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IMPACT OF NPAs ON PROFITABILITY OF THE SELECT PUBLIC AND PRIVATE SECTOR BANKS IN INDIA: AN EMPIRICAL ANALYSIS

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ABSTRACT **DOI No: 10.36713/epra24469** **Article DOI: https://doi.org/10.36713/epra24469**

The issue of Non-Performing Assets (NPAs) continues to be one of the most critical challenges faced by the Indian banking sector, with direct implications on profitability and financial stability. This study examines the impact of NPAs on the profitability position of select scheduled commercial banks in India, comprising five public sector and five private sector banks, over a ten-year period from 2015 to 2024. The research is based on secondary data which has been collected from the websites of RBI and annual reports of respective banks. Using descriptive statistics and regression analysis, the study evaluates the relationship between asset quality ratios (Gross NPA and Net NPA) and profitability indicators (ROA, ROE, ROI, NPM, and NIM). The descriptive results highlight that NPAs, particularly during 2016-2020, severely deteriorated profitability, as reflected in negative ROA, ROE, and NPM values. However, a significant improvement was observed before 2020, with declining NPA levels and stronger profitability ratios. Further, the regression models confirm that Gross NPAs has consistently negative and statistically significant effect on ROA, ROE, and ROI, whereas Net NPAs significantly influence ROI and NIM. The models demonstrate high explanatory power, with R^2 values ranging between 68 percent and 86 percent underscoring the critical role of asset quality in shaping profitability outcomes of the select public and private sector scheduled commerce banks during the study period.

KEYWORDS: ***NPAs, Asset Quality, Profitability, Public and Private Sector Banks.***

INTRODUCTION

The banking sector plays a pivotal role in the economic development of any country by mobilizing savings and channelizing them into productive investments. In India, both public and private sector banks have been instrumental in supporting industrial growth, infrastructure development, and financial inclusion. However, in recent decades, the increasing burden of Non-Performing Assets (NPAs) has emerged as one of the most critical challenges confronting the Indian banking system. NPAs represent loans and advances that have ceased to generate income for banks, thereby eroding profitability and weakening financial stability.

The issue of NPAs assumes particular significance when examining the performance of public and private sector banks, as the magnitude and management of stressed assets differ across these categories. Public sector banks (PSBs), owing to their large exposure to infrastructure, agriculture, and priority sector lending, have historically carried a higher proportion of NPAs. In contrast, private sector banks, while more conservative in their lending practices, are not immune to asset quality deterioration, especially during periods of economic slowdown. The divergence in NPA levels between these two segments highlights the importance of analyzing their relative impact on profitability position.

The profitability position of banks is directly linked to their ability to manage credit risk effectively. Rising NPAs not only reduce interest income but also necessitate higher provisioning requirements, which adversely affect the bottom line. Furthermore, prolonged stress in asset quality diminishes investor confidence, hampers capital adequacy, and restricts future lending capabilities. Hence, an assessment of how NPAs influence profitability provides deeper insights into the operational efficiency and financial soundness of the banking sector. Given the critical role of banks in sustaining economic growth, this study seeks to evaluate the impact of NPAs on the profitability of select Indian public and private sector banks.

REVIEW OF LITERATURE

Ravindra, B., and Ramesh, G. (2024) found that public sector banks, particularly State Bank of India (SBI) and Canara Bank, consistently reported higher Gross and Net NPA levels compared to private sector banks like Axis Bank and Kotak Mahindra Bank. SBI showed notable improvement in ROA and Net NPA, reflecting effective risk management, while Canara

Bank managed to reduce its Net NPA despite challenges. Among private banks, Axis Bank steadily improved its ROA with low Net NPA, and Kotak Mahindra Bank maintained strong profitability with a high ROA and well-controlled Net NPA. Correlation analysis revealed a significant negative relationship between ROA and Net NPA for SBI and Kotak Mahindra Bank, indicating that higher profitability was associated with lower NPAs. Similarly, negative correlations between Net Profit and Net NPA for SBI, Canara Bank, and Axis Bank suggested that rising profitability corresponded with reduced asset quality stress.

