

An Integrative Framework for Evaluating Financial Sustainability In Post-Merger Consolidation: A CRITIC-RAWEC Analysis of Public Sector Banks in India



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Abstract

The vitality of banks in any economy cannot be overstated, serving as the backbone of financial stability, and fostering economic growth through efficient capital allocation. Public Sector Banks (PSBs) in India are entrusted with the responsibility of ensuring financial inclusion, supporting key sectors, and maintaining stability in the financial system. Understanding the financial sustainability of these banks is imperative, given their crucial role in facilitating economic progress. Evaluating their financial sustainability becomes paramount to ensure their ability to meet the demands of a dynamic economic landscape. This paper introduces the Criteria Importance Through Intercriteria Correlation (CRITIC) - Ranking Alternatives with Weights of Criterion (RAWEC) approach as a novel method for assessing the sustainability of PSBs, marking the first implementation of this Multi-Criteria Decision Making (MCDM) technique in the context of banking evaluations. CRITIC, enables a comprehensive review of criteria, while RAWEC, refines the evaluation process by ranking alternatives based on these criteria. Decision-makers in the banking sector can leverage the insights derived from the CRITIC-RAWEC approach to formulate effective strategies, enhance financial resilience, and bolster competitiveness. This research contributes to the evolving landscape of financial sustainability assessment methodologies, showcasing the pertinence and efficacy of the CRITIC-RAWEC approach in the critical evaluation of PSBs in India.

Keywords: Public sector banks, Financial Sustainability, CRITIC, RAWEC, Policy making.

Introduction

Banks, as integral financial institutions within the economic framework, operate as custodians of public deposits while concurrently providing a diverse array of financial services spanning lending, investment, and payment mechanisms. Their pivotal role in the financial ecosystem involves gathering and safeguarding deposits from the public, establishing a foundation of trust and security. This repository function enables banks to facilitate the allocation of funds towards productive endeavours, thereby fostering economic growth and stability. Moreover, banks, functioning as intermediaries, play a fundamental role in the dissemination of credit, enabling access to capital for various purposes, including consumption, investment, and entrepreneurial ventures. Additionally, they serve as channels for facilitating transactions through the provision of payment mechanisms, ensuring the smooth functioning of economic transactions on both local and global scales. In essence, banks emerge as multifaceted institutions crucial for facilitating economic activities and the intermediation of financial resources within the broader socioeconomic landscape. Regulated by authorities, they ensure financial stability and safeguard depositors' interests through diverse financial instruments, significantly influencing government policy evaluations [1]. Public sector banks (PSBs), predominantly

government-owned, play a vital role in a nation's financial infrastructure, with a focus on socio-economic development and financial inclusion. Committed to public interest, financial stability, and social welfare, these banks implement government policies under regulatory oversight, adhering to prudent practices. Categorized into Nationalized Banks and the State Bank of India, they constitute fundamental pillars influencing economic dynamics [2].

In the context of India, PSBs contribute significantly to economic development by mobilizing financial resources for sectors such as agriculture and SMEs in alignment with governmental policies. Addressing financial inclusion, they reach underserved demographics through initiatives like Jan Dhan Yojana. During economic downturns, PSBs stabilize by providing liquidity. Originating from post-independence reforms, major nationalizations in 1969 and 1980 solidified their role, with the State Bank of India and associates making substantial contributions. Despite their pivotal role in socio-economic development, recent reforms underscore the importance of efficiency and governance, shaping India's economic trajectory. Mergers of PSBs aimed to enhance operational efficiency, synergies, and competitiveness, creating stronger entities capable of navigating global challenges. Presently, India has 12

PSBs functioning independently under the Reserve Bank of India's supervision.

The financial sustainability of PSBs in India is crucial for economic stability, enabling effective support for government initiatives, promoting economic growth, and maintaining public trust. Key ratios such as the Cash Deposit Ratio (CDR) and Capital Adequacy Ratio (CAR) play a pivotal role in assessing financial sustainability. The CDR reflects a bank's liquidity management practices, ensuring adequate reserves to uphold depositor confidence and mitigate systemic risks. The CAR, stipulated by central banking authorities, safeguards against undue leverage, averting potential insolvency risks, and ensures the resilience of financial institutions against adverse economic contingencies.

