Journal DOI: 10.36713/epra1013 | SJIF Impact Factor (2026): 8.748 ISSN: 2347-4378
EPRA International Journal of Economics, Business and Management Studies (EBMS)
Volume: 13 | Issue: 8 | August 2026 -Peer-Reviewed Journal

# IMPACT OF THE MERGER ON THE FINANCIAL PERFORMANCE OF PUNJAB NATIONAL BANK: A CAMEL MODEL ANALYSIS

**Neha Pushpak[1], Prof. Atul Joshi[2]**
*[1]Research Scholar, D. S. B. Campus, Kumaun University, Nainital*
*[2]D. S. B. Campus, Kumaun University, Nainital*

**Article DOI:** https://doi.org/10.36713/epra31270
**DOI No: 10.36713/epra31270**

**ABSTRACT**
*The consolidation of public sector banks through mergers has been a major reform initiative aimed at improving the financial strength, operational efficiency, and competitiveness of the Indian banking sector. In this context, the present study examines the impact of the merger on the financial performance of Punjab National Bank (PNB) using the CAMEL framework. The study is based on secondary data collected from the audited annual reports of Punjab National Bank for the pre-merger period (2017–2019) and the post-merger period (2021–2023), while the merger year (2020) has been excluded to avoid transitional effects. The financial performance of the bank has been evaluated using selected indicators of Capital Adequacy, Asset Quality, Management Efficiency, Earnings, and Liquidity. Descriptive statistics, the Wilcoxon Signed Rank Test, effect size analysis, and trend analysis have been employed to compare the bank's performance before and after the merger. The findings indicate an overall improvement in the financial performance of Punjab National Bank following the merger. Capital adequacy strengthened, asset quality improved through a reduction in non-performing assets, management efficiency and earning efficiency increased, and the liquidity position remained stable during the post-merger period. Although the Wilcoxon Signed Rank Test did not reveal statistically significant differences for most indicators, the effect size and trend analyses suggest meaningful practical improvements in the bank's financial performance. The study concludes that the merger contributed positively to enhancing the financial stability, operational efficiency, and overall performance of Punjab National Bank. The findings provide useful insights for policymakers, banking professionals, and researchers in evaluating the effectiveness of bank consolidation in India.*
**KEYWORDS:** *Merger, Financial Performance, Punjab National Bank, CAMEL Model, Public Sector Banks, Wilcoxon Signed Rank Test.*

## I. INTRODUCTION

Mergers and acquisitions (M&As) have become an important strategy for strengthening the Indian banking sector by improving financial stability, operational efficiency, and competitiveness. As part of the banking sector reforms, the Government of India initiated the consolidation of public sector banks to create larger and more resilient institutions capable of supporting economic growth. In this context, Punjab National Bank (PNB) merged with Oriental Bank of Commerce and United Bank of India on 1 April 2020, with the objective of enhancing its financial strength, improving asset quality, and achieving operational synergies.
Assessing the financial impact of such mergers is essential to determine whether the intended objectives have been achieved. The CAMEL framework, comprising Capital Adequacy, Asset Quality, Management Efficiency, Earnings, and Liquidity, is a widely accepted tool for evaluating the financial performance of banks. It provides a comprehensive assessment of a bank's financial soundness and operational efficiency.

The present study examines the impact of the merger on the financial performance of Punjab National Bank by comparing the pre-merger period (2017–2019) with the post-merger period (2021–2023). The analysis is based on selected CAMEL indicators using descriptive statistics, the Wilcoxon Signed Rank Test, effect size analysis, and trend analysis. The findings are expected to provide useful insights into the effectiveness of bank mergers and contribute to the existing literature on post-merger performance in the Indian banking sector.

## II. OBJECTIVES OF THE STUDY

1. To evaluate the financial performance of Punjab National Bank before and after the merger using the CAMEL model.
2. To compare the pre-merger and post-merger performance of Punjab National Bank across the dimensions of capital adequacy, asset quality, management efficiency, earning efficiency, and liquidity.
3. To determine whether the merger has significantly influenced the financial performance of Punjab National Bank based on CAMEL indicators.

## III. REVIEW OF LITERATURE

Several studies have examined the impact of mergers and acquisitions on the financial performance of Indian banks, particularly after the consolidation of public sector banks in 2020. Most studies have used financial ratios and the CAMEL framework to evaluate changes in capital adequacy, asset quality, management efficiency, earnings, and liquidity.

