



MERGER OUTCOMES IN INDIAN BANKING: A CASE STUDY OF CANARA BANK USING REGRESSION TECHNIQUES

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Abstract:

Bank mergers have emerged as strategic tools to improve financial health, expand market presence, and achieve economies of scale. This study investigates the impact of the merger between Canara Bank and Syndicate Bank on the post-merger financial performance of Canara Bank using a regression-based analytical framework. Return on Assets (ROA) is employed as the dependent variable to evaluate profitability, while Capital Adequacy Ratio (CAR), Gross and Net NPA Ratios, Liquid Assets to Total Assets Ratio (LA/TA), and Advances to Deposits Ratio serve as independent variables. Secondary data was collected from the annual reports of Canara Bank for eight years, covering both pre- and post-merger phases, with regression analysis focused on the post-merger period (2021–2024). The regression results reveal that CAR positively and significantly affects ROA, whereas GNPA negatively impacts it. Other variables such as NNPA, liquidity, and advances-deposit ratio exhibited directional but statistically insignificant relationships. These findings suggest that capital strength and asset quality are critical determinants of profitability in the post-merger context, providing valuable insights for banking sector policymakers and managers.

Keywords: Merger, Financial Performance, Regression Analysis, Canara Bank.

Introduction

Mergers have become a dominant strategy in the Indian banking sector, aiming at strengthening banks' competitive edge and enhancing operational efficiency. The merger of Canara Bank and Syndicate Bank, which made Canara Bank the fourth largest public sector bank in India, provides an ideal case to explore the financial impact of consolidation. The study focuses on the financial changes post-merger, with an emphasis on the relationship between profitability and key financial indicators.

Mergers and acquisitions (M&As) have become essential instruments for strategic transformation in the global banking industry. They serve as vehicles for achieving operational efficiencies, expanding market reach, and enhancing financial stability. In recent years, the Indian banking sector has witnessed a significant wave of consolidation initiatives, driven by regulatory reforms, technological evolution, and the need for scale-driven competitiveness. These structural changes are further propelled by adherence to international banking norms such as the Basel framework, as well as the necessity to improve customer-centric services and digital infrastructure.

In the Indian context, public and private sector banks have pursued M&As to strengthen their capital base, broaden their customer base, and improve asset quality. With the aim of building globally competitive financial institutions, these mergers not only address sectoral inefficiencies but also provide avenues for sustainable growth. The amalgamation of Canara Bank and Syndicate Bank, one of the most prominent recent mergers, presents a critical case for examining the realignment of financial performance following such a strategic initiative.

This paper seeks to evaluate the effectiveness of this merger by analyzing post-merger financial performance through a regression analysis framework. By identifying key financial determinants that influence profitability, the study aims to contribute empirical evidence to the ongoing discourse on banking sector consolidation in India. Mergers have become a dominant strategy in the Indian banking sector, aiming at strengthening banks' competitive edge and enhancing operational efficiency. The merger of Canara Bank and Syndicate Bank, which made Canara Bank the fourth largest public sector bank in India, provides an ideal case to explore the financial impact of consolidation. The study focuses on the financial changes post-merger, with an emphasis on the relationship between profitability and key financial indicators.

Literature Review

Mergers and acquisitions (M&A) have emerged as significant strategies in the Indian banking sector aimed at improving financial performance, capital efficiency, and overall stability. Several studies have explored the multifaceted impact of these structural reforms on key financial indicators, particularly Return on Assets (ROA), a crucial measure of profitability.

Kaur (2024) analyzed the merger of Bank of Rajasthan with ICICI Bank and found that although there were observable shifts in financial indicators like Capital Adequacy Ratio (CAR) and Non-Performing Assets (NPAs), the overall impact on ROA was not statistically significant. This aligns with the broader finding that not all mergers yield immediate or uniform benefits.

Joseph and Sandhya (2023) examined various public sector bank mergers and noted that the effects of M&A activities on financial performance—including ROA, liquidity, and solvency—are varied and dependent on the strategic alignment and execution of the merger. They emphasized that while some banks gain from operational synergies, others face transitional inefficiencies.