In the landscape of decision-making methodologies, the Criteria Importance Through Intercriteria Correlation (CRITIC) model stands out as a specialized approach addressing multiple objectives. By determining objective weights in the absence of a decision-maker, CRITIC facilitates systematic consideration of various criteria and their importance levels, fostering transparency and alignment with stakeholders' preferences. This model mitigates subjectivity by amalgamating subjective and objective weights, ensuring a comprehensive evaluation.

Moreover, the Ranking Alternatives with Weights of Criterion (RAWEC) method, introduced by Puska et al. [3], contributes significantly to decision-making, maintaining a distinct identity while being versatile for integration with other methodologies. Its streamlined three-step methodology simplifies decision-making, enhancing efficiency and accessibility in practical applications and academic inquiries.

The combination of CRITIC and RAWEC methods emerges as suitable for assessing the financial sustainability of PSBs in India, particularly post-consolidation through mergers. This approach, termed as CRITIC-RAWEC method, leverages the strengths of both models. It allows for a systematic assessment of various factors influencing the financial viability and resilience of merged entities, enabling the establishment of a comprehensive ranking framework. Through structured evaluations, policymakers, regulators, and stakeholders can discern the relative financial health and sustainability of merged PSBs, informing strategic decisions, ensuring optimal resource allocation, and fostering the long-term stability of the banking sector.

2. Review of Past Literature

In the discourse on the privatization of PSBs in India, Mathur [4] presented arguments both in favour and against this transformative initiative. Das [5] conducted an empirical analysis spanning from the fiscal year 1995-96 to 2000-2001, elucidating a symbiotic relationship among capital, risk, and productivity changes within PSBs. The findings unveiled a mutual reinforcement among these

variables, signifying a degree of interdependence and complementary dynamics, thereby emphasizing the intricate connections shaping the performance landscape of PSBs during the specified period. Contrary to expectations, Kumar and Gulati [6] found in their empirical findings that heightened operational efficiency within the Indian public sector banking industry does not necessarily correspond to heightened overall effectiveness. Mohan [7] systematically studied the performance trajectory of PSBs after the period of deregulation, both in absolute terms and relative to established benchmarks, aiming to discern the determinants contributing to the observed enhancement in performance within the public sector banking sector. Joseph and Prakash [8] asserted that the prevalence of non-performing Assets (NPAs) serves as a critical barometer of banks' performance and, thus, is indicative of the well-being of the banking industry within a nation. The escalating levels of NPAs within the Indian banking sector emerged as a pronounced concern, necessitating scrutiny and strategic interventions to address their implications for the broader national economy. In a comprehensive assessment, Kumar and Gulati [9] evaluated the degree of technical efficiency inherent in the operations of 27 PSBs within the Indian context. Kantharia and Biradar [10] expressed the opinion that navigating performance challenges within a competitive market has posed a formidable undertaking for public sector banks post globalization. Mahajan et al. [11] employed backward stepwise regression analysis to study the impact of determinants on the performance of banks. Singh and Milan [12] analysed the financial data of all public sector commercial banks for a period spread across 11 years (2009–2019) using CAMEL as a performance determinant. Gupta et al. [13] assessed financial performance of a bank using a hybrid multi-criteria decision making (MCDM) methodology, specifically CRITIC. Choudhary and Tandon [14] argued that, given that PSBs constitute a substantial component of the overall banking system in India, there arises an imperative to systematically assess the performance of these banks. Singh and Das [15] examined the post-merger financial performance of amalgamated banks by employing financial metrics such as net profit margin, operating profit margin, return on capital employed, return on equity, earnings per share, capital adequacy ratio, dividend per share, and other relevant indicators. Palamalai and Britto [16] investigated the influence of liquidity, solvency, and efficiency on the profitability of chosen commercial banks in India, utilizing panel data estimations, and employing fixed effect and random effect models. The research discerned the intricate relationships among these variables and their collective impact on the financial performance of the selected banking institutions. Gupta et al. [17] studied the financial performance of PSBs that are constituents of the PSU Bank Nifty Index and operate within the Indian capital market using a hybrid MCDM method, i.e., CRITIC and

