IMPACT OF NON-PERFORMING ASSETS (NPA): COMPARATIVE ANALYSIS OF STATE BANK OF INDIA VS. BANK OF BARODA

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ABSTRACT
This study ventures out to evaluate the impact of NPA on the financial performance of banks by analyzing the past data of two large public sector banks in India, namely State Bank of India (SBI) and Bank of Baroda (BOB), along with measuring the strength of the correlation between NPA and profitability of the banks. For this study, correlation & trend analysis has been applied to measure the relationship between SBI and BOB, and ANOVA, the statistical tool, has been employed to measure the strength of this relationship. The study concluded that NPA has an adverse relationship with the profitability of the banks during the period of study i.e. 2009-10 to 2018-19, which is also evident from the fact that NPAs have steadily increased and profits have sharply reduced during the period of study.

Key words: ANOVA, Bank of Baroda, Correlation, NPA, State Bank of India

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1. INTRODUCTION
Banking sector is considered as pillar of an economy as it plays a crucial role in economic progress of a country. A bank’s main business is collecting deposit from the customers and lending the money so collected to other customer who need these funds for personal or business purposes. Business related to acceptance of deposits do not carry any risk of loss, but there is a lot of risk as in lending side of business as the customers who took loans may not repay these loans on time due to willful defaults or due to deterioration of their financial position or failure
of business apart from various other reasons like economic cycle, natural disasters etc. Initially, banks in India ignored the quality of loan assets as they focused more on expansion by increasing the number of branches, generating employment opportunities, and extending credit facilities to the weaker sectors like agriculture loans, student education loans, small scale industries loans etc. This results in deteriorating quality of assets on continuous basis and the pressure due to increasing NPA became a big risk factor for banking sector. The loss caused by NPA due to provisioning and ultimately writing off of the assets results in reduced profitability and liquidity. Due to its impact on profitability, banks are overly cautious in granting loans as the failure of the banks can have a huge negative impact on various industries. NPA may result in the downfall of an economy like the year 2008 financial downfall of United States of America. Therefore, while allowing credit, banks should assess whether the project is feasible and generate enough cash flows for the repayment of loans and development [20].

As per provisional estimates, the total volume of gross NPA of the Indian banks stood at Rs 10.35 lakh crore i.e. 9.1% of gross advances as of 31st March 2018 [17]. About 85% of this NPA is from loans and advances relating to public sector banks. Hence more than 9% of the loans given by banks turn into NPA or risky assets impacting the profitability and liquidity of the banks in India. For instance, NPA in the SBI was Rs 2.23 lakh crore at the end of 2017-18 as shown in Table 1 below. The Gross NPA of the banks in India has increased from 2.3 % of the total gross advances in 2008 to 9.3 % in 2017 [17]. A big proportion of the bank's assets are not generating any income hence negatively impacting the financial performance and liquidity.

Considering the importance of management of NPA, this paper has focused on the study of NPA for two major banks which are State Bank of India (SBI) and Bank of Baroda (BOB), both these banks are public sector banks operating in India.

**State Bank of India (SBI)** - is the biggest and first-established commercial bank in India, with a history of over 200 years tracing its descent to the Bank of Calcutta which was established in 1806, SBI has a market share of 22.84% in deposits and 19.69% in terms of advances with the largest network of branches (22,141) and customer base of 44.89 crores as per the annual financial statements for 2019-20 [22].

**Bank of Baroda (BOB)** - on 20 July 1908, BOB was founded by Maharaja of Baroda, Maharaja Sayajirao Gaekwad III. It is an Indian nationalized bank (nationalized in 1969) having it's headquarter in Vadodara (Baroda) in the state of Gujarat. BOB is the fourth biggest bank in India in terms of managing assets serving over 82 million customers in more than 20 countries, with a branch network of more than 5500 branches.

A steep increasing trend of NPA for SBI & BOB over the past 10 years ignited our interest to perform further analysis in the form of this paper to analyze the impact of NPA on the financial position and performance of the banks.

