

**“A STUDY ON NON PERFORMING ASSETS OF PUBLIC
SECTOR BANKS IN INDIA WITH SPECIAL REFERENCE TO
STATE BANK OF TRAVANCORE”**

*Thesis submitted to
Cochin University of Science and Technology
for the award of the Degree of
Doctor of Philosophy
under
the Faculty of Social Sciences*

by

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Under the guidance of

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**A Study on Non Performing Assets of Public Sector Banks in
India with Special Reference to State Bank of Travancore**

Ph.D. Thesis under the Faculty of Social Sciences

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Certificate

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Declaration

I, Siraj.K.K. hereby declare that the dissertation entitled “**A Study on Non Performing Assets of Public Sector Banks in India with Special Reference to State Bank of Travancore**” submitted to Cochin University of Science and Technology for the award of the Degree of Doctor of Philosophy is a record of bona fide research done by me under the guidance and supervision of Prof. (Dr). P. Sudarsanan Pillai, Chairman, Board of Studies in Commerce, in the School of Management Studies, Cochin University of Science and Technology and that it has not previously formed the basis for the award of any Degree, Diploma, Associateship, Fellowship, or any other similar title of recognition.

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Abstract

The reforms in Indian banking sector since 1991 is deliberated mostly in terms of the significant measures that were implemented in order to develop a more vibrant, healthy, stable and efficient banking sector in India. The effect of a highly regulated banking environment on asset quality, productivity and performance of banks necessitated the reform process and resulted the incorporation of prudential norms for income recognition, asset classification and provisioning and capital adequacy norms, in line with international best practices. The improvements in asset quality and a reduction in non-performing assets were the primary objective enunciated in the reform measures. In this context, the present research critically evaluates the trend in movement of non-performing assets of public sector banks in India during the period 2000-01 to 2011-12, thereby facilitates an evaluation of the effectiveness of NPA management in the post-millennium period. The non-performing assets is not a function of loan/advance alone, but is influenced by other bank performance indicators and also by the macroeconomic variables. In addition to explaining the trend in the movement of NPA, this research also explained the moderating and mediating role of various bank performance and macroeconomic indicators on incidence of NPA.

To achieve the stated objectives, both secondary and primary data are utilized. In order to corroborate the inferences generated from the secondary data analysis, primary data are obtained on the incidence, impact and management of NPA with special reference to State Bank of Travancore. To assess the relative efficiency of public sector banks in Indian banking sector in the management of NPA, a bank group-wise analysis is undertaken. Statistical packages like Microsoft Excel, SPSS and Amos were used to analyze the data and to generate inferences. The research utilized statistical techniques such as Exponential Growth rate (EG Value), Average Annual Growth rate (AAG Rate), correlation and regression, ANOVA, Welch Statistic, Levene Test,

Sobel test, Chi-square test, Z value, etc. Structural Equation Modeling is used to explain the causes of NPA.

The research findings highlighted the need for improvements in NPA management in Indian public sector banks. Though the PSBs were able to curtail their NPA during the first half of the study period, the trend has reversed in the second half especially since the global financial crisis during 2007. The analysis revealed significant linkages between NPA and selected bank performance indicators and macroeconomic indicators. In a highly competitive, diverse, sophisticated banking environment, NPA can be effectively managed through incorporating more proactive measures, notably an improvement in the credit evaluation, appraisal and monitoring system of banks.

Key Words: Non Performing Assets, Asset Quality, Credit risk management

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Abbreviations

AMC	Asset Management Company
ANOVA	Analysis of Variance
ARC	Asset Reconstruction Company
BIS	Bank for International Settlements
BPLR	Benchmark Prime Lending Rate
CRAR	Capital to Risk Weighted Assets Ratio
CRR	Cash Reserve Ratio
CDR	Corporate Debt Restructuring
DEA	Data Envelopment Analysis
DFT	Development Finance Institutions
DRT	Debt Recovery Tribunal
EG	Exponential Growth
GDP	Gross Domestic Product
GNPA	Gross Non Performing Assets
KYC	Know Your Customer
NNPA	Net Non-Performing Assets
NPA	Non-Performing Asset
NPAs	Non-Performing Assets
NPL	Non-Performing Loan
NPLs	Non Performing Loans
OTS	One Time Settlement
PSB	Public Sector Bank
PSBs	Public Sector Banks
RBI	Reserve Bank of India
RRB	Regional Rural Banks
SBI	State Bank of India
SBT	State Bank of Travancore
SCBs	Scheduled Commercial Banks
SLR	Statutory Liquidity Ratio
SARC	Stressed Assets Resolution Centre
SARFAESI	The Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002
SSI	Small Scale Industry
SSIs	Small Scale Industries
UCB	Urban Co-operative Bank
VIF	Variance Inflation Factor
SPC	Special Purpose Companies

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1.1. Background of the Study

The banking sector plays an important role in the economic growth of a country. Through its intermediary activities, the banking sector fosters the production, distribution, exchange and consumption processes in the economic system. It stimulates the flow of funds in the economy and fuels economic growth. The efficiency of banking system, thus determines the pace of development of the economy. Similar to any other business enterprise, the efficiency of a bank is evaluated based on profitability and quality of assets it possess. But unlike other commercial ventures, Indian banking has social commitments integrated into its operations. The banking system in India has had to serve the goals of economic policies enunciated in successive five year development plan, particularly concerning equitable income distribution, balanced regional economic growth and the reduction and elimination of private sector monopolies in trade and industry. In the post-independence period, the

banking sector has played a catalyst and commendable role in supporting the government to achieve its social and economic objectives through deposit mobilization, mass branch networking, priority sector lending, employment generation etc. Achieving such societal objectives resulted in imposing extensive regulations by the government which in turn hampered the productivity of Indian banking during the pre-liberalization era.

An evaluation of the Indian banking industry during the pre-liberalization era revealed the presence of several shortcomings which crept into the financial system over the years' notably reduced productivity, deteriorated asset quality and efficiency and increased cost structure due to technological backwardness. Among these deficiencies, policy makers identified the erosion of asset quality as the most significant obstacle for the development of a sound and efficient banking sector. In fact, the various practices that were followed during pre-liberalization period that includes asset classification using health code system, accrual basis used to book interest in bank accounts etc., concealed the gravity of asset quality issues of the banking sector. The asset quality is a prime concern and impacts various performance indicators, i.e., profitability, intermediation costs, liquidity, credibility, income generating capacity and overall functioning of banks. The reduction in asset quality results in accumulation of Non-Performing Assets (NPAs).

The intermediation process is the principal function of a commercial bank. Since it involves counterparty risk; risk is inherent in banking. A banker should expect that all loan portfolios' will not fetch returns/earnings in the normal course. The loans/advances is an important source of income for the banks. The strength and soundness of the banking system primarily depend on the quality and performance of the loan portfolio, i.e. the fulfillment of obligations by borrowers promptly.

Non-performing assets indicate an advance for which interest or repayment of principal or both remains overdue for a period of 90 days or more. An advance/loan is treated as non-performing when it fails to satisfy its repayment obligations. Thus, non-performing assets are loans in jeopardy of default. The level of NPAs is an indicator of the efficiency of banker's credit risk management and efficiency of resource allocation to productive sectors. The Basel Committee on Banking Supervision defines credit risk as "potential default of a borrower to meet the obligation in accordance with the agreed terms" (BIS, 2005). Higher non-performing assets resulted in many bank failures (Nayak *et al*, 2010). NPAs represent a real economic cost in modern days as they reflect the application of scarce capital and credit funds to unproductive use. It also affects the lending capacity since funds are blocked and repayment is disturbed and has also resulted in additional cost for intermediation and realizing the NPAs.

The banking sector reforms in India during the post-liberalization period mostly focused on improving the efficiency of the banking sector by incorporating prudential norms for income recognition, asset classification and provisioning and through integrating international standards. The alarming level of NPAs is recognized as one of the major explanations for implementing structural changes and reform measures in the banking sector during this period. Keeping in view the inefficiencies in the banking sector and the presence of non-performing assets, the Committee on Financial System (Narasimham Committee – I) was set up. Few observations of Narasimham Committee –I on the banking sector and its inefficiencies include;

- Gross profits before provisions were no more than 1.10% of working funds indicating low profitability of banks.
- Net profit of public sector banks (PSBs) as a percentage of total assets show as low as 0.17%.

- Average operating costs of banks as a percentage of assets was about 2.3% in India, while it was as low as 1.10% in China, 1.60% in Malaysia, 1.90% in Thailand, 1.00% Japan and 2.10% in European countries.
- The Cash Reserve Ratio (CRR) stood at its legal upper limit of 15% and SLR at 38.50%.
- The Credit to Deposit Ratio (CDR) shows 62.54% and Investment-Deposit Ratio of 38%.
- Huge amount of NPA without any clear cut regulation.
- 40% of bank credit channelize to priority sector at concessional rate.
- Restriction on entry and expansion of domestic, private and foreign banks.
- Non-interest income as percentage of total income shows 9.25%
- High intermediation cost as 2.61%
- The Capital adequacy ratio was 1.5% in India as compared to 4% in Korea and Pakistan, and 4% to 6% in Taiwan, Thailand and Singapore.

Banking reforms were initiated to upgrade the operating standards, health and financial soundness of banks to internationally accepted levels in an increasingly globalized market (Pathak, 2009). The reforms have been undertaken gradually with mutual consent and wider debate amongst the participants and in a sequential pattern that is reinforcing to the overall economy (Badola and Verma, 2006). These reform measures substantiate the views that highlight the key role in economic development that could be played by a banking system free from the types of controls on interest rates and quantities that were prevalent at the time (Barajas *et al*, 2012).

Two decades had completed since the banking sector initiated measures to uplift the banking sector in line with international standards and to improve productivity and efficiency of banks. Many researches on NPA illustrated the relationship between asset quality and financial distress and considered management of NPA as a major prerequisite to counter the recessionary pressures and foster economic development. Some of the major observations from previous researches include;

- The problem of the NPA is severe in countries where severe government intervention had led to the institutional decay of banks or prevented their sound development (Renaud, 1997)
- NPA management assumes priority over other aspects of bank functioning (Batra, 2003)
- The existing capital adequacy regulations tried to protect the interest of depositors (avoiding bankruptcy), but impacted availability of funds for productive purposes. (Murinde and Yaseen, 2004)
- Reduction in NPA ratios does not indicate a reduction of fresh NPA. For ex, Banks have aggressively provided for their bad debts from the treasury profits during 2003-04 in order to show a better NPA picture, resulting a decline in NPA by 24.7% as against a decline of 8% in 2002-03. (Pathak, 2009)
- The NPA is a significant threat to Indian Banking Sector (Estrella et al, 2000; Gopalakrishan, 2004; Ahmed et al, 2007; Heid and Kruger, 2011)
- The Slowdown in economic growth and rapid credit growth are independently associated with higher levels of NPA (Bock and Demyanets, 2012)

Upon analyzing the banking sector in India, it is evident that the NPAs still pose a significant threat to the banking sector. This research is an attempt to examine the non-performing assets of public sector banks (PSBs) in India and to evaluate the various facets of NPA and its management in Indian banking sector.

1.2. Statement of Problem

Indian Banking, whose environment till early 1990's was insulated from the global context and dominated by state controls of directed credit delivery, regulated interest rates and investment structure did not participate in the vibrant global banking revolution. The Indian banking sector is dominated by public sector banks (PSBs) that include SBI & associates and nationalized banks. The post-liberalization period saw an upsurge of many private sector banks and foreign banks. One of the major objectives of banking sector reforms was to encourage operational self-sufficiency, flexibility and competition in the system and to improve banking standards in India to the international best practices. Based on the recommendations of various committees' especially the Committee on Financial Sector Reforms under the chairmanship of Mr. M. Narasimham and according the Basel requirements, various measures were implemented to liberalize the banking sector and it include;

- Liberalizing rules for entry of more domestic and foreign banks.
- Infusion of government capital in PSB and permission to inject private equity
- Deregulation of interest rate except for specific classes
- Reduction of SLR and CRR requirements.
- Reduction in credit controls
- Incorporation of broader definition of priority sector lending.

- Implementation of prudential measures for income recognition, asset classification and provisioning requirements.
- Implementing Basel based capital adequacy requirements.
- Emphasis on performance, transparency and accountability.

RBI issued guidelines in 1993 based on the recommendations of the Narasimham Committee that mandated identification and reduction of NPA to be treated as 'National Priority'. The level of the NPA indicates the efficiency of banker's credit risk management and allocation of resource. The measures incorporate to manage NPA can be classified into precautionary measures and curative measures. Precautionary measures focus strengthening credit risk management system and continuous risk assessment systems of the bank. This will reduce the instances of fresh NPA that have been generated. The curative measures are reactionary in nature and focused on recovering from NPA accounts. It includes measures initiated by RBI such as setting up Asset Reconstruction Companies (ARCs), Debt Recovery Tribunals (DRTs), Securitization Act, Compromise Settlement Schemes, etc.

Despite the various prudential measures taken from the post - liberalization period, the non-performing assets still pose an important threat to the very existence of banking. From ₹636.09 billion in 2000-01, the total gross NPA (GNPA) has increased to ₹979.25 billion in 2010-11 and ₹1,423.26 billion in 2011-12. In percentage terms, Gross NPA increased to 45.3% in 2011-12, compared to 15.7% increase during the previous year. Similarly, from ₹314.63 billion in 2000-01, the total net NPA (NNPA) has increased to ₹418.15 billion in 2010-11 and ₹649.75 billion in 2011-12. In percentage terms, the net NPA increased to 55.6% in 2011-12, compared to 7.7% in the previous year. On the other hand, from ₹5,407 billion in 2000-01, the total loans and advances increased

to ₹42,975 billion in 2010-11 and ₹50,746 billion in 2011-12. In percentage terms, the total loans and advances increased to 18.1% during 2011-12. Along with increase of NPA, there exists an increase in the level of loan restructuring in standard advances during the study period. The observation made by Reserve Bank of India in its annual report 2011-12 state that “In the period immediately following the global financial crisis, when asset quality of banks in most advanced and emerging economies took a beating, the asset quality of Indian banks was largely maintained, partly on account of the policy of loan restructuring”. The restructured standard advances of public sector banks (PSBs) as a percentage of gross advances 5.07% in 2009-10, 4.2% in 2010-11 and 5.92% in 2011-12. The total NPA written off by banks in India during the last 13 years (2000 to 2013) is ₹100,000 crores. (Chakrabarthy, 2013). The financial analysts and rating agencies that include Moody’s maintained a negative outlook on Indian banking and mentioned that the asset quality of banks would continue to deteriorate especially for Indian Public Sector Banks (Moody’s, 2013). It reiterated the fact that even though the post-liberalization period witnessed significant reforms in the banking sector, the asset quality explained by the level of NPA still worries Indian banking sector, its stability and growth.

Examination of published works on NPA in scheduled commercial banks (SCBs) in India showed that; (1). Most of the studies focused on NPA ratio’s (gross NPA ratio and net NPA Ratio) to assess the asset quality and effectiveness of credit risk management. (2). Very few studies were conducted examining the relationship between NPA and bank performance and macroeconomic indicators. The mediation or moderation effect of these variables on asset quality is not studied in depth. (3). The fresh NPA generated during a particular year, gross NPA generation rate and net additions to NPA were not emphasized in assessing the asset quality, (4). Only a few studies were

conducted using banker's perception on incidence, impact and management of NPA, and (5). Many measures were initiated since 2000 to effectively manage the menace of NPA. Further, limited studies have been done on the effectiveness of various measures taken from the post-millennium period, including One Time Settlement/Compromise Scheme (2000), Debt Recovery Tribunals (originally established in 1993, significant amendment was carried out during 2003), Corporate Debt Restructuring (2001), SARFAESI (the act was passed during 2002) and Asset Reconstruction Company (ARC).

Thus, the review of literature available on NPA highlighted the necessity to study NPA since the post-millennium period with specific focus to examine (1) whether NPA is managed effectively in Indian banking sector particularly the public sector banks (PSBs) which holds significant share of deposits and advances of Indian banking sector, (2) the moderating and/or mediating effect of bank performance and macroeconomic indicators on NPA, and (3) the major causes of NPAs and the various measures to be taken to enhance the credit risk management system in Indian banking.

1.3. Research Questions

The various research questions addressed in this study include;

1. Whether the NPA of Public Sector Banks (PSBs) are efficiently managed?
2. Do the various bank groups show similar trend in the movement of NPA?
3. Do additions to NPA occur at a faster rate in post millennium period?
4. Do the selected micro and macro variables pose a mediating and moderating effect on asset quality of banks?

5. Are Public Sector Banks (PSBs) still vulnerable to financial crisis?
6. What are the various reasons and the significance of each in creating NPA?

1.4. Objectives of the Study

The specific objectives of the study are;

1. To analyze the trend of the NPA in Public Sector Banks in India 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 Public Sector Banks.
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.
5. To suggest measures for the efficient and effective management of NPA.

1.5. Hypotheses of the Study

The following hypotheses were set for this research.

- H1 There exist significant differences in the movement of NPA among different bank groups in India.
- H2 There exist significant differences in movement of NPA of State Bank of Travancore with different bank groups in India.
- H3 The Selected bank performance indicators moderate the relationship between advances and NPA of Public Sector Banks.
- H4 The Selected macroeconomic variables mediate the relationship between advances and NPA of Public Sector Banks.

- H5 NPA is a significant moderating variable in the relationship between interest income and net profit of Public Sector Banks.
- H6 Bank Specific reasons are most prominent reasons for the generation of NPA.

1.6. Scope of the Study

1. This research evaluates the trend in the movement of NPA of public sector banks (PSBs) in India during post-millennium period (from 2000-01 to 2011-12). The post-millennium period is considered since RBI implemented the second phase reforms during 1998-99. Also, the significant NPA management measures that include DRTs, SARFAESI Act, ARCs etc. were implemented during this period.
2. The study focuses on public sector banks (PSBs) even though for comparative purpose, all bank groups are considered. The variables selected that include NPA indicators, bank performance indicators and macroeconomic indicators are based on previous studies on NPA conducted in India and international context.
3. The bank groups in India include (a) Public sector banks, (b) Private sector banks and, (c) Foreign banks. Public sector banks are further classified into (a) SBI & Associates, and (b) Nationalized banks.
4. To evaluate the trend in the movement of NPA variables, the study period is divided into pre financial crisis period and post financial crisis period. The period from 2000-01 to 2006-07 is considered as pre financial crisis period, while the period from 2007-08 to 2011-12 is considered as post-financial crisis period. Such a classification is undertaken based on expert feedback on the financial crisis that erupted globally during 2007.

5. In order to substantiate secondary data analysis and to analyze the various facets of non-performing assets, primary data were collected from officers working with State Bank of Travancore. The bank is selected since it is a major associate of the State Bank of India. The public sector banks, which comprise of the State Bank of India and nationalized banks, hold more than 75% of total advances and loans of all scheduled commercial banks in India.

1.7. State Bank of Travancore: A Profile

State Bank of Travancore (SBT) was originally established as Travancore Bank Limited in 1945 under the patronage of His Highness Sri Chithira Thirunal Bala Rama Varma, the Maharaja of Travancore. The bank was made as an associate of the State Bank of India by a special statute of Indian Parliament (SBI Subsidiary Act, 1959). The bank is a nationalized bank with primary operations in Kerala state.

