"Impact of Non-Performing Assets on Profitability: A Study of Public and Private Sector Banks in India."

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Abstract

This research aims to examine the impact of Non-Performing Assets (NPAs) on the profitability of both public and private sector banks in India. In recent years, NPAs have posed a significant challenge for the banking sector, influencing financial stability, lending capabilities, and overall profitability. This paper conducts a comparative analysis utilizing data from selected public and private banks to elucidate the effects of NPAs on critical profitability indicators, such as Net Interest Margin (NIM), Return on Assets (ROA), and Return on Equity (ROE). The study employs multiple regression analysis to assess the extent to which NPAs affect these profitability metrics across various types of banks. Additionally, it explores supplementary factors, including capital adequacy and risk management practices, to provide a comprehensive understanding of the issue. The research findings suggest that public sector banks experience a more significant impact from NPAs compared to private sector banks, resulting in reduced profitability and a higher demand for regulatory oversight. Conversely, private banks exhibit greater resilience thanks to their effective risk management practices and operational effectiveness. This study adds to the existing discussions regarding the performance of the banking sector in India by offering insights into current trends and potential reforms necessary to alleviate the negative consequences of NPAs. The paper concludes with suggestions aimed at improving profitability and fostering a more sustainable banking framework in India.

Key words: NPA, ROA, NIM, ROE

1. Introduction

The banking and financial sector serves as the foundation of the economy, with all commercial and economic activities of the nation relying on a resilient and robust banking framework. The Indian banking sector comprises 18 public sector banks, 42 private sector banks (including small finance banks, payment banks, and regional banks), 45 foreign banks, 45 regional rural banks (RRBs), and over 98,000 other banking entities, including cooperative banks. A diverse range of banking institutions is available to meet the varying needs of the sector. Notably, public sector banks control approximately 70% of the total assets within India's banking landscape.

In terms of infrastructure, the Indian banking sector is well-equipped with modern technology and operates under stringent regulatory oversight. Following significant financial events and reforms in 2016—such as the Pradhan Mantri Jan Dhan Yojana (PMJDY), the Goods and Services Tax (GST), the Unified Payments Interface (UPI), and demonetization—the sector has witnessed a substantial increase in its customer base. The embrace of digitization has further enhanced the viability of banking services, making them more customer-oriented.

Specific financial services have been tailored for individuals residing in rural India or those living below the poverty line, contributing to an increased demand for financial products and thereby fortifying the banking system. However, the Indian banking sector currently faces significant challenges, including a rise in non-performing assets (NPAs), undercapitalization, increased competition, and governance issues. The surge in NPAs poses a systemic risk, potentially undermining the stability of the entire banking framework. Consequently, various financial indicators warrant analysis to effectively manage NPAs within commercial banks in India over the period from 2019-20 to 2023-24.

2. Literature review

Samir and Deepa Kamra (2013) conducted a study on Non-Performing Assets (NPAs) and recovery mechanisms across three public sector commercial banks. The research utilized secondary data covering the period from 1996-97 to 2009-10. The findings indicate a continuous reduction in the percentage of NPAs throughout the study period, possibly due to effective recovery efforts.

Mayur Rao and Ankita Patel (2015) examined NPA management among public, private, and foreign banks operating in India, analyzing data from 2008-09 to 2012-13. Their research revealed that the ratio of Gross NPAs to Gross Advances was increasing in public sector banks. Moreover, there was a significant difference in the Gross NPA ratios among the three categories of banks during the study period.

Prof. Arvind Kumar and Usman Ghani (2015) aimed to analyze the trends of NPAs among scheduled commercial banks from 2002-03 to 2013-14. Utilizing Correlation and ANOVA methods, their study indicated a diminishing trend in NPA ratios, specifically Gross NPAs and Net NPAs. The results showed an inverse relationship between NPA ratios and return on investment, as well as between NPAs and profitability.

Neha Garg (2016) conducted an empirical study focused on the profitability indicators related to NPAs in public and private sector banks. The research revealed a higher magnitude of non-performance in public sector banks compared to private banks during the early years of the study. HDFC Bank was identified as having the most effectively managed NPAs among all analysed banks.

Payel Roy and Dr. Pradip Kumar Samanta (2017) investigated the NPAs of public sector banks, aiming to assess the positions of Gross NPAs and Net NPAs during the period from 2011-12 to 2015-16. The findings indicated that both Gross and Net NPAs in public sector banks were deteriorating during this period, consequently affecting the profitability of these institutions.

