

A Study on the Relationship between Gross Non-Performing Assets and Profitability of Selected Public and Private Sector Banks in India

Ms. Megha G¹, Dr. Bharath V²

¹Research Scholar, Commerce, University Of Mysore, Sjb College Of Management Studies

²Research Guide, Commerce, University Of Mysore, Sjb College Of Management Studies

Abstract

In commercial banks, asset quality is one of the most important factors to assess the financial performance and stability of commercial banks. The negative impact on profitability of Non-Performing Assets (NPAs) includes a decline in interest income, an increase in provisioning and loss of financial strength of banks. The present study has examined the relationship Gross Non-Performing Assets (Gross NPA %) and Return on Assets (ROA) of selected Public Sector and Private Sector Banks in India for the period 2019-20 to 2023-24. The researcher has used secondary data from the published annual reports and audited financial statements of 10 major/commercial banks out of which 5 are Public Sector Banks (State Bank of India, Canara Bank, Punjab National Bank, Karnataka Bank, Bank of Baroda) and 5 are Private Sector Banks (ICICI Bank, HDFC Bank, Axis Bank, Kotak Mahindra Bank, IndusInd Bank). Gross NPA (%) was taken as the indicator of asset quality and Return on Assets (ROA) as the measure of profitability.

Descriptive statistics were used to analyse the mean gross NPA and ROA of the selected banks. Further, GNPA and ROA were calculated for all banks, and their ranking was done using Gross NPA and ROA to find the asset quality and performance of profitability among all banks. Since the study takes a parametric approach for testing the hypothesis, the relationship between Gross NPA and ROA was studied using Pearson's Correlation Analysis. The analysis reveals that the Gross NPAs of the Public Sector Banks are generally higher than that of Private Sector Bank and their profitability is lower. The Gross NPA and ROA show a strong and statistically significant negative correlation, which means that the banks with lower Gross NPA have higher ROA. The study findings suggests that sound credit risk management, timely loan recovery, prudent credit lending and regular review of advances are important factors that contribute to the profitability and financial stability of banks. The results offer useful implications for bank management, policy makers, and financial regulators to improve asset quality and performance of Indian banking system.

Keywords: Gross Non-Performing Assets, Return on Assets, Asset Quality, Profitability, Public Sector Banks, Private Sector Banks, Pearson Correlation, Credit Risk Management, Indian Banking.

1. Introduction

The banking sector is very important in the economic development of every nation as it mobilizes savings, makes it possible to invest, extends credit and supports industrial, commercial and agricultural activities. A well-functioning and effective banking system is linked to financial stability, promotes capital

formation, enables financial inclusion and plays a significant role in sustainable economic growth. The quality of the loan book is one of the most vital factors affecting financial performance and sustainability of banks since its major operation is to convert deposits into loans and advances.

Non-Performing Assets (NPAs) is one of the important financial indicators that reflects the asset quality of the bank. A loan or advance is said to be Non-Performing Asset (NPA) if the interest or principal amount is delinquent for more than ninety days, according to the Reserve Bank of India (RBI). Higher NPAs have negative implications for banks as it reduces interest income, increases provisioning requirements, creates constraint on fresh lending, reduces profitability and adversely impacts the financial strength of banks. Thus, the effective management of NPAs is a big issue for banks, regulators and policy makers globally.

Return on Assets (ROA) is another important measure of how profitable a bank is. ROA is measure of how well a bank uses its overall assets to earn profit. A higher ROA means that assets are being used efficiently and in good management, while a lower ROA means that the assets are being used less efficiently and managed poorly. A major adverse effect on the profitability of banks is expected from NPAs as they directly impact on the interest earning capacity of the banks and credit losses. Thus, have a better understanding about the relation Gross NPAs and ROA is very important for assessing the financial sustainability and operational efficiency of commercial banks.

