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From Amalgamation to Analysis: Investigating Bank of Baroda's Financial Performance Post Merger

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Abstract: *The merger of Bank of Baroda with Dena Bank and Vijaya Bank in April 2019 marked a significant move in the Indian banking sector towards consolidation, efficiency, and resilience. This study evaluates the short-term financial performance of the merged entity using the CAMEL framework, covering Capital Adequacy, Asset Quality, Management Efficiency, Earnings, and Liquidity indicators. A comparative analysis was conducted for the years 2018–19 (pre-merger) and 2020–21 (post-merger), followed by a paired t-test to determine the statistical significance of observed changes. Although numerical improvements were found in most indicators, including capital adequacy, profitability, and employee productivity, the results of hypothesis testing showed that these improvements were not statistically significant at the 5% level. The study highlights the challenges of post-merger integration, the burden of legacy NPAs, and the importance of long-term evaluation frameworks. Policy recommendations emphasize the need for structured integration planning, asset cleansing mechanisms, and human resource alignment. The findings suggest that while mergers hold potential for long-term transformation, their short-term impact remains modest and requires patient policy and institutional support.*

Keywords: Bank Merger, Post-Merger Performance, Public Sector Banks, Capital Adequacy, NPAs, Financial Integration, Indian Banking Reforms

1. Introduction

The Indian banking sector, a critical pillar of the country's financial infrastructure, has evolved significantly over the last few decades. This evolution has been shaped by a series of policy reforms, liberalization measures, technological advancements, and regulatory shifts. One of the most profound developments in recent years has been the Government of India's push toward consolidation in the public banking system. The rationale for this restructuring was rooted in the need to create robust, competitive, and efficiently governed public sector banks (PSBs) that could withstand financial shocks, improve service delivery, and enhance credit flow to critical sectors of the economy. Against this backdrop, the merger of Bank of Baroda with Dena Bank and Vijaya Bank, which came into effect on April 1, 2019, was a landmark reform. This three-way amalgamation was not only the first of its kind in Indian banking history but also the beginning of a broader consolidation wave that saw multiple PSBs being merged to form larger banking entities. The merger aimed at synergizing operations, optimizing capital use, increasing profitability, and minimizing duplication of banking services. It was expected to result in improved governance, larger balance sheets, better risk absorption capacity, and cost efficiency through shared infrastructure, technology, and workforce. The newly formed entity emerged as the third-largest lender in India with a nationwide and international presence. While the theoretical benefits of mergers include increased economies of scale, improved asset quality, and expanded customer reach, the real impact of such consolidations must be evaluated through empirical financial performance. Particularly in the case of Bank of Baroda, the merger involved banks with differing financial health. Dena Bank was grappling with high non-performing assets (NPAs) and was under the Reserve Bank of India's Prompt Corrective Action (PCA) framework, while Vijaya Bank had relatively better financial stability. Therefore, the effectiveness of this merger hinges on whether Bank of Baroda was able to absorb the liabilities of the weaker banks without compromising its own performance, and whether any synergy was achieved in the short to medium term.

In this context, the present study attempts to assess the short-term financial impact of the merger using the CAMEL framework an analytical tool widely accepted by regulators and financial analysts for evaluating a bank's overall performance and financial soundness. The CAMEL framework focuses on five core dimensions: Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality, and Liquidity. Each of these components offers specific insights into the internal financial and operational health of a bank. For instance, Capital Adequacy assesses a bank's ability to absorb losses; Asset Quality measures the level of credit risk and loan portfolio soundness; Management Efficiency reflects the productivity of staff and effectiveness of governance; Earnings Quality gauges profitability; and Liquidity indicates the bank's capability to meet short-term obligations without disruption. To conduct this analysis, the study examines key financial ratios under each CAMEL component for the financial years 2018–19 (pre-merger) and 2020–21 (post-merger). Additionally, statistical analysis through the paired t-test has been employed to evaluate whether any observed differences in performance before and after the merger are statistically significant. This becomes particularly important in assessing whether the merger has yielded tangible results or if its benefits remain limited in the short term. The broader relevance of this study lies in its contribution to policy evaluation. Mergers in the banking sector are not merely corporate strategies; they are also instruments of public policy aimed at strengthening the financial system. Understanding the outcomes of such initiatives, especially in the case of PSBs which handle a large share of public deposits and government schemes, is essential for policymakers, financial analysts, and banking institutions alike. Moreover, since mergers involve significant costs legal, human resource, technological, and operational it becomes crucial to ensure that they yield corresponding benefits in terms of financial performance and service delivery.

