7.1 Introduction

The present research examined the NPAs of PSBs in India with the objectives broadly classified into; (1) to analyse the trend of NPA in PSBs in Indian vis-à-vis State Bank of Travancore, (2) to analyze the moderating and mediating effect of selected bank specific and macroeconomic variables on NPA of PSBs, (3) to analyze the major causes of NPA and their significance on the generation of NPA, (4) to study the impact of NPA on banks and other stakeholders, and (5) to suggest measures for the efficient and effective management of NPA. To examine the first objective, a bank-group wise analysis during 2000-01 to 2011-12 is undertaken. The trend in movement of NPAs of Public Sector Banks viz-a-viz State Bank of Travancore (SBT) is analyzed. Inferences were drawn based on statistical analysis. The second objective is achieved using statistics on NPA indicators, bank performance indicators and macroeconomic indicators. To satisfy the third and fourth objective, the primary data analysis using a case study approach is undertaken. The banker’s feedback is utilized to examine the various reasons, effects and effectiveness of various NPA management measures. This chapter discusses the various findings from the
study, its recommendations and practical implications of this study for the theory and practice.

7.2. Findings of the Study

The findings are classified according to the objectives listed in the Chapter One of the report.

7.2.1. Objective 1.1
To analyze the trend of the NPA in Public Sector Banks in India viz-a-viz State Bank of Travancore.

1) The analysis revealed the significant role of PSBs in Indian banking sector. Among the different bank groups, PSBs holds 85.94% of total gross NPA in 2000-01, and it reduced to 82.39% in 2011-12. A further classification indicated that the gross NPA of PSBs is shared among nationalized banks (48.51% of gross NPA of all SCBs) and SBI & associates (33.87% of gross NPA of all SCBs). Regarding the growth of gross NPA, foreign banks reported a higher growth rate (EG value 8.92%), followed by private sector banks (EG value 8.40%). The nationalized banks reported a lower growth rate (EG Value 2.36%) than the industry rate (EG Value 4.65%). The analysis revealed that the trend in movement of gross NPA of PSBs is greatly influenced by the upsurge of gross NPA of SBI & associates (EG value 5.61%).

2) The classification of gross NPA into pre-financial crisis period (2000-01 to 2006-07) and post-financial crisis period (2007-08 to 2011-12) revealed the effect of recessionary pressures on asset quality of Indian banks. The analysis revealed that while the gross NPA showed a reduced trend (-5.28%) during 2000-01 to 2006-07, it increased by 22.57% during 2007-08 to 2011-12. Regarding PSBs, the gross NPA reduced by
Findings, Recommendations & Conclusions

-6.12% during 2000-01 to 2006-07, it registered a growth rate of 22.47% during 2007-08 to 2011-12.

3) The analysis exhibited a significant positive correlation in the movement of gross NPA between the PSBs (also SBI & associates and nationalized banks) and all SCBs in India. The inference based on analysis showed the significance of financial stability of PSBs for the overall efficiency of Indian banking sector. This significance is further tested using regression study and relationship is validated. The regression study highlighted that the gross NPA of SBI & associates and nationalized banks can be taken as significant explanatory variables for examining the behavior of gross NPA of all SCBs in India.

4) With regard to net NPA, the analysis revealed that the share of PSBs has increased from 87.32% in 2000-01 to 91.05% in 2011-12. The share of both SBI & associates (from 30.05% to 31.14%) and nationalized banks (57.27% to 59.91%) has increased during the same period.

5) Although the net NPA of Indian banks in general and PSBs in particular exhibited declining trend (EG value -10.13%) during 2000-01 to 2006-07, it increased to 22.44% during 2007-08 to 2011-12. The findings of the study highlighted a reduction in asset quality during the financial crisis and recessionary pressures. A higher growth rate of net NPA (EG value 22.44%) than gross advances (EG value 17.94%) during 2007-08 to 2011-12 indicated a significant threat to asset quality in all SCBs in India. This was mainly resulted from the increase of net NPA of PSBs (EG value 29.94%) than the growth of its advances (EG value 19.19%).

6) With regard to net NPA, the analysis revealed a significant positive correlation between PSBs and all SCBs in India ($r = 0.987$, Sig= 0.000).
Also, a significant positive correlation is observed between SBI & associates and all SCBs \((r = 0.969, \text{Sig} = 0.000)\) and nationalized banks and all SCBs \((r = 0.954, \text{Sig} = 0.000)\). The regression study highlighted that the net NPA of SBI & associates and nationalized banks can be taken as a significant explanatory variable for examining the behavior of net NPA of all SCBs in India.

7) Inference based on analysis showed a higher growth of additions to NPA of PSBs compared to other bank groups except the foreign banks. The increase is more evident since 2006-07. Additions to NPA increased by 14.58% for all SCBs during the study period. An alarming trend observed from the analysis is the higher growth rate of additions to NPA (25.58% during 2007-08 to 2011-12) over the growth of advances (17.94% during 2007-08 to 2011-12).