Indian banking system consists of Public Sector Bank and Private Sector Bank, which are regulated by Reserve Bank of India. While both sectors serve comparable financial roles, they have several key differences in the areas of ownership, governance, flexibility, credit evaluation, technology integration, and risk management. Public Sector Banks have seen relatively higher NPAs due to their higher exposure to Priority sector loans, infrastructure loans, corporate advances, stressed legacy assets, etc. Private Sector Banks, on the other hand, have on average stood out with lower Gross NPA ratios due to the effective credit appraisal process, technology-enabled monitoring systems, robust governance and quick recovery processes.

During the last ten years, Indian banking has seen a number of asset quality reforms, which have greatly enhanced the quality of bank assets. The Insolvency and Bankruptcy Code (IBC), Asset Quality Review (AQR), greater norms in provisioning, digital credit monitoring systems, stringent prudential norms and recovery mechanism have helped in reducing the Gross NPAs of the banking industry gradually over time. However, there is still significant disparity in asset quality and profitability of Public Sector Banks and Private Sector Banks, and therefore, it is very pertinent to also explore their relationship empirically.

Thanks to the direct impact of deteriorating asset quality on financial performance, the link between Gross NPAs and profitability has been the focus of many banking researchers. Generally, banks with lower levels of stressed assets can boost profitability, improve capital adequacy, increase lending activity, and increase shareholder value. On the other hand, banks with high NPAs suffer from declining incomes, higher provisioning demands and inefficiency in operations. Therefore, the correlation between Gross NPA and ROA gives some insights in the efficiency of the credit risk management practices of banks.

In this context, the present study examines the correlation between GNPA and ROA of Public Sector Banks and Private Sector Banks in India for the period 2019–20 to 2023–24. This study focuses on five leading Public Sector Banks (PSBs) viz, State Bank of India, Canara Bank, Punjab National Bank, Karnataka Bank, Bank of Baroda and five leading Private Sector Banks (PSBs) viz, ICICI Bank, HDFC Bank, Axis Bank, Kotak Mahindra Bank and IndusInd Bank. The descriptive statistics, bank-wise ranking, and Pearson's correlation analysis are used to assess the impact of asset quality improvement on profitability.

The results are likely to offer valuable inputs for bank management, investors, regulators and policy makers to improve credit risk management practices and boost the Indian banking sector financial performance.

2. Literature Review

Das and Ghosh (2007) studied the credit risk in public sector banks (PSUs) of India and found that poor asset quality has a negative impact on the profitability and financial performance of the banks. The researchers concluded that there is a link between the increase in non-performing assets and the requirements of providing for them and decreasing the return from the bank assets. The authors noted that prudent credit appraisal, the effective management of advances and effective and timely recovery mechanisms are needed to enhance asset quality and profitability.

Lepetit et al. (2008) examined how credit risk relates to profitability in the commercial banks in Europe. Based on their empirical analysis they found that the poor asset quality has a significant negative impact on Return on Assets (ROA) and has a significant increase in the operational risk. The study found that the effective Credit Risk Management enhances the profitability of bank and overall stability of the banking system by reducing the default of loans and enhancing the income generation of banks.

Nguyen et al. (2017) examined the correlation between asset quality, profit diversification and profitability of the Indian Banks. The study found that improvements in Asset Quality has a positive impact on Return on Assets and overall bank performance. Banks that had lower NPAs were seen to be earning higher risk adjusted profits and enjoying better financial stability than banks that had poor quality loan portfolios. As the authors pointed out, sustainable banking profitability is still defined by its effective management of credit risk.

Kumar et al. (2018) explored the factors behind financial stress in Indian banks in the context of hierarchical Bayesian panel data modelling. As part of their study, they found that non-performing loans are one of the biggest causes of financial problems and less profitability. Results indicated that measures related to profitability (ROA and NIM) are strongly related to asset quality, highlighting the importance of proactive credit risk management and proper loan portfolio monitoring.

Almaqtari et al. (2019) used panel data of 69 banks to explore the factors determining the profitability of Indian commercial banks. Among the factors that were identified in the study, asset quality was one of the significant factors contributing to Return on Assets and Return on Equity. Healthy loan portfolios and reduced credit risk led to greater profitability in banks. Banks with healthier loan portfolios and lower credit risks generally earned more profits. The results highlighted the importance of effective NPA management to maintain financial results.

