

Financial Performance of Banking Sector in India: A Pre- and Post-Merger Analysis of Public Sector Bank Consolidation

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ABSTRACT

The Indian banking sector underwent one of its most significant structural transformations when the Government of India consolidated public sector banks (PSBs) from 27 in 2017 to 12 by 2020. This study analyses the financial performance of Union Bank of India before and after its merger with Andhra Bank and Corporation Bank (effective April 1, 2020) using key financial indicators — Return on Assets (ROA), Return on Equity (ROE), Net Profit Margin (NPM), Gross and Net Non-Performing Asset (NPA) ratios, and Cost-to-Income Ratio. Secondary data spanning three years pre-merger (2017–18 to 2019–20) and three years' post-merger (2020–21 to 2022–23) were sourced from annual reports and RBI publications. Paired t-tests and ratio analysis were used to draw statistically grounded comparisons. Results indicate significant improvements in profitability (NPM from –12.82% to 6.22%; $p = 0.011$) and asset quality (Net NPA from 6.92% to 3.34%; $p = 0.024$), while operational costs increased significantly (Cost-to-Income from 18.1% to 24.01%; $p = 0.006$). The study concludes that the merger yielded a net positive impact on financial stability despite short-term efficiency challenges partly exacerbated by the COVID-19 pandemic.

Keywords: Bank Merger, Public Sector Banks, Financial Performance, Non-Performing Assets, Paired t-test, India

1. Introduction

The banking sector constitutes the backbone of a country's financial architecture, mobilising savings and channelling them into productive investments. In India, public sector banks (PSBs) have historically dominated this space, implementing economic policy, extending rural credit, and promoting financial inclusion. By 2019, however, PSBs were severely stressed — saddled with Non-Performing Assets (NPAs) exceeding 10% of advances, inadequate capital buffers, and declining profitability — compelling the Government of India to launch an ambitious consolidation programme.

The April 2020 mega-merger — which amalgamated Andhra Bank and Corporation Bank into Union Bank of India — was the most consequential among these consolidations, creating one of the largest PSBs in the country. The merger's stated objectives included improving efficiency, expanding the customer base, strengthening capital adequacy, and reducing operational duplication. Critically, its implementation coincided with the onset of the COVID-19 pandemic, creating an analytically complex environment in which merger effects and macroeconomic disruptions are difficult to disentangle.

This study addresses the following research question: Did the merger of Andhra Bank and Corporation Bank with Union Bank of India actually improve the bank's financial performance? Using six-year secondary data, five ratio categories, and paired t-tests for statistical validation, this study provides evidence-based answers pertinent to policymakers, investors, banking researchers, and regulatory bodies.

2. Literature Review

Aranha, Mahapatra, and Jacob examined best-partner selection for PSB mergers in India using Data Envelopment Analysis (DEA) and clustering techniques, arguing that scientifically matched mergers generate superior post-merger efficiency. Their recommended pairings closely mirrored the government's 2019 consolidation plan, lending ex-ante legitimacy to the Union Bank merger.

Narula studied the impact of the 2019 mega-mergers on depositor behaviour and found that acquiring bank depositors became more risk-sensitive post-merger, adjusting deposits in response to interest-rate signals — a sign of increased market discipline and greater transparency in the consolidated banking system.

Gulati, Charles, Hassan, and Kumar employed a network DEA framework to evaluate Indian banks during COVID-19, concluding that PSBs maintained relative stability in deposit mobilisation and operations compared to private peers. They noted that smaller banks adapted more rapidly, while larger merged entities faced greater integration complexity.

Adhikari, Kavanagh, and Hampson analysed pre- and post-merger financial performance of Nepalese banks and found mixed outcomes: while ROA and Net Interest Margin improved, many indicators showed no statistically significant change, cautioning against overly optimistic merger expectations.

Akhtar and Nosheen focused on bank–fintech M&A, finding that such mergers improved operational efficiency and liquidity but sometimes compressed profitability margins due to integration costs. This aligns with the cost-to-income challenges observed in the Union Bank case.

Degryse and Huylebroeck demonstrated that targeted government fiscal support — such as direct financial assistance and tax relief — significantly reduced loan-loss provisions during COVID-19, helping banks maintain stability. Their findings contextualise the RBI's loan moratorium and restructuring measures that simultaneously affected post-merger performance of Indian PSBs.