The Travancore Bank Limited became a scheduled bank in 1946 and obtained a license to deal in foreign exchange business in 1947. The paid up capital of the bank was ₹1 crore, of which 30% was contributed by the Government of Travancore, the balance being subscribed by over 4,000 shareholders. In 1959, the Travancore bank entered into a tripartite agreement with Indo Mercantile Bank Ltd, and the Government of Kerala whereby the bank took over a portion of assets and liabilities of the Indo Mercantile Bank Ltd. After State Bank of Travancore came into existence in 1960, the bank also took over Travancore Forward Bank Ltd (14.5.1961), Kottayam Orient Bank Ltd (17.6.1961), The Bank of New India Ltd (17.6.1961), The Vasudeva Vilasom Bank Ltd (1.2.1963), The Cochin Nayar Bank Ltd (8..1964), The Latin Christian Bank Ltd (17.8.1964), The Champakulam Catholic Bank Ltd (1.10.1964), The Bank of Alwaye Ltd (1.2.1965), and The Chaldian Syrian

Bank Ltd (1.10.1965). With the merger of these banks, the State Bank of Travancore has become the premier banking institution in the State of Kerala having the widest and largest network in the state.

The bank is headquartered at Thiruvananthapuram (Kerala) and has 1013 branches spanning 14 states and 2 union territories as on March 31, 2013. The bank has 758 branches in Kerala which is 75% of the bank's total network. During the financial year 2012-13, the bank has achieved three milestones.

1. SBT has surpassed the total business of ₹150,000 crore.
2. SBT has opened its 1000th office during the year.
3. SBT has opened its 1000th branch during the year.

The bank has received national award for excellence in MSME lending and national award for excellence in lending to micro enterprises for the year 2011-12.

1.7.1. Major Highlights

- More than 65 years of dedicated service.
- Premier bank in Kerala.
- Member of largest ATM network in the country with more than 24,000 ATMs.
- Using world class technology through the implementation of 100% core banking solution.
- Preferred bank for NRI, evident from the higher NRI deposits in the state of Kerala.

- Spearheaded financial inclusion initiative in Kerala. 100% financial inclusion was achieved in Kerala in 2007.
- The Bank also provides other financial products like Life Insurance [in tie-up with SBI Life], Mutual Fund Investments in tie-up with five Mutual Funds and General and Accident Insurance in tie-up with United India Insurance Co Ltd.

1.8. Research Methodology

In order to realize the stated objectives, the researcher utilized a combined approach that embraces features of both descriptive and analytical research designs. Though several research studies on NPA in Indian banking sector are available, the studies on a closer look validated NPA problem using secondary data and most often depended ratio analysis to identify whether NPA is managed efficiently. A closer look into the studies highlighted insufficient analytical studies on the interaction between different bank specific performance indicators and macroeconomic indicators on incidence of NPA of banks. The methodology for this research is designed considering the above aspects; to evaluate asset quality of public sector banks explained using the trend in movement non-performing assets.

1.8.1. Descriptive Research

This research by and large is descriptive in nature. A descriptive study used to “make descriptions of the phenomena or the characteristics associated with a subject population: who, what, when, where and how of a topic” (Cooper and Schindler, 2003). The methods typically used in a descriptive study could be surveys, panels, observations or secondary data analyzed in a quantitative manner (Malhotra, 2004). This research used both primary and secondary sources in order to explain the non-performing assets of public

sector banks in India. Statistics on NPA and various NPA indicators during post-millennium period (from 2000-01 to 2011-12) along with selected bank performance indicators and macroeconomic variables were utilized in order to study the trends in movement of NPA, its relationship with selected variables, and efficiency of management of NPA during post-millennium period. A preliminary study focused on two groups - (a) academicians and researchers in banking, (b) experts working in banks' loan/advances section – provided input, which is used to refine the research problem and develop the questionnaire.

1.8.2. The Analytical Phase

The analytical part of this research employed facts or information already available, and analyzed them to make a critical evaluation of the subject. Basically, the analytical part utilized the statistical inputs and verified the research hypotheses put forward in the study. In addition to this, the results of secondary data analysis are verified to provide an insight into 'why' such trends are observed.

1.8.3. Data Sources

In order to achieve the stated objectives, this research utilized both primary data and secondary data.

1.8.3.1. Secondary Data

The primary emphasis of this research is focused on analyzing non-performing assets of public sector banks in India during the period 2000-01 to 2011-12. In specific terms, it includes (a) analyzing the trend in the movement of NPA variances during the study period, (b) the moderating role of bank performance variables on the relationship between advances and NPA, (c) the moderating role of NPA on the relationship between income and profitability of banks, and (d) the mediating role of macroeconomic indicators on the

relationship between advances and NPA of banks. To achieve the stated objectives, data are collected from various sources and include;

1. Research reports, published articles, news reports and conference proceedings available in both national and international level related to NPA. The information obtained from these sources are used for critical evaluation of the subject and identify research gap in the area of study. These secondary sources are part of different chapters in this report.
2. Statistical Data on NPA, bank-specific and economic indicators during 2000-01 to 2011-12, collected mainly from RBI website, Indian Banks Association, IndiaStat and Ministry of National Economy. In addition to the above, information is obtained from individual bank web sites.
3. Unpublished reports on the above topic.

1.8.3.2. Primary Data Source

In order to explain the incidence of NPA and to substantiate the observations from secondary data analysis, the primary data are collected using a structured questionnaire from bankers working with State Bank of Travancore.

1.8.3.3. Research Instrument

A pre-tested questionnaire is used to collect primary data. The questionnaire was divided into four sections. The first section includes questions on demographic characteristics of the sample taken for the study. The second part includes questions relating to various causes of the NPA, the third part includes questions related to the impact and the fourth part includes questions relating to the management of NPA.

The drafted questionnaire based on literature review and after consultation with experts was refined based on a pilot study. A sample of 10 managers was approached and their feedback was obtained. Based on the feedback, some questions were removed and measurement scale was revised for some questions. Also, the pattern of questions and its grouping is revised based on the feedback obtained. The reliability of the questionnaire is assessed using Cronbach alpha. To measure the reliability, the data collected were entered and analyzed in SPSS 17, and its reliability is measured.

1.8.3.4. Sampling Frame

The sample size of the study includes 160 officers working with State Bank of Travancore. The respondents with experience in credit division is considered for the purpose of data collection.

Multi-stage sampling was used to select respondents for the study. Multi-stage sampling combines different sampling methods (Sharma and Guptha, 2009). In the first stage, the total bank was divided into Head Office, Zonal Offices, Stressed Assets Resolution Centre and Bank Branches. The primary data are collected from Head Office and Stressed Assets Resolution Centre in Thiruvananthapuram. Among the zonal offices, Ernakulum zonal office is selected, while the branches from Ernakulum, Thrissur and Kozhikode district were selected. The judgment sampling method is adopted to select officers for the study. While selecting sample, the employees working in the bank are classified into Senior Management, Middle Level Management and Junior Management.

Considerations employed to develop the sample size include;

- Budgetary Constraints.

- Time Limitations
- Review of similar studies and information gathered on sample size used in these studies.

1.8.4. Tools of Analysis

In order to achieve the various objectives mentioned, the data collected were entered, arranged and presented using Microsoft Excel and SPSS 17. The secondary data collected for the study is summarized and initial analysis is done using average and percentage, wherever required. Charts were used to simplify the data for analytical purpose. To achieve the first objective of the study, i.e., to estimate the trend in the movement of NPA in Public Sector Banks vis-a-vis State Bank of Travancore, the statistical measures utilized includes Averages, Ratio, Exponential Growth Rate (EG Rate); Correlation, Regression, ANOVA, Levene and Welch Statistics, F-test, t-test and Sobel test are used as other analytical tools.

The questionnaire included three types of questions, (1) questions with five point scale (2) multiple choice questions (other than five point scale), and (3) open ended questions. In addition, there are questions on ranking factors, according to its importance. Demographic variables such as level of management and level of experience are subject to descriptive analysis using average and percentage. Questions based on the ranking are analyzed using a weighted average. The other questions were analyzed using percentage; Mean Percentage Value, Z- value, etc. Hypothesis testing is also used in the study. In order to test the association among the selected variables and significance of difference between different levels of management, Chi-Square test is applied. To verify whether the results obtained through sample holds in population,

Z-value is obtained. In order to verify the model used in the study, Structural Equation Modeling (SEM) is used.

1.9. Analysis Plan

The analysis is divided into three parts as follows;

1. Trends in movement of NPA of public sector banks in India
2. The mediating and moderating role of bank performance indicators and economic variables on NPA.
3. Perceptions of bankers on causes, impact and management of NPA.

The first part 'trends in the movement of NPA of public sector banks in India vis-a-vis State Bank of Travancore' is further divided into the following;

- a) Trend in movement of NPA indicators, such as Gross NPA, Net NPA, Additions to NPA, Reductions to NPA, and Provisions towards NPA.
- b) Composition of NPA. The classification is based on priority sector advances and non-priority sector advances.

The second part is further divided into the following.

- a) The moderating relationship of bank performance indicators on the relationship between advances and NPA of banks.
- b) The moderating relationship of NPA variables on the relationship between interest income, expense and profitability of banks.
- c) The mediating relationship of macroeconomic indicators on the relationship between advances and NPA of banks.

1.10. Chapter Scheme

Chapter One: Introduction – This chapter comprises of the broader perspectives of the research and includes a statement of the problem, rationale of research, the specific objectives of the research, various hypotheses used in the research, research methodology and various limitations of the research.

Chapter Two: Review of Literature - This chapter reviews the existing literature on non-performing assets. The literatures were classified into (1) Studies on NPA in Indian context, and (2) Studies on NPA in International context.

Chapter Three: Indian Banking Sector: An Overview – This chapter is about Indian Banking Sector, its background and development phases. The major changes in Indian banking sector since the post - liberalization period is explained. As well, the development of Indian banking sector during the study period in terms of number of branches, offices, deposits and advances are explained. An overview of State Bank of Travancore, the selected bank for collecting primary data is also provided.

Chapter Four: Non Performing Assets: A Theoretical Approach – The focus of this chapter is on the conceptual core, the non-performing Assets. The term NPA is defined along with detailed evaluation of various reasons for NPA, its impact on different stakeholders and its management in the post - liberalization period.

Chapter Five: NPA in Indian Banking Sector – This chapter deals with analysis of statistical data on NPA during 2000-01 to 2011-12. The trend of NPA in public sector banks in India (Objective No.1) during the study period is explained. Also, the chapter explains the moderating and mediating role of bank performance indicators and macroeconomic indicators on NPA of public sector banks.

Chapter Six: Incidence of NPA: Causes, Impact and Management –This chapter essentially validates the findings of secondary data analysis based on primary data collected from bankers with special reference to State Bank of Travancore.

Chapter Seven: Findings, Recommendations and Conclusion: The chapter presents the summary of the thesis. The chapter briefs the various findings and put forward significant recommendations to mitigate the effects of NPA. In addition, the chapters narrate the major contributions of this research and possible directions for future research is also included.

1.11. Limitations of the Study

Even though, utmost care is exercised in all aspects of this research, certain limitations have been perceived and are acknowledged herewith.

- The results of the study cannot be generalized to other bank groups except public sector banks as the data are obtained with special focus on public sector banks.

- The research utilized feedback from officers working in State Bank of Travancore, a premier scheduled commercial bank based in Kerala. The incidence of the NPA is explained with special reference to the selected bank.
- The study is conducted for the period 2000-01 to 2011-12. Influence of regulatory measures taken after the study period might influence the findings of the study.
- Respondent bias would have to some extent affected the quality of data in spite of all precautionary measures taken to ensure its reliability.

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2.1. Introduction

This chapter encapsulates the major conclusions and propositions of previous research studies on NPA. The review of literature is utmost important in any research as it offers an explanation for the necessity of the current research initiatives. The asset quality and non-performing assets (NPAs) is debated in many academic literatures across the world. In Indian context, the literature focused mainly on a review of NPA among different bank groups and its management since the post-liberalization period. The review of the literature offered an in-depth view on the treatment of NPA in Indian banking sector over the years. The comparative studies available on NPA helped the researcher to evaluate the incidence of NPA and its management in different economies.

The review is presented in two parts;

2.2. Studies on NPA in Indian context

2.3. Studies on NPA in international context.

The non-performing assets (NPAs) engrossed the attention of researchers in the late 1980's when the necessity to transform the banking sector was felt in Indian economy. The studies in this period highlighted the shortcomings in

the functioning of the banking sector and stressed the need to incorporate prudential norms for income recognition, asset classification and provisioning. Such analysis and inferences to a great extent helped the researcher in identifying the stages of development in NPA management.

2.2. Studies on NPA in Indian Context

The observations of Gopalakrishnan, T.V. (2004), explained in the research study “Management of Non-Performing Advances” portrayed the severity of NPA on bank’s survival and growth. Assessing the performance of Indian banking, especially the public sector banks (PSBs) during 1993-2001, the author confirmed a significant relationship between NPA and macroeconomic indicators like GDP, Inflation, Index of industrial and Agricultural Production, etc. Based on primary data, the author stressed the need to further enhance existing measures to manage NPA. The findings of the study reiterated that NPA pose significant blow on the balance sheets and profitability of banks and high level of NPAs in bank books is a great risk to bank’s health, stability, viability and soundness.

The above observations were further reiterated by Reddy, B.R. (2004) who compiled 38 research papers presented in National Conference on NPA in Tirupathi during 2000. Using both secondary and primary data, these research articles highlighted the developments in the management of NPA. In summary, these studies identified NPA as a severe threat for the existence and stability of Indian banking and demanded more proactive and curative measures to manage it.

In a similar research on NPA in Indian commercial banks, Jain Vibha (2007) explained that in the early stages, the NPA was mainly contributed by directed lending and significant government intervention. The analytical part evaluated the trend in the movement of NPA during 1997-2003 and concluded

that the root cause of NPA is the inadequate credit risk management system. The author reiterated that the profitability of banks is invariably related to its alertness, operational efficiency, customer orientation, creation of large volumes of performing assets and attainment of optimum level of productivity.

In a descriptive research, Pathak (2009) elucidated the role of asset quality in financial health of banks. Using statistical data, the study explained that NPA is a serious threat to the Indian economy, estimated around 9.8% of GDP at constant prices in 2005. The study detailed the list of banks whose NPA is more than their net worth which posed a significant question on the efficiency of credit risk management.

Apart from explaining a conceptual framework of the NPA, Faizanuddin, Md and Mishra R.K. (2011) examined the dimensional approach of NPA in the banking system in India with special focus on State Bank of India, Patna Circle, Bihar. Findings and inferences based on analysis recommended major changes in the recovery policy, project financing norms, legal aspects and supervision of NPA accounts.

Ghosh., *et al* (1998) examined the narrow banking in India and asserted that an increased presence of NPA forced banks to select tactics to reduce risk by investing in safe and liquid assets. A major contribution of this study is their finding that even without a directive, narrow banking on the asset side is being practiced as part of the asset-liability management of these banks. It is observed based on the analysis that the narrow banking may expose weak banks to immense market and interest rate risks and thus make it vulnerable to idiosyncratic and systemic risks arising from macroeconomic shocks.

In a comparative study on NPA of Indian Banks with international markets, Deolalkar, G.H. (1998) stated that the increased focus on NPA

particularly after 1991 influenced the risk-taking behavior of banks. The problem of the NPA is handled differently by different countries depending on the politico-economic system under which the banks operate. The author further stated that banks in India holds higher levels of NPA than international markets. The analysis supported the need for an effective asset reconstruction company (AMC) to manage the NPA accounts. The author recommended more autonomy for banks to improve its operational efficiency and to reduce the increased trend of NPA.

In an attempt to examine the presence of high average NPA shares in total bank advances and the higher level of dispersion among banks, Rajaraman., *et al* (1999) undertook specification tests for the impact of region of operation on domestically-owned banks during 1996-97. The authors based on analysis confirmed that operational environment is an important determinant of bank efficiency. The authors further commented that no sustainable improvement in the performing efficiency of domestic banks is possible without prior improvement in the enforcement environment in difficult regions of the country.

In a descriptive and comparative study Reddy, PK. (2002) assessed NPA management measures in selected Asian countries. The study identified legal impediments, postponement of the problem by the banks to show higher returns and manipulation by the debtors using political influence as major reasons for the high NPA level in Indian banks. All the Asian countries had a weak legal mechanism for asset disposal that prevented early resolution of the problem. The author explained the need to understand the macroeconomic variables and systemic issues pertaining to banks and the economy for solving the NPA problem along with the criticality of a strong legal framework and legislative framework.

In order to examine the presence of variations of NPA within PSBs that are homogenous on ownership dimension, Rajaraman, I. and Vasishtha, G. (2002) applied a panel regression model on the data available on NPA of PSBs for a five year period ending 1999-2000. Twenty seven PSBs were taken for the study. The analysis grouped banks with higher than average NPAs into those explained by poor operating efficiency, and those where the operating indicator does not suffice to explain the high level of NPAs, and leaves an unexplained intercept shift. The results of the study explained that two of the three weak banks identified by the Varma Committee, Indian Bank and United Bank of India, fall in this category. The authors concluded that the recapitalization of banks with operational restructuring is not recommended as a mean to manage NPA in cases where there exists a residual problem even after controlling for operating efficiency.

In a similar research article, Dong, H. (2002) explained that the credit quality is low in PSBs and development finance institutions (DFIs). The study is comparative in nature and drawn conclusions based on the analysis of regional and cross country experiences in dealing with impaired assets during the periods of financial crisis. The study recommended the integration of ARCs as a major tool to manage NPA. The author suggested more operational independence for ARC, changes in the foreclosure laws to speed up the repossession of assets and removal of legislation that tends to protect the defaulting companies, for managing NPA in Indian banking.

In another major research article focused on comparing NPA in Asian markets, Batra, S. (2003) made a significant observation on higher levels of the NPA in Indian banking. The author expressed the view that the most important business implication of the NPAs is that it leads to the credit risk management assuming priority over other aspects of bank's functioning. The

bank's whole machinery is pre-occupied with recovery procedures rather than concentrating on expanding the business. The author asserted that NPA in banks cannot be eliminated, but can only be contained; it has to be done not at a heavy cost of provisioning and increasing the portfolio of credit. Based on the data analysis, the author recommended that along with the recovery of NPA accounts, fresh inflow of NPA should be brought down at a level much less than the quantum of its exit.

In a study on NPA and terms of credit of PSBs in India, Ranjan and Dhal (2003) evaluated the effect of terms of credit, bank size induced risk preferences and macroeconomic shocks on NPA of banks. The study based on panel regression models identified that the terms of credit variables exercise a significant effect on the banks NPA in the presence of bank size and induced preferences and macroeconomic shocks. With regard to the terms of credit variables, changes in the cost of credit in terms of expectation of higher interest rate induce a rise in NPAs. The study further identified that variables like the horizon of maturity of credit, better credit culture, favorable macroeconomic and business conditions can lead to lowering NPAs.

In another descriptive study on management of the NPA in institutional agencies, Mohan, B. and Rajesh, K. (2004) pointed out the significant role played by the prudential norms in the management of NPA of commercial banks. The authors recommended for strengthening the Debt Recovery Tribunals (DRTs) to deal with defaulters diligently. The emphasis of this study was mainly on strengthening regulatory measures to manage NPA in Indian banking sector.