Technique for Order Performance by Similarity to Ideal Solution (TOPSIS). Marjanović and Popović [18] evaluated the financial performance of all banks operating within the Republic of Serbia over the duration spanning from 2012 to 2017, employing an integrated model that combines the CRITIC method with the TOPSIS method. Sama et al. [19] analysed data employing prominent MCDM techniques, including CRITIC, TOPSIS, and grey relational analysis (GRA). Through this analytical framework, the study unveiled HDFC as the leading performer among its counterparts within the private sector banking domain, thereby establishing a benchmark for comparison. Nguyen et al. [20] conducted a study of Vietnamese commercial banks during COVID-19, employing the CRITIC technique to ascertain the objective weights of financial ratios. Aldalou and Perçin [21] examined the financial performance of companies listed within the Food and Drink Index of the Istanbul Stock Exchange, undertaking a sensitivity analysis utilizing the CRITIC weighting method. Ünlü and Yalçın [22] conducted a study to assess the performance of eleven commercial banks traded on the Borsa Istanbul (BIST) for the fiscal year 2018, employing an integrated approach that combines the CRITIC method with the Weighted Aggregated Sum Product Assessment (WASPAS) method. Kalvakolanu et al. [23] employed a combined methodology comprising entropy, CRITIC, and TOPSIS methods to evaluate the levels of job satisfaction among employees of Vijayawada International Airport, situated in India.

The existing literature on PSBs in India provides a thorough examination of various methodologies for assessing financial performance. However, a noticeable research gap emerges, as there is a lack of studies employing a combined approach of the CRITIC method and the RAWEC technique. The RAWEC method, with its simple and robust approach, holds the potential to offer a comprehensive perspective by incorporating CRITIC-derived weights, enabling a nuanced understanding of the post-consolidation financial health of PSBs. The managerial implications of adopting this combined methodology are noteworthy. Such an approach could serve as an integrated evaluation tool for bank managers and policymakers, shedding light on overlooked nuances of financial sustainability.

3. CRITIC Method

The CRITIC method is a criterion weighting approach introduced by Diakoulaki et al. [24]. This method determines the objective weights for criteria in decision-making problems. It analyses the contrast and conflict within the decision matrix using correlation analysis. In summary, the CRITIC method helps in assigning weights to decision criteria based on the contrast and conflict within the decision matrix, offering a structured approach for decision-making processes.

In the application of the CRITIC method, the process

involves several key steps. Firstly, the problem is defined by positing a set of m feasible alternatives denoted as A_i ($i = 1, 2, \dots, m$) and n evaluation criteria denoted as C_j ($j = 1, 2, \dots, n$). Subsequently, a decision matrix is constructed to comprehensively assess the performance of each alternative in relation to every criterion. Following this, a normalization procedure is applied to standardize the criterion values within the decision matrix. After normalization, the standard deviation of the normalized criterion values is calculated for each respective column. Additionally, correlation coefficients are computed for all possible pairs of columns within the decision matrix. These correlation coefficients, coupled with the standard deviation values, are then utilized to ascertain the criteria contrast, thereby elucidating the magnitude of distinctions and conflicts between the various evaluation criteria.