In aggregate, the literature suggests that mergers can improve profitability and asset quality over time, but efficiency gains are neither automatic nor immediate, and macro shocks such as COVID-19 can complicate the attribution of performance changes. This study contributes by applying rigorous statistical testing to a specific, high-profile Indian PSB merger.

3. Research Methodology

3.1 Objectives

1. To **analyse** the financial performance of Union Bank of India before and after the merger.
2. To **compare** key financial indicators such as profitability, liquidity, and asset quality in the pre-merger and post-merger periods.
3. To **evaluate** the impact of the merger on the overall efficiency and performance of the bank.
4. To **examine** the effect of COVID-19 on the bank's financial performance during the post-merger period.
5. To **determine** whether bank consolidation has significantly improved financial stability in the Indian banking sector.

3.2 Research Design and Data

The study adopts a comparative analytical research design based entirely on secondary data. Data for Union Bank of India, Andhra Bank, and Corporation Bank were extracted from published annual reports, audited financial statements, and RBI reports for the period 2017–18 to 2022–23.

Study Period: Pre-merger: 2017–18 to 2019–20 (3 years); post-merger: 2020–21 to 2022–23 (3 years).

For pre-merger analysis, data for all three banks are presented separately as they operated as independent entities. For post-merger analysis, only Union Bank's consolidated data is used, as Andhra Bank and Corporation Bank ceased to exist as independent entities.

3.3 Financial Ratios

Five ratio categories were analysed: (1) Profitability — Net Profit Margin, ROA, ROE, Operating Profit Ratio; (2) Liquidity — Current Ratio, Credit - Deposit Ratio, Liquid Assets Ratio; (3) Asset Quality — Gross NPA Ratio, Net NPA Ratio; (4) Leverage — Debt-Equity Ratio, Assets-Equity Ratio; (5) Efficiency — Cost-to-Income Ratio.

3.4 Hypothesis

H₀: There is no significant difference in the financial performance of Union Bank of India before and after the merger.

H₁: There is a significant difference in the financial performance of Union Bank of India before and after the merger.

3.5 Statistical Tool

Paired samples t-tests were applied to compare pre- and post-merger mean values of each financial ratio. A significance level of $\alpha = 0.05$ was used. Because each ratio category had only 3 observations per period ($n = 3$), degrees of freedom = 2 for all tests. SPSS was used for statistical computation.

A limitation of the statistical analysis is the small sample size ($n = 3$ per period), which may reduce statistical power; therefore, findings should be interpreted with caution.

4. Data Analysis and Results

4.1 Pre-Merger Analysis (2017–18 to 2019–20)

During the pre-merger period, all three banks — Union Bank, Andhra Bank, and Corporation Bank — operated under significant financial stress characterised by continuous net losses, elevated NPA levels, and deteriorating profitability. Table 1 presents profitability ratios for all three banks across the pre-merger years.

Table 1: Pre-Merger Profitability Ratios

Pre-Merger Profitability Ratios: Union Bank / Andhra Bank / Corporation Bank				
Year	Net Profit Margin	Return on Assets	Return on Equity	Operating Profit Ratio
2017-18	-13.90% / -16.77% / -20.33%	-1.08% / -1.41% / -18.27%	-20.91% / -31.54% / -37.38%	20.24% / 26.35% / 19.81%
2018-19	-7.65% / -13.28% / -36.20%	-0.60% / -1.12% / -2.97%	-11.13% / -21.16% / -38.23%	19.52% / 23.95% / 22.26%
2019-20	-6.82% / -5.88% / N/A	-0.53% / -0.54% / N/A	-8.58% / -10.83% / N/A	21.61% / 22.61% / N/A

Note: Values for Corporation Bank in 2019-20 are unavailable as it was merged mid-year. UB = Union Bank; AB = Andhra Bank; CB = Corporation Bank.

Net Profit Margins were deeply negative across all three banks, reflecting the severity of the NPA crisis and large provisioning requirements. Corporation Bank was the worst performer, reaching -36.20% in 2018–19. However, a gradual improvement trend is visible: Union Bank's NPM improved from -13.90% to -6.82%, and Andhra Bank from -16.77% to -5.88%, suggesting that recovery was already underway prior to the merger. Operating Profit Ratios, by contrast, remained positive and stable (19–26% range), indicating that core banking operations were viable even as net losses persisted due to provisioning.