Therefore, this study seeks to bridge the existing research gap by providing an early-stage empirical evaluation of the Bank of Baroda merger using a comprehensive financial model and statistical methods. The findings will offer insights into whether the merger has contributed to the intended financial strengthening or if further reforms and adjustments are needed in post-merger integration practices.

Statement of the problem

Although mergers are widely viewed as a strategic solution for strengthening the banking system, their effectiveness remains subject to debate, especially when the entities involved have contrasting financial positions. In the case of Bank of Baroda, the amalgamation included one relatively weak bank and one moderately strong bank. Thus, there is a need to empirically examine whether the merger resulted in actual performance improvement or simply created a larger institution with the same underlying issues. The problem this study addresses is whether the post-merger performance of Bank of Baroda has shown measurable improvement over its pre-merger status.

Objectives of the study

This study is designed to achieve the following objectives:

1. To analyze the financial performance of Bank of Baroda before and after its merger with Dena Bank and Vijaya Bank.
2. To apply the CAMEL framework to assess the bank's performance across key financial dimensions including capital adequacy, asset quality, management efficiency, earnings quality, and liquidity.
3. To perform statistical hypothesis testing using paired t-test to determine whether changes in performance metrics are statistically significant.
4. To contribute to academic literature and policy discourse on public sector bank mergers by offering evidence-based insights.

Hypotheses of the study

In accordance with the research problem and objectives, the following hypotheses are formulated:

Null hypothesis (H_0): There is no statistically significant difference in the financial performance of Bank of Baroda before and after the merger.

Alternative hypothesis (H_1): There is a statistically significant difference in the financial performance of Bank of Baroda before and after the merger.

This introductory section sets the stage for a detailed empirical and analytical investigation into the financial outcomes of the merger, providing both a rationale and a framework for assessing one of India's most important banking reforms.

2. Review of Literature

The performance of banks before and after mergers has long been an area of academic interest, particularly in the Indian context where state-owned banks have been frequently restructured to address rising non-performing assets (NPAs), governance weaknesses, and fragmented operations. The CAMEL model assessing Capital Adequacy, Asset Quality, Management Efficiency, Earnings Quality, and Liquidityhas emerged as a robust framework to analyze the financial soundness of banks, especially during structural changes such as mergers. Numerous scholars have applied this model to evaluate the efficacy of bank consolidations, offering varied insights across timeframes and institutional contexts.

Dash and Das (2012) were among the first to undertake a detailed CAMEL analysis on a cross-section of Indian public and private sector banks, highlighting significant performance gaps in management and earnings between public sector banks (PSBs) and their private/foreign counterparts. Their work provided a foundational critique of the inefficiencies prevalent in the Indian PSB sector. Gupta (2014) further applied CAMEL indicators to a sample of PSBs between 2009 and 2013, finding considerable variations in inter-bank performance. While Andhra Bank and Bank of Baroda consistently ranked higher, others like UCO Bank lagged, indicating the need for targeted governance reforms. In a post-liberalization context, Kaur and Kaur (2016) analyzed 10 public sector banks over a decade and classified them into stability-based performance tiers using CAMEL indicators. Banks like PNB and BoB were ranked stable, while institutions like Syndicate Bank were labeled financially vulnerable. These categorizations later became relevant when such lower-ranked banks were absorbed into stronger anchor institutions during the consolidation phase initiated after 2018. Focusing on individual cases, Purohit and Bothra (2018) compared the financial soundness of SBI and ICICI Bank using CAMEL ratios and found private sector players to be more agile in asset quality and capital adequacy. However, the study also acknowledged SBI's post-merger struggles in profitability and management efficiency due to complex integration challenges. Likewise, Panboli and Birda (2019) found that HDFC and Axis Bank outperformed public sector banks like Canara and PNB on most CAMEL parameters, reinforcing the view that public banks often face post-merger lags in financial consolidation. Shaifali Mathur (2021) examined the pre- and post-merger performance of the State Bank of India and its associates. Although the study revealed a significant improvement in branch rationalization and capital strength, it also emphasized short-term declines in ROA and ROE. The study concluded that large-scale mergers may yield long-term benefits, but the short-term outcomes are often limited by operational frictions and cultural mismatches among merging entities.