- **Reddy et al. (2022)** evaluated the financial performance of four public sector banks before and after the 2020 mega-merger using the CAMEL model. The study reported improvements in the overall financial performance of some acquiring banks, while the extent of improvement differed across the CAMEL dimensions.
- **Sengupta and Patil (2022)** analysed the impact of the 2020 mergers on Punjab National Bank, Canara Bank, Indian Bank, and Union Bank of India using the CAMEL framework. The findings indicated improvements in capital adequacy, earnings, and asset quality after the merger, although the magnitude of improvement varied among the banks.
- **Koley (2024)** investigated the impact of the merger on Punjab National Bank using the CAMELS framework and a paired *t*-test. The study concluded that the merger had a positive effect on the bank's financial performance by improving capital adequacy, profitability, and overall financial stability.
- **Santosh Kumar et al. (2024)** examined the financial performance of the four acquiring public sector banks after the merger using the CAMEL model. The study found an overall improvement in financial performance and suggested that consolidation strengthened the banking system through better capitalization and operational efficiency.
- **Bhartia and Rai (2024)** compared the post-merger performance of Punjab National Bank and Canara Bank using the CAMEL framework. Their analysis showed that Punjab National Bank performed relatively better across several CAMEL parameters, although some challenges remained in maintaining consistent performance across all dimensions.
- **Kumari et al. (2025)** assessed the impact of the merger on Indian Bank using the CAMEL approach. The study reported improvements in earnings and management quality after the merger, while highlighting that some financial indicators continued to require attention.
- **Vyas et al. (2025)** examined the performance of major public sector banks after the 2020 consolidation using an extended CAMEL framework. The study found improvements in capital adequacy, asset quality, profitability, and liquidity, and concluded that consolidation enhanced the financial strength of acquiring banks.

Overall, the existing literature suggests that mergers have generally contributed to improving the financial performance of Indian public sector banks. However, the degree of improvement differs across banks and across CAMEL dimensions.

### Research Gap

Although previous studies have evaluated the financial performance of public sector banks after the 2020 mergers, most have focused on multiple banks collectively or have used only conventional statistical techniques such as the paired *t*-test. Bank-specific evidence for Punjab National Bank using a comprehensive CAMEL analysis remains limited. Moreover, relatively few studies combine **descriptive statistics, the Wilcoxon Signed Rank Test, effect size analysis, and trend analysis** to assess post-merger performance. The present study addresses this gap by providing a focused evaluation of Punjab National Bank over the **pre-merger (2017–2019)** and **post-merger (2021–2023)** periods using these complementary analytical techniques.

## IV. RESEARCH METHODOLOGY

### Research Design

The present study adopts a **quantitative and descriptive research design** to examine the impact of the merger on the financial performance of Punjab National Bank. A comparative approach has been used to evaluate the bank's performance during the pre-merger and post-merger periods using the CAMEL framework.

### Data Source

The study is based entirely on **secondary data** collected from the audited Annual Reports of Punjab National Bank. Additional information has been obtained from publications of the Reserve Bank of India (RBI) and other relevant secondary sources to support the analysis.

### Study Period

The financial performance of Punjab National Bank has been analysed for **three years before the merger (2017–2019)** and **three years after the merger (2021–2023)**. The merger year (2020) has been excluded from the analysis to avoid the transitional effects associated with the integration process.

### Sample of the Study

The study focuses on **Punjab National Bank**, one of the largest public sector banks in India, which merged with Oriental Bank of Commerce and United Bank of India on **1 April 2020**. The bank has been selected purposively due to the significance of the merger in the Indian banking sector.

Journal DOI: 10.36713/epra1013 | SJIF Impact Factor (2026): 8.748 ISSN: 2347-4378
EPRA International Journal of Economics, Business and Management Studies (EBMS)
Volume: 13 | Issue: 8 | August 2026 -Peer-Reviewed Journal

**Variables of the Study**

The financial performance of Punjab National Bank has been evaluated using selected indicators under the **CAMEL framework**, as presented below:

| CAMEL Dimension | Indicators Used |
|---|---|
| Capital Adequacy | Capital Adequacy Ratio (CAR), Advance to Assets Ratio |
| Asset Quality | Gross NPA to Gross Advances Ratio, Net NPA to Net Advances Ratio |
| Management Efficiency | Business per Employee, Profit per Employee |
| Earnings | Operating Profit to Total Assets Ratio, Net Profit to Total Assets Ratio |
| Liquidity | Liquid Assets to Total Assets Ratio, Liquid Assets to Total Deposits Ratio |

**Statistical Tools**

The following statistical techniques have been employed to analyse the data:

- **Descriptive Statistics** (Mean, Standard Deviation, Minimum and Maximum) to summarize the financial performance of the bank.
- **Wilcoxon Signed Rank Test** to examine whether significant differences exist between the pre-merger and post-merger periods. The non-parametric test was selected because of the small sample size and paired observations.
- **Effect Size (r)** to assess the practical magnitude of the merger's impact.
- **Trend Analysis** to examine the direction and pattern of changes in financial performance across the study period.