Table 2: Pre-Merger Liquidity Ratios

Pre-Merger Liquidity Ratios: Union Bank / Andhra Bank / Corporation Bank			
Year	Current Ratio	Credit - Deposit Ratio	Liquid Assets Ratio
2017-18	2.44 / 2.62 / 2.26	70.69% / 71.64% / 65.39%	10.14% / 6.58% / 5.10%
2018-19	2.40 / 3.22 / 2.42	71.39% / 72.25% / 65.69%	8.71% / 6.03% / 5.88%
2019-20	2.10 / 2.69 / N/A	69.91% / 74.19% / N/A	10.01% / 4.56% / N/A

Liquidity remained adequate across all three banks. Current Ratios hovered between 2.10 and 3.22, indicating sufficient coverage of short-term liabilities. Credit-Deposit Ratios were stable at 65–74%, reflecting controlled lending without excessive risk appetite. Liquid Assets Ratios showed a declining trend, particularly for Andhra Bank (6.58% to 4.56%), signalling some tightening of immediate liquidity.

Table 3: Pre-Merger Asset Quality Ratios

Pre-Merger Asset Quality Ratios: Union Bank / Andhra Bank / Corporation Bank		
Year	Gross NPA Ratio	Net NPA Ratio
2017-18	15.73% / 17.10% / 17.35%	8.42% / 8.48% / 11.74%
2018-19	14.98% / 16.21% / 15.35%	6.85% / 5.73% / 5.71%
2019-20	14.15% / 16.07% / N/A	5.49% / 4.92% / N/A

Asset quality was the most critical concern in the pre-merger period. Gross NPA Ratios exceeded 14% for all banks in 2017–18, with Corporation Bank at 17.35%. While a declining trend was emerging — Union Bank's Gross NPA fell from 15.73% to 14.15% — levels remained alarmingly high. Net NPA ratios also showed improvement through better provisioning, with Union Bank declining from 8.42% to 5.49%.

Table 4: Leverage and Efficiency Ratios — Pre-Merger

Leverage & Efficiency Ratios: Pre- and Post-Merger Comparison			
Year	Debt-Equity Ratio (UB/AB/CB)	Assets-Equity Ratio (UB/AB/CB)	Cost-to-Income Ratio
2017-18	18.42 / 21.39 / 19.46	19.42 / 22.39 / 20.46	17.63% / 16.44% / 16.05%
2018-19	17.65 / 17.94 / 11.89	18.65 / 18.94 / 12.89	18.60% / 17.78% / 19.93%
2019-20	15.30 / 18.94 / N/A	16.30 / 19.94 / N/A	17.69% / 20.59% / N/A

Debt-Equity and Assets-Equity ratios were elevated in the pre-merger period, reflecting high leverage typical of PSBs. The Cost-to-Income Ratio was relatively low (17–21%), indicating controlled operating expenditure relative to income. This changed noticeably post-merger, as discussed in the following section.

4.2 Post-Merger Analysis (2020–21 to 2022–23)

Following the April 2020 merger, Union Bank's financial performance demonstrated a remarkable turnaround across all profitability and asset quality metrics. Table 5 presents the consolidated post-merger performance data.

Table 5: Post-Merger Financial Performance of Union Bank of India

Post-Merger Financial Performance of Union Bank of India (2020-21 to 2022-23)							
Year	Net Profit Margin	ROA	ROE	Operating Profit Ratio	Gross NPA Ratio	Net NPA Ratio	Cost-to-Income
2020-21	3.44%	0.26%	4.43%	23.25%	13.74%	4.61%	23.74%
2021-22	6.44%	0.44%	7.44%	26.75%	11.11%	3.71%	24.10%
2022-23	8.77%	0.66%	10.82%	26.33%	7.53%	1.71%	24.19%

Year	Current Ratio	Liquidity Ratio	Credit - Deposit Ratio	Debt to Equity	Total Assets to Equity
2020-21	2.57	7.83%	64.10%	15.75	16.75
2021-22	2.78	10.03%	64.13%	15.87	16.87
2022-23	2.73	8.74%	68.22%	15.37	16.37