Bawa, et al. (2019) used a comprehensive framework of 31 financial ratios and the Generalized Method of Moments (GMM) to study determinants of Non-Performing Assets in 46 Indian banks. The study revealed that there was significant negative correlation between ROA and NPAs which shows that banks with higher profitability tended to have better asset quality. The authors found that enhancing operational efficiency and profitability is a key factor in reducing stressed assets and improving financial performance.

Bandyopadhyay (2021) investigated the correlation between the NPA and profitability for the PSUs and PSBs banks in India by adopting panel regression techniques. The study revealed that Gross NPAs has a significant negative impact on Return on Assets which shows that rise in stressed assets leads to fall in bank profitability. The study suggested that credit risk assessment systems need to be improved,

technologies to monitor loans introduced, and recovery systems strengthened to boost financial performance.

3. Objectives of the Study

1. To analyse the Gross Non-Performing Assets (Gross NPA %) of selected Public Sector Banks and Private Sector Banks during the period 2019–20 to 2023–24.
2. To examine the relationship between Gross NPA (%) and Return on Assets (ROA) of the selected banks.

4. Hypothesis

Null Hypothesis (H₀): There is no significant relationship between Gross NPA (%) and Return on Assets (ROA) of selected Public Sector Banks and Private Sector Banks.

Alternative Hypothesis (H₁): There is a significant relationship between Gross NPA (%) and Return on Assets (ROA) of selected Public Sector Banks and Private Sector Banks.

5. Research Methodology

The present study uses quantitative research procedure which is descriptive, analytical and comparative type of research to analyze the relationship between Gross Non-Performing Assets (Gross NPA %) and Return on Assets (ROA) of selected PSUs and PSUBanks of India. The study has relied completely on secondary data which were obtained from published annual reports, audited financial statements, investor presentation, the official websites of the selected banks and publications of the Reserve Bank of India (RBI). The analysis is done for a period of 5 years, 2019-20 to 2023-24, which includes 10 leading commercial banks out of which five banks are Public Sector Banks (State Bank of India, Canara Bank, Punjab National Bank, Karnataka Bank, Bank of Baroda) and five banks are Private Sector Banks (ICICI Bank, HDFC Bank, Axis Bank, Kotak Mahindra Bank, IndusInd Bank). The indicators used for asset quality were Gross NPA (%), defined as Gross Non-Performing Assets as a percentage of Gross Advances, and ROA (Return on Assets) defined as Net Profit before Taxation (NPBT) as a percentage of Gross Advances. Descriptive statistics such as Mean and Standard Deviation were used to look into the trend and variability of variables and Pearson's correlation analysis was used to look at the relationship between Gross NPA and ROA. Hypotheses were tested at 5% level of significance ($\alpha = 0.05$) and the data were presented and compiled using Microsoft Excel and were statistically analysed.

6. Data Analysis and Interpretation

The descriptive statistics of Gross Non-Performing Assets (Gross NPA %) and Return on Assets (ROA %) for the selected Public Sector and Private Sector Banks for the period 2019-20 to 2023-24 is provided in table 1. It is seen that there are significant variations in the asset quality and profitability of the selected banks from the above results. Punjab National Bank (PNB) has the highest average Gross NPA (11.19%) amongst Public Sector Banks, followed by Canara Bank (6.85%) and Bank of Baroda (6.34%), which shows that PNB has relatively higher stressed assets and credit risk. State Bank of India (4.02%) and Karnataka Bank (4.19%) had comparatively low Gross NPA levels, however. In terms of profitability, the average ROA has been negative at -0.05% for Punjab National Bank while Karnataka Bank (0.82%) and Bank of Baroda (0.80%) have reported comparatively better profitability among the banks in that group.

Private Sector Banks with HDFC Bank has the lowest average Gross NPA (1.07%), followed by Kotak Mahindra Bank (2.16%) and IndusInd Bank (2.23%) which indicates that they have better asset quality and effective credit risk management. HDFC Bank with an average ROA of 1.75% and Kotak Mahindra Bank with an average ROA of 1.99% have the highest profitability as compared to ICICI Bank with an average of 1.57%. The descriptive statistics indicate that banks with lower Gross NPA ratios generally enjoyed higher ROA, which is indicative of the fact that banks' asset quality deterioration appears to have an inverse relationship with profitability at the present stage.