Table2.1: Summary of Key Literature on CAMEL Analysis and Bank Mergers

S. No.	Author (Year)	Study Focus	Method Used	Key Findings
1	Dash & Das (2012)	CAMEL analysis of Indian banks (PSBs vs private/foreign)	CAMEL model	Private/foreign banks outperformed PSBs in earnings and management efficiency.
2	Gupta (2014)	CAMEL analysis of PSBs from 2009–2013	CAMEL model and ranking	BoB and Andhra Bank ranked high; wide variation in CAMEL scores among PSBs.
3	Kaur & Kaur (2016)	Stability-based classification of 10 PSBs using CAMEL	CAMEL ratios and categorization	BoB and PNB were stable; Syndicate Bank and CBI needed close monitoring.
4	Purohit & Bothra (2018)	SBI vs ICICI Bank post-merger performance	Comparative CAMEL analysis	ICICI stronger in capital and assets; SBI lagged in earnings and liquidity.
5	Panboli & Birda (2019)	Public vs private bank performance using CAMEL	CAMEL metrics and performance grading	HDFC and Axis Bank outperformed PNB and Canara Bank in all components.
6	Shaifali Mathur (2021)	SBI's pre- and post-merger profitability analysis	CAMEL analysis with ratio trends	Improvements in capital and reach; decline in ROA and profitability short term.
7	Sharma & Gupta (2022)	Post-merger efficiency in PSBs	CAMEL + Data Envelopment Analysis (DEA)	Scale efficiency improved; technical efficiency decreased due to merger integration issues.
8	Patel & Mehta (2022)	Short-term impact of BoB-Dena-Vijaya merger	Financial ratio analysis	Quantitative growth seen; no significant improvement in asset quality or employee efficiency.
9	Iyer & Prakash (2023)	Financial trends in PSBs post-consolidation	Ratio and statistical analysis	ROA and ROE improved gradually; operational consolidation took two years.
10	Chakraborty & Dey (2023)	Liquidity performance in merged PSBs	LCR and CASA ratio analysis	Temporary dip in liquidity; recovery observed in the second post-merger year.
11	Rani & Srivastava (2023)	Governance reforms post-merger in PSBs	Qualitative governance framework	Regulatory compliance improved; branch-level autonomy remained limited.
12	Tan & Floros (2020)	Bank mergers in Southeast Asia and performance outcomes	Regional comparative analysis	Post-merger gains often take 3–5 years; leadership and IT integration are critical.
13	Kumar & Sinha (2023)	Customer experience and digital banking post-merger in PSBs	Digital index and satisfaction metrics	Customer access improved; digital adoption accelerated post-merger.
14	Chakraborty & Ghosh (2023)	HR and cultural integration challenges in PSBs	Case study approach	HR misalignment delayed operational synergy; some cultural resistance reported.
15	Singh & Rawat (2023)	Technology and risk control systems in post-merger PSBs	Quantitative + IT systems analysis	Initial disruptions in IT systems affected credit risk and compliance tracking.

More recent studies have introduced nuanced methodologies and expanded variables. Sharma and Gupta (2022) integrated CAMEL analysis with Data Envelopment Analysis (DEA) to explore the post-merger efficiency of newly consolidated banks. Their study, covering six merged entities from 2019–2021, revealed that while scale efficiency improved in most cases, technical efficiency remained stagnant or declined due to complex IT and HR integration. Similarly, Iyer and Prakash (2023) examined 10 PSBs post-merger and found that while balance sheet strength improved within two years, key ratios such as net interest margin (NIM) and return on equity (ROE) remained under pressure. Patel and Mehta (2022) studied the Bank of Baroda merger specifically and noted that although advances and customer deposits showed quantitative growth post-merger, qualitative indicators such as asset quality and employee productivity remained largely unchanged in the immediate aftermath. This was attributed to the financial burden brought in by Dena Bank’s weak loan portfolio and the challenge of cultural harmonization across merged entities.

Chakraborty and Dey (2023) contributed by analyzing liquidity performance post-merger across selected PSBs using the Liquidity Coverage Ratio (LCR) as an extension of CAMEL. Their findings indicated a temporary liquidity crunch in the first post-merger year for banks like Union Bank and Indian Bank, followed by recovery in the subsequent year as operational systems stabilized. An international comparative perspective was offered by Tan and Floros (2020), who examined bank mergers in Southeast Asia and emphasized that successful mergers often require 3–5 years to yield measurable results in profitability and risk absorption. Their study highlighted the importance of leadership alignment and digital integration in determining merger outcomes an insight increasingly relevant to the Indian context as banks adopt centralized IT systems post-merger. Adding a governance dimension, Rani and Srivastava (2023) studied post-merger corporate governance mechanisms in PSBs and found that despite improvements in compliance and reporting structures, decision-making remained highly centralized, limiting branch-level autonomy and innovation.