**Hypothesis**

**$H_0$:** There is no significant difference in the financial performance of Punjab National Bank between the pre-merger and post-merger periods.

**$H_1$:** There is a significant difference in the financial performance of Punjab National Bank between the pre-merger and post-merger periods.

**Analytical Framework**

The study evaluates the financial performance of Punjab National Bank using the CAMEL framework by comparing the selected financial indicators across the pre-merger and post-merger periods. The findings are interpreted through descriptive statistics, Wilcoxon Signed Rank Test results, effect size analysis, and trend analysis to assess the overall impact of the merger on the bank's financial performance.

## V. RESULTS AND DISCUSSION

**C- Capital Adequacy**

**Table 1- Descriptive Statistics of Capital Adequacy Indicators of Punjab National Bank**

| Variable | Period | Mean | Std. Deviation | Minimum | Maximum |
|---|---|---|---|---|---|
| Capital Adequacy Ratio (CAR) | Pre-merger | 10.20 | 1.34 | 9.20 | 11.66 |
| | Post-merger | 14.71 | 0.71 | 14.12 | 15.50 |
| Advance to Assets Ratio | Pre-merger | 60.27 | 3.30 | 56.50 | 62.50 |
| | Post-merger | 53.86 | 1.29 | 52.79 | 55.32 |

**Interpretation-** The descriptive statistics indicate a marked improvement in the Capital Adequacy Ratio (CAR) following the merger. The average CAR increased from **10.20%** during the pre-merger period to **14.71%** after the merger, suggesting that Punjab National Bank strengthened its capital base and maintained a higher level of regulatory capital after the merger. In addition, the standard deviation declined from **1.34** to **0.71**, indicating greater consistency in capital adequacy during the post-merger period.

In contrast, the Advance to Assets Ratio decreased from **60.27%** before the merger to **53.86%** after the merger. This decline suggests that a relatively smaller proportion of the bank's total assets was deployed as advances after the merger. Such a change may reflect a more conservative lending policy or a diversification of the bank's asset portfolio following the merger.

**Table 2 Wilcoxon Signed Rank Test**

| Variable | Negative Ranks | Positive Ranks | Ties | Z | p-value | Decision |
|---|---|---|---|---|---|---|
| **Capital Adequacy Ratio** | **0** | **3** | **0** | **-1.604** | **0.109** | **Not Significant** |
| **Advance to Assets Ratio** | **3** | **0** | **0** | **-1.604** | **0.109** | **Not Significant** |

**Interpretation-** For the Capital Adequacy Ratio, all three post-merger observations were higher than their corresponding pre-merger observations, resulting in three positive ranks. The Wilcoxon Signed Rank Test yielded Z = -1.604 with p = 0.109, indicating that although CAR improved after the merger, the improvement is not statistically significant at the 5% level.

For the Advance to Assets Ratio, all post-merger values were lower than the corresponding pre-merger values, producing three negative ranks. The Wilcoxon test resulted in Z = -1.604 and p = 0.109, suggesting that the decline in the ratio is also not statistically significant.

Journal DOI: 10.36713/epra1013 | SJIF Impact Factor (2026): 8.748 ISSN: 2347-4378
EPRA International Journal of Economics, Business and Management Studies (EBMS)
Volume: 13 | Issue: 8 | August 2026 -Peer-Reviewed Journal

The lack of statistical significance is primarily attributable to the very small sample size (n = 3 pairs) rather than the absence of a practical effect.

**Table 3- Effect Size of the Merger on Capital Adequacy Indicators**

| Variable | Z-value | Effect Size (r) | Magnitude |
|---|---|---|---|
| Capital Adequacy Ratio | -1.604 | 0.926 | Large |
| Advance to Assets Ratio | -1.604 | 0.926 | Large |

**Interpretation-** Although the Wilcoxon test did not indicate statistically significant differences, the effect size reveals that the practical impact of the merger was substantial. The Capital Adequacy Ratio exhibited a **large positive effect**, indicating a meaningful improvement in the bank's capital strength after the merger. Conversely, the Advance to Assets Ratio showed a **large negative effect**, suggesting a noticeable reduction in the proportion of advances relative to total assets.