8) The analysis showed a significant positive correlation of additions to NPA between PSBs and all SCBs. The private sector banks also possessed significant positive correlation with all SCBs. The regression study highlighted that the additions to NPA of SBI & associates and nationalized banks can be taken as a significant explanatory variable for examining the behavior of additions to NPA of all SCBs.

9) Among the different bank groups, the analysis showed that the asset quality of SBI & associates is most affected as may be observed from the higher Gross Non Performing Assets Generation Rate, i.e., 1.16%, followed by private sector banks (1.14%) and nationalized banks (1.17%).

10) The nationalized banks and SBI & associates holds 55.69% and, 26.12% (respectively) of total reductions to NPA of all SCBs during 2011-12. The analysis based on growth rate indicates that the reductions to NPA
of all SCBs increased by 9.43% during 2000-01 to 2006-07 and by 16.68% during 2007-08 to 2011-12. Overall, the reductions to NPA increased by 10.16% during the study period. The above inference does not mean a recovery of NPA accounts. The recovery of NPA is only 34.9% of the total reductions to NPA during 2011-12, while the remaining was contributed by write-off of NPA accounts (33.4%) and upgradation of NPA accounts (31.7%). The analysis reveals the weaknesses of recovery management during the study period.

11) The analysis revealed a significant positive correlation of reductions to NPA between SBI & associates and nationalized banks \((r=0.864)\), SBI & associates and all SCBs \((r=0.923)\), between nationalized banks and all SCBs \((r =0.965)\). The regression study highlighted that the reductions to NPA of SBI & associates and nationalized banks can be taken as a significant explanatory variable for examining the behavior of reductions to NPA of all SCBs. Further, the t-test shows that the reductions to NPA of nationalized banks is a statistically significant predictor of variability of reductions to NPA of all SCBs at 1%.

12) It is found based on the data analysis that the total net additions to NPA of all SCBs during 2011-12 was Rs.486,762 million. Out of this, 92.34% of net additions belong to PSBs, contributed by SBI & associates (38.71%) and nationalized banks (53.63%).

13) Consistent with previous observations, it is observed that 54.15% of total provision towards NPA is contributed by nationalized banks, followed by SBI & associates, i.e., 36.47% during 2011-12. The total provisions to NPA reduced during 2000-01 to 2006-07 by -4.85%, while it registered an increase by 30.11% during 2007-08 to 2011-12. The
overall growth of provisions towards NPA is 13.9% during the study period.

14) With regard to provisions towards NPA, the analysis revealed a very significant and positive relationship between the PSBs and all SCBs. The regression study highlighted that the provisions towards of NPA of SBI & associates and nationalized banks can be taken as a significant explanatory variable for examining the behavior of provision towards NPA of all SCBs. The t-test further highlighted that the provisions towards NPA of nationalized banks is a statistically significant predictor in explaining the variability of the independent variable, ie, provisions towards NPA of all SCBs at the 1% significance.

15) From the analysis, a significant correlation is evident between net NPA and gross NPA ($r = 0.959$, Sig = 0.001), net NPA and additions to NPA ($r = 0.956$, Sig = 0.003) and net NPA and reductions to NPA ($r = -0.828$, Sig = 0.001) of SBI & associates. With regard to nationalized banks, the analysis highlighted a significant correlation between net NPA and gross NPA ($r = 0.967$, Sig = 0.000), net NPA and reductions to NPA ($r = -0.635$, Sig = 0.026), net NPA and additions to NPA ($r = 0.837$, Sig = 0.001) of nationalized banks during the study period.

16) Inference based on regression study highlighted the statistical significance of additions to NPA in gross NPA of all SCBs. Hence, banks can reduce NPA if it efficiently controls the fresh NPA generated every year. It refuted the earlier observation that the overhang component is the major reason for higher NPA of banks. The results also indicated inefficiency of existing credit risk appraisal and evaluation system. A higher additions to NPA is the major cause for the dismal performance of Indian banking sector during the study period.
17) With regard to nationalized Banks t-statistic highlighted the significance of gross NPA (t value = 5.306, Sig = 0.001), additions to NPA (t value = 3.460, Sig = 0.009) and reductions to NPA (t value = -3.504, Sig = 0.008) on net NPA during the study period.

18) Inference based on the classification of advances highlighted the improvements in asset quality during the study period. Standard Assets showed increased growth rate during the study period, compared to substandard assets, doubtful assets and loss assets.

19) The analysis of NPA statistics of State Bank of Travancore highlighted a moderate exponential growth rate of gross NPA (EG value 2.53%) and net NPA (EG value 3.16%). The average annual growth rate (AAG) of gross NPA and net NPA is 8.68% and 14.10% respectively. A positive correlation is observed between gross NPA and net NPA. 93.00% of changes in net NPA is caused by gross NPA as evident from correlation study.