While the above studies cover a wide range of banks and methodological tools, there remains a noticeable gap in literature regarding short-term, post-merger quantitative performance of Bank of Baroda using the full CAMEL framework supported by hypothesis testing. Most studies either focus on State Bank of India or broadly analyze merged PSBs as a group, thereby overlooking the unique dynamics of the BoB-Dena-Vijaya merger the first tri-party amalgamation in India’s banking history.

3. Research Methodology

The present study adopts an explanatory research design with the primary aim of examining the financial performance of Bank of Baroda in the context of its merger with Dena Bank and Vijaya Bank. The approach focuses on understanding the structural changes in key financial indicators during the period surrounding the merger. The analysis covers two specific financial years: 2018–2019 as the pre-merger phase, and 2020–2021 as the post-merger phase. These periods have been carefully chosen to provide a comparative view of the bank’s financial condition immediately before and after the consolidation. The study relies exclusively on secondary data, sourced from credible platforms such as the Reserve Bank of India’s publications, the official websites of the merged banks, Moneycontrol.com, and annual financial reports. These sources provide the necessary financial ratios and performance metrics relevant to the analysis. For analytical purposes, the study employs the CAMEL framework, which evaluates a bank's health across five key dimensions: Capital Adequacy, Asset Quality, Management Efficiency, Earnings Performance, and Liquidity Position. Each component includes specific ratios and indicators that reflect different aspects of the bank’s operational and financial strength. To determine whether there is a significant difference in financial performance pre- and post-merger, the study uses a paired sample t-test. This statistical tool helps assess whether the changes in key financial metrics between the two periods are statistically meaningful or occurred by chance.Overall, this methodology provides a comprehensive and structured approach to evaluating the short-term impact of the merger on Bank of Baroda’s financial standing.

4. CAMEL Model Framework and Variables

The CAMEL framework is a standardized analytical tool widely used by banking regulators and researchers to assess the internal financial strength and performance of banks. In the context of this study, the model provides a comprehensive structure for evaluating the impact of the merger on Bank of Baroda by examining five critical dimensions: Capital Adequacy, Asset Quality, Management Efficiency, Earnings

Quality, and Liquidity. Each dimension is represented through carefully selected financial ratios that are measured and compared for the pre-merger and post-merger periods.

4.1 Capital Adequacy

Capital Adequacy Ratio (CAR): This ratio measures a bank's capital in relation to its risk-weighted assets. It is calculated as (Tier 1 Capital + Tier 2 Capital) divided by Risk-Weighted Assets. A higher CAR reflects the bank's ability to absorb potential losses and maintain financial stability during periods of stress. Regulatory standards such as the Basel III norms and RBI guidelines mandate a minimum CAR threshold to ensure the resilience of the banking system. In this study, CAR serves as a key indicator of the post-merger capital position of Bank of Baroda and whether the consolidated entity strengthened its buffer against credit and operational risks.

Advances to Total Assets Ratio: This ratio indicates the proportion of a bank's total assets that are deployed as advances or loans. It is computed by dividing total advances by total assets and multiplying by 100. A higher ratio suggests a greater share of income-generating assets, but it may also increase the risk exposure if asset quality deteriorates. In the context of this merger, any variation in this ratio reflects how the bank has allocated its resources after consolidation and whether its lending operations have expanded or contracted.

4.2 Asset Quality

Gross NPA to Gross Advances Ratio: This metric assesses the proportion of gross non-performing assets in relation to total gross advances. It serves as a direct indicator of asset quality and credit risk. A lower ratio is desirable as it reflects better control over defaults. In this study, comparing the gross NPA ratio before and after the merger helps determine whether the amalgamation helped contain or amplify bad loans, especially considering Dena Bank's historically high NPA levels.

Net NPA to Net Advances Ratio: This ratio refines the gross NPA measure by considering provisions made for doubtful assets. It is calculated by dividing net NPAs by net advances. A lower net NPA ratio indicates better risk provisioning and recovery mechanisms. It is particularly relevant in this case, as it reveals whether the merged entity managed to improve its provisioning adequacy and reduce actual exposure to bad loans post-merger.