Step 1: This step involves is the formation of the decision matrix showing the performance of different alternatives with respect to various criteria.

$$X = [X_{ij}]_{m \times n} = \begin{bmatrix} X_{11} & X_{12} & \cdots & X_{1n} \\ X_{21} & X_{22} & \cdots & X_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ X_{m1} & X_{m2} & \cdots & X_{mn} \end{bmatrix} \quad (i = 1, 2, \dots, m \text{ and } j = 1, 2, \dots, n) \quad [1]$$

Step 2: Decision matrix is normalised using the equation given below.

$$X_{ij}^* = \frac{X_{ij} - \min(X_{ij})}{\max(X_{ij}) - \min(X_{ij})}, \quad i = 1, 2, \dots, m \text{ and } j = 1, 2, \dots, n \quad [2]$$

Step 3: Both the criterion's standard deviation and its association with other criteria are considered when calculating the weights of the criteria. In this sense, the weight (W_j) of the j th criterion is determined as follows:

$$W_j = \frac{C_j}{\sum_{j=1}^n C_j} \quad [3]$$

where C_j is the amount of data in the j th criterion, which is ascertained as follows:

$$C_j = \sigma_j \sum_{j=1}^n (1 - r_{ij}) \quad [4]$$

Where σ_j is standard deviation of the j th criterion and r_{ij} is the correlation coefficient.

3.1 Application of CRITIC Method to Estimate the Significance of Financial Ratios

The financial stability and sustainability of PSBs are contingent upon their performance across a spectrum of key financial ratios. Recognizing the pivotal role of these ratios in gauging the long-term viability of PSBs, a focus group was convened to identify critical metrics influencing the banks' sustenance over time. The identified ratios encompass various facets of banking operations and are integral to assessing liquidity, profitability, risk management, and regulatory compliance.

1. CDR (C1): The CDR is a vital indicator reflecting a

bank's liquidity management strategies, crucial for maintaining depositor confidence and mitigating systemic risks. A higher CDR suggests increased lending activities relative to deposits, emphasizing the bank's ability to deploy funds effectively.

2. (Credit + Investment) Deposit Ratio (C2): This ratio delves into a bank's asset allocation, revealing the balance between investments and liquidity reserves. It aids in evaluating risk exposure, providing insights into the bank's asset management strategies and liquidity position.
3. Ratio of Demand and Savings Bank Deposit to Total Deposits (C3): This ratio sheds light on the stability of a bank's deposit base, with a higher ratio indicating a substantial portion from stable demand and savings accounts. It offers insights into deposit preferences, liquidity profiles, and deposit mobilization strategies.
4. Ratio of Net Interest Income to Total Asset (C4): Net interest margin signifies the spread between interest earned and interest paid, crucial for assessing a bank's profitability from core banking activities. A higher margin indicates efficient utilization of assets to generate earnings.
5. Return on Assets (ROA) (C5): ROA measures a bank's efficiency in generating earnings from its total assets. It serves as a key performance indicator, offering insights into operational efficiency, profitability, and risk-adjusted returns.
6. Return on Equity (ROE) (C6): ROE evaluates the bank's profitability in relation to shareholders' equity, showcasing the effectiveness of equity utilization. Higher ROE signifies enhanced value

creation for shareholders.

7. Cost of Funds (C7): The cost of funds quantifies the expenses incurred by a bank in acquiring funding. It provides insights into the efficiency of fund procurement, influencing overall profitability.
8. Return on Investments (ROI) (C8): ROI evaluates profitability from the investment portfolio, reflecting the efficiency of capital allocation and investment management.
9. CAR (C9): CAR, a regulatory measure, assesses a bank's financial stability by comparing capital to risk-weighted assets. Higher CAR indicates robust financial health and resilience.
10. Ratio of Non-Performing Assets (NPA) to Net Advances (C10): This ratio gauges the credit risk exposure, with a higher ratio indicating potential vulnerabilities. A lower ratio signifies a healthier loan portfolio with fewer non-performing assets.

In conclusion, the comprehensive evaluation of these ratios is indispensable for the sustained health and resilience of PSBs. The focus group's identification of these critical metrics underscores the significance of proactive monitoring and management to ensure the long-term viability of PSBs.

To discern the significance of the identified financial ratios in evaluating the performance of PSBs, CRITIC method is employed. The application of this method involves the formulation of a decision matrix, encapsulating the pertinent data of twelve PSBs for the fiscal year 2022-23. Table 1 serves as a representation of the initial decision matrix, incorporating the numerical values corresponding to the identified financial ratios for 12 PSBs.