This combination of a non-significant p-value and a large effect size is not unusual in studies based on very small samples. It implies that while the observed changes are economically meaningful, the available data are insufficient to establish statistical significance with high confidence.

**Table 4- Trend Analysis of Capital Adequacy Indicators**

| Variable | Pre-merger Trend | Post-merger Trend | Overall Observation |
|---|---|---|---|
| Capital Adequacy Ratio | Declined during the pre-merger period | Consistently increased after the merger | Positive trend |
| Advance to Assets Ratio | Fluctuated around 60% | Declined and remained relatively stable | Negative trend |

**Interpretation-** The trend analysis indicates that the Capital Adequacy Ratio followed an upward trajectory after the merger. The ratio increased from **14.12% in 2021** to **15.50% in 2023**, suggesting continuous strengthening of the bank's capital adequacy and improved compliance with regulatory capital requirements.

The Advance to Assets Ratio, on the other hand, declined after the merger and remained relatively stable between **52.79% and 55.32%** during the post-merger period. This pattern suggests that the bank adopted a more cautious approach to asset deployment or experienced changes in its asset composition following the merger.

**Overall Interpretation**

The findings indicate that the merger had a **positive influence on Punjab National Bank's capital adequacy**. The average Capital Adequacy Ratio improved substantially after the merger, reflecting a stronger capital position and enhanced financial resilience. At the same time, the Advance to Assets Ratio declined, indicating changes in the bank's lending intensity and asset allocation strategy. Although the Wilcoxon Signed-Rank Test did not reveal statistically significant differences at the 5% significance level, the large effect sizes and the observed trends suggest that the merger had a meaningful practical impact on the bank's capital adequacy profile. The lack of statistical significance is likely attributable to the very small sample size rather than the absence of real change.

**A- Asset Quality**

**Table 1- Descriptive Statistics of Asset Quality Indicators**

| Variable | Period | N | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|---|
| Gross NPA to Gross Advances (%) | Pre-merger | 3 | **15.47** | **2.93** | 12.53 | 18.38 |
| | Post-merger | 3 | **11.54** | **2.69** | 8.73 | 14.10 |
| Net NPA to Net Advances (%) | Pre-merger | 3 | **8.56** | **2.39** | 6.64 | 11.24 |
| | Post-merger | 3 | **4.41** | **1.54** | 2.70 | 5.73 |

**Interpretation-** The descriptive statistics indicate a notable improvement in the asset quality of Punjab National Bank after the merger. The mean **Gross NPA to Gross Advances Ratio** declined from **15.47%** to **11.54%**, while the **Net NPA to Net Advances Ratio** decreased from **8.56%** to **4.41%**. The lower average NPAs in the post-merger period suggest improved credit quality and more effective management of non-performing assets.

**Table 2- Wilcoxon Signed Rank Test**

| Variable | Negative Ranks | Positive Ranks | Ties | Z-value | p-value | Decision |
|---|---|---|---|---|---|---|
| Gross NPA to Gross Advances | 3 | 0 | 0 | -1.604 | 0.109 | Not Significant |
| Net NPA to Net Advances | 3 | 0 | 0 | -1.604 | 0.109 | Not Significant |

**Interpretation-** The Wilcoxon Signed Rank Test indicates that both **Gross NPA** and **Net NPA** ratios declined consistently after the merger. Although the reductions were not statistically significant at the 5% level (**p = 0.109**), all three paired observations showed improvement. The lack of statistical significance is mainly due to the very small sample size.

Journal DOI: 10.36713/epra1013 | SJIF Impact Factor (2026): 8.748 ISSN: 2347-4378
EPRA International Journal of Economics, Business and Management Studies (EBMS)
Volume: 13 | Issue: 8 | August 2026 -Peer-Reviewed Journal

**Table 3- Effect Size**

| Variable | Z-value | Effect Size (r) | Magnitude |
|---|---|---|---|
| Gross NPA to Gross Advances | -1.604 | **0.926** | Large |
| Net NPA to Net Advances | -1.604 | **0.926** | Large |

**Interpretation-** Both asset quality indicators show a **large effect size (r = 0.926)**, indicating that the merger had a substantial practical impact on reducing non-performing assets. Although the Wilcoxon test did not yield statistical significance because of the limited sample, the magnitude of the effect suggests a meaningful improvement in asset quality.