4.3 Management Efficiency

Business per Employee: This ratio measures the total business handled (sum of deposits and advances) per employee. It reflects staff productivity and managerial efficiency. A higher value indicates effective utilization of human resources. Since mergers often lead to realignment or reduction in workforce, changes in this ratio can reveal how efficiently Bank of Baroda integrated and utilized its enlarged workforce.

Profit per Employee: This metric evaluates profitability in relation to human resource deployment. It is derived by dividing net profits by the number of employees. A rise in this ratio post-merger would indicate improved operational performance and better cost control, while a decline may suggest inefficiencies arising from integration challenges.

Return on Assets (ROA): ROA is calculated by dividing net income by total assets. It reflects how effectively the bank is using its assets to generate profit. A higher ROA denotes more efficient use of available resources. This indicator is crucial to determine if the merged entity was able to maintain or improve asset utilization efficiency.

Return on Equity (ROE): ROE measures the return generated on shareholders' equity and is calculated as net income divided by total equity. It is a key profitability measure for investors and stakeholders. Changes in ROE post-merger provide insight into the institution's ability to generate shareholder value after absorbing the financials of the two merged banks.

4.4 Earnings Quality

Operating Profit to Total Assets Ratio: This ratio measures the earnings generated from core banking operations (excluding interest and taxes) relative to total assets. It indicates how efficiently the bank's core functions are contributing to overall profitability. An increase in this ratio post-merger would imply operational synergy, while a decline may indicate merger-related cost burdens.

Net Profit to Total Assets Ratio: This profitability ratio shows the percentage of net profit earned on total assets. It provides a broad view of the bank's earning capacity after accounting for all expenses and taxes. A comparative analysis of this ratio before and after the merger helps assess whether the consolidation resulted in sustainable improvements in overall earnings.

4.5 Liquidity

Liquid Assets to Total Assets Ratio: This ratio evaluates the proportion of liquid resources (such as cash, short-term investments, and government securities) in total assets. It indicates the bank's ability to meet short-term obligations without disrupting operations. A decrease in this ratio may point to increased exposure to illiquid assets, which can be risky during periods of economic stress.

Liquid Assets to Total Deposits Ratio: This ratio reflects the availability of liquid assets to cover customer deposits. It is an important measure of depositor confidence and short-term solvency. In the context of a merger, any fluctuation in this ratio reveals how well the bank managed its liquidity buffer post-consolidation, especially when handling a combined deposit base.

5. Results

This section presents a detailed analysis of the financial performance of Bank of Baroda by comparing pre-merger (2018–19) and post-merger (2020–21) data across twelve key financial indicators under the CAMEL framework. The merger, effective from April 1, 2019, was intended to improve the bank's capital base, reduce operational redundancies, and strengthen overall performance. To verify whether these objectives were realized in the short term, both ratio-based analysis and statistical hypothesis testing have been conducted.

5.1 Capital Adequacy

Capital adequacy is fundamental to a bank's financial health, reflecting its ability to absorb losses without disrupting depositor obligations. In this study, the Capital Adequacy Ratio (CAR) rose from 13.42% before the merger to 14.99% after, reflecting a gain of 11.7%. This indicates that the merged entity became more resilient to credit risk and was better positioned to meet regulatory capital norms set by the Reserve Bank of India under Basel III. The Advances to Total Assets ratio also improved marginally from 60% to 61%, suggesting a moderate increase in credit expansion. This may reflect the bank's ability to deploy a greater portion of its asset base towards income-generating advances, although the increase is not substantial enough to indicate aggressive lending post-merger.

5.2 Asset Quality

The asset quality dimension, represented by Gross and Net NPA ratios, is critical for understanding the risk profile of the bank's loan portfolio. The Gross NPA to Gross Advances ratio declined from 9.61% to 8.87%, while the Net NPA ratio declined from 3.33% to 3.09%. This decline, though modest, points to an initial improvement in loan recovery and risk provisioning. It is especially significant considering that Dena Bank, one of the merging entities, was previously under the RBI's Prompt Corrective Action (PCA) framework due to high NPAs. However, these figures should be interpreted cautiously, as a one-year post-merger window may not be sufficient to fully reflect the merged bank's ability to clean up its loan book, especially in a period impacted by COVID-19-related repayment stress.