The purpose of this study is to compare the performance of two major Indian Public Sector Banks namely SBI & BOB with respect to the management of NPA by analyzing the gross and net NPA. Secondly, the study also attempts to measure the impact of non-performing assets on profitability of banks.

This paper has been organized into five sections where current Section 1 gives brief introduction of NPA, Section 2 presenting a comprehensive literature review on the relationship of NPA with profitability. Section 3 presenting the details of the methodology followed, data collection. The result and discussions have been included in Section 4. Section 5 discussed the conclusion to the study, the practical implications, and future research avenues.

**2. LITERATURE REVIEW**

The correlation between NPA and profitability is one of the fundamental areas of various studies in the banking domain due to potential regulatory implications in the banking sector.
Several types of research have been conducted to study the association between NPA and banks' profitability across the world, which has been classified into two categories as below:

2.1. Literature related to Research on Banks in India

A recent study [1], covering all scheduled commercial banks in India by using geometrical mean, highlighted that not only NPA negatively impacts the financial results of banks but also negatively affects the wealth of shareholders. A paper on analysis of NPA of Indian banks, using ratio analysis, compared the NPA of various banks in India. In their view, public sector banks have experienced more NPA than private banks as private banks paid more attention to resolve the problem and take effective measures for reduction of NPA, hence improving their financial performance comparatively. The study emphasized that to improve the productivity and profitability of the banking sector in India, it was important to bring banks out of the massive burden of NPA. Focusing on bank-specific macroeconomic determinants of NPA [19],

Using ratio analysis and graphical presentation on scheduled commercial banks of India, the author identified that the core problems related to the financial position of the banks are high volume of NPA. The study also suggested that banks should use more effective loan recovery measures apart from available legal measures such Lok Adalats and SARFAESI Act, as banks were not able to drive full benefits of existing measures without an effective recovery mechanism. While analyzing the various recovery mechanisms available to scheduled commercial banks in India [23],

A study on IFCI Bank & IDBI Bank using multiple regression analysis, pointed out that increasing NPA impacts the profitability of the banks as echoed by the result of analysis of ROA, ROE & ROCE as measures of profitability of banks. This study recommended that rigorous credit appraisal and recovery policies must be implemented management to control continuously increasing NPA [15].

2.2. Literature related to Research across the World (other than India)

Many studies ([18], [12], [16], [13]) around the world have examined the impact of NPA on the performance of the banks with mixed conclusions. However, most researchers suggest that NPA has a strong adverse correlation with the financial performance of banks. A research on the influence of default rates on the profits of 31 banks in Nepal using descriptive analysis, correlation, and regression concluded that the management of credit risk is very crucial for a bank's financial performance as it has considerable impact on the profits of the banks [18].

The researchers studied the correlation between NPA and efficiency of Malaysian and Singaporean banks and discovered that increase in NPA reduce banks’ cost efficiency, hence reducing their profitability [12]. This study also supports the hypotheses suggested by another study that bad management in banks results in extending inferior loans, which results in an increase in the level of NPA and hence negatively impacting the profitability of the banks [7].

A paper on Nigerian commercial banks by analyzed the correlation between credit risk and financial performance of Nigerian banks using descriptive analysis, correlation, and regression techniques of statics for the period of 2004-2008, and revealed a negative relationship between profitability and credit risk of banks in Nigeria [11]. A study on commercial banks in Nigeria using panel data regression concluded that an increase in NPA resulted in reduced profitability of banks [14]. A study conducted on Kenyan Banks, concluded that NPA is considered a strong determinant of the profitability of a bank. A high level of NPA negatively affects the bank's net profit because of impact of provision against doubtful debts and writing off of bad debts which in general reduces profits of the bank and liquidity levels [16].