Table 1. Initial Decision Matrix

PSBs	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Bank of Baroda	73.04	100.05	40.15	2.49	0.07	1.11	4.02	6.37	14.99	3.09
Bank of India	58.31	88.17	36.69	2.06	0.28	4.83	4.20	6.68	14.93	3.35
Bank of Maharashtra	58.85	98.00	53.99	2.68	0.30	4.81	4.20	6.60	14.49	2.48
Canara Bank	63.22	89.10	32.73	2.19	0.23	4.62	4.45	6.59	13.18	3.82
Central Bank of India	47.45	92.48	49.27	2.27	-0.26	-4.12	4.42	6.88	14.81	5.77
Indian Bank	67.40	100.21	42.30	2.63	0.50	8.21	4.33	6.60	15.71	3.37
Indian Overseas Bank	53.15	92.89	42.52	2.21	0.31	5.02	4.69	6.53	15.32	3.58
Punjab And Sind Bank	63.41	96.73	32.81	2.14	-2.55	-39.16	4.92	6.62	17.06	4.04
Punjab National Bank	60.94	96.46	44.54	2.43	0.15	2.29	4.40	6.44	14.32	5.73
State Bank of India	66.54	103.26	45.40	2.61	0.48	8.40	4.04	6.65	13.74	1.50
Uco Bank	54.08	99.62	39.16	2.24	0.06	0.85	4.17	6.56	13.74	3.94
Union Bank of India	63.97	99.86	36.33	2.36	0.27	4.68	4.61	6.73	12.56	4.62

Table 2 presents the normalized matrix derived from the initial decision matrix for 12 PSBs in the fiscal year 2022-23. The normalization process standardizes the data, enabling a more equitable comparison of the identified financial ratios across the diverse set of banks.

Table 2. Normalised Matrix

PSBs	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Bank of Baroda	1.00	0.79	0.35	0.69	0.86	0.85	1.00	0.00	0.54	0.63
Bank of India	0.42	0.00	0.19	0.00	0.93	0.92	0.80	0.60	0.53	0.57
Bank of Maharashtra	0.45	0.65	1.00	1.00	0.93	0.92	0.80	0.45	0.43	0.77
Canara Bank	0.62	0.06	0.00	0.20	0.91	0.92	0.52	0.43	0.14	0.46
Central Bank of India	0.00	0.29	0.78	0.34	0.75	0.74	0.55	1.00	0.50	0.00
Indian Bank	0.78	0.80	0.45	0.92	1.00	1.00	0.65	0.45	0.70	0.56
Indian Overseas Bank	0.22	0.31	0.46	0.23	0.94	0.93	0.26	0.31	0.61	0.51
Punjab And Sind Bank	0.62	0.57	0.00	0.13	0.00	0.00	0.00	0.50	1.00	0.41
Punjab National Bank	0.53	0.55	0.56	0.60	0.89	0.87	0.58	0.13	0.39	0.01
State Bank of India	0.75	1.00	0.60	0.88	0.99	1.00	0.99	0.56	0.26	1.00
Uco Bank	0.26	0.76	0.30	0.29	0.86	0.84	0.84	0.38	0.26	0.43
Union Bank of India	0.65	0.77	0.17	0.47	0.92	0.92	0.35	0.70	0.00	0.27

Table 3 showcases the correlation coefficients among the identified financial ratios. This coefficient analysis elucidates the interdependencies and relationships between the various ratios, providing insights into potential multicollinearity or distinct patterns of association.