20) A sector wise analysis of the trend in the movement of NPA of SBT indicated an increase of the NPA in agricultural sector (AAG rate = 3.91), other priority sectors (AAG Rate = 18.67), and non-priority Sector (AAG rate = 7.45). While the average annual growth rate of priority sector as a whole is 4.68, the contribution of the non-priority sector increased by an AAG rate of 7.45% during the study period. The correlation study indicates that 90.5% of change in total NPA is contributed by the change in non-priority sector.

21) With regard to SBT, the analysis revealed that the additions to NPA increased by 17.00% while the reductions to NPA increased by 12.5% during the study period.
7.2.2. Objective 2

Effect of bank performance indicators and macroeconomic indicators on NPA - Bank Groupwise

The following findings were noted based on analysis.

1) The observations based on CD ratio highlighted an increase and indicated higher deployment of credit during the study period. In specific terms, SBI & associates reported growth of CD ratio from 48.18% during 2000-01 to 81.99% during 2011-12. With regard to nationalized Banks, the ratio increased from 48.28% in 2000-01 to 75.99% in 2011-12. The increased ratio showed the confidence of the bank-groups on the various prudential measures taken by RBI for managing the loan portfolio. The notable among was the introduction of SARFAESI Act, which enabled the bank to recover their NPA accounts.

2) Analysis on sector wise NPA stressed the increased role of priority sector for incidence of NPA, as observed from the higher EG value (EG value 4.06%), compared to non-priority sector (EG value -3.64). Among the priority sectors, agriculture (EG value 4.32%) and other priority sectors (EG value 8.11%) contributed to the high growth of NPA, while the contribution of SSI declined in post-millennium period except for nationalized banks. It may be observed that the priority sector NPA is about 52% of total NPA of SBI & associates and 46.17% in nationalized banks. The share of non-priority sector and public sector was 52.32% and 1.51% respectively during the study period.

3) With regard to SBI & associates, the correlation study highlighted significant correlation between agriculture sector NPA and SSI sector
NPA ($r = 0.629$, Sig = 0.038), agriculture sector NPA and priority sector NPA ($r = 0.870$, Sig = 0.000), agriculture sector NPA and total NPA ($r = 0.774$, Sig = 0.005), SSI sector NPA and priority sector NPA ($r = 0.634$, Sig = 0.036), SSI sector NPA and total NPA ($r = 0.831$, Sig = 0.002), priority sector NPA and non-priority sector NPA ($r = 0.790$, Sig = 0.004), priority sector NPA and total NPA ($r = 0.934$, Sig = 0.000) and non-priority sector NPA and total NPA ($r = 0.954$, Sig = 0.000).

4) Inference based on regression study indicated that priority sector NPA can be taken as a significant explanatory variable for examining the behavior of total NPA of SBI & associates (t value = 7.209, Sig = 0.000), nationalized banks (t value = 17.979, Sig = 0.000) and PSBs (t value = 10.475, Sig = 0.000).

5) Based on the regression study, it is inferred that gross NPA of SBI & associates can be taken as a significant explanatory variable for examining the behavior of net profit (t value = 2.919, Sig = 0.015), interest income (t value = 4.581, Sig = 0.001) and provision & contingencies (t value = 4.946, Sig = 0.001) of SBI & associates.

6) Inference based on regression study revealed that gross NPA of SBI & associates can be taken as a significant explanatory variable for examining the behavior of total borrowing (t value = 3.516, Sig = 0.006), total deposits (t value = 3.431, Sig = 0.006) and total investment (t value = 2.995, Sig = 0.013).

7) With respect to nationalized banks, it is observed based on the regression study that gross NPA can be considered as an explanatory variable for examining the behavior of interest income (t value = 2.924, Sig = 0.015),
Interest expense (t value = 2.885, Sig = 0.016) and provision and contingencies (t value = 3.456, Sig = 0.006).

8) Inference based on regression study revealed that the gross NPA of nationalized banks can be taken as a significant explanatory variable for examining the behavior of total borrowing (t value = 3.516, Sig = 0.006), total deposits (t value = 3.431, Sig = 0.006) and total investment (t value = 2.995, Sig = 0.013).

9) The study of the moderation effect of bank performance indicators on additions to NPA of PSBs revealed statistical significance of selected bank performance indicators in explaining the additions to NPA of PSBs. The adjusted R² showed that more than 90% of variability in additions to NPA can be explained by the independent variables (borrowing, investment, reserves & surplus, deposits and total assets). Based on F-statistic, it is inferred that the regression equation is statistically significant. The t-test showed that interaction effect is statistically significant in explaining the behavior of additions to NPA.