The authors [2] studied the key factors determining the credit risk of banks in banking sector of emerging economies like India, Korea, Mexico, etc., and compared it with the banking sector...
systems in developed economies like Japan, Australia, the US, and France. The study emphasized that effective governing rules are essential for banking systems offering complex products and services; quality of management is very important in the cases of loan-based banks in developing economies. An increase in loss due to non-performing assets is treated as significant factor in for increase in potential credit risk as credit risk is higher than that in developed economies. A study [4] that evaluated the performance of Japanese commercial banks for the period between 1993 and 1996 through analysis of risk factors and assets quality confirmed that there is a negative relationship between financial performance and non-performing loans. The study also confirmed that after control of risk factors, banks suffer reduced operational efficiency due to cost-cutting. These findings are in line with the finding by another study [10] that was conducted on the bank in the United States.

On the contrary to the above studies, a study [13] that examined the effect of credit risk on the profitability of the Kenyan commercial banks. Data for the period of 2004-2008 was collected and analyzed, revealing that the profits of banks are not impacted by the volume of credit and non-performing assets, therefore emphasizing that other variables such as credit policy, industry norms and general economic conditions, etc. have an impact on profits other than credit and non-performing assets.

From the above review of literature, it can be seen that the studies are focused on the financial performance of banks with respect to NPA in India in general, but none assessing the comparative impact of SBI & BOB across 2009-2019. It is against this backdrop that this research has been undertaken to fill the gap identified.

3. RESEARCH METHODOLOGY

Sources of Data - Secondary sources like annual reports of SBI & BOB and RBI data warehouse has been used to collect data using various statistical tools as used by various researchers [11] [14] [15] [18] [24]. These tools, given below, accurate and reliable results to test the data statistically.

3.1. Statistical Tools and Techniques of Analysis used

Following statistical tools have been employed for this study: -

Mean – is the average of value of population also referred as expected value.

Standard deviation (SD) – is a measure of variance in a set of value, higher SD means high variation between value and vice-versa. Standard deviation helped to understand whether the comparative performance of the banks with respect to NPA is consistent throughout the study.

Covariance (CV) – consider both mean and standard deviation hence helps to understand the consistency of performance of banks with respect to the management of NPAs while taking into account both mean and standard deviation.

Correlation Analysis: provides relationship between to independent variable where -1 is perfect negative correlation and +1 is perfect positive relationship. A 0 value means no relationship. Correlation Analysis has been used to establish whether there is a relationship between NPA and net profit.

ANOVA – is a statistical tool of regression providing analysis of variances between dependent (Net Profit) and independent variables (Net NPA). The equation given below has been incorporated for the generating ANOVA tables from regression analysis:

\[ Y_1 = a + bX + u \]

Where \( Y = \) Net profit; \( X = \) Net NPA;
\( a = \) intercept, \( b = \) regression parameter; \( u = \) standard error.
4. ANALYSIS & FINDINGS

Analysis of data collected from secondary sourced was performed using the abovementioned statistical tools, the result of which has been presented below in Table 2 which shows that NPA to gross advances ratio of BOB & SBI. The mean of gross NPA ratio of the past ten years for both the banks is above 6% with SBI in a slightly better position. However, the standard deviation of SBI is much lower at 2.23 as compared to BOB’s standard deviation at 4.39 which indicated that SBI’s gross NPA to gross advances are more consistent as compared to BOB.

Table 2 Gross NPA to Gross Advances Ratio of BOB & SBI for 2011 to 2020

<table>
<thead>
<tr>
<th>YEAR</th>
<th>BOB</th>
<th>SBI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average</td>
<td>6.68</td>
<td>6.20</td>
</tr>
<tr>
<td>Maximum</td>
<td>13.21</td>
<td>11.55</td>
</tr>
<tr>
<td>Minimum</td>
<td>1.38</td>
<td>3.35</td>
</tr>
<tr>
<td>Mean</td>
<td>6.68</td>
<td>6.20</td>
</tr>
<tr>
<td>SD</td>
<td>4.39</td>
<td>2.23</td>
</tr>
<tr>
<td>CV</td>
<td>65.71</td>
<td>35.99</td>
</tr>
</tbody>
</table>

Source – Calculated by author from data collected from RBI/ dbie.rbi.org.in

This has also been confirmed by comparison of Coefficient of Variation which is much higher at 65.71% in the case of BOB as compared to SBI's 35.99% coefficient of variance. With this, it could be established that SBI’s gross NPA to gross advances ratio over the past 10 years was more consistent during the past 10 years as compared to BOB.