In an analytical research article, Das, A., *et al* (2004) examined the efficiency of Indian Banking in the post liberalization era, during 1997-2003,

using Data Envelopment Analysis (DEA). They underlined that Indian banks in the post liberalization period are not much differentiated in terms of input or output oriented technical efficiency and cost efficiency. Based on statistical analysis, the authors commented that bank size, ownership, and the fact of its being listed on the stock exchange are some factors that have a positive impact on the average profit efficiency and to some extent revenue efficiency scores of banks. The study also recognized that the median efficiency scores of Indian banks in general and of the biggest banks in particular have improved considerably during the post-reform period.

In another descriptive and comparative study titled “Changing Dynamics in Asian Non-Performing Loan”, Vassiliou, L. (2004) evaluated various NPL resolution techniques in Asian countries. The study confirmed that most countries applied techniques like forming AMC, Corporate Debt Restructuring (CDR) Committee and Securitization to manage the increased level of NPAs. The study highlighted the significant role played by ARC, SARFAESI Act and National Company Law Tribunal in the management NPA.

Naidu, B.R. and Naidu, A.P.S. (2004) assessed the impact of NPA on the profitability of PSBs. The authors identified the diversion of funds as the number one reason for the NPA in the banking sector. The study highlighted that NPA in PSBs is significant, at about 16% of credit portfolio and is reported in excess of international standards. The study recommended amendments of laws relating to recovery of loans and implementation of new strategies to deal with NPA.

In a similar study on management of the NPA in commercial banks, Rao, B. (2004) emphasized the need for more proactive measures to manage NPA of banks. The study used the financial results relating to NPA from 1998-99 to

2001-02. The study recognized that the alarming level of NPA deteriorated the bank's profitability and the initiatives taken by RBI such as DRTs, ARCs, CDR and ARF influenced the level of NPA to some extent. Even though the curative measures could able to manage the NPA to some extent, the study holds that the key to successful NPA management is the presence of a sound credit appraisal system to ensure the quality of the loan portfolio.

Khasnobis, S. (2005) in the research article "NPA- An emerging challenge in India" explained that the distribution of the NPA in the Indian banking system followed a 80-20 rule, wherein 20% of borrowers are responsible for 80% of value of impaired assets and vice versa. The study found that the large impaired assets which comprise industrial assets possess good restructuring potential. The small assets, however, have to be put through a recovery process, where the collateral- based financing practice followed by the banking system offers a fair recovery potential. The author recommended speeding up of the recovery process for successful NPA management.

In a theoretical and descriptive research article, Chaudhuri, T. (2005) explained the resolution strategies for maximizing value of NPA in India. Based on literature review, the study concluded that if a resolution strategy for recovery of dues from NPAs is not put in place quickly and efficiently, the impaired assets would deteriorate in value over time and little value would be realized at the end. The study recommended a State - Resolution - Mapping (SRM) framework to maximize recovery of NPA accounts. The literature, however, has not specifically discussed about the various resolution strategies that could be put in place for recovery from NPAs, and in particular, in which situation which strategy should be adopted.

Kakker, R. (2005) studied “Role of Asset Reconstruction Company in NPA Management”. The author stressed the need for management of the NPA by stating that a high level of NPAs severely affects the economy in many ways. The study was concluded by stating that ARC’s with statutory/regulatory powers are likely to emerge as nodal resolution agencies coexisting with CDR mechanisms for management of NPA.

In a study of the determinants of the NPA in Indian PSBs, Biswas and Deb (2005) examined the random and non-random reasons for NPA in PSBs during 1995-2004. The authors underlined the shortfalls of existing system and the existence of a high degree of arbitrariness in defining NPA. A notable contribution of this research study is its conceptualization of random reasons for default in a simplified framework of a Poisson process. The study pointed out that while one set of policies granting greater autonomy to the PSB are proved quite effective in restricting formation fresh NPA, the other set of policies designed to recover loans, after default, has failed to deliver the goods. Finally, the authors concluded that the incidence of the NPA is as much due to the malfunctioning of the banking institutions as due to the external institutional environment.

Basu, P. (2005) in an exploratory study examined India’s banking system with specific focus on a question “How distress is India’s Banking System? Based on the review of major performance indicators during 2000-01 to 2003-04, the author observed that the banking system distress in India is considerable, both in absolute terms and when compared with the distress faced by many of the East African countries on the eve of their crisis. The study reiterated the significant linkage between asset quality and level of NPAs to financial vulnerability in the banking sector. The study recommended various banking reforms, integration of best practices from abroad and the development of capital market to counteract the threat of financial distress.

In a descriptive study, Choksi (2006) viewed that the prudential norms are formulated on the basis of objective criterion rather than on any subjective criterion, to provide a more transparent and vibrant banking sector in the post liberalization era. The study was mainly focused on the various guidelines of RBI on asset classification, prudential norms on income recognition and provision of advances.

In an analytical study on NPA, Shiralashetu and Akash (2006) examined the bank-wise and sector-wise NPA during 2003-04. The authors reported that the priority sector, in particular the SSI sector contributed NPA significantly during the study period. The study underlined that PSBs accounts for 91.07% and private sector banks account for 8.93% of the total NPA of priority sector. Based on the study, the authors recommended improvements in recovery management and credit management to deal with NPAs in the banking sector.

In a descriptive study on reforms and reorganization of banking in India Chakrabarti, R. (2006) discussed the major contemporary issues affecting the banking sector in India. In particular, the study stressed on the nature and effects of interest rate deregulation, public sector bank performance, the nature and management of NPAs, and the new competitive market structure of commercial banking. The author briefed that Indian banking sector is suffering from considerable NPAs in their asset portfolio. The study recommended more transparency in PSBs decisions and subjecting these banks to competitive pressures to accomplish the improvements in their performance rather than selling them lock, stock and barrel to private parties.

In a similar study on management of NPA, Noronha (2006) also stressed the need for managing NPA for a robust banking system. Using statistical information available on NPA and classification of loan assets, the impact of

various measures such as One-time settlement scheme, SARFAESI Act, Lok Adalats, Debt Recovery Tribunals, etc were analyzed. The study asserted that NPA is unavoidable in the banking sector and proper management would lead to curbing them and in turn lead to a healthy growth of the financial sector.

In a descriptive study on NPA in PSB, Reddy. B.K., *et al* (2006) analyzed trends in NPAs of PSB, its sectoral composition, asset quality diagnosis and the scenario of NPAs at the bank level. The analysis highlighted the gross and net NPA has reduced from 23.2% and 14.5% in 1993-94 to 7.8% and 3.0% respectively during 2003-04. Based on analysis, the study concluded that the quality of the portfolio of the PSB has improved quite impressively due to the effectiveness of various measures initiated by the RBI and Government of India. A major limitation of the study is that is relied heavily on NPA ratios to generate inferences.

In a descriptive study on the effect of the NPA in cooperative banks, Michael., *et al* (2006) has explained the importance of central co-operative banks in rural development and financial inclusion. The study addressed the threat posed by alarming level of NPA for cooperative banks. The study focused on a theoretical assessment of the effect of NPA on the operational efficiency of Central Co-operative Banks in India. The study suggested the need for effective recovery strategy and prompt, preventive and curative measures to curb the menace of NPA.

John, K. and Philip Thomas (2006) examined the NPA in Indian Banking Sector with a focus on recovery through Debt Recovery Tribunals. The authors commented that the prudential norms introduced into the banking sector helped in reducing the volume of the NPA in the balance sheets of the banks. The study used the all India figures relating to DRT cases during 1996

to 2005. The analysis revealed a meager recovery through the speedy process of DRT. The authors concluded that the bulk of the NPA in the banking sector remains as an economic cost to the nation. The study is useful as it explains inadequacy of an existing recovery mechanism and the need for streamlining it for better management of NPA.

In an exploratory research on NPA, Chipalkatti and Rishi (2007) examined the behavior of Indian banks in the context of tighter regulatory standards that became effective after 1999. Based on the analysis, the authors observed that "weak" Indian banks - defined by low profitability and low capital ratios camouflaged the magnitude of their gross NPAs in the post-1999 period. The study revealed a disturbing fact; that the true nature of India's bad loan problem is more serious than explained the prior research studies.

In a comparative study on the NPA in Indian Public, Private and Foreign Sector Banks, Vallabh., *et al* (2007) examined the fundamental factors which impact NPA of banks using an extended Altman model. The model consisted macroeconomic factors and bank-specific parameters. The macroeconomic factors of the model are GDP growth rate and excise duty, and the bank-specific parameters are Credit Deposit Ratio (CDR), loan exposure to priority sectors, Capital Adequacy Ratio (CAR), and liquidity risk. The authors, based on analysis, commented that the NPA movement can be explained well by the factors considered in the model for the public and private sector banks. The other notable observation is that the banks' exposure to priority sector lending reduces the NPA. Even though some of the observations of this study are refutable, the study provided an insight on a few analytical tools that can be widely used in analyzing the asset quality of banks.

In an analytical study on NPA with special reference to State Bank of Hyderabad, Rajendar, K. and Suresh, S. (2007) evaluated the effectiveness of the reform process on the basis of the recommendations of the Narasimham Committee, using statistical data on banks for the period 2000-01 to 2005-06. Inference based on ratio analysis showed a reduction in NPA during the period. The authors pointed out that the better management of the NPA is the result of good recovery and sufficient provisioning for doubtful debts and write-off bad debts.

In a similar study on the impact of NPA on the performance of commercial banks, Aravanam and Vijayakumar (2007) deliberated on the impact of NPA on the performance of banks using statistical data for the period 2000-01 to 2005-06. The authors observed that the level of the NPA is a critical indicator for assessing banks' credit risk, asset quality and efficiency in allocation of resources to productive sectors. Based on the analysis, the study recommended improvements in credit appraisal systems of banks.

Rajendran, K. and Karthikeyan, K. (2007) in their article on NPA explained that the high level of NPA not only affects the overall quality of the loan portfolio but also puts a burden on the income statement of banks in the form of higher provisions. The study reviewed recovery of NPA through various mechanisms like OTS, DRTs, ARCs, SARFAESI Act, etc during 2003-04 to 2005-06. Inference based on analysis revealed a considerable improvement in the management of NPA through the various mechanisms mentioned above. The study suggested the need to consider 'reduction of NPA' in the banking sector as a national priority item.

In a descriptive study on NPA in India and China from a public policy perspective Istrate., *et al* (2007) evaluated three major aspects of the NPA: the

degree of the NPA problem, its causes and the solutions adopted to address the issue. The research provided an insight by classifying the causes for NPA into systematic and situational causes. A notable contribution of this research is about recognizing a proper classification of NPA and its contribution by providing a mix of short-term and long-term remedial measures in dealing with NPA.

Chipalkatti and Rishi (2007) in their research article on “Do Indian Banks understate their bad loans” examined the bank’s behavior in India during the period 1996-2002. Using econometric techniques on 78 banks, the study tested the hypothesis that weaker banks – defined as those with low capital adequacy ratios and low profitability – understate their loan loss provisions and their gross NPA when compared to the earlier period due to the tightening of CAR guidelines and provision norms. Inference based on analysis revealed that the weak banks camouflaged the magnitude of their gross NPA in the post 1999 period. The authors cautioned that the true nature of India’s bad loan problem is more serious than alluded to in various studies.

Ramu, N. (2008) examined the management of the NPA in Urban Cooperative Banks (UCBs) with special reference to 5 UCBs in Tamil Nadu. The author stated that even though the banks played an important role in credit deployment its NPA stood alarming as seen from their gross NPA and net NPA ratios at 23.4% and 12.5% respectively in 2005. Based on the analysis, the authors recommended improvements in the credit management through removing existing deficiencies in the credit appraisal, monitoring and improving the overall lending policies.

In a similar study on NPA in commercial banks with special reference to small scale sector, Rajeev (2008) used various econometric models and

analyzed the level of NPA and its relationship with key performance indicators in Indian banking. Inference based on analysis revealed that rural branches contribute more NPA in SSI sector. Also, the analysis revealed that PSBs have improved their efficiency during 1997-2005 compared to private and foreign banks. Regarding the generation of the NPA, the study pointed out that inadequate funds and higher amounts of accumulated NPAs resulted in the creation of the more NPA in SSI.

Karunakar., *et al* (2008) in a descriptive study on NPA in Indian context observed that the level of NPA depends on how various risks are managed in the business. The study is explanatory in nature and briefed the NPA trends of PSBs from 1992-93 to 2005-06. Based on the study, the authors concluded that the lasting solution to the problem can be achieved only with proper credit assessment and risk management mechanism.

In an analytical study on NPA of banks in India and China, Shanker, D., *et al* (2009) compared the operative performances of the banking institutions, considering the institutional differences in the banking sectors of these two economies. The study utilized non-parametric technique, to assess the efficiency of the banks between 2002 and 2005. Inference based on analysis showed a decline in efficiency of restructured Chinese banks. The findings revealed that two Indian banks, SBI and ICICI, have consistently been shown to be the most efficient banks. The authors attributed efficiency differences to the institutional differences in both countries.

In another descriptive study on NPA in PSBs, Jayakumar, A. and Amutha, R. (2009) examined some of the core dimensions in the NPA of PSBs using financial data during 2000 and 2007. A notable observation in this study is that even though statistical data showed a decline in NPA ratio, there has

been a constant increase in NPA of PSBs. The incidence of NPAs is marginally greater in the old private sector banks than PSBs. The study briefed the various reasons and measures to curtail NPA and cautioned that the bank should be vigilant and incorporate various preventive measures to curtail the ever increasing level of NPA.

Basak, A. (2009) in a study on performance appraisal of urban cooperative banks (UCBs) examined the devastating role of NPA on the operational efficiency of UCBs in India. The author analyzed the issue with special reference to Contai Cooperative Bank Limited in West Bengal for the period 1995-96 to 2006-07. The study strongly recommended that the banks should take proactive measures in tackling the alarming level of NPA through an efficient system of credit appraisal and like.

In a similar descriptive study on trends and issues on priority sector advances, Uppal, R.K. (2009) examined the priority sector advances of the public, private and foreign bank groups. The study utilized parameters that include lending to priority sector and targets achieved while lending to priority sector during 2006-07. The author explained that the NPA is significant in PSBs while it was least in foreign bank groups. It is observed that NPA of PSBs has increased because of high priority sector advances. The study contributed valid insights into the issues on priority sector lending and suggested various strategies to sort out these issues.

Rajendar, K. (2009) examined the management of the NPA in PSBs in India using statistics available for 1999-00 to 2006-07. Inference based on analysis showed a decrease in NPA evidenced by net NPA ratios. The findings support various reform measures particularly SARFAESI Act 2002, ARCs, Lok Adalats, One Time Settlement (OTS) and DRTs.

Dash, M.K. and Kabra, G. (2010) examined the determinants of NPA in the Indian Commercial Banks with particular emphasis on the sensitivity of NPA to macroeconomic and bank specific factors in India. The study used regression analysis and a panel data set covering 10 years (1998-99 to 2008-09). The authors explained that both bank specific and macroeconomic factors has impacted the loan portfolio of commercial banks in India. Based on analysis, the study concluded that the commercial banks that are aggressive and charge relatively higher interest rates incurred greater NPAs.

On a similar topic, Debarshi Ghosh, D. and Ghosh, S. (2011) examined the composition, trend and management of NPAs in PSBs. The results of the study indicated an increased CRAR and NPA level during 2009-10. The analysis shared the general view that NPA is still a significant threat that should be managed to improve the efficiency of Indian banking sector.

Misra, B.M. and Dhal, S. (2010) examined the pro-cyclical movement of NPA in PSBs using pooled data regression analysis using 27 banks during 1996-2008. The authors opined that NPAs are influenced by three major sets of factors, i.e., terms of credit, bank specific indicators relating to asset size, credit orientation, financial innovations (non-interest income), and regulatory capital requirement and the business cycle shocks. The authors concluded that the terms of credit variables such as interest rate, maturity, collateral and bank specific variables have a significant effect on the banks' NPAs in the presence of macroeconomic shocks. The study is significant for policy decision makers since it provides useful insight into the various indicators that should be properly managed to curtail the menace of NPAs.

Thiagarajan, S. and Ramachandran, A. (2011) analyzed the credit risk component of the Indian Banking sector using financial data for the period

2001-2010. In specific terms, the authors examined the use of certain key credit risk ratios to measure the credit risk. Inference based on ratio analysis highlighted a gradual decrease in the ratio of NPA to total loans for both public and private sector banks from 2001 to 2008 and gradual increase from 2009 to 2010. Their findings are consistent with the findings that although a similarity exists in movement of selected ratios, the sector wise comparison showed significant differences among different bank groups.

Chaudhary, K. and Sharma, M. (2011) examined the loan portfolio of Indian PSBs and private sector banks with specific focus on the classification of advances, priority sector and non-priority sector advances, etc. The study was basically concentrated on the structural differences between PSBs and private sector banks, Based on the analysis, the authors recommended integration of modern statistical tools like Value-at-risk analysis and Markov Chain analysis to improve the quality of risk assessment practices. The authors also recommended to incorporate information sharing among the bankers about the credit history of the borrower.

Prasad and Veena, D. (2011) in their study examined the trends and issues relating to the NPA in Indian Banking Sector. Inference based on analysis indicated that the impact of increased recovery on NPA, decline in fresh slippage, sharp increase in gross loans, setting up of ARC, etc helped to present better NPA ratio's. The authors pointed out that PSBs problems are mainly due to excessive manpower, excessive NPA while private sector banks consolidated themselves through the adoption of latest technology and systems. The study recommended revitalizing the PSBs and incorporating the best practices in operations, technology and management to improve financial performance.

In a comparative study Malyadri, P. and Sirisha, S. (2011) examined the nature of NPAs in PSBs and private sector banks in India. The scope of the study was limited to the analysis of NPAs pertaining to only weaker sections during the period 2004-2010. The inference based on analysis revealed that asset quality of PSBs and private sector banks improved consistently during the study period as reflected in the decline in the ratios such as NPAs as percentage of advances to weaker sections.

Jayasree, M. and Radhika, R. (2011) in their study examined the sector-wise comparison of NPA for the period 2004-05 to 2008-09. The analysis highlighted higher levels of NPA in new private sector banks and foreign banks. The analysis supported the findings that the NPA had a negative impact on net-profit. The significance of this study is in its finding that prudential norms and RBI guidelines, securitizations and changes in law have a positive impact on asset quality of banks.

Siraj, K.K. and Pillai, P.S. (2011) in their study assessed the impact of global financial crisis on NPA of the banking sector. The study measured the annual average growth rate (AAG) of NPA indicators, before and during the financial crisis. The authors confirmed the susceptibility of Indian banking sector to financial crisis citing higher operating expenses, higher provisions, higher additions to the NPA, a reduced CD ratio and deterioration in the asset quality. The study recommended improvements in the management of the loan portfolio to withhold the impact created by the financial crisis.

Poongavanam, S. (2011) examined various literatures on issues, causes and remedial solution to manage NPA in Indian banking sector. The article explained the significant changes in Indian banking during the liberalization period and indicated the need to further enhance measures to manage the NPA.

The author concluded the study stating the need to provide more importance to NPA management and proper remedial solutions.