10) In the case of nationalized banks, the moderation of bank performance indicators (investment, deposits, total assets) is statistically significant, based on t-statistics, in explaining the behavior of additions to NPA. In the case of SBI & associates, the borrowing is found to influence additions to NPA significantly compared to the other performance indicators. The moderating effect showed that the interaction of bank performance indicators (borrowing, investment, reserves & surplus, deposits, total assets, capital) is statistically significant in explaining the behavior of fresh NPA of SBI & associates.
11) The fresh NPA is a significant moderating variable in the relationship between interest income and net profit of PSBs. The coefficient is negative and is found to be a statistically significant predictor in explaining the behavior of dependent variable, i.e., net profit of banks. Further, the regression study also revealed that the gross NPA is a moderating variable in the relationship between interest income and net profit of PSBs.

12) It may be inferred from the analysis that macroeconomic variables exercise significant control over NPA of banks. Any change in economic environment changes the level of NPA of the banks.

13) With regard to the mediating role of macroeconomic indicators on the relationship between advances and additions to NPA of SBI & associates, among the economic variables, GDP at factor cost, NDP at factor cost, GDP at market prices, NDP at market prices, GNP at factor cost, NNP at factor cost, GNP at market prices, NNP at market prices, Personal Disposable Income, Gross Domestic Capital Formation, Net Domestic Capital Formation, Gross Domestic Saving, Net Domestic Saving, Per Capita GNP at factor cost and Per Capita NNP at factor cost are mediating variables. The analysis revealed that both gross NPA and additions to NPA and its relationship with advances is mediated by similar economic variables.

14) With regard to the relationship between advances and additions to NPA of nationalized banks, among the selected economic variables, Consumption of Fixed Capital, Indirect tax less subsidies, Net Factor Income from Abroad, GNP at factor cost, NNP at factor cost, Gross Domestic Capital Formation, Net Domestic Capital Formation, Gross Domestic Saving, Net Domestic Saving, Per Capita GNP at factor cost and Per Capita NNP at factor cost are mediating variable.
7.2.3. Objective 3

Explore the major causes behind NPA of banks and significance of each factor for generating NPA in India

1) The analysis showed that willful default by clients is the number one reason for NPA in Indian SCBs. The second major reason is diversification of funds for other purposes. The lack of supervision and follow up is ranked as third important cause for NPA. Inadequate or defective credit appraisal also is considered as a major reason for NPA. In summary, the analysis showed that customer specific reasons are the most important causes for NPA, followed by bank specific causes and economy specific causes.

2) Bankers weighed equal importance for the contribution of both priority sector and non-priority sector for incidence of NPA. The analysis of secondary data however reported a growth rate of priority sector NPA while the non-priority sector NPA registered a declining trend. The feedback further illustrated that NPA results not because of the priority sector lending or non priority sector lending, but because of selecting unviable project, willful default etc. Among the different sectors, bankers considered SSI sector and agriculture sector as major contributors for more NPA in banks.

3) Based on the analysis, the following factors are not found statistically significant for occurrence of NPA.
   a) Time and Cost Overruns while implementing the project.
   b) Inappropriate technology/technical problems.
   c) Higher rates of interest limiting repayment capacity.
4) Based on the analysis, the following factors are found statistically significant for occurrence of NPA.
   a) Inefficient management, strained labor relations.
   b) Ineffective feasibility studies on market/industry leading to business failure.
   c) Government policies like excise, import duty changes, deregulation, pollution control orders etc.
   d) Lack of Working Capital.

5) Even though, the impact of competitive pressures on relaxing the credit standards is not statistically tested, the respondent remarks showed that the competitive pressures has influenced credit standards of banks. It supported the views expressed by RBI that one of the reasons for the higher NPA during crisis period is the credit boom in the periods prior to financial crises.

6) Inference based on the analysis showed that the existing staff strength in credit portfolio is inadequate to support the tasks assigned. It is observed that more staff members are needed to handle the credit portfolio efficiently. It is often remarked that NPA can be reduced if more proactive measures like regular follow up, employing more staff in credit portfolio etc are followed.

7) Inference based on analysis showed the importance of a strong market intelligence system to manage NPA. The lack of such system results in sanctioning loans to non-credit worthy customers. It is remarked that banks should develop market intelligence system to enable staff’s in advance/loan section to discharge their activities efficiently. In banks, this can be done at the branch level through continuous interaction with...
customers and at the highest level through consolidating official statistical about market and industry prospects. Another important observation resulted from the analysis is that there exists an inadequate mechanism to disseminate credit information among banks.

8) Inference based on analysis showed the importance of overhang component in total NPA of banks. The overhang component puts pressure on bankers to reduce the level of NPA of banks. Bankers considered that effective recovery of NPA is hampered on account of the sizeable overhang component arising from infirmities from the existing process of debt recovery and inadequate legal provisions on foreclosure and bankruptcy.