5.3 Management Efficiency

The management efficiency indicators reflect the operational effectiveness of the bank post-merger. Business per Employee increased from ₹18.88 lakhs to ₹19.96 lakhs, while Profit per Employee rose from ₹0.78 lakhs to ₹1.01 lakhs an increase of approximately 29.5%. These improvements indicate enhanced staff productivity, better integration of the workforce, and effective branch-level rationalization. Moreover, Return on Assets (ROA) and Return on Equity (ROE) also improved significantly from 0.05% to 0.07% and 0.94% to 1.50% respectively. These ratios demonstrate the bank's improved capacity to generate returns from its assets and equity base, which may be attributed to operational synergies and better cost control mechanisms implemented after the merger.

Table5.1: Comparative CAMEL Analysis of Bank of Baroda (Pre- and Post-Merger)

S. No.	CAMEL Financial Indicator	Pre-Merger (2018–19)	Post-Merger (2020–21)	Difference	% Change
1	Capital Adequacy Ratio (%)	13.42	14.99	+1.57	+11.70%
2	Advances to Total Assets (%)	60.00	61.00	+1.00	+1.67%
3	Gross NPA to Gross Advances (%)	9.61	8.87	–0.74	–7.70%
4	Net NPA to Net Advances (%)	3.33	3.09	–0.24	–7.21%
5	Business per Employee (₹ Lakhs)	18.88	19.96	+1.08	+5.72%
6	Profit per Employee (₹ Lakhs)	0.78	1.01	+0.23	+29.49%
7	Return on Assets (ROA) (%)	0.05	0.07	+0.02	+40.00%
8	Return on Equity (ROE) (%)	0.94	1.50	+0.56	+59.57%
9	Operating Profit to Total Assets (%)	1.29	1.78	+0.49	+37.98%
10	Net Profit to Total Assets (%)	–0.88	0.07	+0.95	+107.95%
11	Liquid Assets to Total Assets (%)	11.36	10.42	–0.94	–8.28%
12	Total Deposits to Total Assets (%)	81.77	83.69	+1.92	+2.35%

Source: Calculated from Bank of Baroda's annual financial statements (2018–19 and 2020–21)

5.4 Earnings Quality

Profitability indicators showed the most encouraging trend among all CAMEL components. The Operating Profit to Total Assets ratio increased from 1.29% to 1.78%, and the Net Profit to Total Assets ratio improved remarkably from –0.88% to +0.07%, marking a complete turnaround from a loss-making position to positive profitability. This improvement may reflect not only cost optimization measures post-merger but also a better alignment between revenue streams and risk management practices. The shift from negative to positive net profit indicates the bank's success in stabilizing its core operations and integrating financial systems across the merged entities. However, it is important to note that this recovery occurred in a highly challenging economic environment affected by the pandemic, which further highlights the significance of the turnaround.

5.5 Liquidity

Liquidity indicators presented mixed results. The Liquid Assets to Total Assets ratio declined from 11.36% to 10.42%, suggesting a slight reduction in the proportion of highly liquid instruments held by the bank. Although this decline is not drastic, it may reflect a strategic shift towards longer-term lending or investment. On the other hand, the Total Deposits to Total Assets ratio increased from 81.77% to 83.69%, indicating improved deposit mobilization and a better capacity to fund the asset base through stable liabilities. The rise in this ratio post-merger is a positive sign, as it reflects public confidence in the consolidated entity and its ability to attract and retain low-cost deposits.

5.6 Statistical Hypothesis Testing

To validate whether the observed differences in financial indicators are statistically significant, a paired sample t-test was applied. This test compares the means of matched pre- and post-merger values for all twelve indicators. The result of the paired t-test produced a t-statistic of 1.9473 and a p-value of 0.005. Given that the significance level (α) is set at 0.05, the p-value exceeds this threshold. Therefore, the null hypothesis is rejected**.** This implies that although there are numerical improvements in many CAMEL indicators post-merger, these changes are not statistically significant in the short-term context of this study. The results suggest that the merger, while beneficial in certain operational and financial aspects, has not yet led to transformative or statistically measurable changes in the bank's overall financial health within one year of integration.

6. Discussion

The results of this study reveal that although there were measurable improvements in several CAMEL indicators such as capital adequacy, asset quality, earnings, and employee productivity—these changes were not statistically significant within the short-term post-merger period. This finding aligns with a growing body of academic research that suggests the financial benefits of large-scale bank mergers, particularly in the public sector, are rarely immediate. Several interrelated factors may explain why the merger of Bank of Baroda with Dena Bank and Vijaya Bank has not yet translated into substantial or statistically robust performance enhancement.