E. Hari Prasad and G.V. Bhavani Prasad (2017) conducted research on the NPAs of scheduled commercial banks, analysing data from 2001-02 to 2015-16. Their descriptive study identified significant disparities in NPAs among different banks. The increase in NPAs was attributed to an inadequate credit appraisal system.

Varuna Agarwala and Nidhi Agarwala (2019) examined the non-performing assets of the banking sector and their growth patterns from 2010 to 2017. The researchers employed secondary data sourced from the Reserve Bank of India database, concluding that private sector banks exhibited a lower growth rate in NPAs compared to other categories of banks within the scope of the study.

Objectives

1. To examine the impact of Non-Performing Assets (NPAs) on the profitability of public and private sector banks in India.
2. To assess the relationship between NPAs and key profitability metrics such as Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM).
3. To analyze the trends in NPAs and profitability indicators over the last ten years in public and private sector banks.

Hypothesis

H01 There is no significant impact of NPAs (Gross NPA Ratio and Net NPA Ratio) on the profitability of public and private sector banks in India.

H02 There is no significant relationship between NPAs (Gross NPA Ratio and Net NPA Ratio) and profitability metrics (ROA, ROE, and NPM) of banks.

H03 There is no significant difference in the trends of NPAs and profitability indicators (ROA, ROE, and NPM) over the last ten years between public and private sector banks.

Scope of the study

This study aims to understand the relationship between Non-Performing Assets (NPAs) and the profitability of banks, focusing specifically on a comparative analysis of public and private sector banks in India. The research seeks to provide insights into how NPAs impact key financial performance metrics such as Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM).

The research is centered on the Indian banking sector, covering both public sector banks (e.g., State Bank of India, Bank of Maharashtra, Canara bank, Union bank of India, Bank of Baroda) and private sector banks (IndusInd Bank, City union bank, kotak mahindra bank, IDFC first bank, yes Bank). These banks were chosen for their significant market share and role in the Indian economy.

The study analyses data at the bank-wide level, considering overall performance metrics and NPA data. Departments indirectly linked to the findings include:

- Risk Management (NPA control).

- Finance and Accounting (profitability assessment).

- Credit Operations (loan disbursal and recovery).

The research focuses on the Indian banking system as a whole. Data is sourced from banks operating in India, with performance metrics and trends reflecting operations across the country's financial landscape.

The period under study spans the **latest six fiscal years (2018–2024)**, providing a focused view of recent trends and developments in NPAs and profitability. This timeframe ensures the inclusion of critical financial events and regulatory changes affecting the Indian banking sector.

Limitations of study

✓ The research utilizes publicly available data, including annual reports and publications from the Reserve Bank of India (RBI). Discrepancies in disclosure practices among banks may impact the accuracy of the data.

✓ The analysis is limited to selected public and private sector banks, thereby excluding smaller regional and cooperative banks, which may constrain the generalizability of the findings.

✓ This study primarily examines the Gross Non-Performing Assets (NPA) Ratio, Net NPA Ratio, Return on Assets (ROA), Return on Equity (ROE), and Net Profit Margin (NPM). Other profitability determinants, such as non-interest income and operational efficiency, are only partially addressed as control variables.

✓ The decision to focus on five public and five private sector banks may introduce a bias, as these institutions may not adequately represent the broader sector.

3. Research Methodology

1. Research Design:

The study employs a **quantitative and analytical research design**, utilizing secondary data to examine the relationship between NPAs and profitability metrics over the latest Six years (2018–2024).

2. Data Collection:

- **Data Type:**

Secondary data collected from:

- o Annual reports of selected banks.
- o Reserve Bank of India (RBI) publications (e.g., Trends and Progress of Banking in India)
- o Websites of respective banks.

- **Data Variables:**

- o **Dependent Variables:** Profitability indicators
  - Return on Assets (ROA)
  - Return on Equity (ROE)
  - Net Profit Margin (NPM)
- o **Independent Variables:**
  - Gross NPA Ratio
  - Net NPA Ratio

3. Sampling Design:

Population:

All public and private sector banks in India.

Sample:

A purposive sampling method is used to select:

- o **Five public sector banks**
- o **Five private sector banks**

Criteria for Selection:

- o Market share and significance in the Indian banking sector.
- o Availability of consistent data for the study period (2018–2024).

4. Period of Study:
The study covers six years **(2018–2024)** to capture the most recent trends and developments in NPAs and profitability.