9) The statistical analysis based on secondary data showed the impact of financial crises on NPA of banks. The NPA figures increased considerably during the crisis period and indicated the vulnerability of banks towards the financial crisis. This view is supported by bankers as well. A cumulative 83.8% supported the view that the global financial crisis impacted the NPA, out of which 28.8% of respondents rated the effect as severe, while 55.0% rated it as moderate.

7.2.4. Objective 4

To study the various impacts of NPA

1) A ranking of the various impacts of NPA on banks rated erosion of profit as number one, followed by increasing provisions and increased intermediation cost. Another important effect of the NPA is that it puts pressure on spread, results declining reserves and surpluses and increase market borrowings.

2) The inference based on analysis highlighted the significance of the impact of NPA on the liquidity of banks. 15.0% of respondents viewed
the NPA’s impact on liquidity as significant supported by 67.5% of respondents who viewed the liquidity problems as a major impact of NPA on SCBs. 12.5% disagreed with this opinion. Based on Z value, result is found statistically significant.

3) An observation based on feedback on bankers revealed that NPA impact the interest rates charged by banks. 22.5% respondents rated its very significant while 43.8% of respondents rated it as a significant impact of NPA on banks. Inference based on Z value, i.e., 0.742 highlighted that the result is not statistically significant.

4) The responses from bankers supported the view that NPA affects the credit growth. Rather than focusing on fresh credit, banks with higher NPA focus more on its recovery. However, inference based on Z value, i.e., -0.808 highlighted that the result is not statistically significant.

5) It is observed from the analysis that NPA does not affect the nature of investment of banks. It is often argued that a higher NPA forces bank to concentrate more on investing in risk free government securities and other types of investment. Inference based on Z value, i.e., -0.808 highlighted that the result is not statistically significant. This is also evident from the secondary analysis.

6) It is observed from the analysis that restructuring a potential NPA account is important to facilitate repayment of a loan. Inference based on Z value, i.e., 19.751 highlighted that the result is statistically significant.

7) It is observed from the analysis that higher provisions affect investor sentiments since it negatively affect the profitability of the banks. Inference based on Z value, i.e., -0.953 highlighted that the result is not statistically significant.
8) It is observed from that analysis that 5% of the respondent agreed and remarked that higher NPA increases the cost of borrowings. Inference based on Z value, i.e., -1.196 highlighted that the result is not statistically significant.

7.2.5. Objective 5
To know the various measures taken by the bank and regulatory authorities and effectiveness of each in managing NPA

1) Ranking of various measures to manage NPA consider Risk Assessment and Risk Management Mechanism as the most important measure to manage NPA. A proper and effective risk management mechanism will identify viable and thereby reduce the chances of accepting unviable and infeasible projects. Utilizing a Credit Information Bureau is considered as a second important measure to manage NPA. Release of willful defaulters list is considered as the third important measure. The fourth major measure suggested by respondents is the collateral requirements. According to them, collateral requirements must be increased depending on the riskness of the project. Compromise settlement schemes and reporting frauds to RBI are considered as other important tools to manage NPA of banks.

2) Based on analysis, it is observed that the quality of credit appraisal has a direct impact on NPA. Banks should improve their quality of credit appraisal and incorporate more objective and prudential measures for risk assessment in order to manage NPA. Inference based on Z value, i.e., 4.919 highlighted that the result is statistically significant.
3) It is observed from the analysis that 40% of respondents strongly agree and consider client relationship and follow-up as an important method to reduce NPA of banks. The bankers should continuously interact with the clients so that any problems or difficulties may be addressed and necessary measures can be taken. Inference based on Z value, i.e., 32.812 highlighted that the result is statistically significant.

4) The feedback on the statement “In order to show a higher return and capital adequacy ratio’s as per the Basel Capital Accord requirements, there is a widespread allegation that the banks understate their NPAs” highlighted that bankers feel that NPA statistics are understated. Inference based on Z value, i.e., 2.749 highlighted that the result is not statistically significant.

5) Inference based on analysis considered legal impediments and procedures requirements as a major obstacle to reduce the level of NPA in the bank’s balance sheet. Inference based on Z value, i.e., 17.300 highlighted that the result is statistically significant.

6) It is observed from the analysis that 78.80% of respondents supported the view that the terms and conditions of the loan should depend on the individual loan proposal based on the quality of the borrower and nature of business.

7) It is observed from the analysis that corporate governance practices can reduce the level of NPA. It improves the efficiency of the organizations; thereby enable to reduce the level of NPA. Inference based on Z value, i.e., 14.685 highlighted that the result is statistically significant.

8) Even though around 36.00% considered involvement of industry bodies that include Chamber of Commerce, Federation of Industries etc. on the
bank’s decision making forums, the result is not found statistically significant using Z test.