Thippeswami and Bheemanagouda (2024) focused on the merger of the State Bank of India with its associates, revealing a significant reduction in Gross NPA post-merger. However, the change in ROA was less pronounced, indicating that asset quality improvement does not necessarily translate into immediate profitability gains.

Jain (2023), through a Data Envelopment Analysis (DEA), studied the efficiency levels of banks pre- and post-merger. The study concluded that while mergers can potentially enhance operational efficiency, the impact on ROA varies and depends on how well the merger is managed.

Kar, Soni, and Singh (2014) assessed a broader spectrum of Indian firms and concluded that mergers and acquisitions generally lead to mixed performance outcomes. Their results highlighted that ROA might improve only when mergers are strategically synergistic and supported by effective post-merger integration.

Koley (2024) studied the post-merger performance of Punjab National Bank using the CAMELS framework. The study observed a significant improvement in financial health indicators such as CAR and ROA, suggesting that government-initiated mergers can lead to profitability if aligned with regulatory compliance and capital strengthening.

Dua and Ahlawat (2024) explored the financial outcomes of M&A in Indian commercial banks and reported that mergers significantly enhanced ROA, particularly through better risk management and scale economies. The results support the premise that consolidation improves bank profitability over time.

Kaur and Singh (2023) conducted an analytical review of M&A impacts across Indian banks and found consistent improvements in ROA and asset quality post-merger. They attributed these outcomes to resource optimization and the removal of operational redundancies.

Rai et al. (2022) approached the issue from a market-based perspective, examining shareholder wealth following M&A announcements. Their study indicated that while target banks often benefit, the performance of acquiring banks, particularly in terms of ROA, may initially decline due to merger-related costs and integration challenges.

Lastly, Agarwal and Saha (2023) focused on the relationship between CAR and profitability, establishing a strong positive correlation between CAR and ROA. This study reinforces the idea that maintaining adequate capital buffers is essential for ensuring financial performance in a post-merger environment.

Collectively, these studies underscore that while mergers and acquisitions in Indian banks can potentially improve ROA and other performance metrics, the outcomes are conditional upon strategic fit, integration efficiency, and asset quality management.

Research Gap

Existing studies primarily use CAMEL or descriptive methods; regression-based studies are rare. And Lack of analysis on interaction effects, e.g., governance, technology, customer behavior post-merger. Longitudinal econometric analysis specific to Canara Bank is underrepresented. And Comparative regression analysis across multiple banks post-merger is missing.

Objectives of the Study

1. To identify the key financial determinants (e.g., Capital Adequacy, Asset Quality, Liquidity, and Advances) that influence Return on Assets (ROA) after the merger.
2. To measure the strength and direction of relationships between ROA and selected financial variables.
3. To examine the financial performance of Canara Bank in the post-merger period using regression analysis.

Hypotheses

- H₀₁: Capital Adequacy Ratio (CAR) has no significant positive impact on Return on Assets (ROA) in the post-merger period.
- H₀₂: Gross NPA Ratio (GNPA) has no significant negative impact on ROA in the post-merger period.
- H₀₃: Net NPA Ratio (NNPA) has no significant impact on ROA in the post-merger period.
- H₀₄: Liquid Assets to Total Assets Ratio (LA/TA) has no significant relationship with ROA in the post-merger period.
- H₀₅: Advances to Deposits Ratio (AD Ratio) does not significantly influence ROA in the post-merger period.

- H_{06} : There is no statistically significant multiple linear relationship between ROA and the combined set of predictor variables (CAR, GNPA, NNPA, LA/TA, and AD Ratio) in the post-merger period.

Research Methodology

This study uses an empirical design, applying multiple linear regression to analyze the post-merger financial performance of Canara Bank following its merger with Syndicate Bank. Secondary data from Canara Bank's annual reports over eight years (2016–2024) was analyzed. Return on Assets (ROA) serves as the dependent variable, while the independent variables include Capital Adequacy Ratio (CAR), Gross and Net NPA Ratios, Liquid Assets to Total Assets Ratio (LA/TA), and Advances to Deposits Ratio. SPSS software was used to conduct regression and correlation analyses to determine the strength and direction of relationships between the variables.