Sheth, B. S., and Vaishnani, H. B. (2024) observed that public sector banks recorded significant improvement in ROE, eventually surpassing private banks by 2024, reflecting effective recovery measures and government support. Private banks consistently outperformed in ROA, showing better asset utilization, though the narrowing gap indicated improving efficiency in public banks. In terms of NPM, private banks maintained an advantage, while public banks displayed steady growth, signaling enhanced profitability and cost control. The study further revealed that NPAs had a stronger adverse effect on public banks, reducing their profitability and necessitating greater regulatory oversight, whereas private banks showed higher resilience owing to stronger risk management and operational efficiency.

Das, S. K. (2023) it was found that public sector banks (PSBs) were more severely impacted by NPAs, while private banks as a group faced a smaller burden, despite a rise in loan defaults. The study highlighted that income diversification, earnings management, and loan quality significantly influenced NPAs in the post-crisis period. Non-Interest Income (NII), representing diversification, showed a positive association with NPAs, whereas ROA had a negative relationship, indicating that reduced interest income pushed banks toward riskier lending to sustain earnings.

Renuka, A., and Divya, P. (2023) study revealed that, apart from SBI and PNB, most banks exhibited a negative relationship between Gross NPAs and Net Profit. SBI and PNB, however, consistently recorded profit growth despite high GNPA levels, reflecting their focus on effective NPA management and loan recovery. While these two banks showed a positive association between NPAs and profitability, others demonstrated the opposite trend. For example, Bank of Baroda's NPAs rose by nearly 24.9% compared to 2018. Using a random-effects panel regression, the model yielded an R-squared 57% explanatory power. The results confirmed that higher NPAs generally led to lower net profits.

Sharma, P., et al. (2023) study confirmed that its empirical outcomes were consistent with earlier research, establishing a significant relationship between the Gross NPA (GNPA) ratio and key profitability indicators such as Net Profit Ratio, ROA, and ROE. It also highlighted the association between GNPA and banks' liquidity ratios, including cash flow margin, current ratio, acid test ratio, cash ratio, and operating cash flow ratio. Furthermore, the findings indicated that GNPA had a notable impact on the capital adequacy ratio.

Jaiswal, L. B. (2023) study showed that rising NPAs caused a significant decline in bank profitability, though institutions managed to partly mitigate their adverse effects. Increasing gross NPAs indicated that a larger share of bank assets had stopped generating income, reducing profitability and limiting credit growth. The higher provisioning requirements for potential losses further strained earnings, while structural challenges added to the decline. Profitability, measured through Return on Assets (ROA), reflected this downward trend, with banks experiencing reduced returns in recent years. This erosion in profitability made them more vulnerable to economic shocks and heightened risks to depositor confidence.

Tank, D. S. (2023) found that private sector banks performed better than public sector banks in managing NPAs. The correlation analysis revealed a negative relationship between net NPAs and net profits for most banks, except HDFC, ICICI, and IndusInd. NPAs adversely affected the profitability of SBI, BOI, BOB, HDFC, KMB, and IndusInd, as funds locked in NPAs could not be used productively, while provisions further reduced profits. The study emphasized that controlling NPAs is crucial for enhancing efficiency and profitability in both public and private sector banks.

Srivastava, P., et al. (2022) observed that Gross NPAs were significantly higher in public sector banks, with BOI recording 14.838%, while private sector banks like HDFC Bank reported a much lower mean of 1.258%. SBI showed the highest mean NPA value at ₹64,741.568 crore, whereas HDFC had the lowest at ₹3,151.342 crore. The study concluded that NPAs were concentrated more in public sector banks, particularly SBI, and had a negative impact on profitability, as reflected in the negative correlation between Net NPA and Net Profit.