Table 3: Correlation Coefficient Matrix for Identified Financial Ratios

Criterion	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
C1	1.00	0.49	-0.32	0.45	0.02	0.03	0.24	-0.52	0.01	0.46
C2	0.49	1.00	0.26	0.73	0.05	0.05	0.29	-0.23	-0.08	0.35
C3	-0.32	0.26	1.00	0.65	0.38	0.36	0.40	0.12	-0.01	0.10
C4	0.45	0.73	0.65	1.00	0.41	0.41	0.49	-0.22	-0.12	0.41
C5	0.02	0.05	0.38	0.41	1.00	1.00	0.63	-0.10	-0.63	0.23
C6	0.03	0.05	0.36	0.41	1.00	1.00	0.63	-0.09	-0.64	0.25
C7	0.24	0.29	0.40	0.49	0.63	0.63	1.00	-0.22	-0.34	0.48
C8	-0.52	-0.23	0.12	-0.22	-0.10	-0.09	-0.22	1.00	-0.12	-0.21
C9	0.01	-0.08	-0.01	-0.12	-0.63	-0.64	-0.34	-0.12	1.00	0.02
C10	0.46	0.35	0.10	0.41	0.23	0.25	0.48	-0.21	0.02	1.00

In Table 4, the CRITIC method computes the criteria weights for each identified ratio, offering a quantitative representation of the relative importance of each financial metric in the decision-making process.

Table 4: Criteria Weights for Identified Financial Ratios

Criterion	Weight
C1	0.10
C2	0.10
C3	0.10
C4	0.09
C5	0.09
C6	0.09
C7	0.09
C8	0.12
C9	0.13
C10	0.09

The calculated weights in Table 4 guide the prioritization of these financial ratios based on their perceived significance, facilitating a more nuanced and informed evaluation of the PSBs' performance. The CRITIC method assigns the highest and second-highest weights to the CAR and ROI specifically 0.13 and 0.12, respectively. Safeguarding an optimal level of capital relative to the inherent risks is imperative for a bank to reinforce its resilience against financial

shocks and ensure the protection of depositor interests. Elevated CAR serve as a critical indicator of heightened financial robustness and the ability to withstand adversities. Conversely, diminished ratios may signal vulnerabilities and a raised risk of insolvency, necessitating prudent risk management strategies. Similarly, an augmented ROI signifies superior returns derived from investment endeavours relative to the capital invested. This epitomizes adept

capital allocation and proficient investment stewardship. Conversely, a diminished ROI may imply suboptimal performance of investments or the accrual of losses within the bank's investment portfolio, necessitating a reassessment of investment strategies. In summary, the CRITIC method's weight allocation underscores the paramount importance of maintaining robust capital adequacy and optimizing investment returns for ensuring the sustained financial health and resilience of the evaluated PSBs. The discernment of these criteria as top priorities aligns with the broader industry consensus on the critical role played by capital strength and effective investment management in navigating the complexities of the banking landscape.

4. RAWEC Method

The subsequent phase of the research involves the hierarchical evaluation of PSBs based on meticulously identified financial ratios. The advanced RAWEC method for alternative ranking has been selected for implementation to discern the most optimal ranking reflective of superior financial indicators. The rationale behind this selection is rooted in a commitment to refining decision-making processes within the context of PSBs. Unlike emerging methodologies that introduce intricate steps, the RAWEC method simplifies proceedings by curtailing the number of steps and circumventing convoluted calculations. The steps involved in RAWEC method are described below:

Step 1: Creating the decision matrix is the first step in all other MCDM techniques. Here, the alternatives are assessed based on predefined criteria which lends itself to the formation of the preliminary decision matrix.

$$X = \begin{matrix} A_1 \\ A_2 \\ \vdots \\ A_m \end{matrix} \begin{bmatrix} C_1 & C_2 & \cdots & C_n \\ x_{11} & x_{12} & \cdots & x_{1n} \\ x_{21} & x_{22} & \cdots & x_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ x_{m1} & x_{m2} & \cdots & x_{mn} \end{bmatrix} \quad [5]$$

Step 2: Normalizing the initial decision matrix involves applying double normalization, as expressed by the following expressions:

$$n_{ij} = \frac{x_{ij}}{x_{j \max}}, \text{ and } n'_{ij} = \frac{x_{j \min}}{x_{ij}}, \text{ for benefit criteria and} \quad [6]$$

$$n_{ij} = \frac{x_{j \min}}{x_{ij}}, \text{ and } n'_{ij} = \frac{x_{ij}}{x_{j \max}}, \text{ for cost criteria} \quad [7]$$

