regulators. For lower-ranked banks (BEA, CNEP), strengthening the capital structure and increasing the Equity-to-Assets ratio (C1), enhancing liquidity management (C4), and optimizing credit portfolio and core revenue generation (C3, C6, C7) can improve solvency, resilience, and profitability.

For regulators, these findings can inform targeted audits, monitoring, and capacity-building programs, encourage knowledge transfer and adoption of best practices from higher-performing banks, and support the design of policies and incentives to enhance financial efficiency, stability, and inclusion across the public banking sector.

Conclusion:

In this study, we focused on analyzing the performance of Algerian public banks using multi-criteria decision-making (MCDM) methods. To evaluate this performance, we selected a set of representative financial ratios, namely:

- Total Equity / Total Assets
- Total Deposits / Total Assets
- Total Loans / Total Assets

- Liquid Assets / Total Assets
- Net Period Profit (Loss) / Total Assets
- Net Interest Income After Special Provisions / Total Assets
- Net Interest Income After Special Provisions / Total Operating Income

In order to perform a rigorous assessment, we proposed a combined approach using two MCDM methods: the Analytic Hierarchy Process (AHP) to determine the weights of the criteria, and the Combined Compromise Solution (CoCoSo) for the final ranking of the banks.

The experimental results showed that BADR is the best-performing bank according to the criteria used, followed by CPA, while BEA has the lowest performance.

This methodology not only provides a robust comparative assessment of public banks but also offers actionable insights for decision-makers. Lower-ranked banks can improve capital adequacy, liquidity, and profitability, while regulators can use the findings to guide audits, capacity-building programs, and policy design to strengthen financial efficiency, stability, and inclusion across the sector.

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