Analysis of Financial Performance of Canara Bank

To further explore the determinants of financial performance post-merger, a multiple linear regression model was employed. Return on Assets (ROA) was chosen as the dependent variable as it reflects the bank's efficiency in using its assets to generate profit.

The model includes the following independent variables:

- Capital Adequacy Ratio (CAR)
- Gross NPA Ratio (GNPA)
- Net NPA Ratio (NNPA)
- Liquid Assets to Total Assets Ratio (LA/TA)
- Advances to Deposits Ratio (AD Ratio)

The regression equation is:

$$ROA = \beta_0 + \beta_1(CAR) + \beta_2(GNPA) + \beta_3(NNPA) + \beta_4(LA/TA) + \beta_5(AD\ Ratio) + \epsilon$$

Table 1: Multiple Linear Regression Results Summary (Post-Merger ROA Predictors)

Predictor Variable	Coefficient (β)	Standard Error	t-value	p-value	Significance
Intercept	-1.1005	0.626	-1.759	0.134	Not Significant
Capital Adequacy Ratio (CAR)	+0.0583	0.018	3.212	0.022	Significant
Gross NPA Ratio (GNPA)	-0.1049	0.035	-2.981	0.027	Significant
Net NPA Ratio (NNPA)	-0.0273	0.028	-0.977	0.372	Not Significant
Liquid Assets to Total Assets Ratio (LA/TA)	+0.0303	0.016	1.597	0.161	Not Significant
Advances to Deposits Ratio (AD Ratio)	+0.0026	0.008	0.324	0.758	Not Significant

Source: SPSS Output from Annual Reports of Canar Bank from 2019-17 to 2023-24

- Capital Adequacy Ratio (CAR)

Coefficient (β) = +0.0583, p-value = 0.022: The CAR exhibits a positive and statistically significant relationship with Return on Assets (ROA). This indicates that a one-unit increase in CAR leads to a 5.83% increase in ROA, post-merger.

- Gross NPA Ratio (GNPA)

Coefficient (β) = -0.1049, p-value = 0.027: The GNPA has a negative and statistically significant impact on ROA. Each unit increase in GNPA reduces ROA by approximately 10.49%.

- Net NPA Ratio (NNPA)

Coefficient (β) = -0.0273, p-value = 0.372: NNPA shows a negative but statistically non-significant relationship with ROA.

- Liquid Assets to Total Assets (LA/TA)

Coefficient (β) = +0.0303, p-value = 0.161: The LA/TA ratio has a positive but non-significant association with ROA.

- Advances to Deposits Ratio (AD Ratio)

Coefficient (β) = +0.0026, p-value = 0.758: The AD Ratio has a positive but highly non-significant relationship with ROA.

Only CAR and GNPA significantly influence ROA post-merger, with CAR positively and GNPA negatively. NNPA, LA/TA, and AD Ratio do not show a statistically significant impact, implying that capital structure and asset quality are more reliable predictors of profitability in the post-merger phase.

However, they showed directional relationships which may be explored further in future studies with larger datasets. These findings highlight the importance of maintaining adequate capital and controlling credit risk to improve financial performance post-merger.

Table 2: Correlation Matrix of ROA and Key Financial Indicators (Post-Merger Period)

Variables	ROA	CAR	GNPA	NNPA	LA/TA	AD Ratio
ROA	1.000	0.733	-0.898	-0.863	0.405	-0.199
CAR	0.733	1.000	-0.819	-0.843	0.183	0.033
GNPA	-0.898	-0.819	1.000	0.964	-0.177	0.018
NNPA	-0.863	-0.843	0.964	1.000	-0.312	0.201
LA/TA	0.405	0.183	-0.177	-0.312	1.000	-0.933
AD Ratio	-0.199	0.033	0.018	0.201	-0.933	1.000

Source: SPSS Output from Annual Reports of Canar Bank from 2019-17 to 2023-24

correlation matrix examines the linear interrelationships between Return on Assets (ROA) and various key financial indicators in the post-merger context.