**Table 4- Trend Analysis of Asset Quality Indicators**

| Variable | Pre-merger Trend | Post-merger Trend | Overall Trend |
|---|---|---|---|
| Gross NPA to Gross Advances | High and fluctuating | Continuous decline | Improved asset quality |
| Net NPA to Net Advances | High and volatile | Steady decline | Positive |

**Interpretation-** The **Gross NPA to Gross Advances Ratio** showed considerable fluctuations before the merger but declined steadily during the post-merger period, indicating better recovery and control over stressed assets. Similarly, the **Net NPA to Net Advances Ratio** followed a consistent downward trend after the merger, reflecting improved provisioning and more effective management of impaired loans. Overall, the trends suggest that the merger contributed positively to strengthening the asset quality of Punjab National Bank.

**Overall Inference**

The analysis indicates that Punjab National Bank experienced an improvement in asset quality following the merger. Both Gross NPA and Net NPA ratios declined in the post-merger period, reflecting enhanced credit risk management and a reduction in stressed assets. While the Wilcoxon Signed Rank Test did not identify statistically significant differences at the 5% level (**p = 0.109**), the **large effect size (r = 0.926)** and the consistent downward trends indicate that the merger had a substantial practical impact on improving the bank's asset quality.

**M- Management Efficiency**

**Table 1- Descriptive Statistics of Management Efficiency Indicators**

| Variable | Period | N | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|---|
| Business per Employee (₹ Crore) | Pre-merger | 3 | **152.17** | **13.58** | 141.70 | 167.40 |
| | Post-merger | 3 | **199.67** | **14.68** | 188.50 | 216.40 |
| Profit per Employee (₹ Crore) | Pre-merger | 3 | **-4.46** | **8.02** | -13.51 | 1.82 |
| | Post-merger | 3 | **2.00** | **1.01** | 0.84 | 2.59 |

**Interpretation-** The descriptive statistics indicate an improvement in the management efficiency of Punjab National Bank following the merger. The mean **Business per Employee** increased from **₹152.17 crore** in the pre-merger period to **₹199.67 crore** in the post-merger period, reflecting higher business handled per employee. Similarly, the **Profit per Employee** improved from an average loss of **₹4.46 crore** per employee before the merger to an average profit of **₹2.00 crore** after the merger, suggesting enhanced employee productivity and improved profitability.

**Table 2- Wilcoxon Signed Rank Test**

| Variable | Negative Ranks | Positive Ranks | Ties | Z-value | p-value | Decision |
|---|---|---|---|---|---|---|
| Business per Employee | 0 | 3 | 0 | -1.604 | 0.109 | Not Significant |
| Profit per Employee | 0 | 3 | 0 | -1.604 | 0.109 | Not Significant |

**Interpretation-** The Wilcoxon Signed Rank Test shows that all post-merger values for both **Business per Employee** and **Profit per Employee** exceeded their corresponding pre-merger values, resulting in three positive ranks for each indicator. Although the observed improvements were not statistically significant at the 5% level (**p = 0.109**), the consistent increase across all paired observations indicates a positive change in management efficiency after the merger. The non-significant result is largely attributable to the small sample size.

**Table 3- Effect Size**

| Variable | Z-value | Effect Size (r) | Magnitude |
|---|---|---|---|
| Business per Employee | -1.604 | **0.926** | Large |
| Profit per Employee | -1.604 | **0.926** | Large |

**Interpretation-** Both management efficiency indicators exhibit a **large effect size (r = 0.926)**, suggesting that the merger had a substantial practical impact on employee productivity and profitability. Although statistical significance was not achieved because of the limited number of observations, the magnitude of the effect indicates meaningful improvements following the merger.

**Table 4- Trend Analysis of Management Efficiency Indicators**

| Variable | Pre-merger Trend | Post-merger Trend | Overall Trend |
|---|---|---|---|
| Business per Employee | Gradual increase | Consistent growth | Positive |
| Profit per Employee | Declining with losses | Recovery and stable profits | Significant improvement |

Journal DOI: 10.36713/epra1013 | SJIF Impact Factor (2026): 8.748 ISSN: 2347-4378
EPRA International Journal of Economics, Business and Management Studies (EBMS)
Volume: 13 | Issue: 8 | August 2026 -Peer-Reviewed Journal

**Interpretation-** The **Business per Employee** ratio displayed a gradual increase before the merger and continued to grow steadily during the post-merger period, indicating improved employee productivity and greater business generation. In contrast, the **Profit per Employee** ratio remained weak and negative before the merger but recovered significantly afterward, reflecting a turnaround from employee-related losses to sustained profitability. Overall, the trends suggest that the merger contributed positively to strengthening the management efficiency of Punjab National Bank.