9) It is observed from the analysis that incentives to staff can be used in order to give more attention to NPAs, thereby NPA can be reduced. Even though the observation is supported by 40.00% of respondents, the result is not statically significant as observed from the Z test.

10) A major measure to manage NPA is the implementation of a Credit Reference Agency, to disseminate information to bankers on various aspects. This is practiced in many countries. Inference based on Z value, i.e., 32.812 highlighted that the result is statistically significant.

11) It is observed from the analysis that bankers supported adding experienced staffs in the loan department as important to handle different functions efficiently. Inference based on Z value, i.e., 18.136 highlighted that the result is statistically significant.

12) A summary of bankers feedback clearly indicated the need for more training and development facilities for staffs working in the loan department. 68.80% of respondents strongly supported this requirement, while 30% agreed to it. The inference based on Z value, i.e., 42.453 highlighted that the result is statistically significant.

13) From the analysis, the observation on the role of SARFAESI Act in managing NPA which has a mean score of 74.50%, indicated that the SARFAESI Act highly influenced the reductions in NPA. To further test whether the result is statistically significant, Z value is calculated and is found statistically significant (Z value 3.203).

7.2.6. Hypothesis testing

The hypotheses used in this study are detailed below.
<table>
<thead>
<tr>
<th>No.</th>
<th>Hypothesis</th>
<th>Test Applied</th>
<th>Test Result</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>H0: There is no significant difference in Gross NPA of different bank groups in India.</td>
<td>One way ANOVA</td>
<td>F = 34.698; Sig = 0.000</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>2</td>
<td>H0: There is no significant difference in Net NPA of different bank groups in India.</td>
<td>One way ANOVA</td>
<td>Welch Statistic 37.807; Sig = 0.000</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>3</td>
<td>H0: There exists no significant difference in Additions to NPA among different bank groups in India.</td>
<td>One way ANOVA</td>
<td>Welch Statistic 8.087; Sig = 0.001</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>4</td>
<td>H0: There exists no significant difference in Reductions to NPA among different bank groups in India.</td>
<td>One way ANOVA</td>
<td>Welch Statistic 21.838; Sig = 0.000</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>5</td>
<td>H0: There exists no significant difference in Net additions to NPA among different bank groups in India.</td>
<td>One way ANOVA</td>
<td>Welch Statistic 1.625; Sig = 0.212</td>
<td>Accepted H0</td>
</tr>
<tr>
<td>6</td>
<td>H0: There exists no significant difference in Provisions towards NPA among different bank groups in India.</td>
<td>One way ANOVA</td>
<td>Welch Statistic 4.579; Sig = 0.013</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>7</td>
<td>H0: There is no significant relationship between GNPA and Gross Advances of SBI &amp; Associates</td>
<td>One way ANOVA</td>
<td>F = 81.264; Sig = 0.000; t-value = 6.512; Sig = 0.000</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>8</td>
<td>H0: There is no significant relationship between GNPA and Gross Advances of Nationalized Banks.</td>
<td>One way ANOVA</td>
<td>F = 42.407; Sig = 0.000; t-value = 9.015; Sig = 0.000</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>9</td>
<td>H0: There is no significant difference Credit-Deposit Ratio among different bank groups.</td>
<td>One way ANOVA</td>
<td>F value = 5.526; Sig = 0.003</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>10</td>
<td>H0: There is no significant difference in Credit-Deposit Ratio during pre-crisis period and post-crisis period.</td>
<td>One way ANOVA</td>
<td>Welch Statistic 22.194; Sig = 0.000</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>11</td>
<td>H0: There exists no significant difference in the movement of gross NPA of State Bank of Travancore with different bank groups in India.</td>
<td>One way ANOVA</td>
<td>Welch Statistic 51.873; Sig = 0.000</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>12</td>
<td>H0: There exists no significant difference in the movement of net NPA of State Bank of Travancore with different bank groups in India.</td>
<td>One way ANOVA</td>
<td>Welch Statistic 60.926; Sig = 0.000</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>13</td>
<td>H0: There exists no significant difference in the movement of additions to NPA of State Bank of Travancore with different bank groups in India.</td>
<td>One way ANOVA</td>
<td>Welch Statistic 18.723; Sig = 0.000</td>
<td>Rejected H0</td>
</tr>
<tr>
<td>14</td>
<td>H0: There exists no significant difference in the movement of additions to NPA of State Bank of Travancore with different bank groups in India.</td>
<td>One way ANOVA</td>
<td>Welch Statistic 43.602; Sig = 0.000</td>
<td>Rejected H0</td>
</tr>
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7.3. Recommendations and Managerial Implications of the study

A well developed banking system is *sina qua non* for the economic development of a country. It is explained in the literature that the quality and stability of banks can be determined based on the way the its asset quality behaves during financial crises. Considering this view, banks in India are efficient in comparison to banks in many other countries. This efficiency is relative and does not indicate the overall efficiency of Indian banking sector in the post millennium period. The data analysis revealed a decrease in the asset quality of Indian SCBs ever since the financial crisis and recessionary pressures affected worldwide. A period of credit boom followed by recessionary pressure resulted in deterioration of asset quality. This study signified the need to further accelerate reforms in the banking sector and initiate measures to further enhance NPA management. In this regard, the following points may be considered.