Thiagarajan, S., *et al* (2011) in their empirical study examined the determinants of credit risk in the Indian banks. Using econometric models on a panel data at the bank level for 22 PSBs and 15 private sector banks in India for the period 2001-2010, the study elucidated that the lagged NPAs had a strong and statistically significant positive influence on the current NPAs. There is a significant inverse relationship between the GDP and the credit risk for both public and private sector banks. The study revealed that both macroeconomic and bank-specific factors played crucial role in determining the credit risk of the commercial banking sector.

Yadav, M.S. (2011) in the research article on the impact of NPAs on profitability and productivity of PSBs in India, examined various micro variables affecting productivity and efficiency of banks. Using simple linear regression analysis on financial data between 1994-95 to 2005-06, the author explained that the level of the NPAs of PSBs affected fifty percent profitability of the banks and its impact has increased at very large extent with other strategic banking variables. Also, the high coefficient value explained a high degree of variability in productivity and efficiency of PSBs in terms of business per employee and operating profit per employee.

Chaudhary, S. and Singh, S. (2012) examined the impact of post-liberalization banking sector reforms on asset quality of SCBs in India. The objective of the research study was to analyze the impact the reforms on group-wise/year-wise asset quality of public, private and foreign banks in India. The study utilized secondary data on NPA, classification of assets etc for the period 1996-07 to 2009-10 and used statistical tools such as ratio

analysis and ANOVA technique. Based on the analysis, the authors concluded that asset quality has shown a significant improvement over the years in all the groups of the banks. The results of the study supported the role of banking reforms in transforming banks into a strong, stable, profitable and prosperous entities.

Siraj,.K.K. and Pillai, P.S. (2012) examined the performance of NPA in Indian banking during post-millennium period. To achieve its stated objectives, the authors utilized bank-group wise performance statistics during post-millennium period up to the period ended 31st December 2011. Using various statistical tools such as AAG rate, correlation and regression study, the study recognized that NPA remains a major threat and the incremental component explained through additions to NPA poses a great question mark on the efficiency of credit risk management practices of banks in India.

The review of literature mentioned above indicated the distressing role of NPAs in banking sector stability and growth, Even though many studies focussed on explaining the trend in the movement of the NPA, the analytical part mostly concentrated on ratio analysis, correlation and regression using a shorter study period. The primary emphasis of these studies was to evaluate the movement of NPA and to check effectiveness of various regulatory measures in managing NPA of banks. The majority of these studies recommended further studies on NPA and the establishment of more proactive and curative measures to manage it. NPA emanates due to various reasons and is influenced by many bank specific and economy specific factors. This relationship which is moderating or mediating in nature is not explained in the literatures. A detailed discussion on NPA during the financial crisis and a comparison between pre-crisis and post-crisis period is not undertaken. Also, the expert feedback on incidence of the NPA and its management is discussed

in a few studies. The present research addresses the suggestions of previous researches and discusses NPA in detail.

2.3. Studies on NPA in International context

Various studies were conducted in the international context on NPA and its trends. These studies explained various facets of NPA that includes the various reasons behind the accumulation of NPA, the effectiveness of measures taken by the government to reduce NPA, to name a few. Some of the studies focused on specific factors and its impact on increasing or decreasing the level of the NPA in the banking sector.

Herr and Miyazaki (1999) in their research article about the NPA problem in the Japanese banking industry briefed the various problems faced by the banking sector in managing their NPA accounts. Aggressive levels of NPA during 1990s, a tax system that doesn't provide tax reductions for write offs, increased number of bankruptcies etc., were evident in the Japanese banking sector since 1990. The authors based on literature review rated securitization as an effective way to handle NPAs in the banking industry. The authors also proposed sale of NPA to a jointly established Special Purpose Companies (SPCs) to allow banks to remove NPA from their balance sheets.

Krueger, A. and Tornell, A. (1999) examined the financial crisis in Mexico and the credit crunch and increased level of NPA. The authors explained that the bail out policy adopted in 1995 could not resolve the problem of NPA in the banking sector. Based on the analysis, the authors explained that NPA is unlikely to disappear on their own even under a high growth scenario. The authors called for an alternate strategy under which all NPAs were recognized at once and the fiscal costs were all paid up-front as preferable to solve the issue of the NPA in the banking sector.

Adhikari, R. and Oh Soo Nam (1999) examined the banking sector reforms after the Asian financial crisis. The authors observed that in countries where not only the financial sector, but also the whole process of economic reform is not complete, the banking sector accumulated a huge financial burden. The NPA ratio in Indonesia was estimated around 80%, 60% in Thailand etc. The authors stressed the need for financial sector reforms focused on resolving unviable banks (closure, merger, nationalization), recapitalizing viable banks (capital injection), resolving NPAs (restructuring, rescheduling, sale and swap), revamping the regulatory framework (regulation, supervision, reorganization), strengthen the bank management and credit culture (governance, foreign participation, no political interference) and strengthen the borrower repayment culture (exit laws, repayment of directed credits, reform of corporate sector).

Woo, D. (2000) examined two approaches to resolving NPAs during financial crisis with special focus on the Asian financial crisis that erupted in 1997. The study examined the creation of AMC and the development of out-of-court centralized corporate debt workout framework to manage NPA accounts. Based on literature review, the the author recommended setting up of AMC for financial restructuring and of the out-of-court centralized corporate debt workout framework for corporate restructuring. But the study also cautioned that there are some inherent weaknesses in both of these approaches due to their dependence on government involvement.

Hoshino, Y. (2002) examined the trend in the movement of NPA of Japanese Banks during the period 1996-2001. The authors examined the problems of NPA within Japanese banks from the viewpoint of both economic and accounting aspects. The author observed the existence of some constitutional problems in the banking system such as the convoy system, the

existence of a main bank relationship, and insufficient information disclosures. In the light of analysis, the author recommended; (1) raising the loan rate and developing the new commission rate business, (2) reducing costs such as branch and salary overhead, implementing drastic organizational and asset restructuring, and (3) disposing NPA, and transforming poorly managed banks.

Montreevat, S. and Rajan, R. (2003) examined financial crisis, bank restructuring and foreign bank entry in Thailand. The study focused crisis scenario during 1997-98 and the steps taken for financial sector restructuring. The authors observed that the accumulation of NPA forced banks to develop risk average lending policy. They recommended the setting up of different AMC to manage the increased level of the NPA in the market.

Ralph, K. (2003) in a research study on “selected issues in the treatment of NPAs in macro economic statistics” explained that due to the linkages between loan recognition and interest accrual, and between loan write-offs and operating surplus, the treatment of NPAs significantly impacted the calculation of major aggregates in the national and international economic accounts. Based on statistical analysis, the authors recommended the treatment of loan principal and its valuation, loan interest and the operating surplus. The study is significant as it contributes to the literature on the statistical treatment of NPA in national and international accounts.

Wadman, I. and Peterson, J. (2004) examined the trends in NPAs in Italy and Sweden. They explained the ways in which Sweden and Italy secured their NPAs from three aspects; the market, legal and financial aspect. The results of the study highlighted historic actions of the government, credit culture and management decisions to be crucial causes for the spread of the NPA. While

the Swedish legal system allowed banks to secure their own defaulted loans in a fast and efficient way, the Italian is more unwieldy and doesn't give the banks any incentive to work out their NPA. The results also showed the necessity to adopt mechanisms that best adapt to the environment in which the bank exists.

Shih, V. (2004) examined the political constraints and financial policies in China dealing with NPAs. The study is conducted in the wake of political distress on account of the stagnation of economic reforms and higher levels of NPAs in the banking sector. The author evaluated the opinion that the politicians make policies based on both political and economic considerations. The framework is tested on three cases related to China's NPAs problem: the politicization of the NPAs problem, policies designed to slow the creation of NPAs and policies aimed at decreasing the pool of NPAs. The findings strongly supported the role of political considerations in shaping financial policies in China.

Zuniga, J.D. and Espenilla, N.A. (2004) examined the trends and development in insolvency and risk management in the Philippines. Using statistics for the period 1999-2004, the study explained the risk management practices of the Philippines and the measures taken by regulatory authorities to curb NPA. They concluded the study stating that asset quality improvement using measures such as intensified collection efforts, restructuring, foreclosures and the sale of NPA reflected in the easing of NPA and NPA ratios.

Yang LI., *et al* (2004) applied distance function approach to study the relationship between NPA and bank efficiency. Using Taiwan's banking statistics for the period 1999-2001, the study concluded that that public banks

need to spend more resources than private banks to cut their NPA. Both bank groups followed a similar trend the study period. Compared to those established before deregulation, banks established after deregulation required almost twice as many resources in order to reduce one unit of NPA. The study also found that NPA shadow prices increased over time for old banks, but decreased over time for new banks. It is recommended based on the study that Taiwan's commercial banks on average could increase their technical efficiencies provided that all banks operated on the production frontier.

In a descriptive research paper, He, D. (2004) examined the role of the AMC in resolving NPA in the Republic of Korea during 1997-98 financial crises. The author emphasized the role of the NPA in the financial crisis. The author argued that the development of a market for distressed assets was critical to Korea's success in resolving NPA. Using statistical data analysis, the study explained that AMC incentive to dispose of NPA rapidly was conditioned by a strong desire on the part of the Korean society for a quick recovery of public funds injected for financial sector restructuring. The study listed the various NPA resolution techniques that include international bidding, ABS issuance, foreclosure and public auction, etc. The study concluded by emphasizing the role of the AMC in managing the NPA in the banking sector.

In an analytical study on the relationship between bank ownership and NPA with special focus on Taiwanese banks, Hu, J.L., *et al* (2004) utilized statistical data of 40 Taiwanese commercial banks during 1996-1999. The analysis revealed that the rate of NPA decreases when government shareholding in a bank goes higher up to 63.51 percent, while thereafter it increases. The study also found that the banks' sizes are negatively related to the rate of NPA. The revenue source diversification cannot effectively reduce the rate of NPA. Another notable finding of the study is that banks established

after deregulation, in average, have lower rates of NPA than those established before deregulation.

In a similar study, Xu Min (2005) examined the resolution of NPA in China. The alarming level of NPA, despite the economic growth of the nation, was the focus point of the study. Using ratio analysis the study asserted that NPA resolution progress is not satisfactory because of the bulk disposal which requires regulatory approval. The results of the study recommended further strengthening of the legal and regulatory framework that includes implementation of securitization law, the acceleration of the transfer process from banks to AMC and provision for banks to sell NPA below book value to third parties.

In order to validate the research question “Do high levels of problem loans usually seen as a signal of the financial distress of a bank necessarily imply bank’s inefficiency? Dongili, P. and Zago, A. (2005) examined the relationship between bad loans and efficiency in Italian banks during the period 1998-2003. Using a directional output distance function, the study found a strong correlation between the NPA and economic efficiency of banks. The results of the study showed that once problem loans are taken into account, the economic efficiency of banks increases significantly, suggesting that a significant aspect of banking production, credit quality, needs to be considered when evaluating banks’ performances.

Ahtialan, P. (2005) developed a model to study the bank lending behavior in the presence of customer-specific capital and the critical nature of the loan decision. It is shown that the bank is in a corner solution with respect to its best customers, and other customers often have an incentive to get to a corner. The author argued that it can be optimal to extend loans to (present and

expected future) good customers at an interest rate loss. A rationed customer with a concave enough probability function can receive a larger loan by asking for less. The study is useful as it provides insight into the developing relationship between bank lending and interest rate, differentiated for type of customers.

With a view to examine the macroeconomic implications of the NPA in Sub-Saharan Africa, Ffack, H. (2005) investigated the leading causes of NPA during the economic and banking crises in the 1990s. Using correlation and causality analysis based on data drawn from 16 African countries for the period 1993-2002, the study highlighted strong causality between loans and economic growth, real exchange rate appreciation, the real interest rate, net interest margins and interbank loans. The results of the study showed that macroeconomic stability and economic growth are associated with a declining level of NPA; whereas adverse macroeconomic shocks coupled with the higher cost of capital and lower interest margins are associated with a rising scope of NPA.

In a similar study, Loi (2006) analyzed the NPA problem in Vietnam Banking Industry. The literature explained that the accumulation of the NPA in Vietnam banks is mainly due to the policy driven lending practices and insufficient or limited credit assessment skills. The resolution of the NPA is found difficult on account of the inadequate legal framework, lack of reliable information, limited methods to resolve NPAs and non availability of second buyers even though there exists a state owned AMC. Some of the measures initiated by the government which were found effective includes creation AMCs, legal and institutional developments and creation of separate bank to undertake directed and policy lending activities, and autonomy for banks to decide on lending and remarkable changes in banking regulations pertaining to

capital adequacy and safety requirements and loan classifications and loan loss provisioning. It may be observed that similar structural reforms were projected in India as well by the various committees' reports formed after financial liberalization movement in 1991.

Chang (2006) examined the role of the NPA and Capital Adequacy in banking structure and competition with special reference to Korean banking industry. The empirical analysis used unique data set of the entire commercial banking sector in Korea, which covers both pre and post banking crisis periods over 28 years between 1976 and 2003. The researcher through using empirical studies highlighted that the change from price cap regulation to rate of return regulation impacted the banking structure.

With a view to assist the policy makers in developing measures to combat NPA, Lancaster, J. (2006) studied the NPA management in Bank for Agriculture and Agricultural Cooperative (BAAC), Thailand. Using population study and financial data obtained for the period 2000 to 2003, the study deployed regression analysis to determine how the non-performing loan ratio of BAAC branches can be explained by the debt suspension program implementation and the average loan of customers. Based on the result of five multiple regression analysis tests, the study found that debt suspension program has negative impact on the NPA ratio while and average loan has a positive impact on the NPA ratio in the area with highest income only. Expansion of the loan amount should go together with the expansion of number of borrowers. There is no evidence suggesting that lower average loan (higher depth of outreach) would contribute to higher NPA ratio.

Rottke B and Gentgen, J. (2006) examined the workout management of NPA with special reference to German NPA market. Specifically, the authors

reviewed two approaches for NPA resolution (1) a workout solution of NPA in their own workout department (integrative approach) and (2) the option of outsourcing the workout to a third party. Based on the assumption of transaction cost economics, the authors found that the specificity of the investment of the workout manager (and also the bank) is crucial for the decision of integrating or disintegrating the workout of real estate loans. The study revealed that the bank and the workout manager both under-invest in integration and disintegration scenarios. However, if the degree of specificity of the investments is equal, non-integration is superior to integration. Forward integration is superior to non-integration, if the bank's investment is more specific than the workout manager's investment.

In order to study the significance of the NPA in Bangladesh banking sector, Adhikary, B.K. (2007) examined the behavior of NPA statistics during the period 2000-2005. The results of the study highlighted the presence of the alarming level of NPA in both Nationalized Commercial Banks and in the Development Financial Institutions. The results of the analysis revealed that poor enforcement of laws relating to settlement of NPA, followed by insufficient debt recovery measures on the part of the banks, has aggravated the financial malaise. The study suggested prevention of the 'flow problem of bad loans' accompanied by other resolution measures to sort out the NPA mess in Bangladesh.

In a similar study, Ferguson, P. (2007) examined Securitization of NPA in Russia. The analysis revealed that the securitization of the bad loans has not occurred in Russia at anticipated levels because of legal and regulatory impediments that have discouraged investors and lenders alike. The study is significant as it highlights the legal and regulatory impediments while combating the problem of NPA in different markets.

In a descriptive study on the strength of the banking sector in East Asia, Turnert, P. (2007) examined whether Asian Financial Crisis stimulated structural changes in banking practices. The author based on literature identified NPA and poor risk management practices as major factors that contributed to bank failures during the crisis period. The author analyzed various East Asian markets including Indonesia, Malaysia, South Korea, Philippines, etc. The results of the study highlighted major structural changes in the banking sector in some countries. Based on the study, the author suggested that increased government control, poor risk management practices, quality of public information, NPA and quality of loan portfolio, etc. were some areas that banks and regulatory authorities shall concentrate to avoid banking failures in future.

In an attempt to study the determinants of NPA and its relationship with various macroeconomic variables, Vallcorba, M. and Delgado, J. (2007) examined the determinants of the NPA in Uruguayan banks. The results of the study indicated the existence of a relationship between NPA ratio and variation of wages measured in dollars and interest rates. The study concluded that lower wages and higher rates lead to a higher default ratio in the long term. This conclusion emphasized the importance of the exchange-rate risk over the credit risk in such economies with dollarized banking systems.

Chaffai, M.E., *et al* (2007) conducted a study on the price of bad loans, using a database of 2154 banks located in 29 emerging countries during 1996-2000. These banks were selected from Eastern Europe, Asia and Latin-America. To study the objective, the authors estimated a logit model of bank failure where NPL shadow price is introduced as one exogenous variable among other variables such as the bank's size, equity and temporal dummies. The estimation function used in the study enabled the researchers to derive the

shadow price of bad loans. The results of the study showed that the NPA shadow prices serve as an indicator of the bank's absolute level of credit risk. In particular, it is found using a logit model that bad loans estimated shadow prices are a good predictor of banks' risk of failure.

In a similar study on NPA and productivity in Chinese banks, Matthews, K., *et al* (2007) examined the productivity growth of the nationwide banks of China over the ten years to 2006. In this study, the authors considered NPA as an undesirable output and addressed the problem of inference inherent in the use of DEA as a measure of relative performance. Based on the analysis, the study found that the average productivity of the Chinese banks improved modestly over the selected period. Adjusting for the quality of loans, by treating NPA as an undesirable output, the average productivity growth of the state-owned banks was zero or negative while the productivity of the joint-stock banks was markedly higher.

In another descriptive study on NPA in German banking sector, Nico, B.R. and Julia, G. (2008) examined workout management of NPA using a formal model based on transaction cost economics. The authors approached the NPA problem from an academic standpoint, integrating both the banking and the real estate perspective. The results of the study indicated that the specificity of the investment of the workout manager (and also the bank) is crucial for the decision of integrating or disintegrating the workout of real estate loans. The degree of specificity required to perform the workout tasks is dependent on the status of underlying credit engagement and the characteristics of the collateral (the real estate).

Suzuki, Miah and Yuan (2008) examined China's Non Performing Loan Crisis and the role of economic rents. The authors in their study applied the

financial restraint model as the analytical framework and argue that failure to create sufficient economic rents is the chief reason underlying the dismal performance of banks. The results of the study indicate that while the formal financial system is less important than the informal system—especially for financing the private enterprises that are playing a crucial role in economic growth—not addressing the NPA crisis in the formal financial system will likely invite an economic slow-down.

Boudriga, A., *et al* (2009) examined the bank specific and institutional environment determinants of NPA with special focus on MENA countries. Using a sample study on 46 banks in 12 countries over the period 2002-2006, the study employed random-effects panel regression model that controls for cluster effects at the country level. The study found that bank specific factors that include foreign participation coming from developed countries, high credit growth, and loan loss provisions reduce the NPA level. However, highly capitalized banks experience high levels of credit exposure. Credit quality of banks is also positively affected by the relevance of the information published by public and private bureaus.

Boudriga, A., *et al* (2009) examined the relationship between bank supervision and its impact on NPA. The study employed aggregate banking, financial, economic and legal environment data for a panel of 59 countries during 2002-2006. The results of the study indicated that higher capital adequacy ratio and prudent provisioning policy reduce the level of problem loans. The findings do not support the view that market discipline leads to better economic outcomes and reduce the level of problem loans. The study is useful for regulators, bankers and investors as well. To reduce credit risk exposure, the effective way to do it is through enhancing the legal system,

strengthening institutions and increasing transparency and democracy, rather than focusing only on regulatory and supervisory issues.