Kumar, R., and Kaur, M. (2021) concluded that NPAs negatively affected the profitability of both public and private sector banks, with rising NPAs leading to reduced profitability. While NPAs had an insignificant impact on the interest income to total assets ratio, they adversely influenced the net interest margin of both categories of banks.

Benny, A. K., et al. (2019) observed a sharp rise in both gross and net NPAs in public and private sector banks over the preceding two years, with the increase beginning around 2011–12. While the net profit ratio grew slowly until 2014–15, it rose substantially in 2015–16 before declining again in 2016–17, indicating that excessive NPA growth adversely impacts profits. The study also found that public sector banks showed a strong association between GNPA, NNPA, and net profit, whereas private sector banks displayed no significant impact on their net profit ratio.

Dawn, S. (2017) highlighted NPAs as a critical challenge for the Indian banking sector, particularly UCO Bank, where rising Gross and Net NPAs blocked substantial funds. The study found a strong negative correlation between Net NPAs and Net Profit, which significantly reduced profitability. ROA declined throughout the period and turned negative in the last three years, while Net Interest Margin also dropped considerably, underscoring the adverse impact of NPAs on the bank's performance.

Kumari, R., et al. (2017) emphasized that both public and private sector banks should focus on variables influencing performance. The study revealed that GNPA and NNPA had a significant positive impact on the financial performance (ROA) of public sector banks, while their effect on private sector banks was insignificant. Additionally, the age of banks showed no significant relationship with profitability in either sector.

3. NEED FOR THE STUDY

The study is essential because Non-Performing Assets (NPAs) continue to be a major obstacle to the profitability and financial stability of Indian banks. High levels of NPAs reduce interest income, increase provisioning requirements, and weaken overall performance indicators such as ROA, ROE, and Net Profit. Public sector banks, with higher exposure to priority sectors, often face greater asset quality stress compared to private sector banks, which, though better managed, are not immune to default risks. An analysis is therefore necessary to understand how NPAs differently affect the profitability of banks. Such an assessment will not only highlight the operational strengths and weaknesses of public and private banks but also provide valuable insights for policymakers, regulators, and banking institutions to design effective strategies for asset quality improvement, credit risk management, and sustainable growth of the Indian banking system.

4. OBJECTIVE OF THE STUDY

1. To examine the effect of Non-Performing Assets on the Profitability Position of Select Public and Private Sector Scheduled Commercial Banks in India.

5. HYPOTHESIS OF THE STUDY

H_0: There is no significant impact of NPAs on the profitability position of select public and private sector scheduled commercial banks.

H_1: There is a significant impact of NPAs on the profitability position of select public and private sector scheduled commercial banks.

6. RESEARCH METHODOLOGY

a). Sampling Design

i. Sample Size: The study covers ten scheduled commercial banks in India, with an equal representation of five public sector banks and five private sector banks.

Public and Private Sector Scheduled Commercial Banks		
SI. N.	**Name of Banks**	**Market Capitalization (Cr.)**
Part-A: Public Sector Banks		
1	State Bank of India (SBI)	671577.66
2	Bank of Baroda (BOB)	119355.04
3	Punjab National Bank (PNB)	110090.90
4	Union Bank India (UBI)	89389.52
5	Canara Bank (CB)	79985.00
Part-B: Private Sector Banks		
1	HDFC Bank Limited (HDFCBL)	1346791.01
2	ICICI Bank Limited (ICICIBL)	915477.50
3	Kotak Mahindra Bank Limited	408967.53
4	Axis Bank Limited (ABL)	328692.81
5	IDBI Bank Limited (IDBIBL)	81019.35

Sources: *RBI and moneycontrol.com*

ii). **Sampling Method:** A purposive sampling technique has been adopted, focusing on banks with significant market presence and consistent availability of data throughout the study period.

b). Data Collection: This research is entirely based on secondary data collected from reliable sources including the official publications and reports of the Reserve Bank of India (www.rbi.org.in) as well as annual reports of select banks.

c). Tools and Techniques: Descriptive tools such as Mean, Standard Deviation, Coefficient of Variation, Skewness, Kurtosis, and Compound Annual Growth Rate (CAGR) are used for summarizing data and Regression Analysis is applied to test hypotheses and derive meaningful interpretations.