Graph 1 - Gross NPA to Gross Advances Ratio

Source – Calculated by author from data collected from RBI/ dbie.rbi.org.in

Graph 1 above depicted that the gross NPA to gross advances ratio of both the banks has continuously been increasing over the past 10 years. For BOB, the gross NPA ratio increased from 1.38 in 2010-11 to 9.40 in 2019-20. Similarly, for SBI, the gross NPA ratio was 3.35 in 2010-11 which has increased to 6.41 in 2019-20. Both the banks have witnessed a very steep increase especially from 2015-16 to 2017-18. The ratio reached its highest points in 2017-18 before showing improvement during the last 2 years for both the banks.
Table 3: Statistical ratios of Net Profit and Net NPA - SBI & BOB - 2010-11 to 2019-20

<table>
<thead>
<tr>
<th>Year</th>
<th>SBI</th>
<th>BOB</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Net Profit</td>
<td>Net NPA</td>
</tr>
<tr>
<td>Average</td>
<td>8731</td>
<td>44904</td>
</tr>
<tr>
<td>Maximum</td>
<td>14488</td>
<td>110855</td>
</tr>
<tr>
<td>Minimum</td>
<td>-6547</td>
<td>12347</td>
</tr>
<tr>
<td>Mean</td>
<td>8731</td>
<td>44904</td>
</tr>
<tr>
<td>SD</td>
<td>6283</td>
<td>28283</td>
</tr>
<tr>
<td>CV</td>
<td>72</td>
<td>63</td>
</tr>
</tbody>
</table>

Source – Calculated by author from data collected form RBI/dbie.rbi.org.in

In Table 3 above, the correlation of SBI is -0.788, which showed that there is a negative relationship between net profit and net NPA meaning higher the NPA lowers the profits of the bank. It also showed that there is a 78.8% impact of increase (or decrease) of NPA on profits of the bank.

Graph 2 - NET NPAs

Source – Calculated by author from data collected form RBI/dbie.rbi.org.in

Similarly, the correlation for BOB was -0.83745 which showed that net profits and net NPA are strongly negatively correlated similarly to SBI. However, the strength in the case of BOB is stronger at 83.7%. From this, it could be concluded that when NPA increases, the net profit of the bank shows a decrease. For example, during 2017-18, the NPA of both the banks were at the highest levels during the past 10 years and the profits were at the lowest levels which explains the adverse relationship between NPAs and profitability.

Graph 2 above presented trends of net NPA while Graph 3 showed trends of net profit of SBI and BOB during the period of study. The above graphs clearly showed an increasing trend in NPA over the past 10 years resulting in decreasing profits (losses in 2017-18) as NPAs are increasing for both the banks. As the NPAs are growing, the profits are decreasing for both the banks. Both banks have shown improved profitability in 2018-19 and 2019-20 as NPA has decreased from a peak of 2017-18.
Graph 3 - NET PROFIT

Source – Calculated by author from data collected form RBI/ dbie.rbi.org.in

After establishing the nature of the association of NPA and performance measures in the case of SBI & BOB using the coefficient of correlation, to investigate the strength of the impact of increase or decrease of NPA in banks portfolios on its overall financial performance, regression analysis had been employed. With the help of SPSS software, the below model summary and ANOVA tables had been developed for testing the hypotheses.