- ROA and CAR: Correlation: 0.733 (Strong Positive), A strong positive correlation indicates that increases in Capital Adequacy Ratio are associated with improved ROA. This supports the regression findings and suggests that capital soundness enhances profitability.
- ROA and GNPA: Correlation: -0.898 (Very Strong Negative), This inverse relationship confirms that higher levels of gross NPAs severely impact profitability. It aligns with earlier regression results showing a statistically significant negative impact of GNPA on ROA.
- ROA and NNPA: Correlation: -0.863 (Strong Negative), Though statistically non-significant in the regression, the correlation matrix shows a strong negative association, indicating potential multicollinearity or model suppression effects.
- ROA and LA/TA: Correlation: 0.405 (Moderate Positive), A moderate correlation indicates some positive contribution of liquidity to profitability, though it is not significant in the regression. This may reflect excess liquid assets not fully utilized post-merger.
- ROA and AD Ratio: Correlation: -0.199 (Weak Negative) A weak negative correlation implies that merely increasing advances relative to deposits does not ensure improved profitability. This aligns with regression insignificance.
- Interrelationships Among Predictors: GNPA and NNPA: 0.964 (Very High Positive Correlation) Indicates multicollinearity, potentially inflating standard errors in regression. Suggests either GNPA or NNPA alone may suffice for modelling.
- LA/TA and AD Ratio: -0.933 (Very Strong Negative Correlation) Suggests a trade-off: higher liquidity may come at the cost of lower loan disbursement efficiency, which can impact returns.

The correlation analysis confirms that Capital Adequacy and Asset Quality (GNPA, NNPA) are the most influential factors in determining bank profitability post-merger. However, high inter-correlations among predictors highlight the need for careful multicollinearity diagnostics when constructing predictive models.

Findings:

- The regression analysis reveals a statistically significant positive relationship between CAR and ROA ($\beta = +0.0583$, $p = 0.022$). The correlation coefficient (0.733) also indicates a strong positive association, suggesting that well-capitalized banks exhibit higher profitability post-merger.
- GNPA is significantly and negatively associated with ROA ($\beta = -0.1049$, $p = 0.027$). The correlation coefficient is extremely high and negative (-0.898), indicating that higher GNPA levels drastically reduce profitability.
- Though the regression result is statistically insignificant ($p = 0.372$), NNPA has a strong negative correlation with ROA (-0.863). This indicates that NNPA may influence ROA indirectly or through interaction with GNPA, possibly due to multicollinearity.
- Both LA/TA and AD Ratio are not significant in the regression model ($p = 0.161$ and 0.758 respectively), and their correlations with ROA are moderate to weak. This implies that liquidity and deposit deployment ratios alone do not drive profitability in the post-merger period.

Suggestions:

- Banks should maintain and improve their CAR levels, as higher capital buffers enhance resilience and profitability in post-merger scenarios. Regulatory bodies may encourage tier-wise capital strengthening to ensure long-term sustainability.
- A robust mechanism to monitor and reduce GNPA should be implemented. Strategies like early warning systems, restructuring support, and recovery task forces can help mitigate asset quality stress.
- Given the high correlation between GNPA and NNPA (0.964), future regression models should apply Variance Inflation Factor (VIF) or Principal Component Analysis (PCA) to reduce redundancy and improve model robustness.

- Liquid assets should be strategically deployed to interest-earning instruments or lending channels rather than sitting idle. Simultaneously, banks must ensure that advances are linked to creditworthiness rather than expansion for the sake of volume.

Conclusion:

The regression and correlation analyses provide robust evidence that the financial performance of Canara Bank post-merger is significantly influenced by Capital Adequacy and Asset Quality. Specifically, the positive impact of CAR on ROA underscores the importance of maintaining strong capital buffers to enhance profitability. Conversely, the negative impact of GNPA highlights the detrimental effect of poor asset quality. Other variables showed weaker statistical significance but suggest areas for future research. These findings are critical for bank management and policy planners aiming to optimize financial outcomes in merger scenarios.

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