In a similar study, Maggi, B. and Guida, M. (2009) attempted to model NPA probability in the commercial banking system with special focus on banks in Italy. The database for the study included a panel across two years (2003 and 2004). The results of the study indicated that traditional efficiency indicators of cost elasticity do not fit properly with the problem and proposed a measure based on the costs for managing and monitoring the loans which, according to the related density function, is effective. The study recommended for further study since the probability of an uncertain loan to become non performing is extremely costly for the banking system across the world.

In another significant study on the role of the AMC in the management of NPA, Haibo, K., *et al* (2010) examined the NPA that is disposed through AMC with Collateralized Debt Obligations Disposal. The research paper utilized Monte Carlo method to explore the role of AMC in non performing assets CDO pricing. The results of the study provided a theoretical guidance and technical support for the research of AMC non performing asset disposal with CDO in China.

Somoye, R.O.C. (2010) in the study 'The variation of risks on non performing loans on bank performance in Nigeria' examined the performance of banks within the context of non performing loans. The NPA in a bank's portfolio is assessed using a sample study of 15 banks selected from the total 24 banks. The study used audited financial statements and applied tools like multiple regression model of Ordinary Least Square (OLS) method, correlation coefficient and Student't' distribution. The results showed that earnings risk is most prevalent in explaining the variations in NPA

followed by interest rate risk and monetary rate. The study recommended an efficient loan appraisal technique consisting of conventional investment analysis and risk measurements. The study also recommended that the credit policy must be in line with the institutional objectives. The Basel accords according the author need to be reviewed in the light of financial crunch of 2007.

Espinoza, R. and Prasad, A. (2010) examined NPA in the GCC banking system and their macroeconomic systems. The study was first of its kind in the region, and investigated the effect of global financial crisis on NPA. The study estimated a macroeconomic panel VAR in order to discuss the potential feedback effects of bank performance on the supply of credit and growth. The results of the study highlighted a strong and significant inverse relationship between real (non-oil) GDP and nonperforming loans. Among bank control factors, efficiency and past expansion of the balance sheet were found to be significant. The authors suggested that in the context of their exchange rate pegs, a stronger focus on macro prudential regulation, particularly through capital and liquidity buffers, and countercyclical provisioning, could help mitigate the impact of macroeconomic risks to the banking system and the feedback effects of credit risks in the economy.

Bologna, P and Prasad A (2010) examined the Oman banking sector resilience in the context of global financial crisis during 2007-09. The exposure to the Oman banking sector towards various types of risk is also assessed in this report. The study found that the deterioration in credit quality is relatively limited and the coverage provided by the loan loss reserves remains adequate. The study highlights the relatively less exposure of Oman banks to NPA due to the higher rates of provisions provided every year.

Aremu, O.S., *et al* (2010) in their study “effective credit processing and administration as a panacea for NPA in Nigerian Banking System” addressed

the threat of NPA emphasizing that the NPA creates nightmare for not only the borrower and lender, but also poses a serious setback to the economy. The study is undertaken for the period 2003-2009. The results of the study refuted earlier suggestions to increase the loan loss provisions to manage NPA since it as it jeopardizes the profitability of the banks in the country. The authors based on the study recommended improvements in credit administration, adequate segregation of duties in credit administration, effective internal controls, religious compliance with policies and transparency in credit administration to maintain credit administration more transparent and effective.

In order to examine the relationship between bank efficiency and NPA with special reference to Malaysia and Singapore, Abd Karim, M.Z., *et al* (2010) examined the cost efficiency using the stochastic cost frontier approach assuming normal-gamma efficiency distribution model proposed by Greene (1990). The cost efficiency scores were then used in the second stage Tobit simultaneous equation regression to determine the effect of non-performing loans on bank efficiency. Inference based on analysis showed that there exists no significant difference in cost efficiency between banks in Singapore and Malaysia, although banks in Singapore exhibit a higher average cost efficiency score. Based on the Tobit simultaneous equation regression results, the study explained that higher NPA reduces cost efficiency. The result also supports the hypothesis of bad management proposed by Berger and DeYoung (1992) that poor management in the banking institutions results in bad quality loans, and therefore, escalates the level of NPA.

In order to study the role of interest rate spread on NPA, Collins, NJ and Wanjau, K., (2010) examined the relationship between the effects of interest rate spread on the level of NPA in the Kenyan banking sector. The study adopted a descriptive research design on a sample of all commercial banks in Kenya. The

results of the study indicated that interest rate spread affect performing assets in banks as it increases the cost of loans charged to the borrowers, regulations on interest rates have far reaching effects on assets non-performance, for such regulations determine the interest rate spread in banks and also help mitigate moral hazards incidental to NPAs. The study recommended charging an interest rate based on client assessment to improve performing assets in banks. Otherwise, an ineffective interest rate policy to increase the level of interest rates and consequently the NPA.

In order to examine the macroeconomic and bank specific determinants of the NPA in Greece, Louzis, D.P., *et al* (2010) employed dynamic panel data methods using financial data on 9 leading commercial banks in Greek, from 2003 to 2009. Inference based on analysis revealed that the NPA in the Greek banking system can be explained mainly by macroeconomic variables (GDP, unemployment, interest rates, public debt) and management quality. It is also found that bank-specific variables such as performance and efficiency possess additional explanatory power when added into the baseline model thus providing support to the 'bad management' hypothesis, linking these indicators to the quality of management.

Siraj, K.K. (2010) undertook a study on banking sector in the Sultanate of Oman, with special focus on the effect of global financial crisis on the Oman banking sector. The study used banking performance indicators for the period 2007-09. Based on the analysis, the study concluded that the banks in Oman were not affected by the global financial crisis due to a sound credit management mechanism and less exposure to the international financial system.

In another descriptive study, Liu, Y. and Yang, W. (2010) examined the causes of NPA in Taiwan banking system during 1999-2000. The study

utilized five economic and financial factors to examine their impacts on the increasing NPA. The study employed NPA statistics of 13 banks and applied descriptive statistics and multicollinearity test, cluster analysis and panel data analysis. The results of the analysis showed that financial deregulation, soundness of bank management, and changes in land prices have significant impact on financial instability in Taiwan. The study recommended strong banking regulations and supervision, strengthening the efficiency of bank management and improving the quality of loans and asset portfolios by reducing the dependency on land-secured loans to reduce NPA of banks.

In a comparative study on NPA and financial soundness, Shajari, P and Shajari, H. (2010) examined the relationship between financial soundness indicators (asset quality, capital adequacy and profitability) and key macroeconomic, bank-specific, and structural variables. The authors in their study utilized financial data from 1979 to 2009 and applied a combination of reduce form model of Jimenez and Sausina (2005) and also the approach adopted by Demirguc Kunt and Huizinga (2010). The results of the study confirmed that asset quality and capital adequacy are influenced by the business cycle. Lending interest rate has a negative effect on asset quality. Capital adequacy is affected by short term deposit interest rate and changes in the exchange rate. Profitability fluctuates with the inflation rate and NPA ratio. Beside the macroeconomic variables, the study identified management instability as one of the important determinants of the asset quality in Iran`s banking system.

Tracey, M. (2011) examined the impact of NPA on Loan Growth using an econometric case study of Jamaica and Trinidad and Tobago. To undertake the study, the author utilized banking statistics from Bank of Jamaica, the Central Bank of Trinidad and Tobago The study estimated the threshold range

for the Loan-NPL relationship using regression analysis for two Caribbean countries. The results of the study suggested a threshold range for NPA as determining differential loan behavior of banks. An implication of the study is the inference drawn which highlight that bank lending behavior could restrain economic activity, especially in periods of stress when NPA is high.

Adebolaa, S.S. *Et al* (2011) examined the determinants of the NPA in Islamic banking in Malaysia for the period 2007 to 2009. The authors utilized the ratio of NPA to the total financing in Islamic banks to measure the extent of the NPA in Malaysia. The study employed ARDL of Pesaran and Shin (1999) and Pesaran et al. (2001) to examine the effects of some macroeconomic variables which include industrial production index, interest rate and producer price index. The results of the study indicated two long run relationship among the variables and noted that the interest rate has significant positive long run impact on NPA. Industrial production index turns out with a positive but an insignificant sign. The results reflected the popular belief that the Islamic banking system in Malaysia is not fully motivated by profit and loss mechanism, as the impact of interest rate is stronger relative to productivity. The producer price index appeared to have a negative and significant impact on NPA.

Abel, E.E. (2011) examined the asset quality and identified the major determinants of bank asset quality in an era of regulation-induced industry consolidation, in a case study on Nigerian banking sector. The study selected panel data from 19 out of a total of 25 banks operating in Nigeria. A multivariate constant coefficient regression model is adopted as the estimation technique. Based on the analysis, it is found that deterioration in asset quality and increased credit crisis in the Nigerian banking industry between the periods 2004 and 2008 were exacerbated by the inability of banks to optimally

use their huge asset capacity to enhance their earnings profiles. The results showed excess liquidity syndrome and relatively huge capital bases fueled reckless lending by banks; and that increase in the level of unsecured credits in banks' portfolios ironically helped to mitigate the level of NPA.

Nkusu, M. (2011) examined the link between NPA and macroeconomic performance using a sample of 26 advanced countries that spans the period from 1998 to 2009. The study addressed two empirical questions on the NPA and macro financial vulnerabilities: the question of the determinants of the NPA and that of the interactions between the NPA and economic performance. The analysis showed that provisioning for bad loans can make a difference on banks' ability to withstand adverse shocks to the quality of their loan portfolio and their ability to continue lending after such shocks. The study recommended that even though NPA remain a permanent feature of banks' balance sheets, policies and reforms should be geared to avoiding sharp increases that set into motion the adverse feedback loop between macroeconomic and financial shocks. In this regard, preventing excessive risk-taking during upturns through adequate macro prudential regulations is the first best.

Olweny, T. and Shipho, T.M. (2011) examined the impact of bank-specific factors like capital adequacy, asset quality, liquidity, and operational cost efficiency and income diversification on the profitability of commercial banks in Kenya. The study used financial statements of 38 Kenyan banks for the period 2002-08 and applied regression method to evaluate the objectives. The results of the study showed that all bank specific factors had a statistically significant impact on profitability, while none of the market factors had a significant impact. Based on the findings the study, the authors recommended policies that would encourage revenue diversification, reduce operational costs, minimize credit risk and encourage banks to minimize their liquidity holdings.

Zeng, S. (2012) applied a dynamic model to study the NPA of banks in China. The author attempted to find: 1) the Hamiltonian multiplier of the bank NPA growth rate in the model which expresses the rate of change in NPA over time with respect to the NPAs, 2) a model that demonstrates the equilibrium value of the saddle point of the bank NPA; 3) a model explaining the NPA phenomenon in the Chinese banking system-mainly the state owned banks. 4) A test of hypothesis: the equilibrium value of the bank NPLs is dependent on micro-economic factors under the circumstances of macro-economic factors. The results of the study identified a significant decline in NPA of state owned banks, mainly due to the setting up of AMCs, implementation of new policies, etc. The results of the study also stressed the need to strengthen banks' internal management effort must be enhanced.

In an analytical study, Klein, N (2013) investigated the significant linkages between macroeconomic conditions, bank specific factors on incidence of NPA, with special focus on Central, Eastern and South-Eastern Europe in the period of 1998–2011. The panel VAR analysis broadly confirms the existence of strong macro-financial linkages. In particular, the impulse response functions revealed that a positive shock to GDP growth and credit (as a ratio of GDP) contributes to the reduction of NPA while a higher inflation leads to higher NPAs. In addition, other things being equal, a positive shock (increase) to NPA ratio leads to a contraction of credit-to-GDP ratio and real GDP and to a higher unemployment rate.

In the international context, studies on NPA mainly focused on identifying the trend and the reasons for the incidence of NPA and its interaction with various performance indicators. The studies also contributed significantly towards implementing new measures to manage NPA in post-crisis (Asian financial crisis) period.

2.4. Conclusion

Review of literature on NPA in Indian and international context revealed the complexity of the NPA to the development and growth of banking across the world. The studies in general compared NPA and its incidence and suggested various measures to mitigate the risk of NPA and reduce to the minimum possible level. Many of the suggestions put forward in the literature are common and may be classified into two (1) strengthening the credit risk management system, and (2) changes in regulatory measures. These measures are significant and help banks to improve the quality of asset portfolio and recover NPA accounts at the earliest.

Many of the measures stated in the literature were implemented in the Indian banking sector. Still the level of NPA is alarming and its fluctuations during financial crisis are really a reason to worry about. Hence a further research on NPA in banking is required.

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INDIAN BANKING SECTOR: AN OVERVIEW

C o n t e n t s	3.1 Introduction
	3.2 History of Indian Banking
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3.1. Introduction

The banking system is central to a nation's economy. Banks are special as they not only accept and deploy large amounts of uncollateralized public funds in a fiduciary capacity, but also leverage such funds through credit creation. In general, the banking system performs four basic functions essential to economic development and growth: mobilization of savings, allocation of resources to productive uses, facilitating transactions and risk management and exerting corporate control. The banking system in India is significantly different from that of other Asian nations because of the country's unique geographic, social and economic characteristics. India has a large population and land size, a diverse culture, and extreme disparities in income, which are marked among its regions. The banking system in India has had to serve the goals of economic policies enunciated in the successive five year development plans, particularly concerning

equitable income distribution, balanced regional economic growth and the reduction and elimination of private sector monopolies in trade and industry.

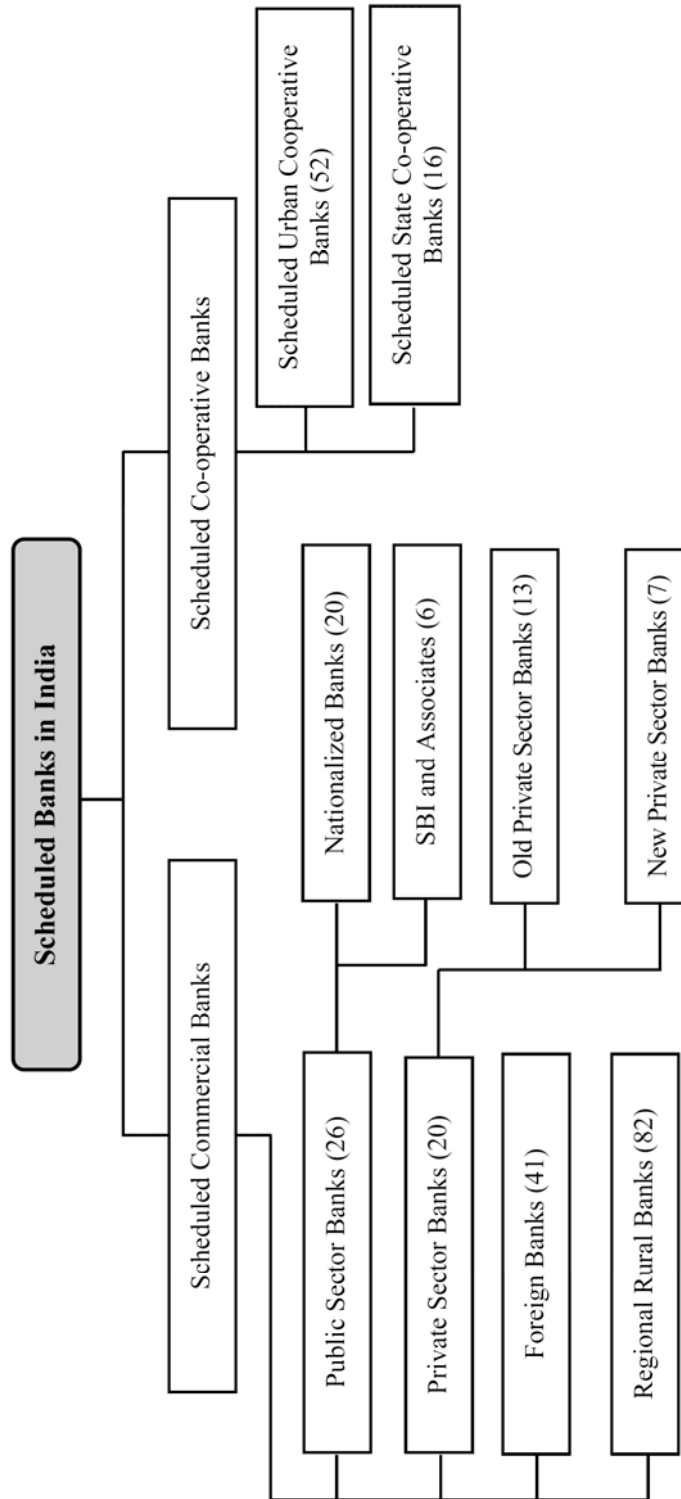
3.2. History of Indian Banking

The history of modern Indian banking goes back to 1683 when the first Indian Bank was established on western lines in Madras. The establishment of the Bank of Calcutta in 1806 marked the beginning of the modern banking era in India. Two more Presidential Banks, namely, Bank of Bombay and Bank of Madras were set up in 1840 and 1843 respectively. With the launch of the Swadeshi movement in 1905, there were outbursts of banking activities. Many banks like Bank of Burma (1904), Bank of India (1906), Canara Bank (1906), Bank of Rangoon (1906), Indian Specie Bank (1906), Indian Bank (1906), Bank of Baroda (1908) and Central Bank (1911) had their operation with a paid up capital of Rupees Five lakhs and above. The Indian banking system had developed considerably since 1935. The Reserve Bank of India has started its operation in 1935. A critical review of the growth of banking in India in the pre-independence period revealed that the banking system had neither a definite shape nor policy until the creation of RBI in 1935. With enactment of the Banking Regulation Act in 1949, the Indian banking system had undergone substantial changes structurally, geographically and functionally. In 1955, the RBI acquired control of the Imperial Bank of India, which was renamed as State Bank of India (SBI). In 1959, SBI took over control of eight private banks floated in the erstwhile princely states, making them as its 100% subsidiaries. It was in 1960, when RBI was empowered to force compulsory mergers of weak banks with the strong ones. The move significantly reduced the total number of banks from 566 in 1951 to 85 in 1969 (Goyal and Joshi, 2012). As observed by Banerjee (2004), India's postwar development strategy was in many ways a socialist one, and the government felt that the banks in private hands did not lend enough to those who

needed it most. Up to 1990's, this psychology prevailed as may be observed from various policies and developments in Indian banking.

The Indian financial system consists of different types of financial institutions, classified into banking and non-banking institutions. The banking institutions comprise of; Commercial Banks, Industrial or Investment Banks and Rural Banks. The commercial banking system consists of 'Nonscheduled banks' and 'Scheduled banks'. Nonscheduled banks refer to those banks that are not included in the Second Schedule of the Banking Regulation Act and, thus, do not satisfy the conditions laid down by that schedule. Scheduled banks consist of scheduled commercial banks and scheduled cooperative banks. The former are further divided into four categories: (1) Public Sector Banks (which are further classified as Nationalized Banks and State Bank of India (SBI) & Associate banks); (2) Private Sector Banks (which are further classified as Old Private Sector Banks and New Private Sector Banks that emerged after 1991; (3) Foreign Banks in India; and (4) Regional Rural Banks (which operate exclusively in rural areas to provide credit and other facilities to small and marginal farmers, agricultural workers, artisans, and small entrepreneurs). These scheduled commercial banks with exception of the foreign banks are registered in India under Companies Act.