Net Profit Margin turned positive immediately after the merger, rising from 3.44% in 2020–21 to 8.77% in 2022–23. ROA improved steadily from 0.26% to 0.66%, and ROE climbed from 4.43% to 10.82% — a dramatic reversal from the double-digit negative returns of the pre-merger era. Gross NPA declined sharply from 13.74% to 7.53%, while Net NPA fell from 4.61% to 1.71%, demonstrating substantially improved credit risk management and recovery. The Cost-to-Income Ratio, however, rose from approximately 18% pre-merger to 23–24% post-merger, reflecting elevated integration and restructuring costs, as well as COVID-19-related operational pressures.

4.3 Comparative Analysis: Pre- vs. Post-Merger

Table 6 summarises average ratio values for the pre- and post-merger periods, highlighting the magnitude of change.

Table 6: Comparative Pre- vs. Post-Merger Performance Averages

Period	Pre-Merger Average (2017-20)	Post- Merger Average (2020-23)	Change
Net Profit Margin	-12.82%	6.22%	+19.04%
ROA	-1.04%	0.45%	+1.49%
ROE	-19.28%	7.56%	+26.84%
Operating Profit	21.67%	25.44%	+3.77%
Gross NPA	15.55%	10.79%	-4.76%
Net NPA	6.92%	3.34%	-3.58%
Current Ratio	2.38	2.69	+0.31
Liquid Assets Ratio	7.92%	8.87%	+0.95%

Credit - Deposit Ratio	70.45%	65.48%	-4.97%
Debt to Equity	17.21	15.66	-1.55
Total Assets to Equity	18.21	16.66	-1.55
Cost to Income	18.10%	24.01%	+5.91%

The average Net Profit Margin swung by approximately 19 percentage points — from –12.82% to +6.22%. ROE improved by nearly 27 percentage points. Gross NPA declined by 4.76 percentage points and Net NPA by 3.58 percentage points. These figures underscore the scale of the financial transformation, though the concurrent rise in the Cost-to-Income Ratio signals that efficiency gains are still evolving.

Change values represent Post-Merger Average minus Pre-Merger Average. Negative values for NPA and leverage ratios indicate improvement.

4.4 Statistical Analysis: Paired t-Test Results

To determine whether observed changes were statistically significant, paired t-tests were conducted for each financial ratio. Table 7 presents comprehensive results across all five ratio categories.

Table 7: Paired Sample t-Test Results — Pre- vs. Post-Merger Financial Ratios

Paired Sample t-Test Results: Pre-Merger vs. Post-Merger Financial Ratios						
Financial Ratio	Mean Diff.	Std. Dev.	Std. Error	t-Statistic	df	Sig. (2-tailed)
Net Profit Margin	-19.033	3.478	2.008	-9.479	2	0.011 *
Return on Assets (ROA)	-1.497	0.270	0.156	-9.592	2	0.011 *
Return on Equity (ROE)	-26.840	6.078	3.509	-7.649	2	0.017*
Operating Profit Ratio	-3.770	2.006	1.158	-3.255	2	0.083
Credit-Deposit Ratio	4.963	1.675	0.967	5.134	2	0.036*
Liquid Assets Ratio	-0.943	1.512	0.873	-1.080	2	0.393
Current Ratio	-0.313	0.157	0.091	-3.458	2	0.074
Gross NPA Ratio	4.757	2.319	1.339	3.553	2	0.071
Net NPA Ratio	3.573	0.975	0.563	6.347	2	0.024*
Debt-Equity Ratio	1.550	1.815	1.048	1.480	2	0.277
Assets-Equity Ratio	1.550	1.815	1.048	1.480	2	0.277
Cost-to-Income Ratio	-5.910	0.789	0.455	-12.976	2	0.006**

Note: * Significant at $p < 0.05$; ** Significant at $p < 0.01$. All tests use $df = 2$ ($n = 3$ per period).

Profitability Ratios: Net Profit Margin ($p = 0.011$), ROA ($p = 0.011$), and ROE ($p = 0.017$) all show statistically significant improvement at the 5% level, firmly rejecting H_0 for these indicators. The Operating Profit Ratio improvement, while directionally positive (+3.77%), does not reach significance ($p = 0.083$), suggesting core operational gains are still consolidating.