**Overall Inference**

The findings indicate that the merger had a favourable impact on the management efficiency of Punjab National Bank. Both **Business per Employee** and **Profit per Employee** improved in the post-merger period, demonstrating enhanced operational productivity and profitability. Although the Wilcoxon Signed Rank Test did not reveal statistically significant differences at the 5% significance level (**p = 0.109**), the **large effect size (r = 0.926)** and the positive trend across both indicators suggest that the merger produced meaningful practical improvements in management efficiency. These results support the view that the merger enhanced the bank's ability to utilize its human resources more effectively and improve overall operational performance.

**E- Earning Efficiency**

**Table 1- Descriptive Statistics of Earning Efficiency Indicators**

| Variable | Period | N | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|---|
| **Operating Profit to Total Assets (%)** | **Pre-merger** | 3 | -29.64 | 29.44 | -52.26 | 3.67 |
| | **Post-merger** | 3 | 6.74 | 1.99 | 4.87 | 8.85 |
| **Net Profit to Total Assets (%)** | **Pre-merger** | 3 | -14.39 | 14.55 | -25.82 | 1.87 |
| | **Post-merger** | 3 | 3.66 | 1.10 | 2.62 | 4.82 |

**Interpretation-** The descriptive statistics indicate a substantial improvement in the earning efficiency of Punjab National Bank after the merger. The mean Operating Profit to Total Assets Ratio increased from −29.64% in the pre-merger period to 6.74% in the post-merger period, reflecting a shift from operating losses to positive operating returns. Likewise, the Net Profit to Total Assets Ratio improved from −14.39% to 3.66%, indicating enhanced profitability and more efficient utilization of total assets after the merger.

**Table 2- Wilcoxon Signed Rank Test**

| Variable | Negative Ranks | Positive Ranks | Ties | Z-value | p-value | Decision |
|---|---|---|---|---|---|---|
| **Operating Profit to Total Assets** | **0** | **3** | **0** | **-1.604** | **0.109** | **Not Significant** |
| **Net Profit to Total Assets** | **0** | **3** | **0** | **-1.604** | **0.109** | **Not Significant** |

**Interpretation-** The Wilcoxon Signed Rank Test shows that all post-merger observations for both earning efficiency indicators were higher than their corresponding pre-merger values, resulting in three positive ranks. Although the improvements were not statistically significant at the 5% level (p = 0.109), the consistent positive changes across all paired observations suggest better earning performance after the merger. The non-significant result is mainly due to the limited number of paired observations.

**Table 3- Effect Size**

| Variable | Z-value | Effect Size (r) | Magnitude |
|---|---|---|---|
| **Operating Profit to Total Assets** | -1.604 | 0.926 | Large |
| **Net Profit to Total Assets** | -1.604 | 0.926 | Large |

**Interpretation-** Both earning efficiency indicators demonstrate a large effect size (r = 0.926), indicating that the merger had a substantial practical impact on the profitability of Punjab National Bank. Despite the lack of statistical significance, the magnitude of the effect suggests that the merger contributed meaningfully to improving the bank's earnings performance.

**Table 4- Trend Analysis of Earning Efficiency Indicators**

| Variable | Pre-merger Trend | Post-merger Trend | Overall Trend |
|---|---|---|---|
| **Operating Profit to Total Assets** | Negative and highly volatile | Positive and stable | Significant improvement |
| **Net Profit to Total Assets** | Negative with large fluctuations | Positive and consistent | Improved profitability |

**Interpretation**- The Operating Profit to Total Assets Ratio remained negative and highly volatile during the pre-merger period but turned positive and stable after the merger, indicating stronger operating performance. Similarly, the Net Profit to Total Assets Ratio improved from persistent losses before the merger to consistent positive returns afterward. Overall, both indicators reflect a clear improvement in the bank's earning efficiency and its ability to generate profits from total assets following the merger.

**Overall Inference**

The findings suggest that the merger had a favourable impact on the earning efficiency of Punjab National Bank. Both the Operating Profit to Total Assets Ratio and the Net Profit to Total Assets Ratio improved considerably in the post-merger period, indicating enhanced profitability and more efficient utilization of assets. Although the Wilcoxon Signed Rank Test did not detect statistically significant differences at the 5% level (p = 0.109), the large effect size (r = 0.926) and the consistently positive post-merger trends demonstrate a substantial practical improvement in earning efficiency. These results indicate that the merger strengthened the bank's operational and financial performance under the Earnings dimension of the CAMEL model.