Table 1: Descriptive Statistics of Gross NPA and ROA

Bank	Bank Type	Mean Gross NPA (%)	SD of Gross NPA	Mean ROA (%)	SD of ROA
Canara Bank	Public Sector	6.85	1.98	0.44	0.52
State Bank of India	Public Sector	4.02	1.59	0.71	0.29
Punjab National Bank	Public Sector	11.19	4	-0.05	0.7
Karnataka Bank*	Public Sector	4.19	0.65	0.82	0.35
Bank of Baroda	Public Sector	6.34	2.86	0.8	0.36
ICICI Bank	Private Sector	4.63	2.36	1.57	0.58
HDFC Bank	Private Sector	1.07	0.11	1.75	0.04
Axis Bank	Private Sector	2.97	1.36	0.87	0.56
Kotak Mahindra Bank	Private Sector	2.16	0.7	1.99	0.27
IndusInd Bank	Private Sector	2.23	0.45	1.28	0.39

Table 2 shows the Average Gross NPA (%), which is the gross NPA rate of the selected banks, with the lowest bank having the best asset quality. HDFC Bank has got the lowest average Gross NPA of 1.07% while Kotak Mahindra Bank recorded 2.16% Gross NPA and IndusInd Bank recorded 2.23% Gross NPA. Other banks with relatively low Gross NPA levels, including the Axis Bank and the State Bank of India, showed effective credit appraisal and recovery measures. On the other hand, Canara Bank and Bank of Baroda had comparatively strong Gross NPAs figures, while the last remaining Punjab National Bank with the highest average Gross NPA of 11.19%, had relatively weak asset quality and higher credit risk exposure. It is evident from the ranking that the majority of the Private Sector Banks were located in the higher rank in the asset quality.

Table 2: Ranking Based on Gross NPA

Rank	Bank	Mean Gross NPA (%)
1	HDFC Bank	1.07
2	Kotak Mahindra Bank	2.16
3	IndusInd Bank	2.23
4	Axis Bank	2.97
5	State Bank of India	4.02
6	Karnataka Bank	4.19
7	ICICI Bank	4.63
8	Bank of Baroda	6.34
9	Canara Bank	6.85
10	Punjab National Bank	11.19

The selected banks have been ranked according to their average Return on Assets (ROA) in Table 3. Kotak Mahindra Bank has the highest average ROA of 1.99% followed by HDFC Bank at 1.75% and ICICI Bank at 1.57%. These banks had greater efficiency in their asset utilization to earn profits. Satisfactory profitability was achieved by IndusInd Bank and Axis Bank as well. Public Sector Banks did a bit better in the relative rankings with Karnataka Bank and Bank of Baroda ranking in the better half with Canara Bank and Punjab National Bank on the bottom. Significantly, the Gross NPAs of Punjab National Bank (PNB) were substantially higher, while the average ROA was negative (−0.05%), which suggests that asset quality has a negative impact on profitability. The profitability rankings further corroborate this finding that the less the banks' NPAs, the greater their financial performance.

Table 3: Ranking Based on Mean ROA

Rank	Bank	Mean ROA (%)
1	Kotak Mahindra Bank	1.99
2	HDFC Bank	1.75
3	ICICI Bank	1.57
4	IndusInd Bank	1.28
5	Axis Bank	0.87
6	Karnataka Bank	0.82
7	Bank of Baroda	0.8
8	State Bank of India	0.71
9	Canara Bank	0.44
10	Punjab National Bank	-0.05

The result of Pearson correlation analysis to find the relationship between Gross NPA (%) and Return on Assets (ROA) is presented in Table 4. Pearson correlation coefficient was equal to −0.824 with strong negative correlation. The negative number signifies that a higher Gross NPA would result in a lower Return on Assets while the lower Gross NPA would a sign of higher profitability. In addition, the relationship was statistically significant at the 5% level ($p = 0.003 < 0.05$). Thus, it is concluded that the null hypothesis

which said that there is no significant relationship between Gross NPA and ROA is rejected and the alternative hypothesis is accepted. The results validate the fact that asset quality deterioration has a significant impact on bank profitability, highlighting the need for proper credit risk management, prudent lending practices, timely loan recovery and regular advancement monitoring to boost the profitability and sustainability of banks.