3.1 Comparative analysis of impact of gross NPA to Advances ratio on Return on assets ratio

To study the impact of gross NPA to gross advances ratio on ROA I have used the linear regression model. To use this model the following regression equation is formulated:

$ROA = \beta_0 + \beta_1 \times NPA\ Ratio + \epsilon$

Where, ROA = Return on Assets

NPA Ratio NPA\Ratio NPA Ratio = Gross NPAs to Gross Advances Ratio

β_0\beta0β_0= Intercept (the value of ROA when NPA Ratio is 0)

β_1\beta1β_1= Slope or coefficient (shows how much ROA changes for a one-unit change in NPA Ratio)

ϵ = Error term (captures the unexplained variance)

**Data analysis and interpretation**

I have employed the Univariate General Linear Model (GLM) to examine the relationship between financial performance indicators (ROE, ROA, and Net Profit Margin) and the type of banking sector (public vs. private) over the period 2019–2024. The GLM is a flexible method that allows the examination of interactions between categorical and continuous variables, providing estimated marginal means to evaluate differences and trends.

Graphs representing the Estimated Marginal Means (EMMs) for ROE, ROA, and Net Profit Margin were generated in SPSS to visualize the interaction between the banking sector and financial performance indicators over time. These graphs provide an intuitive representation of how the financial performance of public and private sector banks evolved from 2019 to 2024.
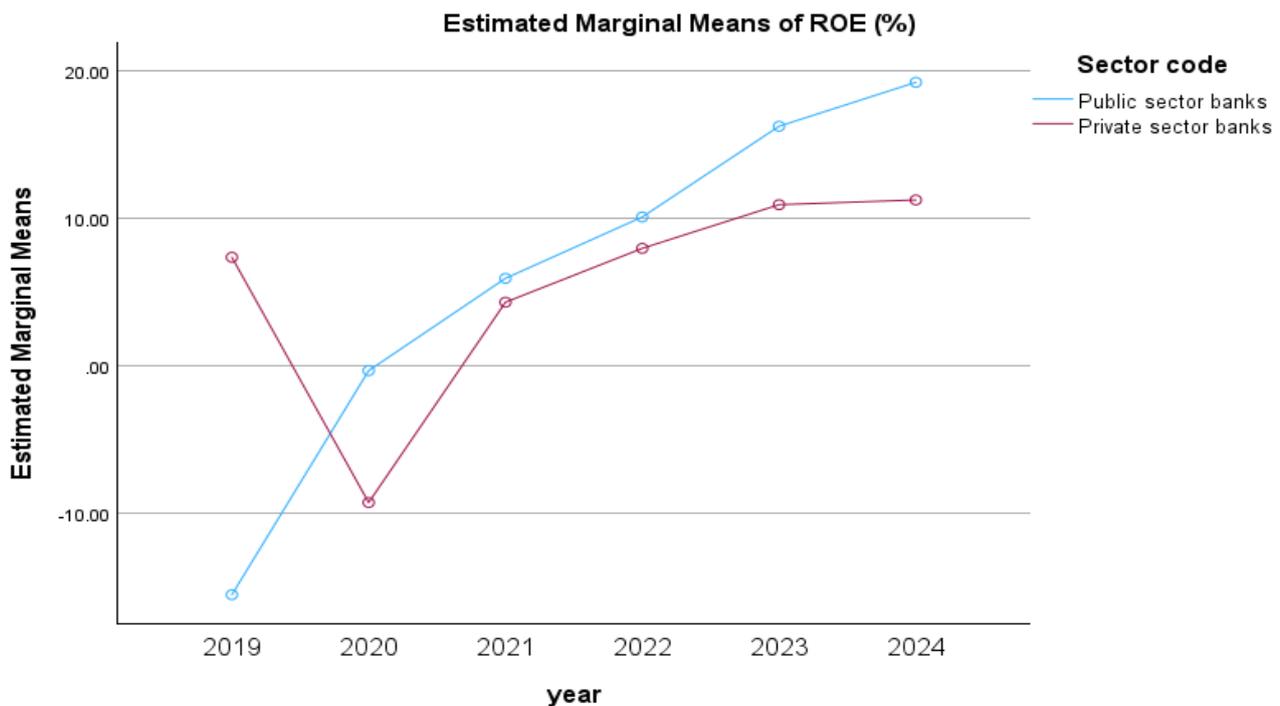