The figure no. 1 shows the structure of scheduled banks in India.



Source: Report on Trend and Progress of Banking in India, 2012, Reserve Bank of India

Figure 3.1 Scheduled Banking Structure in India (As on March 31, 2012)

As explained by Prasad and Ghosh (2005), the Indian financial system prior to reforms in 1991 essentially catered the needs for planned development. The preemption of a large proportion of the bank deposits in the form of reserves and an administered interest rate regime resulted in high-cost and low-quality financial intermediation. The existence of a complex structure of interest rates arising from the economic and social concerns about providing concessional credit to certain sectors resulted in cross subsidization and implied that higher rates were charged to non-concessional borrowers. The system of administered interest rates was characterized by detailed regulatory prescriptions on lending and deposits, leading to a multiplicity of interest rates. The lack of transparency, accountability, and prudential norms in operations of the banking system led to a rising burden of non-performing assets. On the expenditure front, inflexibility in licensing of the branches and the management structures constrained the operational independence and functional autonomy of the banks and raised its overhead costs. The financial environment during this period was characterized by segmented and underdeveloped financial markets. This resulted in a distortion of interest rates and inefficient allocation of the scarce resources.

In India, prior to nationalization, the banking was restricted mainly to the urban areas and neglected the rural and semi-urban areas. Large industries and big business houses enjoyed the major portion of the credit facilities. Agriculture, small-scale industries and exports did not receive deserved attention during the period. In the earlier stages of development, banking credit was directed towards selected activities only. For example, in the decade of 1960s, more than 80% of credit was allocated for trade and industry sector whereas agriculture and small manufacturing sectors were completely neglected. Therefore, inspired by a large social purpose, 14 major banks were nationalized

in 1969. In 1980, the government nationalized 6 more banks with deposits of more than ₹200 crores. Nationalization of banks was intended to enable the banks to play the role of catalytic agents for economic growth. Since then the banking system in India has played a pivotal role in the Indian economy, acting as an instrument of social and economic change. The nationalization of commercial banks resulted in (1) massive expansion of branches, especially in rural and semi-urban areas, and (2) diversification of credit to till then neglected sector (priority sector lending). The planners adopted a supply side approach and primarily pursued the agenda of social banking.

The regulatory framework during the pre-liberalization period focused mainly on regulation of interest rate, directed lending and expansion of banking network in backward areas. With multi-agency approach, the banking network in the rural areas has made its formidable presence in providing rural financial services. The loans provided by banks have contributed substantially to the growth of various priority sectors. Besides, the banking facilities were made available in unimaginable remote areas for tapping the latent savings of the rural masses. Though the volume of loans provided by banks has increased substantially, the health of these institutions also took a beating with increased thrust to financing under what is called ‘directed lending’ and by implementing various government sponsored programs using banking as a channel of credit purveyor. In the post nationalization period there was a rapid expansion of banks in terms of coverage and also of deposit mobilization. The number of bank offices multiplied rapidly from 8,300 in July 1969 to 59,752 in 1990, which further increased to more than 62,000 in 1995, and it was 83,229 during 2011-12.

Many researches on growth of banking sector confirmed a uniform pattern of growth in various economies. Sharmer and Hub (2009) classified the stages of development into; (1) a state government highly regulated early

development phase characterized with the primary objective of maintaining stability, (2) a deregulated growth phase where measures are taken based on competitive and market driven forces characterized with the primary challenge of ensuring growth, and (3) a deregulated and opened up the market where externalities plays a significant role. Currently, the Indian banking sector is in the third stage, achieving progress through incorporating prudential norms in line with international best practices.

At the time of carrying out general economic reform in the country, the need to initiate financial sector reform was greatly emphasized.

3.3. The Growth Phases

To understand the Indian banking sector in detail, it is essential to recognize the stages of development and growth of banking in India. Karunakar *et al* (2008) classified the development of modern banking into the following phases.

1. **Preliminary phase:** Series of births and deaths of banks in the first five decades of twentieth Century.
2. **Business phase:** Laying of solid and sound foundation for banking business, which was taken place between 1949 and 1969, by enacting Banking Companies' Regulation Act 1949.
3. **Branching out phase (1969 to 1985):** When 20 major commercial banks were nationalized in two phases and these banks have reached the larger mass of the population through the opening of branches and lead bank schemes.
4. **Consolidation phase:** During this phase (1985 –1991) weaknesses and defects of mass branching were identified and attended through various committees' investigation.

5. **Reforms and strengthening stage (1991 to till date):** In fact first phase of reforms started with the Narasimham Committee report in 1991.

Subsequently there were a series of reforms in statutory Liquidity Ratio (SLR), Cash Reserve Ratio (CRR), new norms for asset classification (NPA), provisioning and capital adequacy norms, permission for entry of new private banks and foreign banks, deregulation of interest rate, setting up of Debt Recovery Tribunals and enactment of Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act (SARFAESI) 2002.

3.4. Banking Sector reforms since 1991

Since 1991, India has undertaken comprehensive banking sector reforms, aimed to increase the profitability and efficiency of the then 28 public sector banks that controlled about 90% of the deposits, assets and credit. The reforms were initiated in the middle of 'current account' crisis that occurred in early 1991. The crisis was caused by poor macro economic performance characterized by a public deficit of 10% of the gross domestic product (GDP), a current account deficit of 3% of GDP, inflation rate of 10% and growing domestic and foreign debt. The crisis was triggered by a temporary oil price boom following the Iraqi invasion of Kuwait in 1990. The reforms contributed financial deepening although the pace was only slightly faster in the 1990s than in the 1980s as evidenced by an increase in M2 and deposits as a share of GDP. In fact, the financial liberalization focused mainly on the banking sector, since the Indian financial system is mainly bank based financial system and its dominant role as resource mobiliser financial intermediary in the market.

A major component of financial liberalization initiatives is banking sector reforms. The need for a healthy, vibrant, stable and viable banking

system to support the economic growth of the country has been engaging the attention for quite some time. This has become all the more essential as the globalization process in progress and the banks have a key role to play as facilitators of smooth and efficient integration of global financial markets. As observed by Das (2010), the impetus to financial sector reforms came with the submission of three influential reports by Chakravarthy Committee in 1985, the Vaghul in 1987 and the Narasimham Committee in 1991. The prominent among them was the Narasimham Committee (in 1991 and 1998 respectively). The Committee put forward various measures to reform the banking sector which includes (1) a reduction of the CRR and SLR (2) interest rate and entry deregulation, (3) reform of priority sector lending, (4) entry and branch deregulation, (5) a shift in the banking sector supervision from intrusive micro-level intervention over credit decisions toward prudential regulations, and (6) restructuring of public sector banks. The impact of liberalization on Indian banking (Gupta et al, 2011; Zhao et al, 2006; Kovea, 2003) brought in remarkable benefits for the banking sector as a whole, notably the public sector banks. The changes were manifested in improved efficiency and competitiveness.

3.4.1. Reduction in SLR and CRR

It is widely known that India's high reserve requirement based on CRR was one of the main causes of low profitability and high spreads in the banking system. In line with the recommendations of Narasimham Committee, the RBI reduced CRR gradually in the post reform period. CRR was gradually brought down from 15% in 1991 to 5.25% in 2010. The pace of reduction in CRR has been determined by considering the following factors: pace of reduction in the fiscal deficit, monetary developments vis-à-vis growth in real output, and developments in foreign exchange markets. For example, the RBI increased the CRR in August 1993 in order to sterilize foreign capital inflows. SLR refers to the

minimum reserves that banks have to keep in the form of cash or gold valued at a price not exceeding the current market price, or government and other approved securities valued at market price. In the post reform period, SLR was reduced gradually from 38.5% in 1991 to 23% in 2012.

3.4.2. Interest Rate Deregulation

India pursued financial sector reforms as part of structural reforms initiated in the early 1990s. Interest rate deregulation in the post reform period resulted in liberalizing the complex structure of deposit and lending interest rates. Deregulation of interest rates was intended to strengthen the competitive forces, improve allocative efficiency of resources and strengthen the transmission of monetary policy. The process of deregulation of interest rates, which began in the early 1990s, was largely completed by October 1997. A few categories of interest rates that continued to be regulated on the lending side were small loans up to ₹2 lakh and rupee export credit, and on the deposit side, the savings bank deposit interest rate. The rates on small loans up to ₹2 lakh and rupee export credit were deregulated in July 2010, when the Reserve Bank replaced the Benchmark Prime Lending Rate (BPLR) system with the Base Rate system. With this, all rupee lending rates were deregulated.

3.4.3. Reforms in Priority Sector Lending

Directed credit program involving loans on preferential terms and conditions to priority sector was a major tool of development policy in both developed and developing countries in the 1960s, 1970s and mid-1980s. It envisaged the involvement of scheduled commercial banks in the financing of priority sectors like agriculture, small scale industries, weaker sector development, education, housing etc., Priority sector lending is criticized as one of the major reasons for accumulation of non-performing assets during

pre-reform period (Patidar and Kataria, 2012; Roy, 2007). The target imposed on domestic banks was 40%, while it was 32% for foreign banks up to 1991. Even though it was not changed during the reform period, the burden directed lending practice was gradually reduced by (1) expanding the definition of priority sector lending, and (2) liberalizing lending rates on advances in excess of ₹200,000.

3.4.4. Deregulation of Entry Barriers and Branching

Based on Narasimham Committee recommendations governing branch licensing restrictions, the Reserve Bank of India changed its licensing policy in 1992 in order to provide banks with operational autonomy to rationalize their branch networks. Banks were allowed to shift their existing branches within the same locality, open certain types of specialized branches, convert existing non-viable rural branches to satellite offices, spin off business of a branch and open extension counters and administrative units without prior approval of the RBI. In 1993-94, banks were permitted to close one loss-making branch at rural centers serviced by two commercial bank branches by mutual consent with approval of the RBI. In 1993, the RBI required new private sector banks that entered the banking sector in 1994 to open 25% of their branches in rural or semi-urban areas. In 1998-99, old and new foreign banks were permitted to open up to 12 branches a year, as against the earlier stipulation of 8 branches.

Guidelines and requirements for establishing new private sector banks were promulgated in 1993 and includes; (1) Maintain minimum paid up capital of ₹1 billion, (2) list its shares on stock exchanges, (3) fulfill the priority sector lending requirement with modification allowed in the composition of such lending for an initial period of three years, (4) set a ceiling of 1% of total voting rights held by an individual shareholder as stipulated by the Banking

Regulation Act 1949, (5) postpone setting up a subsidiary or mutual fund unit at least three years after its establishment, and (6) use modern infrastructural facilities to provide good customer service. In 1994, the Banking Regulation Act 1949 was amended in order to raise the ceiling of voting rights of an individual shareholder in a private bank from 1% to 10%.

3.4.5. Adoption of Prudential Norms

Adoption of prudential norms in banking since 1991 primarily aimed to strengthen the banking sector and inducing greater accountability and market discipline. These norms include not only capital adequacy, asset classification and provisioning but also accounting standards, exposure and disclosure norms and risk management and asset-liability management. Following the recommendations of the Narasimham Committee, the RBI issued guidelines on income recognition, asset classification and provisioning during 1992-93. With the new guidelines, putative “incomes” from NPA have no longer been treated as income. The period of non-payment to classify an advance as NPA was shortened to two quarters. Further, based on the recommendations of Narasimham Committee in 1998, the RBI advised banks in 1999-2000 to disclose the details of the maturity profile of deposits and borrowings, loans and investments, provisions, etc. As for regulatory supervision, the RBI developed a rating model for banks based on capital, assets, management, earnings and liquidity (CAMEL) in 1999-2000 to improve its assessment on the performance of each bank and the aggregate strength and soundness of the banking system. Further, the RBI issued detailed guidelines for risk management system in banks.

3.4.6. Restructuring of Public Sector Banks

Public sector banks have been known for accumulating a large amount of NPA from the previously high regulated regime. The new prudential

guidelines introduced in 1992 revealed the true state of NPA problems of these banks to some extent. In 1992-93, their NPA amounted, on average, to 24% of the total loan portfolio. Initially, only 15 public sector banks achieved net profit, while 13 banks made overall losses. (Joshi and Little, 1996) Loss making banks accounted for 30% of the total deposits or assets of all public sector banks. Public sector banks made an aggregate loss of about ₹35 billion. About half of the public sector banks had negative net worth. The following are some of the measures adopted to restructure the public sector banks after 1990.

1. Recapitalization: The government provided ₹40 billion for recapitalization of 19 nationalized banks from 1991-92 to 1992-93. During 1993-99, the government engaged in additional recapitalization programs for 19 nationalized banks by spending ₹164.5 billion or between 0.02% and 0.07% of GDP each year (Nandy, D 2010).
2. Debt Recovery and Bankruptcy
3. Partial Privatization
4. Writing off of bad debts
5. Setting up of Asset Reconstruction Company
6. Reduction of Operational Costs

In a report on restructuring weak public sector banks (1999) RBI observed that the emphasis on maintenance of capital adequacy and compliance with the requirement of asset classification and provisioning norms put severe pressure on the profitability of PSB. Deregulation of interest rates on deposits and advances has intensified competition and PSBs were forced to contend with competition not only from other public sector banks but also from old/new private sector banks, foreign banks and financial institutions.

3.5. Growth Statistics – Scheduled Commercial Banks in India

3.5.1. Number of Banks in India

There has been a decline in total number of banks, including RRBs in India from 300 in 2000-01 to 173 in 2011-12. Few banks were ceased to exist and few were merged with other banks. An evaluation of the reasons for this decline revealed that the driving force behind merger, acquisitions and exit of banks during this period was mainly due to; (1) severe competition during post-liberalization era and focus on economies of scale, cost efficiency, and profitability (2) adoption of “too big to fail” principle followed by banks, and (3) financial distress arising out of bad loans and erosion of capital funds (Jayadev and Sensarma, 2007). Importantly, the consolidation is seen within public sector banks (PSB) and within private sector banks (Phalke et al, 2010). Details of the number of banks during the study period are given in table no. 3.1.

Table 3.1 Statistical Tables on Number of Banks in India (2001-2012)

Year	Number of Commercial Banks	Scheduled Commercial Banks	of which: Regional Rural Banks	Non-Scheduled Commercial Banks
2001	300	296	196	5
2002	297	293	196	4
2003	292	288	196	4
2004	291	286	196	5
2005	288	284	196	4
2006	222	218	133	4
2007	182	178	96	4
2008	173	169	90	4
2009	170	166	86	4
2010	167	163	82	4
2011	167	163	82	4
2012	173	169	82	4

Source: Statistics Relating to Commercial Banks in India, RBI Report 2012

3.5.2. Offices of Scheduled Commercial Banks in India

Contrary to the decline in the number of banks during 2000-01 to 2011-12, the total number of offices of SCBs including RRBs increased from 67,812 in 2000-01 to 101,260 in 2011-12. The growth of PSBs is noteworthy in this context. From 47,493 offices in 2000-01, it has increased to 70,314, i.e., an increase of 48% during the study period. Statistics on the offices of scheduled commercial banks during the study period is summarized in table no. 3.2 and is shown below.

Table 3.2 Offices of Scheduled Commercial Banks in India (2001-2012)

Year	SBI & Associates	Nationalized Banks	PSBs	Private Sector Banks	Foreign Banks	RRBs	Private Sector Banks	Total
2001	13,677	33,816	47,493	5,387	248	14,669	15	67,812
2002	13,722	33,832	47,554	5,600	252	14,689	20	68,115
2003	13,751	34,182	47,933	5,592	212	14,717	24	68,478
2004	13,799	34,465	48,264	5,949	224	14,716	27	69,180
2005	13,921	34,988	48,909	6,448	245	14,746	25	70,373
2006	14,313	35,866	50,179	6,834	261	14,747	28	72,049
2007	14,680	37,443	52,123	7,426	272	14,827	48	74,696
2008	15,859	39,283	55,142	8,340	279	15,065	48	78,874
2009	16,913	41,011	57,924	9,261	295	15,508	48	83,036
2010	18,240	43,654	61,894	10,480	310	15,790	49	88,523
2011	19,027	46,389	65,416	12,045	319	16,185	54	94,019
2012	19,787	50,527	70,314	13,868	323	16,698	57	101,261

Source: Statistical Tables Relating to Banks in India – Reserve Bank of India, 2012

The total number of offices of SCBs has increased from 67,812 in 2000-01 to 101,261 in 2011-12, i.e., an overall increase of 49% during the study period.

3.5.3. Bank Branch Statistics

The dispersion of bank branches in different regions (rural, semi-urban, urban and metropolitan) is explained in the bank branch statistics. During the study period, the statistics highlighted highest growth of branches in metropolitan areas, i.e., an average annual growth (AAG) rate of 6.76% during the study period, followed by urban areas (5.61%) and semi-urban areas. The growth rate is considerably less in rural areas, i.e., an AAG rate of 0.98% during the study period. It indicates that during post-millennium period, banks given priority to expand their network in metropolitan, urban and semi-urban areas. Table no. 3.3 illustrates the bank branch statistics during the study period.

Table 3.3 Offices of Scheduled Commercial Banks in India (2001-2012)

Year	Number of Bank Offices in India	(a) Rural	(b) Semi-Urban	(c) Urban	(d) Metropolitan
2001	67,937	32,585	14,843	11,193	9,316
2002	68,195	32,503	14,962	11,328	9,402
2003	68,500	32,283	15,135	11,566	9,516
2004	69,170	32,227	15,288	11,806	9,750
2005	70,373	30,790	15,325	12,419	11,839
2006	72,072	30,251	15,991	13,232	12,598
2007	74,653	30,409	16,770	14,202	13,272
2008	78,787	30,927	18,027	15,566	14,267
2009	82,897	31,598	19,337	16,726	15,236
2010	88,203	32,529	21,022	18,288	16,364
2011	94,019	33,868	23,299	19,046	17,806
2012	101,261	36,130	25,931	20,321	18,879

Source: Statistics Relating to Commercial Banks in India, RBI Report 2012

3.5.4. Performance of Scheduled Commercial Banks

3.5.4.1. Deposits

The aggregate deposits of SCBs increased from ₹989,141 Crores in 2000-01 to ₹5909,082 Crores in 2011-12. The average annual growth rate of deposits during this period is 17.71%, which is mainly contributed by the increase in time deposits (AAG rate of 18.39%) over demand deposits (AAG rate of 14.41%). Deposits as a percentage of GNP have increased from 56% in 2000-01 to 72.5% during 2011-12. Table no. 3.5 illustrates the growth of deposits, deposits of SCBs per office and per capita deposits of SCB during the study period.