6.1 Short-Term Integration Lag

One of the foremost reasons for the lack of statistically significant impact is the limited time frame analyzed. The post-merger year considered in this study is 2020–21—only the first full fiscal year following the merger implementation in April 2019. Empirical literature on bank mergers, both in India and globally, consistently notes that integration benefits take anywhere from 2 to 5 years to materialize. The early post-merger phase is typically marked by alignment of systems, restructuring of organizational processes, rationalization of branches, and the harmonization of risk management practices. These transitions are resource-intensive and often result in short-term cost pressures that can offset initial financial gains.

6.2 Burden of Legacy Non-Performing Assets

Another important factor is the absorption of Dena Bank's distressed loan portfolio. Dena Bank was placed under the Reserve Bank of India's Prompt Corrective Action (PCA) framework prior to the merger due to its high levels of gross and net NPAs. Although Bank of Baroda had a comparatively healthier balance sheet, integrating the stressed assets from Dena Bank diluted its overall asset quality. While the post-merger data shows a marginal improvement in gross and net NPA ratios, the reduction was not significant enough to demonstrate strong credit quality gains. This suggests that the merged entity spent the initial year in consolidating and provisioning for legacy issues rather than aggressively expanding or diversifying its credit base.

6.3 Technological and Cultural Integration Challenges

Large public sector bank mergers are not only financial and administrative consolidations—they are also technological and cultural integrations. Bank of Baroda, Vijaya Bank, and Dena Bank operated on different core banking platforms and had distinct operational cultures, decision-making structures, and staff hierarchies. Post-merger integration required significant IT harmonization, migration of customer data, retraining of employees, and reconfiguration of internal controls. These processes, though essential for long-term stability, are time-consuming and frequently disruptive in the short run. The fact that the merger occurred just before the COVID-19 pandemic further compounded these challenges, as physical restrictions and economic uncertainty delayed branch-level synchronization and human resource alignment.

6.4 Cost Rationalization and Synergy Delays

One of the commonly cited advantages of mergers is operational synergy, including branch consolidation, reduction of overlapping roles, and optimization of costs. However, these synergies are rarely immediate. In the initial years, integration-related costs often rise due to legal, infrastructural, and human resource expenditures. For instance, offering voluntary retirement schemes (VRS), retraining employees, and updating infrastructure across formerly separate branches incur short-term financial burdens. As a result, while the post-merger profitability indicators (such as Net Profit to Total Assets and ROE) showed numerical improvement, the gains were insufficient to overcome transitional costs and yield statistically significant results.

6.5 Policy and Strategic Implications

The findings of this study raise important considerations for policymakers, banking regulators, and financial strategists. While consolidation is a strategic imperative for creating robust and competitive public sector banks, its effectiveness depends on the pace and depth of integration planning. Policymakers must ensure that merger plans are accompanied by clear frameworks for technological integration, staff redeployment, capital infusion, and NPA resolution. Moreover, merger evaluations should not be confined to short-term financial performance alone. Instead, long-term indicators such as market share expansion, improvement in customer satisfaction, digital inclusion, and risk-adjusted return on capital (RAROC) should be considered.

6.*6 Need for Long-Term and Multi-Dimensional Assessment*

Finally, the results emphasize the importance of adopting a longitudinal and multi-dimensional approach to merger assessment. A single-year financial analysis, even with robust tools like the CAMEL framework and t-tests, may not capture the full spectrum of integration challenges and strategic transformations. Subsequent years may reveal improvements in efficiency, credit delivery, financial inclusion, and customer engagement that were not visible in the initial phase. Future research could also integrate qualitative data such as employee interviews, customer satisfaction surveys, and branch-level performance reviews to offer a more holistic understanding of merger outcomes.

7. Conclusion

The present study critically examined the short-term financial performance of Bank of Baroda following its merger with Dena Bank and Vijaya Bank, using the well-established CAMEL framework. Through a comparative analysis of twelve key financial indicators before and after the merger, this research sought to determine whether the strategic consolidation resulted in statistically significant improvements in the bank’s financial health. The findings reveal a mixed performance. On one hand, there were visible numerical improvements in most parameters, particularly in capital adequacy, earnings quality, and management efficiency. For instance, the Capital Adequacy Ratio improved from 13.42% to 14.99%, operating profit as a percentage of total assets increased from 1.29% to 1.78%, and profit per employee rose by nearly 30%. These results suggest a moderate strengthening of the bank’s operational and financial base post-merger. On the other hand, asset quality showed only marginal recovery, and liquidity indicators slightly weakened, indicating that the bank continues to navigate legacy challenges inherited from the absorbed entities. Importantly, the results of the paired sample t-test indicate that the observed improvements are not statistically significant at the 5% confidence level (p-value = 0.0005). This confirms that the merger, within the one-year post-integration period analyzed, did not result in substantial or transformative financial changes. This conclusion does not undermine the policy rationale behind the merger. Rather, it emphasizes the critical need for continuous monitoring and long-term performance assessment. Merger-related synergies particularly in the public banking sector require extended integration periods due to the complexities involved in harmonizing systems, aligning organizational cultures, and absorbing financial stress from weaker institutions. Therefore, the benefits of such consolidations are more likely to manifest over a longer horizon, typically three to five years, rather than within a single financial cycle.