Variables Consideration: The study considers asset quality ratios - Gross Non-Performing Assets (GNPAs) and Net Non-Performing Assets (NNPAs) as independent variables, while profitability indicators such as Return on Assets (ROA), Return on Equity (ROE), Return on Investment (ROI), Net Profit Margin (NPM), and Net Interest Margin (NIM) serve as dependent variables for the analysis.

d). Study Period: The research spans a period of ten years from 2015 to 2024.

e). Scope of the Study: The scope is limited to scheduled commercial banks in India, specifically including five public sector and five private sector banks to provide a balanced comparative analysis.

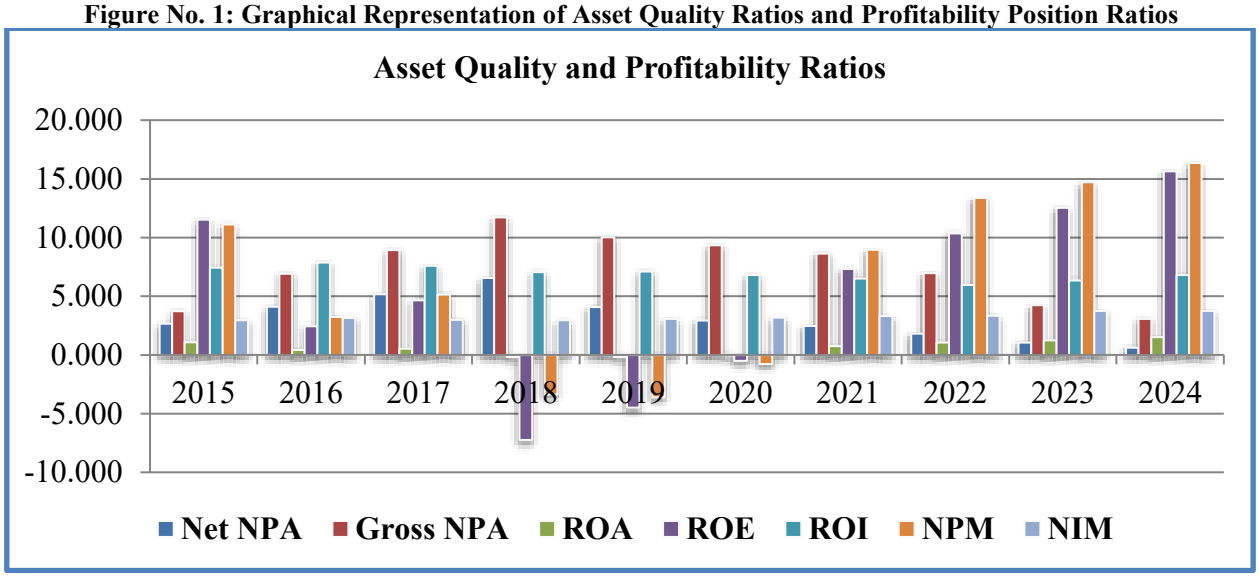
7. RESULTS DISCUSSIONS

Table No. 1: Assets Quality and Profitability Position

Year	Assets Quality		Profitability Position				
	Net NPA	Gross NPA	ROA	ROE	ROI	NPM	NIM
2015	2.672	3.713	1.072	11.529	7.429	11.125	2.967
2016	4.099	6.928	0.410	2.442	7.874	3.220	3.156
2017	5.164	8.920	0.537	4.661	7.586	5.144	3.000
2018	6.550	11.726	-0.184	-7.229	7.062	-3.370	2.953
2019	4.086	10.010	-0.177	-4.479	7.108	-3.613	3.067
2020	2.927	9.354	0.026	-0.511	6.794	-0.768	3.189
2021	2.464	8.644	0.760	7.324	6.507	8.949	3.305
2022	1.824	6.979	1.053	10.351	5.966	13.381	3.334
2023	1.046	4.232	1.237	12.545	6.350	14.717	3.758
2024	0.608	3.077	1.523	15.654	6.792	16.340	3.763
Average	**3.144**	**7.358**	**0.626**	**5.229**	**6.947**	**6.513**	**3.249**
SD	**1.850**	**2.904**	**0.605**	**7.623**	**0.587**	**7.485**	**0.300**
CV	**0.588**	**0.395**	**0.967**	**1.458**	**0.084**	**1.149**	**0.092**
Skew	**0.465**	**-0.237**	**-0.097**	**-0.358**	**-0.050**	**-0.162**	**1.018**
Kurt	**-0.294**	**-1.130**	**-1.342**	**-1.038**	**-0.562**	**-1.589**	**-0.121**
CAGR	**-0.138**	**-0.019**	**0.036**	**0.031**	**-0.009**	**0.039**	**0.024**

Sources: Annual Reports and RBI

Figure No. 1: Graphical Representation of Asset Quality Ratios and Profitability Position Ratios