Table 3.4 Growth Statistics – Deposits of SCBs (2001-2012)

Year	Aggregate deposits of SCB (₹ crore)	Demand deposits	Time deposits	Deposits of SCB per Office (Lakh)	Per capita Deposit of SCB (₹)	Deposits of SCB as % GNP
2001	989,141	159,407	829,734	1,456	9,770	56.00
2002	1,131,188	169,103	962,085	1,659	11,008	54.40
2003	1,311,761	187,837	1,123,924	1,925	12,253	58.80
2004	1,504,416	225,022	1,279,394	2,270	14,089	57.80
2005	1,700,198	248,028	1,452,171	2,570	16,281	57.70
2006	2,109,049	364,640	1,744,409	3,050	19,130	62.70
2007	2,611,934	429,731	2,182,203	3,680	23,382	66.60
2008	3,196,940	524,310	2,672,630	4,340	28,610	70.10
2009	3,834,110	523,085	3,311,025	4,980	33,919	72.70
2010	4,492,826	645,610	3,847,216	5,480	39,107	74.20
2011	5,207,969	641,705	4,566,264	6,090	45,505	73.60
2012	5,909,082	625,330	5,283,752	6,430	51,106	72.50

Source: Statistics Relating to Commercial Banks in India, RBI Report 2012

3.5.4.2. Credit, Investment and Priority Sector Advances

The total credit of SCBs increased from ₹529,271 Crores in 2000-01 to ₹4611,852 Crores in 2011-12, i.e., an AAG rate of 21.95% during the study

period. On the other hand, the total investments of SCB grew from ₹367,184 Crores in 2000-01 to ₹1737,787 Crores in 2011-12, i.e., an AAG rate of 15.47. The per capita credit of SCBs also showed an improved trend, from ₹5,228 in 2000-01 to ₹39,909 in 2011-12. A notable feature observed from the trend analysis is the reduction in percentage share of priority sector in total credit of SCB, from 31% in 2000-01 to 29% in 2011-12. The statistics highlighted growth in credit deployment and indicates the catalytic role played by the banking sector in overall development of the country.

Table 3.5 Growth Statistics – Credit, Investment & Priority Sector Advances (2001-2012)

Year	Credit of SCB in India (₹ crore)	Investments of SCB (₹ crore)	Credit of SCBs per office (₹ lakh)	Per capita Credit of SCB (₹)	SCBs' Advances to Priority Sectors (₹ crore)	Share of Priority Sector Advances in total credit of SCB (%)
2001	529,271	367,184	779	5,228	182,255	31.00
2002	609,053	437,482	893	5,927	205,606	34.80
2003	746,432	541,750	1,143	7,275	254,648	35.10
2004	840,785	677,588	1,330	8,273	276,621	32.03
2005	1,100,428	739,154	1,700	10,752	370,603	32.20
2006	1,507,077	717,454	2,210	13,869	512,790	33.81
2007	1,931,190	791,516	2,760	17,541	655,317	33.08
2008	2,361,913	971,714	3,220	21,218	781,476	31.55
2009	2,775,549	1,166,410	3,620	24,617	908,929	30.30
2010	3,244,788	1,384,753	3,980	28,431	1,091,510	31.20
2011	3,942,083	1,501,619	4,580	34,187	1,315,859	30.60
2012	4,611,852	1,737,787	5,020	39,909	1,471,330	29.00

Source: Statistics Relating to Commercial Banks in India, RBI Report 2012

3.6. Bank Group Wise Statistics for 2011-12

Deposits constituted more than three fourth of the liabilities of the banking sector. The total term deposits showed a marginal increase whereas both demand deposits and savings bank deposits reduced during 2011-12. The total deposit represents 77.76% of total liabilities. The total borrowings of SCB were ₹8401 Billion, i.e., 10.12% of total liabilities of SCB. The total loans and advances of SCB were ₹50,746 Billion during 2011-12, an increase of 18.1 from 2010-11. The term loans represent 54.74% of total loans and advances whereas the share of cash credit, overdraft etc was 39.49%.

3.6.1. Branches of SCBs 2011-12

Statistics on branch networks of Indian scheduled commercial banks in India (excluding RRB) as on 31st March 2012 is given in Table no. 3.6. Banks should satisfy requirements set forward by RBI and should obtain prior approval/license to open new branches. The opening of branches is governed by the provisions of Section 23 of the Banking Regulation Act, 1949.

Table 3.6 Branches of Scheduled Commercial Banks – As on 31.03.2012

Bank Groups	Rural	Semi-Urban	Urban	Metro-politan	Total
SBI & Associates	6,582	5,619	3,504	3,125	18,830
Nationalized Banks	15,606	12,154	10,744	10,132	48,636
Public Sector Banks	22,188	17,773	14,248	13,257	67,466
Private Sector Banks	1,581	4,687	3,569	3,615	13,452
Old Private Sector Banks	881	2,025	1,395	1,085	5,386
New Private Sector Banks	700	2,662	2,174	2,530	8,066
Foreign Banks	7	8	61	246	322
All SCBs	23,776	22,468	17,878	17,118	81,240

Source: Statistical Tables Relating to Banks in India – Reserve Bank of India, 2012

From the table above, it is observed that the higher percentage of branches, i.e., 29.26% operate in rural areas, followed by 27.65% in semi-urban areas.

3.6.2. Share of bank groups in total deposits

The share of bank groups in total deposit is appended in Table no. 3.7

Table 3.7 Total Deposits and Share of bank groups (2011-12)

	Amount in ₹ Billion					
	SBI & Associates	Nationalized Banks	Public Sector Banks	Private Sector Banks	Foreign Banks	All SCBs
Amount						
Total Deposits	14,050	35,970	50,020	11746	2,771	64,537
Demand Deposits	1,197	2,647	3,844	1659	801	6,304
Savings Bank Deposits	4,537	7,604	12,141	2729	419	15,289
Term Deposits	8,317	25,719	34,036	7358	1,551	42,945
Percentage of Total *						
Total Deposits	21.77	55.74	77.51	18.20	4.29	100.00
Demand Deposits	18.99	41.99	60.98	26.32	12.71	100.00
Savings Bank Deposits	29.67	49.74	79.41	17.85	2.74	100.00
Term Deposits	19.37	59.89	79.25	17.13	3.61	100.00

Source: Report on Trend and Progress of Banking in India 2011-12, p.55, RBI

* Data Analysis

As may be observed from the table above, 77.51% of total deposit is mobilized by public sector banks, further distributed into Nationalized Banks 55.74% and SBI & Associates 21.77%. Private sector banks hold 18.20% of total deposits of all SCB, while the share of foreign banks is 4.29% only. The analysis confirms the strategic position of public sector banks in Indian banking sector.

The above analysis is further explained using figure no. 3.2.

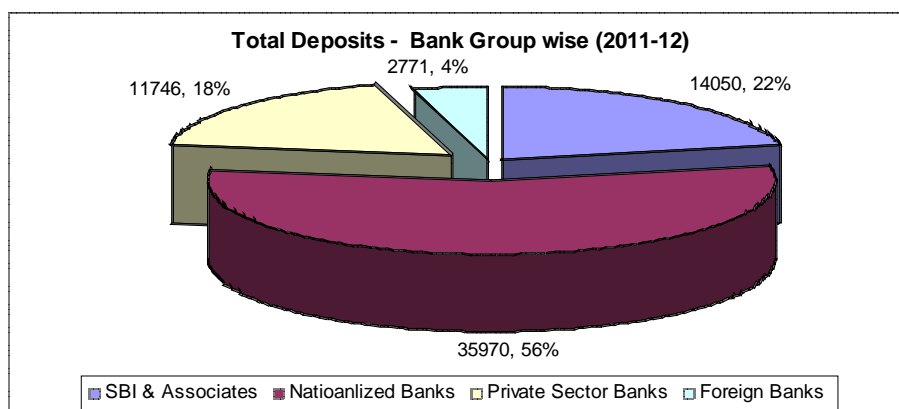


Figure 3.2. Share of different bank groups in total deposits (2011-12)

3.6.3. Share of bank groups in total loans and advances

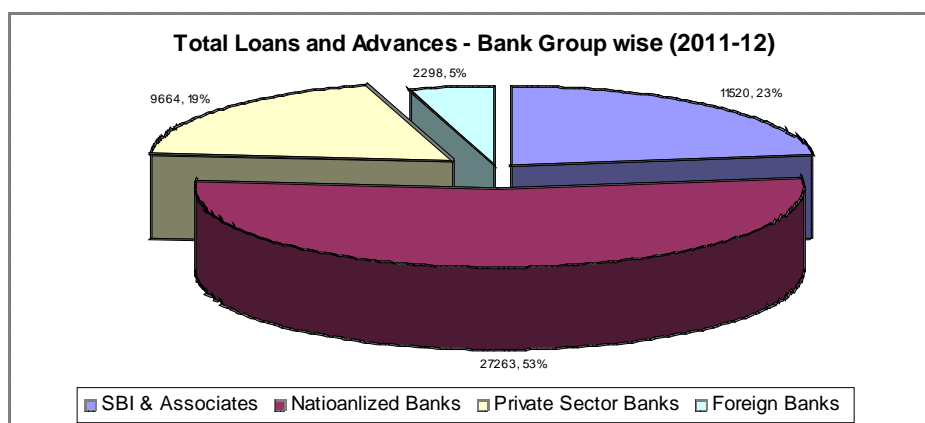
During 2011-12, Public sector banks hold 76.43% of total loans and advances of all SCBs. The share of SBI & Associates is 22.70% while Nationalized Banks hold 53.73% of total loans and advances. The share of private sector banks in total loans and advances is 19.04%, while the share of foreign banks is about 4.53%. Similar to the observed results on total deposits, the strategic position of public sector banks in total loans and advances is significant. Hence, it may be inferred from the analysis that a deterioration of asset quality of public sector banks will significantly influence the Indian banking sector. The details of total loans and advances of different bank groups is appended in table no. 3.8.

Table 3.8 Total Loans and Advances of bank groups (2011-12)

	Amount in ₹ Billion					
	SBI & Associates	Nationalized Banks	Public Sector Banks	Private Sector Banks	Foreign Banks	All SCBs
Loans and Advances	11,520	27,263	38,783	9,664	2,298	50,745
Bills Purchased and Discounted	888	1,419	2,307	357	257	2,921
Cash Credit, Overdraft etc	4,958	11,127	16,085	2,860	1,099	20,044
Term Loans	5,674	14,717	20,391	6,447	942	27,780
Percentage of Total *						
Loans and Advances	22.70	53.73	76.43	19.04	4.53	100.00
Bills Purchased and Discounted	30.40	48.58	78.98	12.22	8.80	100.00
Cash Credit, Overdraft etc	24.74	55.51	80.25	14.27	5.48	100.00
Term Loans	20.42	52.98	73.40	23.21	3.39	100.00

Source: Report on Trend and Progress of Banking in India 2011-12, p.55, RBI

* Data Analysis

**Figure 3.3 Total Loans and Advances of bank groups (2011-12)**

Details of other performance indicators including total capital, borrowings, total assets etc. during 2011-12 is detailed in Table No. 3.9

Table 3.9 Bank Group Wise Assets and Liabilities As at 31st March 2012**(Amounts in ₹ Billion)**

	SBI & Associates	Nationalized Banks	Public Sector Banks	Private Sector Banks	Foreign Banks	All Scheduled Commercial Banks
Number of reporting banks	6	20	26	20	41	87
Total Capital	11.53	170.96	182.50	47.83	406.31	636.64
Reserves and Surplus	1,060.96	2,312.31	3,373.27	1,545.12	531.07	5,449.46
Deposits	14,050.24	35,969.89	50,020.13	11,745.87	2,770.63	64,536.64
Borrowings	1,587.82	3,030.31	4,618.12	2,584.20	1,199.14	8,401.46
Total Liabilities	17,712.14	42,667.68	60,379.82	16,778.01	5,836.00	82,993.83
Cash and balances with RBI	790.59	2,331.45	2,799.92	705.56	231.69	3,737.17
Investments	4,173.22	10,867.54	15,040.76	5,269.82	2,004.88	22,305.47
Advances	11,519.91	27,263.21	38,783.12	9,664.18	2,298.49	50,745.79
Total Assets	17,712.14	42,667.68	60,379.82	16,778.01	5,836.00	82,993.83

Source: Statistical Tables Relating to Banks in India – Reserve Bank of India, 2012.

3.7. Movement of NPA variables

The movement of NPA variables is explained by comparing the changes during 2000-01, 2007-08 and 2011-12. The percentage of share of individual bank groups in total NPA is calculated. A percentage rate of change comparing the time periods selected is also made. The percentage rate of change is calculated using the equation

$$\text{Percentage Rate of Change} = ((V_{\text{present}} - V_{\text{past}}) \div V_{\text{past}}) \times 100$$

3.7.1. Gross NPA

Gross Non Performing Assets (GNPA) indicates an advance that is irrecoverable, for the bank has made provisions, and which is still in the bank's books of accounts. Many researches including Aggarwal, S and Mittal, P (2012) have briefed on the devastating role of the alarming level of gross NPA in Indian banking sector and attributed it mostly to the overhang component carried over from the previous years. The overhang component can be best explained using GNPA. GNPA is often referred as an indicator reflecting the quality of asset, where a higher GNPA indicates deterioration in asset quality and vice versa.

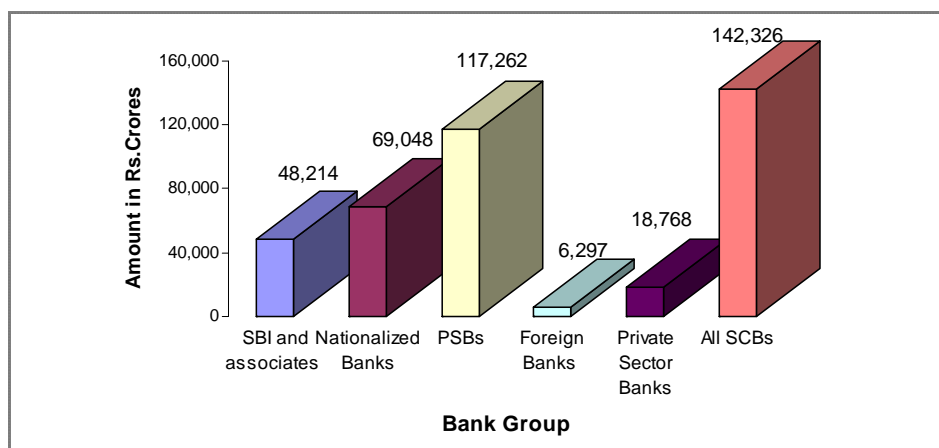
Table 3.10 GNPA of all SCBs in India (2006-07 & 2011-12)

	Amount in ₹ Million				GNPA/ Advances (2011-12)	Percent Rate of Change (2006-07 to 2011-12)
	2006-07	%	2011-12	%		
SBI and associates	126,769	25.20	482,144	33.88	4.60	280.33
Nationalized Banks	262,914	52.27	690,476	48.51	2.76	162.62
Public Sector Banks	389,684	77.47	1,172,620	82.39	3.30	200.92
Foreign Banks	22,336	4.44	62,966	4.42	2.68	181.90
Private Sector Banks	90,971	18.09	187,678	13.19	2.13	106.31
All Scheduled Commercial Banks	502,990	100.00	1,423,264	100.00	3.05	182.96

Source: Statistical Tables Relating to Banks in India (2006-07 and 2011-12)

GNPA of scheduled commercial banks in India was ₹636,091 million during 2000-01 and increased to ₹1423,264 million in 2011-12, a percentage increase of 123.75% from 2000-01. Analysis of GNPA during 2011-12 indicates significant contribution of nationalized banks i.e., 48.51% in total GNPA of all SCBs in India. The share of SBI & associates and private sector banks was 33.88% and 13.19% respectively. It may be inferred from table 3.10 that there exists a sharp increase in GNPA since 2007, from ₹502,990 million in

2006-07 to ₹1423,264 million in 2011-12, i.e., a percentage rate of change of 182.96% from 2006-07.



Source: Data Analysis

Figure 3.4 GNPA of all SCB in India - Bank GroupWise (2011-12)

The reasons for this upsurge are many and includes recessionary pressures and reduced cash flows of the corporate sector (Business Standard, 2012), continued slowdown of economy on the back of rising interest rate regime (The Economic Times, 2012), etc. The lax credit appraisal system during boom period also contributed to this dismal performance during the crisis period.

3.7.2. Net Non-Performing Assets (NNPA)

Net NPA is calculated by using the equation; $GNPA - (Balance\ in\ Interest\ Suspense\ account + DICGC/ECGC\ claims\ received\ and\ held\ pending\ adjustment + Part\ payment\ received\ and\ kept\ in\ suspense\ account + Total\ Provision\ held)$

The NNPA of all SCBs stood at ₹314,632 million during 2000-01, increased to ₹649,760 million during 2011-12, i.e., a change of 106.51%. In

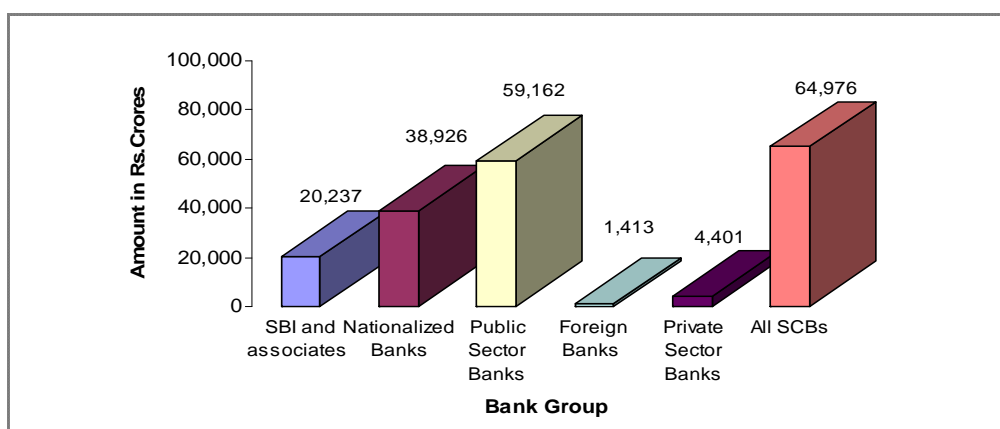
percentage terms, nationalized banks hold the highest percentage of NNPA of all SCBs, i.e., 59.91% during 2011-12, while SBI & associates and private sector banks were 31.14% and 6.77% respectively.

Table 3.11 Net NPA of all SCBs in India (2007 & 2012)

Bank Group	Amount in ₹ Million				NNPA/ Advances (2012)	Percent Rate of Change (2006-07 to 2011-12)
	2007	%	2012	%		
SBI and associates	63,593	31.47	202,366	31.14	1.93	218.22
Nationalized Banks	89,657	44.37	389,256	59.91	1.55	334.16
Public Sector Banks	153,250	75.84	591,622	91.05	1.67	286.05
Foreign Banks	9,136	4.52	14,126	2.17	0.16	54.62
Private Sector Banks	39,688	19.64	44,012	6.77	1.88	10.89
All Scheduled Commercial Banks	202,073	100.00	649,760	100.00	1.39	221.55

Source: Statistical Tables Relating to Banks in India (2006-07 and 2011-12)

A comparison of NNPA with total advances showed that SBI & associates possess highest percentage of the Net NPA ratio, i.e., 1.93%, followed by private sector banks (1.88%) and nationalized banks (1.55%). Their level of NNPA ratio is above the industry average, i.e., 1.39%. It is worthwhile to note that the NNPA growth rate of PSB is less compared to other banks during 2000-01 to 2006-07, but significantly increased thereafter. Lower levels of NNPA is contributed mainly by the higher levels of reductions to NPA, which further is the result of write off and up gradation of NPA accounts.