ROE (Return on Equity) measures profitability relative to shareholders' equity. Public sector banks (blue line) show a significant upward trend in ROE from 2020, with steady growth up to 2024, indicating improved profitability. Private sector banks (pink line) show a sharp decline in ROE in 2020, possibly due to external

factors, but recover and stabilize by 2021, growing moderately afterward. By 2024, public sector banks achieve a higher ROE compared to private sector banks.
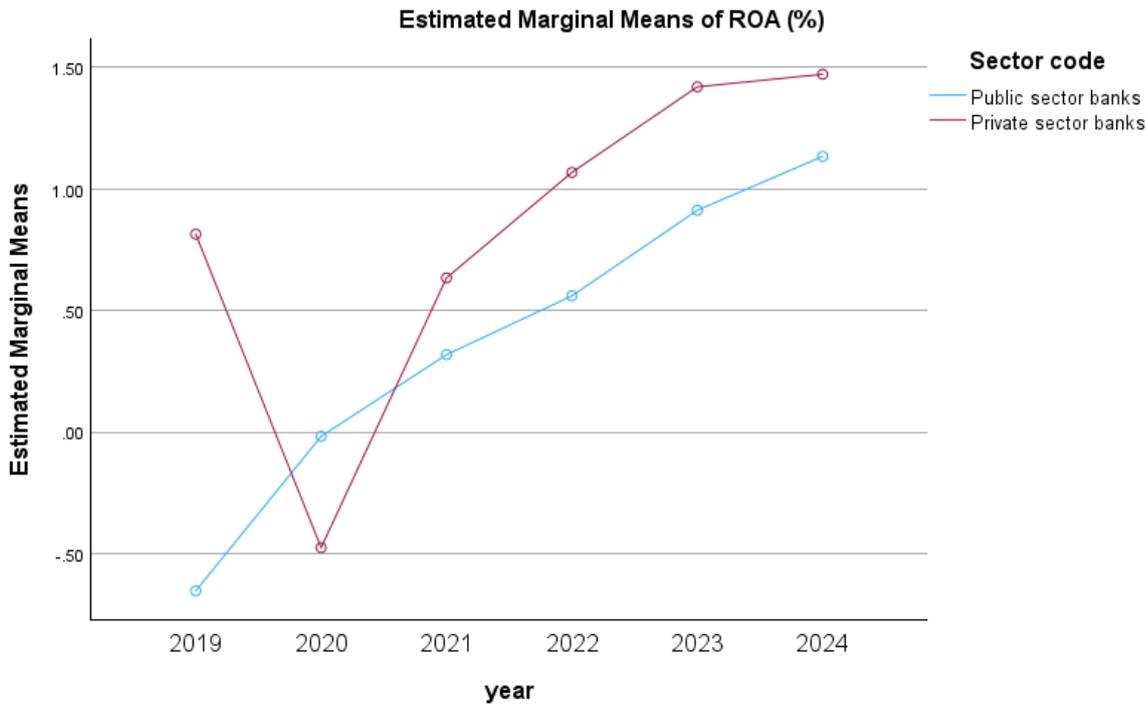
ROA (Return on Assets) measures profitability relative to total assets. Public sector banks show consistent growth in ROA after 2020, though they remain below private sector banks throughout the period. Private sector banks recover rapidly post-2020, surpassing public banks and stabilizing around 2023–2024. The private sector's superior ROA highlights better efficiency in asset utilization compared to public sector banks.
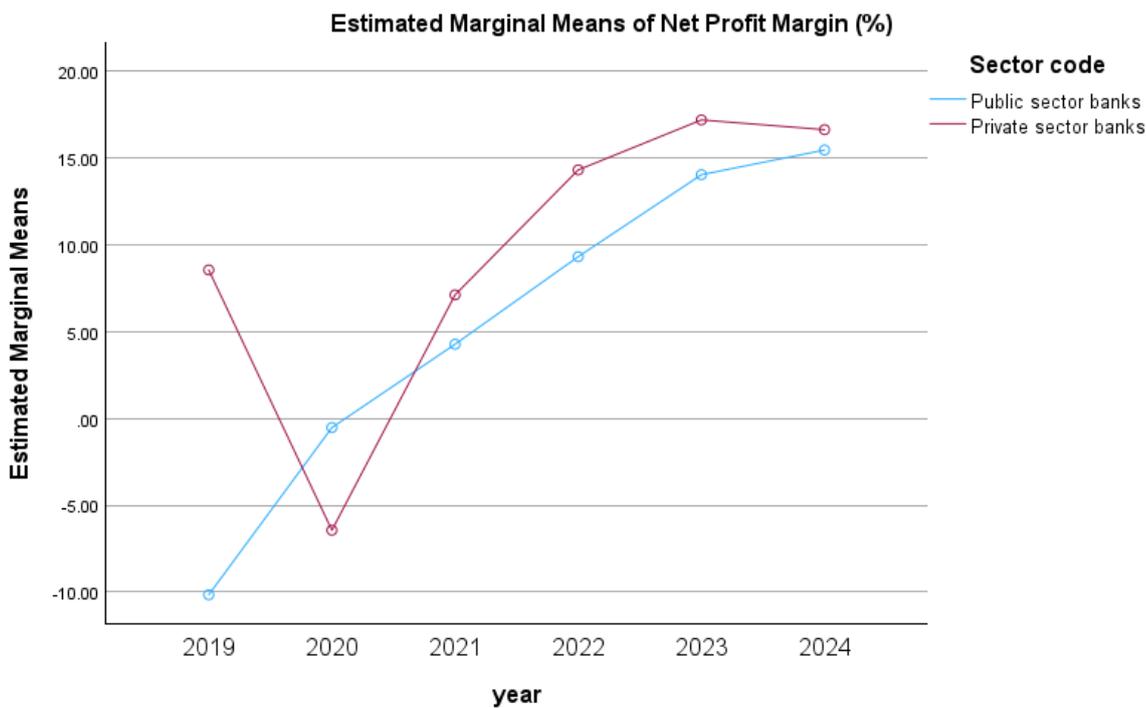
Net Profit Margin indicates profitability relative to revenue. Both public and private sector banks experience a recovery post-2020, with private banks outperforming public banks up to 2023. Public sector banks show steady growth but lag behind private sector banks in profitability until 2024, where the gap narrows.