The above table highlights the interrelationship between asset quality and the profitability position of the select banks over the period 2015-2024. Asset quality indicators demonstrate a significant decline in NPAs over time. The Net NPA ratio fell sharply from 2.67% in 2015 to 0.61% in 2024, while the Gross NPA ratio declined from 3.71% to 3.08% over the same period. This downward trend indicates consistent improvement in loan recovery and credit monitoring, further supported by the negative CAGR values of -13.8% (Net NPA) and -1.9% (Gross NPA). The higher Coefficient of Variation (CV = 0.588 for Net NPA) reflects greater volatility in Net NPAs compared to Gross NPAs.

Profitability indicators show strong fluctuations during the study period. Return on Assets (ROA) and Return on Equity (ROE) were adversely affected between 2018–2020, with negative values reflecting the stress caused by mounting NPAs and provisioning requirements. However, both ratios improved substantially thereafter, with ROA rising to 1.52% and ROE to 15.65% in 2024, demonstrating recovery and enhanced efficiency. ROI remained relatively stable (average 6.95%), with low variability (CV = 0.084), indicating consistent investment returns despite fluctuations in profitability. Net Profit Margin (NPM) showed extreme volatility, turning negative during 2018–2020 due to heavy provisioning and losses, but recovered strongly thereafter, reaching 16.34% in 2024. The high CV of 1.149 and negative kurtosis (–1.589) underline its instability. Net Interest Margin (NIM), on the other hand, remained stable throughout, averaging 3.25% with very low variation (CV = 0.092), suggesting sustained efficiency in interest income generation.

Table No. 2: Multicollinearity Tests

Collinearity Statistics		
Independent Variables	**Tolerance**	**VIF**
Net NPA	0.3674	2.7216
Gross NPA	0.3674	2.7216

The Variance Inflation Factor (VIF) and Tolerance values are used to examine the presence of multicollinearity among the independent variables Net NPA and Gross NPA. The results show that both variables have identical Tolerance values of 0.3674 and VIF values of 2.7216. Since the VIF values are well below the accepted threshold level of 10 (even within the stricter limit of 5), it indicates that multicollinearity is not a serious concern in the model. Hence, both Net NPA and Gross NPA can be retained as independent variables in the regression analysis without affecting the reliability of the results.