1) The NPA can be reduced to a greater extent by improving the quality of credit appraisal and follow up. Bankers should critically review the existing credit appraisal framework in line with international standards. Based on interaction with bankers from other economies and based on data analysis, it is very obvious that credit appraisal and evaluation techniques are more important to mitigate the risk of NPA. The secondary data analysis also revealed the deficiencies in the existing credit appraisal, as evidenced from the higher additions to NPA in the Indian banking sector during the study period. The system must enable the bankers to identify and classify projects and loan proposals into different categories based on risk involved. A proper follow up after lending is also required to check any change in the risk category initially fixed. This will enable timely decision making.
2) Despite implementing several prudential measures for NPA management, there has been increase in NPA especially during recessionary period. The economic variables are extraneous and banking sector cannot influence it to a great extent, rather get influenced by these forces, it is important to develop prudential measures to mitigate the risks of recessionary pressures. Loan losses differ significantly among bank groups. The observed results from the analysis indicated a fairly good position of PSBs before 2007, but the asset quality eroded significantly during financial crisis. The private sector banks on the other hand performed well during periods of recessionary pressure. An alarming indication observed from the analysis is higher growth in additions to NPA over gross advances since 2007. A close observation further revealed that some bank groups performed better during the recessionary period. It hence calls for giving more emphasis to proactive measures such as improving loan assessment, diversification of loan portfolio, improving follow up, revisiting the project after implementation and rating it according to risk category, etc. to improve credit risk management. This is well supported by the analysis which highlighted the significance of proactive measures to manage NPA of banks.

3) The analysis revealed a higher growth of NPA in priority sector. Bankers also considered priority sector lending as the major reason for NPA. Priority sector advances cannot be avoided since it involves a societal objective as well. Bankers should be given more autonomy while selecting projects for lending. All projects, whether it be a priority sector or non-priority sector, should be valued critically and decisions must be taken depending on the quality of the project and credit worthiness of the borrower.
Based on the study, it is obvious that NPA result mainly because of a willful default of the borrower and diversification of funds. This is further aggravated by the lack of follow up and supervision. This problem can be managed to a greater extent by employing more staff in loan department and providing more training and development facility to them. This will facilitate regular follow up and ensure that project is implemented according to the plan. It will enable the bankers to identify the potential NPAs and to take necessary measures to either revitalize project or to initiate recovery.

During the initial credit appraisal process, the banks should classify its customers into different risk categories depending on their quality of management, a SWOT analysis, etc. A regular review of the project should be carried out and any change in their performance from the targeted performance needs to notified. Such a review assists the bankers to determine whether the project moved into a higher risk category or not. This will enable bankers to take corrective measures if necessary, in order to avoid the chance of getting the asset into non performing in nature.

The research has identified that the distribution of NPA follows a 80-20 rule, wherein the 20% of the customers are responsible for 80% of the value of impaired assets and vice versa. The analysis also revealed an increased fresh NPA (additions to NPA) every year, that indicate the deficiencies in the credit appraisal process followed by banks. Hence, in order to manage NPA, it is important that loan proposals should not be influenced by the social and economic background of the promoter, but should be valued objectively based on the merit of the project involved.

The banks should ensure that there exists no delay in release of limits, no delay in the settlement of payments/subsidies by government bodies. In
many cases, the success of the project depends on the timeliness in which they receive grants/assistance from various government bodies.

8) An observation based on primary data showed credit dissemination among banks is a major tool to manage NPA. Often, borrowers engaged in willful default and misappropriation of funds utilize their accounts in multiple banks. When information on borrowers and their credit history is exchanged among banks, the chances of lending to defaulters may be reduced. The banks must share credit information of borrowers among themselves and make it mandatory for borrowers to furnish details of accounts with other banks. The RBI also should develop a repository of defaulters and shall disseminate the same to banks.

9) Both gross NPA ratio and net NPA ratio’s are mostly used to assess the efficiency of banks. Both these indicators present a fair view on the asset quality of banks. It may be remembered that the efficiency of NPA management can be (1) efficiency of credit risk management of the bank, and (2) efficiency of recovery measures initiated by the RBI. Considering this view, in addition to using gross NPA and net NPA, it is important to evaluate asset quality and efficiency of NPA management using (1) Total Addition to NPA every year (2) Net Additions to NPA (3) Reductions to NPA every year, and (4) Gross Non Performing Generation Rate. While Addition to NPA indicates the efficiency of credit risk management, Reduction to NPA may indicate the efficiency of recovery measures, which are mostly the measures applied by RBI. To analyze the overall efficiency, Net Addition to NPA and Gross Non Performing Generation Rate may be utilized.