4.1. Hypotheses tested to determine the impact of NOA on the net profit of SBI and BOB

Below hypotheses had been tested: -

H0: There is no significant impact of NPA on the net profit of SBI
H1: There is a significant impact of NPA on the net profit of SBI

Regression Analysis of SBI - Table 4A - ANOVA Output & Model Summary

<table>
<thead>
<tr>
<th>Multiple R</th>
<th>R-Sq.</th>
<th>Adj. R-Sq.</th>
<th>Standard Error</th>
<th>F</th>
<th>Sig F</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.837</td>
<td>0.700</td>
<td>0.663</td>
<td>1996.866</td>
<td>18.703</td>
<td>0.003</td>
<td>0.001</td>
</tr>
</tbody>
</table>

Net profit - Dependent Variable; Net NPA – Predictor (Independent Variable)
Significance Level = 0.05 (5%)

Tables 4A above showed regression analysis of SBI where net profit is the dependent variable and net NPA is a predictor or independent variable with a 0.05 level of significance. Net profit are highly correlated with NPA and the correlation is strong at 0.837. R square value of 0.700 showed that the correlation can be explained to an extent of 70.0%. As the P value of F-Test (0.001) is less than the level of signification of 5%, the null hypothesis stands rejected. Hence the alternative Hypotheses (H1) is accepted. Hence it is concluded that there is a highly significant influence of NPA on the Net profit of SBI.
Regression Analysis of BOB - **Table 4B** - ANOVA Output & Model Summary

<table>
<thead>
<tr>
<th>Multiple R</th>
<th>R-Sq.</th>
<th>Adj. R-Sq.</th>
<th>Standard Error</th>
<th>F</th>
<th>Sig F</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.788</td>
<td>0.621</td>
<td>0.574</td>
<td>4324.225</td>
<td>13.112</td>
<td>0.007</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Net profit - Dependent Variable
Net NPA – Predictor (Independent Variable)
Significance Level = 0.05 (5%)

Tables 4A above showed regression analysis for BOB where net profit is the dependent variable and net NPA is a predictor or independent variable with a 0.05 level of significance. Net profit and NPA are highly co-related and the relationship is extremely significant and strong at 0.788. R square value of 0.621 explains the 62.1% impact of NPA on the net profits of the bank. As the P value of F-Test (0.000) is less than the level of significance of 5%, hence the null hypothesis stands rejected. Hence the alternative Hypotheses (H1) is accepted and it is concluded that there is a significant influence of NPA on the net profit of BOB.

5. FINDINGS

SBI has a lower CV value of 35.99 as compared to BOB’s CV value of 65.71 which demonstrates that gross NPA ratio of SBI is more consistence as compared to BOB. Correlation analysis reveals that incase of both the bank banks, net profit and net NPA are negatively correlated, hence it can be concluded that an increase in NPA results in a decrease of profits or higher losses and vice versa. Regression Analysis outcomes have shown that there is a significant impact of NPA on net profits for both the banks. The change in profits can be explained to the extent of 70% for SBI and 62% for BOB due to a change in the level of NPAs.

6. CONCLUSION

The comparative data extracted from annual reports of respective banks and tabulated above showed that NPA has been on the rise in SBI and BOB at an alarming rate. SBI and BOB, which were otherwise profit-making banks, have made losses in 2017-18 when the NPA of these banks were at the highest level. The ANOVA and correlation analysis of SBI & BOB has shown that NPA has a significant and negative impact on the profitability of both banks.

Therefore, it can be concluded that growing NPA impacts the profitability of banks negatively, which is in line with various studies [1] [23] [15] [24]. The adverse impact of an increased level of NPA results in lower profits for investors in terms of lower dividends and falling market capitalization. This may even lead to the loss of investments of the investors. It is suggested that the banks should make their credit policy and credit appraisal procedure more stringent, and strictly follow the guidelines issued by the regulatory bodies.

This study has been performed primarily on annual financial reports and financial data published by RBI. However, many other qualitative factors may affect the performance of the banks, but due to lack of information and confidentiality constraints, it could not be included in this study. The future avenues can be on a holistic study of banking performance by considering the qualitative and quantitative factors impacting the financial performance of the banks.

REFERENCES