Table No. 3: Linear Multiple Regression Analysis

Linear Regression Analysis										
	ROA		**ROE**		**ROI**		**NPM**		**NIM**	
	Co-eff.	**P-value**	**Co-eff.**	**P-value**	**Co-eff.**	**P-value**	**Co-eff.**	**P-value**	**Co-eff.**	**P-value**
Intercept	1.960	0.000	21.983	0.000	7.022	0.000	22.055	0.000	3.647	0.000
Gross NPA	-0.145	0.027	-1.696	0.026	-0.194	0.029	-1.477	0.080	0.008	0.838
Net NPA	-0.085	0.332	-1.361	0.192	0.429	0.006	-1.487	0.231	-0.144	0.037
F Stat.	**18.424**		**22.517**		**7.622**		**13.855**		**7.906**	
P Value	**0.002**		**0.001**		**0.017**		**0.004**		**0.016**	
R Square	**0.840**		**0.865**		**0.685**		**0.798**		**0.693**	
Adj-R^2	**0.795**		**0.827**		**0.595**		**0.741**		**0.605**	
S E	**0.274**		**3.170**		**0.373**		**3.811**		**0.188**	
Normality	**0.522**		**0.766**		**0.990**		**0.369**		**0.053**	
Heteroskedasticity	**0.016**		**0.001**		**0.726**		**0.444**		**0.020**	
Autocorrelation	**1.788**		**2.035**		**1.909**		**1.670**		**1.319**	

Sources: Processed by SPSS

The regression results indicate that **Return on Assets (ROA):** Gross NPA shows a negative and statistically significant relationship with ROA (Coefficient -0.145, p 0.027), implying that higher NPAs reduce asset returns. Net NPA, however, is statistically insignificant (p 0.332). The overall model is robust (R^2 0.840, Adj. R^2 0.795), suggesting that around 84% of the variation in ROA is explained by asset quality variables.

8. FINDINGS AND SUGGESTIONS

a). Findings

Return on Equity (ROE): Both Gross NPA (-1.696, p 0.026) and Net NPA (-1.361, p 0.192) negatively influence ROE, though only Gross NPA is significant. The model has high explanatory power (R^2 0.865), indicating that asset quality strongly influences shareholders' returns.

Return on Investment (ROI): Net NPA exhibits a positive and statistically significant relationship with ROI (0.429, p 0.006), while Gross NPA has a negative but significant effect (-0.194, p 0.029). This suggests that while overall NPAs adversely affect investment returns, in some cases Net NPA restructuring may still yield favorable outcomes. The model explains 68.5% of ROI variation (R^2 0.685).

Net Profit Margin (NPM): Gross NPA has a negative but weakly significant effect (-1.477, p 0.080), whereas Net NPA shows an insignificant effect (-1.487, p 0.231). With an R^2 of 0.798, the model indicates a strong explanatory power, showing that NPAs significantly erode profit margins.

Net Interest Margin (NIM): Net NPA has a negative and significant relationship with NIM (–0.144, p 0.037), while Gross NPA shows no significance (p 0.838). The model explains 69.3% of variations in NIM (R^2 0.693), highlighting that credit quality directly impacts the efficiency of interest income.

Model Diagnostics: The F-statistics across all models are significant ($p < 0.05$), confirming overall model validity. The R^2 values range between 0.685 and 0.865, indicating strong explanatory power. Normality tests mostly fall within acceptable limits. However, heteroskedasticity issues are observed in ROA, ROE, and NIM models ($p < 0.05$), which may require remedial measures. Durbin-Watson statistics are within acceptable range (1.5–2.5), indicating no major autocorrelation problems.

b). Suggestions

The results clearly indicate that both Gross NPA and Net NPA significantly erode profitability indicators such as ROA, ROE, ROI and NIM, while improvements in asset quality directly enhance financial performance. Hence, banks should prioritize aggressive NPA reduction strategies, including stricter credit appraisal, timely monitoring of loan accounts, and rapid resolution of stressed assets. Since Gross NPA was found to have a stronger negative influence on profitability, particular attention must be given to early detection and resolution of large, high-value defaults. Net NPA's significant impact on ROI and NIM also suggests the need for better recovery and