Findings of Data Analysis

Public sector banks showed remarkable improvement in ROE, ultimately surpassing private sector banks by 2024. This highlights successful recovery strategies and potentially effective government interventions.

Private sector banks consistently outperformed public sector banks in ROA, underscoring superior efficiency in asset utilization. However, the narrowing gap suggests gradual improvements in public banks' operational efficiency.

For NPM, private sector banks maintained a lead throughout the period, but public sector banks exhibited steady growth, indicating improved profitability and cost management.

The study highlights the resilience of both banking sectors, particularly in overcoming challenges observed during 2020, likely influenced by the COVID-19 pandemic. The differences in performance trends reflect underlying structural and operational disparities, such as ownership, governance, and strategic priorities.

The Univariate GLM proved to be an effective method for analyzing financial data, accounting for sectorial interactions and enabling a statistically adjusted comparison. The graphical representation of EMMs further facilitated a clear understanding of performance trends, offering valuable insights for policymakers, banking institutions, and stakeholders.

Recommendations:

Public Sector Banks

- ✓ Focus on Asset Utilization: Public sector banks should implement strategies to improve Return on Assets (ROA) by optimizing asset management, enhancing operational efficiency, and leveraging technology to streamline processes.

- ✓ Strengthen Risk Management Practices: To sustain the upward trend in ROE, public banks must adopt robust risk management frameworks to mitigate credit risks and improve capital utilization.

- ✓ Promote Innovation and Technology Adoption: Embracing digital banking solutions and fintech collaborations can enhance customer experience and operational efficiency.

- ✓ Enhance Employee Training: Investing in employee upskilling, particularly in data analytics and customer service, can drive better decision-making and improve competitiveness.

Private Sector Banks

- ✓ Maintain Operational Excellence: Private sector banks should continue focusing on maintaining superior operational efficiency to retain their lead in ROA and Net Profit Margin.

- ✓ Expand Financial Inclusion Efforts: While focusing on profitability, private banks should invest in expanding their reach to underserved segments, ensuring inclusive growth and building long-term customer relationships.

- ✓ Prepare for Economic Volatility: Strengthen capital buffers and diversify revenue streams to remain resilient during economic downturns or unforeseen crises.

✓ Leverage Technology for Competitive Advantage: Continue investing in advanced technologies such as artificial intelligence and machine learning for predictive analytics, fraud detection, and personalized banking services.

Conclusion

This study analyzed the financial performance of public and private sector banks over the period 2019–2024 using the Univariate General Linear Model (GLM). By examining key financial indicators—return on Equity (ROE), Return on Assets (ROA), and Net Profit Margin (NPM)—we identified significant trends and sectorial differences. The application of the GLM allowed for the generation of Estimated Marginal Means (EMMs), which provided a robust framework for evaluating these differences over time.

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