Here, $x_{j \min}$ represents the minimum value among

alternatives based on specific criteria, while $x_{j \max}$ denotes the maximum value among alternatives for the same criteria. Through double normalization, the initial decision matrix undergoes normalization through two distinct methods. Firstly, via the first normalization (n_{ij}), all criteria are transformed into benefit criteria, wherein the highest values for individual criteria are assigned the maximum value, denoted as one. Next, through the second normalization (n'_{ij}), all criteria are converted into cost criteria. In this process, the lowest values among alternatives for specific criteria are elevated to the maximum value, i.e., one.

Step 3: Determining the deviation from the criterion weight involves amalgamating the weighting of the normalized decision matrix with the assessment of deviations from the criteria weights. This process employs the following expressions:

$$v_{ij} = \sum_{i=1}^n w_j \cdot (1 - n_{ij}) \quad [8]$$

$$v'_{ij} = \sum_{i=1}^n w_j \cdot (1 - n'_{ij}) \quad [9]$$

Here, w_j signifies the criteria weight. The procedure commences with computing the deviations of the normalized data from the maximum values, represented by the number 1. Subsequently, the total deviation from the criteria weight is computed by multiplying the deviation by the criteria weight. It is preferred for the deviation of the first value (v_{ij}) to be minimized, while for the second value (v'_{ij}), it is preferred to be maximized. These deviations form the basis for calculating the final value of the alternatives.

Step 4: Determining the value of the RAWEC method involves utilizing the following formula:

$$Q_i = \frac{v'_{ij} - v_{ij}}{v'_{ij} + v_{ij}} \quad [10]$$

The evaluation of an alternative's superiority is contingent upon the magnitude of its value derived from this method. The alternative with the highest value is deemed the optimal choice.

4.1 Implementation of RAWEC Model to Compute Financial Sustainability of PSBs

The initial decision matrix, encompassing financial ratio data for 12 PSBs, is presented in Table 1. Subsequently, Table 5 delineates the benefit normalization of the decision matrix, while Table 6 elucidates the cost normalization process.

Table 5: Benefit Normalisation (n_{ij}) of PSBs

PSBs	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Bank of Baroda	1.00	0.97	0.74	0.93	0.14	0.13	1.00	0.93	0.88	0.49
Bank of India	0.80	0.85	0.68	0.77	0.56	0.57	0.96	0.97	0.88	0.45
Bank of Maharashtra	0.81	0.95	1.00	1.00	0.60	0.57	0.96	0.96	0.85	0.60
Canara Bank	0.87	0.86	0.61	0.82	0.46	0.55	0.90	0.96	0.77	0.39
Central Bank of India	0.65	0.90	0.91	0.85	-0.52	-0.49	0.91	1.00	0.87	0.26
Indian Bank	0.92	0.97	0.78	0.98	1.00	0.98	0.93	0.96	0.92	0.45
Indian Overseas Bank	0.73	0.90	0.79	0.82	0.62	0.60	0.86	0.95	0.90	0.42
Punjab And Sind Bank	0.87	0.94	0.61	0.80	-5.10	-4.66	0.82	0.96	1.00	0.37
Punjab National Bank	0.83	0.93	0.83	0.91	0.30	0.27	0.91	0.94	0.84	0.26
State Bank of India	0.91	1.00	0.84	0.97	0.96	1.00	1.00	0.97	0.81	1.00
Uco Bank	0.74	0.96	0.73	0.84	0.12	0.10	0.96	0.95	0.81	0.38
Union Bank of India	0.88	0.97	0.67	0.88	0.54	0.56	0.87	0.98	0.74	0.32