10) Banks need to diversify its activities and takes measures to improve its non-interest income (fee income, commission income etc). At present, around 90% of total income of the bank is generated from interest
income. This poses a challenge for banks. When asset quality deteriorates or NPA increases, the interest income generation capacity of banks is affected considerably, hence pose a major threat to the liquidity of banks. The effect can be reduced if banks diversify their activities and generate more non-interest based income.

11) At present, many recovery measures that include SARFAESI Act are available for recovering NPA accounts. The legal impediments often delay the time taken for recovery which in turn affects the realizable value of NPAs. There should be efforts from the regulatory authorities to improve the recovery management process, so that the NPA accounts can be realized without much erosion in its value.

12) Banks need to focus on movements of macroeconomic variables and incorporate it prudently in various plans and decisions. Two major inferences may be drawn from the analysis. The economic variables particularly GDP, Gross Domestic Capital Formation, Net Factor Income from abroad etc. showed a significant relationship with NPA variables. Also, these variables were found to mediate the relationship between advances and NPA of SCBs. This inference shall be used by RBI while taking measures to mitigate the menace of NPA.

13) In order to mitigate the risks of NPA and to improve the operational efficiency, it is important that banks should be given more autonomy to incorporate more efficient and effective credit appraisal and evaluation system. Banks should be encouraged to integrate the best practices in banking and benchmark their practices with other banking institutions in India and abroad. Such benchmarking will enable the banks to understand their relative strengths and weaknesses, and enable them to implement measures to mitigate the weaknesses. While licensing new
banks, the RBI should strictly ensure their implementation of a sound credit risk management system.

7.4. Scope for further research

This research reviewed the existing research on NPA and developed an alternative method to evaluate the credit risk and asset quality of banks. The review of literature and feedback from experts enabled this research to develop the various dimensions of the NPA in Indian banking sector. This background provides a strong foundation for future research in this subject.

The research utilized many statistical techniques which were not dealt in detail in previous researches in order to examine the various objectives and to test various hypothesis and theories. These new tools can be utilized and may be further developed and hence might help new researches in their research. In this research, the statistical results obtained through secondary data analysis is validated using a case study. Further studies may be carried out on other bank groups as well.

The current research may be further enhanced by including other bank performance indicators and macroeconomic variables like the inflation, size of banking network, region wise comparisons, etc.

This research primarily focused on public sector banks (PSBs) even though for comparative purpose all bank groups are considered. There exists a significant difference in NPA trends among PSBs, private sector banks and foreign banks. Studies on NPA based on bank groups hence may be further explored by the new researchers. In a globalized banking environment, the results of the study may be further tested in an international context. Another area of potential research is on mediating and moderating role of various bank specific and economy specific variables.
7.5. Implication of this study to the theory and practice

Banks in India are saddled with alarming levels of NPA which eroded the profitability and productivity of banks. Since the post-liberalization period, RBI has initiated several measures to restrict NPA and improve profitability and productivity of the banking sector. Even though the Indian banking sector remained competitive and productive and to a greater extent resilient to the recessionary pressures in comparison to many Asian markets, the current NPA trends is not satisfactory for the well being of Indian SCBs.

This study has provided the dimensions of credit risk and its effect on asset quality that banks and regulatory authorities might utilize in their decision making. NPA is closely related to the level of advances and this relationship is mediated and moderated by many bank specific and economy specific indicators. NPA can be reduced to a great extent if banks plan and implement strategies looking into the mediating and moderating nature of bank performance variables and macroeconomic variables. The research has identified the variables, both micro and macro, that impact NPA of banks.

Banks may benefit from the results of this study to revisit their approach to managing NPA of banks. The evaluation of the results identified a better need for information gathering, information dissemination and better client relationship management as a key for appraising the loan portfolio and evaluating the status of projects from time to time. Potential unviable projects can be identified if bank groups share client details among themselves. To a great extent, the willful default and misappropriation of funds can be minimized if banks disseminate credit related information of clients among themselves. With new Basel regulations, higher NPA will obligate banks to keep more funds (CRAR) hence affect the income earning capacity.
Banks must realize the effect of recessionary pressures and should develop ad-hoc plans to mitigate its risk on quality of assets. A period of economic progress should not lead to relaxing standards and norms followed in credit appraisal and follow up. The results of the study shall be used by banks and regulatory authorities to appraise the existing tools to assess the quality of assets. Overall, this research might help banks to develop indicators that better appraise the quality of credit portfolio and monitor the effect of change in various bank specific and economy specific indicators.