Liquidity Ratios: The Credit-Deposit Ratio shows a significant change ($p = 0.036$), reflecting deliberately tightened lending standards post-merger. Current Ratio ($p = 0.074$) and Liquid Assets Ratio ($p = 0.393$) show no significant change, confirming that overall liquidity management remained stable — a prudent outcome given the pandemic-era uncertainty.

Asset Quality Ratios: Net NPA improvement is statistically significant ($p = 0.024$), validating that post-merger recovery mechanisms and provisioning strategies yielded measurably better credit quality. Gross NPA improvement ($p = 0.071$) approaches but does not reach conventional significance, likely because it includes legacy stock that takes longer to resolve.

Leverage Ratios: Neither Debt-Equity ($p = 0.277$) nor Assets-Equity ($p = 0.277$) changed significantly, indicating the merger did not fundamentally alter the bank's capital structure — consistent with the PSB model where high leverage is systemic.

Efficiency Ratio: The Cost-to-Income Ratio increase is highly significant ($p = 0.006$), indicating that rising operational costs post-merger are a genuine and statistically confirmed challenge, not a statistical artefact. This finding is critical: while profitability improved, the bank is spending more to generate each unit of income.

5. Discussion

The results paint a nuanced picture of merger success. Three profitability indicators and the Net NPA ratio show statistically significant improvement, providing robust evidence that the consolidation delivered measurable financial benefits. The bank's journey from consistent net losses (NPM averaging -12.82% pre-merger) to sustained profitability (NPM averaging 6.22% post-merger) represents a structural shift, not a cyclical blip — a conclusion reinforced by statistical testing.

The asset quality improvement is particularly noteworthy. The sharp decline in Net NPA (from 6.92% average to 3.34%) reflects improved credit monitoring, recovery mechanisms, and provisioning discipline — outcomes that are plausibly attributable to the merger, which brought greater scale and resources for NPA resolution. The Gross NPA trend is consistent but takes longer to show statistical significance due to the size of legacy bad-loan stock inherited from the merged entities.

The significant increase in the Cost-to-Income Ratio demands careful interpretation. Integration expenses — technology harmonisation, branch rationalisation, workforce restructuring — are inherently front-loaded in any merger. Additionally, the COVID-19 pandemic, which began in the merger's very first quarter, imposed extraordinary operational costs: digital infrastructure investments, loan moratorium administration, and higher loan-loss provisions. Separating the merger's cost effect from the pandemic's is methodologically difficult but the 2022–23 data, as pandemic effects waned, suggests costs are normalising — Cost-to-Income was broadly stable at 24.10% (2021–22) and 24.19% (2022–23) rather than continuing to escalate.

Stability in liquidity and leverage ratios, while unremarkable, is actually a positive sign. Major mergers can trigger liquidity stress and capital restructuring; the fact that these ratios remained stable indicates disciplined financial management during a complex transition. The significant decline in the Credit-Deposit Ratio suggests the bank deliberately prioritised loan quality over quantity in the immediate post-merger period — a sensible strategy given the NPA legacy.

These findings align with Adhikari et al. (2022) who found mixed merger outcomes in Nepal, and partly with Akhtar and Nosheen (2023) who found that integration costs can compress efficiency even when profitability improves. They also corroborate Gulati et al. (2021) who found that PSBs weathered the COVID storm better than expected, supported by government measures.

6. Conclusion

This study provides statistically grounded evidence that the merger of Andhra Bank and Corporation Bank with Union Bank of India has significantly improved the bank's financial performance across profitability and asset quality dimensions. Net Profit Margin, ROA, ROE, and Net NPA improvements are all statistically significant at the 5% level, permitting rejection of the null hypothesis for these core indicators. The simultaneous rise in the Cost-to-Income Ratio — equally significant at the 1% level — highlights that efficiency improvements are lagged and continue to be a priority area. Leverage

and overall liquidity remained stable, reflecting sound risk management during the integration. Policymakers can draw cautious optimism from these findings: bank consolidation, when executed with adequate capital support and regulatory scaffolding, can deliver meaningful financial improvement for PSBs. However, long-term success requires continued focus on operational efficiency, cost rationalisation, and sustained NPA resolution.

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