Table 6: Cost Normalisation (') of PSBs

PSBs	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10
Bank of Baroda	0.65	0.88	0.82	0.83	-36.43	-35.18	0.82	1.00	0.84	0.54
Bank of India	0.81	1.00	0.89	1.00	-9.11	-8.11	0.85	0.95	0.84	0.58
Bank of Maharashtra	0.81	0.90	0.61	0.77	-8.50	-8.14	0.85	0.97	0.87	0.43
Canara Bank	0.75	0.99	1.00	0.94	-11.09	-8.47	0.90	0.97	0.95	0.66
Central Bank of India	1.00	0.95	0.66	0.91	9.81	9.52	0.90	0.93	0.85	1.00
Indian Bank	0.70	0.88	0.77	0.78	-5.10	-4.77	0.88	0.97	0.80	0.58
Indian Overseas Bank	0.89	0.95	0.77	0.94	-8.23	-7.79	0.95	0.98	0.82	0.62
Punjab And Sind Bank	0.75	0.91	1.00	0.96	1.00	1.00	1.00	0.96	0.74	0.70
Punjab National Bank	0.78	0.91	0.73	0.85	-17.00	-17.11	0.89	0.99	0.88	0.99
State Bank of India	0.71	0.85	0.72	0.79	-5.31	-4.66	0.82	0.96	0.91	0.26
Uco Bank	0.88	0.89	0.84	0.92	-42.50	-45.96	0.85	0.97	0.91	0.68
Union Bank of India	0.74	0.88	0.90	0.88	-9.44	-8.37	0.94	0.95	1.00	0.80

The subsequent phase in ascertaining the ranking of PSBs in terms of financial sustainability involves the computation of performance values utilizing the RAWEC method, as shown in Table 7. In accordance with this methodology, the bank attaining the highest score is accorded the first ranking, while the one garnering the least score is positioned at the last of the ranking order.

Table 7: Final Ranking of PSBs as Derived Using RAWEC method

PSBs	Qi	Rank
Bank of Baroda	0.92	2
Bank of India	0.76	8
Bank of Maharashtra	0.83	6
Canara Bank	0.76	11
Central Bank of India	1.85	1
Indian Bank	0.83	7
Indian Overseas Bank	0.76	9
Punjab And Sind Bank	-0.84	12
Punjab National Bank	0.84	5
State Bank of India	0.91	4
Uco Bank	0.92	3
Union Bank of India	0.76	10

The results obtained through the RAWEC method indicate that the Central Bank of India holds the top rank, followed by Bank of Baroda at the second position. In contrast, Punjab & Sind Bank is ranked lowest, and Canara Bank is second to the bottom. When examining the financial data, notable differences among the banks become apparent. The

Central Bank of India stands out with a strong CAR of 14.81%, signalling a robust financial position. Conversely, Punjab and Sind Bank shows a concerning ROA of (-2.55%), indicating financial challenges.

5. Conclusion

PSBs play a pivotal role in India's financial framework,

serving as key facilitators of capital allocation, drivers of economic growth, and promoters of financial inclusion. However, the ongoing wave of periodic mergers, aimed at enhancing operational efficiency, underscores the critical need to ensure the enduring financial sustainability of PSBs. Thorough scrutiny of these mergers is imperative to gauge their impact on vital aspects such as asset quality, capital adequacy, and operational resilience. The assessment of the financial health of PSBs post-mergers assumes paramount importance, serving as a crucial mechanism for risk mitigation and the preservation of stability within the banking sector. Furthermore, the outcomes of these evaluations wield considerable influence over policy-making processes, shaping decisions related to banking regulations, capital infusion, credit allocation, and overall financial stability. Therefore, judicious policy interventions, informed by comprehensive evaluations of PSB mergers, are indispensable for upholding the integrity and efficacy of India's banking sector, thereby contributing to sustained economic development.

In a pioneering approach, this study employs two MCDM techniques, CRITIC and RAWEC, in tandem to assess and rank the financial performance of PSBs. The findings of this analysis reveal that the Central Bank of India claims the top position, with Bank of Baroda following closely at rank 2. Conversely, Punjab and Sind Bank is positioned at last, and Canara Bank occupies the second-to-last position. These rankings offer valuable insights that can inform strategic decisions, aiding stakeholders in navigating the complexities of the evolving banking landscape and ensuring the continued stability and progress of India's financial sector.

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