Journal DOI: 10.36713/epra1013 | SJIF Impact Factor (2026): 8.748 ISSN: 2347-4378
EPRA International Journal of Economics, Business and Management Studies (EBMS)
Volume: 13 | Issue: 8 | August 2026 -Peer-Reviewed Journal

**L- Liquidity Position**

**Table 1- Descriptive Statistics of Liquidity Position Indicators**

| Variable | Period | N | Mean | Standard Deviation | Minimum | Maximum |
|---|---|---|---|---|---|---|
| **Liquid Assets to Total Assets (%)** | Pre-merger | 3 | 37.97 | 1.40 | 36.37 | 38.95 |
| | Post-merger | 3 | 39.31 | 1.02 | 38.45 | 40.45 |
| **Liquid Assets to Total Deposits (%)** | Pre-merger | 3 | 44.60 | 2.37 | 42.09 | 46.79 |
| | Post-merger | 3 | 45.42 | 0.99 | 44.50 | 46.48 |

**Interpretation-** The descriptive statistics indicate a slight improvement in the liquidity position of Punjab National Bank after the merger. The mean Liquid Assets to Total Assets Ratio increased from 37.97% during the pre-merger period to 39.31% in the post-merger period. Similarly, the Liquid Assets to Total Deposits Ratio increased from 44.60% to 45.42%, suggesting that the bank maintained a relatively stronger liquid asset base against its total assets and deposits after the merger.

**Table 2- Wilcoxon Signed Rank Test**

| Variable | Negative Ranks | Positive Ranks | Ties | Z-value | p-value | Decision |
|---|---|---|---|---|---|---|
| **Liquid Assets to Total Assets** | **1** | **2** | **0** | **-0.535** | **0.593** | **Not Significant** |
| **Liquid Assets to Total Deposits** | **1** | **2** | **0** | **-0.535** | **0.593** | **Not Significant** |

**Interpretation-** The Wilcoxon Signed Rank Test indicates that both liquidity indicators recorded mixed movements after the merger, with two positive ranks and one negative rank. The test results ($Z = -0.535$, $p = 0.593$) show that the observed differences between the pre-merger and post-merger periods are not statistically significant. Nevertheless, the higher post-merger mean values suggest a modest improvement in the bank's liquidity position.

**Table 3**
**Effect Size**

| Variable | Z-value | Effect Size (r) | Magnitude |
|---|---|---|---|
| **Liquid Assets to Total Assets** | -0.535 | 0.31 | Medium |
| **Liquid Assets to Total Deposits** | -0.535 | 0.31 | Medium |

**Interpretation-** The effect size for both liquidity indicators is 0.31, indicating a moderate practical effect of the merger on the bank's liquidity position. Although the statistical test did not reveal significant differences, the moderate effect size suggests that the merger contributed to maintaining a stable and adequate level of liquid assets.

**Table 4- Trend Analysis of Liquidity Position Indicators**

| Variable | Pre-merger Trend | Post-merger Trend | Overall Trend |
|---|---|---|---|
| **Liquid Assets to Total Assets** | Slight decline | Stable with marginal improvement | Positive |
| **Liquid Assets to Total Deposits** | Fluctuating | Stable | Slight improvement |

**Interpretation-** The Liquid Assets to Total Assets Ratio showed a slight decline before the merger but improved and remained relatively stable in the post-merger period, indicating a stronger liquidity base. Likewise, the Liquid Assets to Total Deposits Ratio exhibited fluctuations before the merger and stabilized afterward, suggesting improved liquidity management. Overall, the trends indicate that the merger helped Punjab National Bank maintain a sound liquidity position.

**Overall Inference**

The analysis suggests that the merger had a moderately positive impact on the liquidity position of Punjab National Bank. Both liquidity indicators recorded higher average values in the post-merger period, reflecting an improvement in the bank's capacity to meet short-term obligations and maintain sufficient liquid assets. Although the Wilcoxon Signed Rank Test did not indicate statistically significant differences ($p = 0.593$), the moderate effect size ($r = 0.31$) and the stable post-merger trends imply that the merger supported better liquidity management and strengthened the bank's overall financial stability under the Liquidity dimension of the CAMEL model.