8. Suggestions and Recommendations

Based on the findings of this research and the broader challenges identified during the post-merger analysis of Bank of Baroda, several key recommendations are proposed to enhance the effectiveness of public sector bank mergers in India. These suggestions are aimed at ensuring that the strategic objectives of consolidation such as financial stability, operational efficiency, and global competitiveness are not only achieved but sustained over time.

8.1 Strengthen Post-Merger Integration Planning

The success of any bank merger depends heavily on the quality of post-merger integration. It is recommended that future mergers should be accompanied by a detailed integration roadmap addressing technological alignment, organizational structure, reporting systems, and operational harmonization. This should include:

- A dedicated integration task force with cross-functional leadership
- Standardization of Core Banking Systems (CBS) and risk management tools
- Streamlined compliance and internal audit protocols
- Unified customer relationship management systems

This proactive planning can minimize disruptions and accelerate the realization of merger-related synergies.

8.2 Address the Burden of Stressed Assets before Merger

One of the major reasons behind the limited post-merger financial improvement in Bank of Baroda was the absorption of Dena Bank's high NPA burden. Before merging weaker institutions, it is advisable to conduct a rigorous pre-merger audit of asset quality and undertake stress testing. To protect the financial integrity of the stronger anchor bank, the following measures are suggested:

- Segregation of high-risk assets into a "bad bank" or special purpose vehicle
- Enhanced provisioning norms and capital support from the government
- Timely recapitalization packages linked to performance and clean-up metrics

Such measures would ensure that legacy weaknesses do not erode the financial strength of the consolidated entity.

8.3 Focus on Long-Term Human Resource Integration

Public sector bank mergers involve large-scale workforce restructuring. Human resource alignment is critical not only for productivity but also for cultural cohesion. Therefore, banks should:

- Implement targeted training and retraining programs to build a unified workforce
- Design transparent transfer and promotion policies across merged branches
- Establish grievance redressal mechanisms to maintain employee morale
- Promote cross-branch knowledge exchange and leadership development

This approach can enhance managerial efficiency and support change management.

8.4 Enhance Customer Experience and Communication

Mergers often cause confusion among customers regarding account migration, service continuity, and branch restructuring. It is recommended that banks adopt customer-centric integration strategies by:

- Notifying customers well in advance of any account or branch changes
- Providing clear and consistent communication through digital and physical channels
- Ensuring uninterrupted access to services across merged branches
- Expanding digital support, mobile banking, and grievance redressal platforms

Customer trust and satisfaction are crucial for deposit retention and brand stability in the post-merger period.

8.5 Institutionalize Post-Merger Monitoring and Evaluation

A standardized monitoring mechanism should be developed to evaluate the post-merger performance of PSBs at regular intervals. This can be led jointly by the Reserve Bank of India and the Ministry of Finance. The monitoring framework should include:

- Key financial indicators such as ROA, NPA ratio, and CAR
- Operational metrics like cost-to-income ratio and digital adoption levels
- Branch-level profitability and regional outreach
- Human resource performance and customer satisfaction scores

This data-driven review process will enable early detection of post-merger challenges and guide corrective interventions.

8.6 Adopt a Long-Term Evaluation Framework

This study confirms that short-term improvements are not necessarily reflective of merger success. Therefore, mergers should be evaluated through a long-term lens that considers not only financial metrics but also social and developmental outcomes. Future studies and institutional reviews should track:

- Credit penetration in underserved regions
- Growth in MSME lending and priority sector credit
- Expansion of digital banking infrastructure
- Contribution to financial inclusion and economic resilience

By framing mergers as long-term public sector reforms rather than short-term financial interventions, policymakers and banking leaders can better align institutional goals with national development objectives.

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