Table 4: Pearson Correlation between Gross NPA and ROA

Variables	N	Pearson's r	p-value	Nature of Relationship	Decision
Mean Gross NPA (%) and Mean ROA (%)	10	-0.824	0.003	Strong Negative	Reject H_0

7. Conclusion

The study focussed on the correlation between Gross Non-Performing Assets and Return on Assets of selected Public Sector Banks and Private Sector Banks in India for the year 2019-20 to 2023-24. The descriptive statistics and ranking by banks reveal that there was a positive correlation between the profitability of banks and their Gross NPA ratios. HDFC Bank and Kotak Mahindra Bank exhibited good asset quality and profitability, while the Punjab National Bank had the highest Mean Gross NPA and the lowest Mean ROA. The comparative results shows that the selected Private Sector Banks overall had better profit earnings ratios and lesser loan losses compared with the selected Public Sector Banks.

The correlation coefficient was used to measure the correlation between the Gross NPA and ROA. It was found that there was strong and statistically significant negative correlation between Gross NPA and ROA ($r = -0.824$, $p = 0.003$). The null hypothesis was thus rejected which further proved that the increase of Gross NPA is correlated with fall in profitability of selected banks. The study findings suggest that to maximize interest income, minimize provisioning pressures, and maximize the productive capacity of bank assets, effective NPA management is a must. In order to enhance asset quality, profitability, and long-term financial stability, banks need to revamp their credit appraisal process, borrower monitoring, stressed accounts identification, leveraging information technology to support risk analytics, and timely recovery actions.

References

- Almaqtari, F. A., Al-Homaidi, E. A., Tabash, M. I., & Farhan, N. H. S. (2019). Bank-specific and macroeconomic determinants of profitability of Indian commercial banks: A panel data approach. *International Journal of Finance & Economics*, 24(1), 168–185. <https://doi.org/10.1002/ijfe.1655>
- Bardhan, S., & Mukherjee, V. (2016). Bank-specific determinants of nonperforming assets of Indian banks. *International Economics and Economic Policy*, 13(3), 483–498. <https://doi.org/10.1007/s10368-016-0344-4>
- Berger, A. N., & DeYoung, R. (1997). Problem loans and cost efficiency in commercial banks. *Journal of Banking & Finance*, 21(6), 849–870. [https://doi.org/10.1016/S0378-4266\(97\)00003-4](https://doi.org/10.1016/S0378-4266(97)00003-4)
- Bawa, J. K., Goyal, V., Mitra, S. K., & Basu, S. (2019). An analysis of NPAs of Indian banks: Using a comprehensive framework of 31 financial ratios. *IIMB Management Review*, 31(1), 51–62. <https://doi.org/10.1016/j.iimb.2018.08.004>

5. Das, A., & Ghosh, S. (2007). Determinants of credit risk in Indian state-owned banks: An empirical investigation. *Economic Issues*, 12(2), 48–66.
6. Lepetit, L., Nys, E., Rous, P., & Tarazi, A. (2008). Bank income structure and risk: An empirical analysis of European banks. *Journal of Banking & Finance*, 32(8), 1452–1467. <https://doi.org/10.1016/j.jbankfin.2007.12.002>
7. Nguyen, T. P. T., Nghiem, S. H., Roca, E., & Sharma, P. (2017). The efficiency, profitability and stability of banks: Evidence from Asian banking systems. *Economic Modelling*, 63, 290–300.
8. Kumar, N., Shrivastava, A., Singh, D. P., & Kumar, P. (2018). Determinants of financial stress of Indian banks: A hierarchical Bayesian panel data modelling approach. *Vision: The Journal of Business Perspective*, 22(4), 373–386. <https://doi.org/10.1177/0972262918800994>