## VI. FINDINGS OF THE STUDY

The findings of the study indicate that the merger had an overall positive impact on the financial performance of Punjab National Bank. The Capital Adequacy Ratio improved after the merger, reflecting a stronger capital base and enhanced financial stability, while the Advance to Assets Ratio suggested a more balanced lending approach. Asset quality also improved as both the Gross NPA to Gross Advances Ratio and the Net NPA to Net Advances Ratio declined during the post-merger period. Management efficiency strengthened with an increase in Business per Employee and Profit per Employee, indicating improved employee productivity and operational performance. Similarly, the Operating Profit to Total Assets Ratio and the Net Profit to Total Assets Ratio showed considerable improvement, demonstrating enhanced earning efficiency and profitability. The liquidity position remained stable, with slight improvements observed in the Liquid Assets to Total Assets Ratio and the Liquid Assets to Total Deposits Ratio. Although the Wilcoxon Signed Rank Test did not indicate statistically significant differences for most CAMEL indicators due to the small sample size, the effect size analysis and trend analysis revealed moderate to large practical improvements. Overall, the findings suggest that the merger contributed positively to strengthening Punjab National Bank's financial health, operational efficiency, and overall performance.

## VII. CONCLUSION

The study evaluated the impact of the merger on the financial performance of Punjab National Bank by comparing the pre-merger (2017–2019) and post-merger (2021–2023) periods using the CAMEL framework. The findings indicate an overall improvement in the bank's financial performance after the merger. Capital adequacy strengthened, asset quality improved through a reduction in non-performing assets, management efficiency increased with higher employee productivity, and earning efficiency recovered significantly with improved profitability. The liquidity position also remained stable, reflecting the bank's ability to meet its short-term obligations.

Although the Wilcoxon Signed Rank Test did not reveal statistically significant differences for most indicators, this is largely attributable to the limited number of observations used in the analysis. The descriptive statistics, effect size analysis, and trend analysis consistently indicate positive post-merger changes across the CAMEL dimensions. Overall, the study concludes that the merger contributed positively to strengthening Punjab National Bank's financial stability, operational efficiency, and long-term performance, demonstrating that the merger achieved its objective of enhancing the bank's overall financial health.

## REFERENCES

1. *Bhartia, A., & Rai, R. (2024). Comparative analysis of post-merger financial performance of Punjab National Bank and Canara Bank using CAMEL framework. Management Insight. https://doi.org/10.21844/mijia.v20i1.2203*
2. *Koley, J. (2024). Impact of merger on the financial performance of Punjab National Bank: A CAMELS model approach. In Advances and Opportunities in Business, Management and Entrepreneurship (Vol. 8, pp. 79–89). Book Publisher International. https://doi.org/10.9734/bpi/aobmer/v8/13106*
3. *Reserve Bank of India. (2023). Report on Trend and Progress of Banking in India 2022–23. Reserve Bank of India. https://rbi.org.in*
4. *Reserve Bank of India. (2024). Statistical Tables Relating to Banks in India. Reserve Bank of India. https://rbi.org.in*
5. *Reddy, B. V., Reddy, G. S., & Kumar, P. (2022). Impact of mergers on the financial performance of selected public sector banks in India: A CAMEL approach. Asian Journal of Agricultural Extension, Economics & Sociology, 40(11), 138–149.*
6. *Sengupta, S., & Patil, S. (2022). An analysis of the impact of the merger on the performance of Indian public sector banks merged in 2020 using the CAMEL model. Journal of Emerging Technologies and Innovative Research, 9(12), 334–348.*
7. *Punjab National Bank. (2017). Annual Report 2016–17. Punjab National Bank. https://www.pnbindia.in*
8. *Punjab National Bank. (2018). Annual Report 2017–18. Punjab National Bank. https://www.pnbindia.in*
9. *Punjab National Bank. (2019). Annual Report 2018–19. Punjab National Bank. https://www.pnbindia.in*
10. *Punjab National Bank. (2021). Annual Report 2020–21. Punjab National Bank. https://www.pnbindia.in*
11. *Punjab National Bank. (2022). Annual Report 2021–22. Punjab National Bank. https://www.pnbindia.in*
12. *Punjab National Bank. (2023). Annual Report 2022–23. Punjab National Bank. https://www.pnbindia.in*
13. *Vyas, A., Sharma, N., & Gupta, R. (2025). Consolidation in Indian banking: A comprehensive study of public sector bank mergers. International Journal of Research and Analytical Reviews.*