Source: Data Analysis

Figure 3.5 Net NPA of all SCBs in India (2007 & 2012)

3.7.3. Additions to NPA

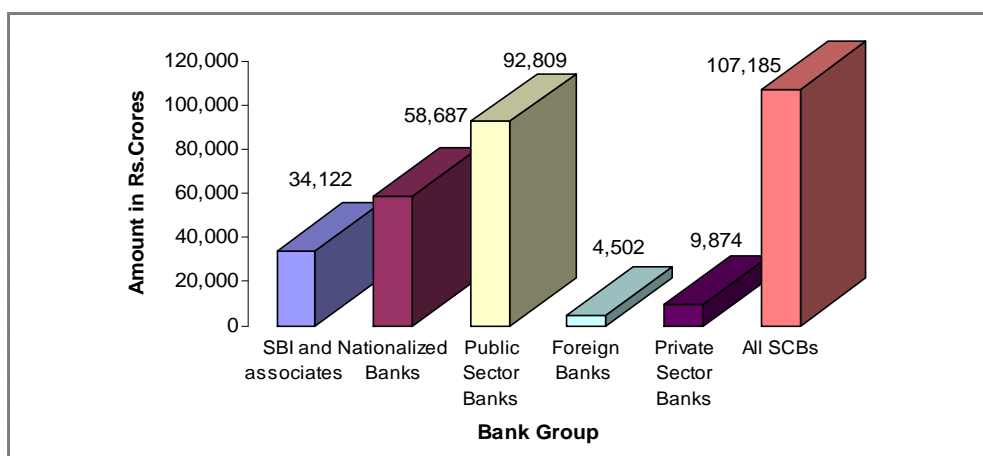
Additions to NPA indicate the fresh NPA generated every year. It highlights the efficiency of credit risk management particularly credit appraisal standards. Statistical data on additions to NPA showed efficiency in managing fresh NPA accounts till 2007. It is observed from the analysis that the growth of additions to NPA was marginal compared to growth of advances during 2000-01 to 2006-07. The trend reversed and considerable increase in additions to NPA is seen from 2007 onwards. The total additions to NPA was ₹190,558 million during 2000-01 and increased to ₹1071,845 million during 2011-12. In percentage terms, the share of nationalized banks accounted for 54.75% of total additions followed by SBI & associates, i.e., 31.83% during the year 2011-12.

Table 3.12 Additions to NPA of all SCBs in India (2006-07 & 2011-12)

Bank group	Amount in ₹ Million				Additions/ Advances (2012)	Percent Rate of Change (2006-07 to 2011-12)
	2007	%	2012	%		
SBI and associates	62,645	23.90	341,218	31.83	3.26	444.69
Nationalized Banks	133,501	50.93	586,868	54.75	2.34	339.60
Public Sector Banks	196,146	74.83	928,086	86.59	2.61	373.16
Foreign Banks	14,171	5.41	45,017	4.20	1.92	517.67
Private Sector Banks	51,798	19.76	98,742	9.21	1.12	90.63
All Scheduled Commercial Banks	262,114	100.00	1,071,845	100.00	2.30	308.92

Source: Statistical Tables Relating to Banks in India (2006-07 and 2011-12)

A significant observation from table 3.12 is the drastic increase in additions to NPA since 2007. The increase is significant for SBI & Associates, a percentage change of 444.68% in between 2006-07 and 2011-12.



Source: Data Analysis

Figure 3.6 Additions to NPA of all SCBs in India (2011-12)

Addition to NPA is unavoidable and occurs with growth in advances. Efficiency in managing NPA focuses on reducing the rate of additions to NPA.

During the year ended 31st March 2012, the additions to NPA as a percentage of advances were 3.26% for SBI & associates and 2.34% for nationalized banks, followed by foreign banks i.e., 1.92%, and private sector banks i.e. 1.12%. The results highlighted that asset quality of SBI & associates were significantly affected by the financial crisis, followed by nationalized banks.

3.7.4. Reductions to NPA

Reductions to NPA reflect the recovery from NPA accounts every year. Once an account becomes NPA, bankers emphasize its speedy recovery. In post-millennium period, banks prioritized recovery of NPA accounts as one of its key performance objectives. RBI stressed the need for prompt corrective action to manage the NPA and reduce NPA from a bank's balance sheet. Misra, BS (2011) explained that to evaluate bank's health and quality of assets, three important parameters should be considered (1) the fresh addition to NPAs in a particular year; (2) the reduction in NPA that year; and (3) the net addition/reduction after accounting for fresh slippages and reductions. The reduction in NPA during a year can come through recovery (cash recovered from past NPAs), up gradation (assets which had fallen into the NPA category and have started to pay off) and write-off (NPAs taken out from the balance sheet of the bank). The preferred mode of reduction would be recovery, up gradation and write-off, in that order. RBI (2002) has emphasized that from a policy perspective, it becomes imperative that a reduction in NPAs would require, both a 'stock' (a one-time cleansing of balance sheet) and 'flow' (preventing substantial accretion) solution.

Thus reduction to NPA is an important indicator that explains the success of the initiative taken by banks to recover NPA accounts. Banks in post-millennium period stressed more on the importance of recovery from NPA accounts. Contrary to additions to NPA, a higher reduction indicates the

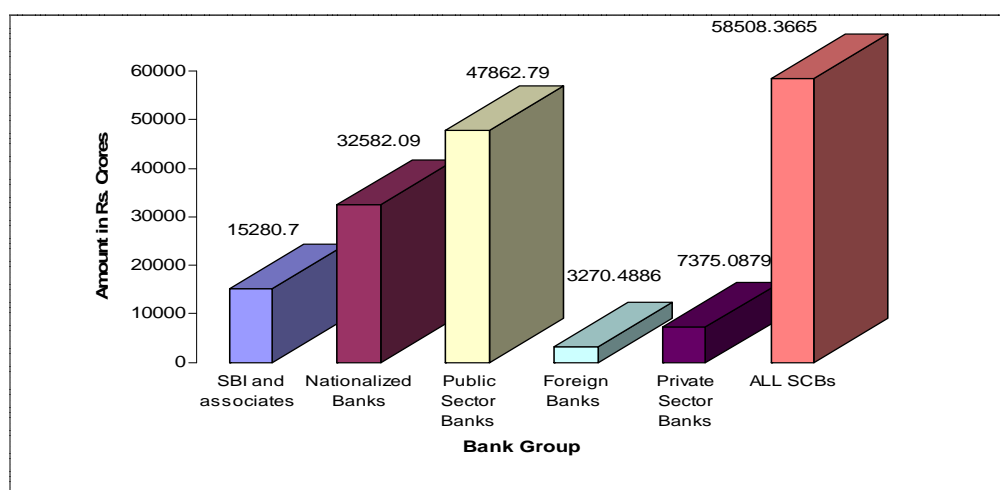
soundness of the recovery management mechanism of the bank, but if reduction is due to recovery of NPA accounts. The total reductions to NPA for the year ended 31st March 2001 was ₹155,895 million. The reduction was ₹262,448 million in 2006-07 and increased to ₹585,083 million in 2011-12. An increased trend is witnessed during the study period. In order to convert NPA accounts and improve asset quality, higher reductions to NPA is necessary. At times when the addition to NPA is significant, the banks concentrate on recovery of NPA accounts, in order to improve the asset quality and to manage NPA accounts. Regarding the relative share of different bank groups on total reductions to NPA of all SCBs, Nationalized Banks contributed a sizeable share of total reduction, i.e., 55.69%, followed by SBI & Associates, i.e., 26.12%. It may be remembered that these bank groups recorded higher additions to NPA also during the study period. The share of private sector banks and foreign banks in reductions to NPA were 5.59% and 12.61% respectively.

Table 3.13 Reductions to NPA – Bank GroupWise (2006-07 and 2011-12)

	Amount in ₹ Million				Percent Rate of Change (2006-07 to 2011-12)
	2007	%	2012	%	
SBI and associates	61,286	23.35	152,807	26.12	149.33
Nationalized Banks	158,758	60.49	325,820	55.69	105.23
Public Sector Banks	220,043	83.84	478,628	81.81	117.52
Foreign Banks	10,818	4.12	32,704	5.59	202.31
Private Sector Banks	31,585	12.03	73,750	12.61	133.50
All Scheduled Commercial Banks	262,448	100.00	585,083	100.00	122.93

Source: Statistical Tables Relating to Banks in India (2006-07 and 2011-12)

It may be observed from the analysis that the higher recoveries of NPA is mainly because of a variety of options available for banks to deal with NPA that includes SARFAESI Act, Debt Recovery Tribunals, Lok Adalats etc.



Source: Data Analysis

Figure 3.7 Total Reductions to NPA – Bank Group 2011-12

3.7.4.1. Reduction to NPA - Classification

The reductions to NPA results from (a) upgradation of NPA accounts, (b) write off of NPA accounts, and (c) recovery of NPA accounts. Table No.3.14 summarize the reductions to NPA classified into different modes of recovery. As may be observed from the analysis, there has been an increase in upgradation of NPA accounts during the study period 12.6% to 33.1%. While the recovery of NPA accounts has shown a declining trend. The analysis highlighted the fact that reduction of NPA accounts does not really means recovery of NPA accounts, but occurred mainly due to the up gradation and write off of NPA accounts. The trend highlights the weaknesses in the credit risk and recovery management system.

Table 3.14 Mode of Reductions to NPA – (2000-01 and 2011-12)

	Upgradation as % of reduction in NPAs	Write off as % of reduction in NPAs	Recovery as % of reduction in NPAs
2000-01	12.6	39.3	48.1
2001-02	12.0	49.4	38.7
2002-03	16.0	50.7	33.4
2003-04	12.3	48.3	39.4
2004-05	15.2	39.0	45.8
2005-06	15.2	40.2	44.6
2006-07	14.5	42.5	42.9
2007-08	17.4	40.7	41.8
2008-09	23.8	39.6	36.6
2009-10	21.3	50.2	28.4
2010-11	24.2	42.4	33.4
2011-12	31.7	33.4	34.9

Source: Chakrabarty (2013)

3.7.5. Provisions towards NPA

RBI requires banks to maintain a certain amount to account for future losses on loan defaults. Provision towards NPA reduces the profitability of banks. Banks (as strict as their criteria for issuing loans could be) assume that a certain percentage of loans will not pay up at all/not pay regularly. Banks hence provision for these losses earlier rather than when the loss occurs so that the losses if and when they occur still guarantee a bank's solvency and capitalization. The total provision towards NPA was ₹66,701 million during 2000-01 and increased to ₹381,466 million during 2011-12. The overall growth rate was 13.9% during the period. An analysis showed that 54.15% of total provision is held by nationalized banks, followed by SBI & associates, i.e., 36.47% during 2011-12. Foreign banks hold 0.11% of total provision, the lowest among the bank groups.

Table 3.15 Provision towards NPA 2006-07 and 2011-12

Bank Group	Amount in Rs, million				Percent Rate of Change (2006-07 to 2011-12)
	2007	%	2012	%	
SBI and its associates	17,838	22.07	139,136	36.47	680.00
Nationalized Banks	45,091	55.79	206,552	54.15	358.08
Public Sector Banks	62,930	77.86	345,688	90.62	449.32
Foreign Banks	3,712	4.59	406	0.11	-89.06
Private Sector Banks	14,178	17.54	35,371	9.27	149.48
All Scheduled Commercial Banks	80,821	100.00	381,466	100.00	371.99

Source: Statistical Table Relating to Banks in India – various issues.

From ₹17,838 million during 2006-07, the total provision of SBI & associates increased to ₹139,136 million during 2011-12, an increase of 679%. On the other hand, the total provision of nationalized banks increased from ₹45,091 million in 2006-07 to ₹206,552 million during 2011-12, i.e., a percentage change of 458%. Overall, the total provision increased from ₹80,821 million in 2006-07 to ₹381,466 million in 2011-12, a change of 371%. Inference based on analysis revealed an increase in provision towards NPA especially since 2007, contributing erosion of profitability of banks, particularly the PSBs in India.

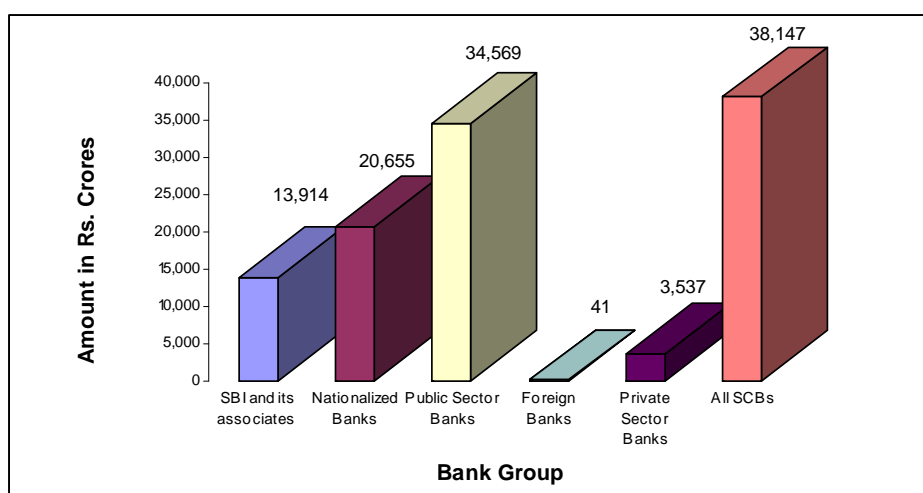


Figure 3.8 Provision towards NPA 2011-12

An evaluation of various NPA indicators during the study period, explained above, showed that even though the different bank groups managed to control their NPA during the initial periods, the NPA figures reported an upsurge during financial crisis. Experts in banking sector viewed this upsurge as the result of lax credit standards during the financial boom period.

3.8. Performance of State Bank of Travancore (2000-01 to 2011-12)

To analyze the performance of SBT, three major approaches were used (1). Ratio analysis of major growth indicators, (2). Growth rate of selected performance (financial performance and financial position) indicators, and. (3). Growth of NPA indicators.

3.8.1. Ratio Analysis of major performance indicators

The table no. 3.17 and 3.18 highlighted the movement of selected performance indicators of the bank during the study period. The major inferences based on the analysis are given below.

- During the study period, the cash to deposit ratio was highest during 2009 when it reached 9.26%. On an average, the bank maintained a cash to deposit ratio of 6.77%. During 2011-12, the cash to deposit ratio of other Kerala based banks were 4.95% (Federal Bank), 6.47% (Catholic Syrian Bank), 7.35% (Dhanalakshmi Bank) and 4.31% (South Indian Bank).
- The credit to deposit ratio, which is a major indicator of how much deposit is deployed in the form of credit, stood the highest during 2007, when it reached 80%. On an average, the bank maintained a credit to deposit ratio of 69.02%. During 2011-12, the credit to deposit ratio of other Kerala based banks were 77.15% (Federal

Bank), 72.26% (Catholic Syrian Bank), 74.19% (Dhanalakshmi Bank), and 74.74% (South Indian Bank).

- The average C+I to D ratio (Credit +Investment to Deposit Ratio) during the period was 108.37%. Among the Kerala based banks, only Federal banks registered a higher ratio than SBT, ie, 112.71%.
- About 36% of the total advances is directed to priority sector during the period. The highest share is recorded in 2008 when the priority sector advances were 41.73% of total advances.
- About 47.90% of total advances were term loans. The ratio of term loans to total advances was above 50% from 2007 onwards, except during 2012 when it declined to 47.90%.
- About 84.06% of total advances are secured advances during the period.
- The return on advances showed a declining trend during the period, but showed an increasing trend from 2007 onwards. On an average, the return on advances stood at 9.37% during 2000-01 to 2011-12.
- Profit per employee recorded the lowest rate in 2012, when it reached ₹0.42 lakhs.
- The capital adequacy ratio was 13.55% during 2011-12
- On an average, the ratio of net NPA to net advances stood at 1.54%. The ratio showed a declining trend from 2000-01, but recorded an increased from 2009-10 onwards.

A detailed analysis of selected performance indicators is given in table 3.16 and table 3.17 given below.

Table 3.16 Selected Ratio's of State Bank of Travancore 2000-01 to 2010-12

No		In percent											
		2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
1	Cash - Deposit Ratio	6.09	7.38	5.20	4.86	8.55	4.76	7.95	9.26	5.54	6.82	8.10	6.68
2	Credit - Deposit Ratio	55.28	55.24	57.58	56.45	61.53	72.57	80.00	79.59	77.81	75.59	79.17	77.44
3	Investment - Deposit Ratio	47.12	47.34	50.47	54.65	43.89	40.89	30.86	32.11	31.47	31.14	30.82	31.39
4	(Credit + Investment) - Deposit Ratio	102.40	102.59	108.06	111.10	105.42	113.46	110.86	111.70	109.28	106.73	110.00	108.83
5	Ratio of deposits to total liabilities	79.91	81.61	83.68	82.16	83.58	81.59	81.55	80.54	85.00	85.58	81.94	83.15
6	Ratio of priority sector advances to total advances	31.50	30.40	33.60	37.22	38.36	41.10	39.92	41.73	39.79	36.64	37.47	36.21
7	Ratio of term loans to total advances	24.12	27.37	33.53	37.65	44.10	47.86	52.08	51.22	51.45	54.95	54.10	47.90
8	Ratio of secured advances to total advances	86.45	82.36	87.10	86.67	83.26	85.98	87.12	84.57	80.29	79.82	81.53	83.62
9	Ratio of investments in non-approved securities to total investments	7.77	5.83	5.37	4.45	3.27	4.29	2.24	6.00	11.04	14.01	19.82	18.93
10	Ratio of interest income to total assets	9.77	9.39	8.92	8.09	7.60	7.57	8.11	8.39	8.83	8.05	8.02	8.70
11	Ratio of net interest income to total assets (Net Interest Margin)	2.94	2.74	2.94	3.18	3.39	3.15	3.25	2.34	2.75	2.57	2.60	2.33
12	Non-interest income to total assets	1.44	1.49	1.69	2.18	1.55	1.16	0.64	1.07	1.23	0.97	0.89	0.83
13	Ratio of intermediation cost to total assets	2.67	2.15	2.07	2.10	1.90	2.08	1.85	1.68	1.71	1.76	1.69	1.57

Source: Statistical Table Relating to Banks in India – various issues.

Table 3.17 Selected Ratio's of State Bank of Travancore 2000-01 to 2010-12

No	In percent											
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
14	1.23	0.67	0.38	-0.08	0.36	0.93	1.21	0.61	0.48	0.79	0.80	0.74
15	12.54	7.10	4.28	-1.01	4.69	12.24	14.95	7.23	5.49	9.77	9.95	8.52
16	1.71	2.07	2.56	3.26	3.03	2.22	2.03	1.73	2.26	1.79	1.80	1.59
17	0.67	0.73	0.90	1.02	0.86	0.86	0.86	0.89	1.30	1.26	1.12	0.65
18	20.56	21.50	25.66	29.68	24.05	21.02	22.26	23.28	30.64	26.88	23.09	13.93
19	72.07	92.59	4.00	0.56	1.37	0.34	0.18	0.45	1.06	0.34	3.68	1.01
20	8.19	8.00	6.81	5.54	4.76	4.89	4.96	6.11	6.21	5.58	5.57	6.20
21	10.77	9.87	9.51	8.55	7.79	7.90	8.62	9.84	10.43	9.47	9.53	10.45
22	11.84	11.50	10.06	8.80	8.58	8.47	8.75	7.27	6.98	6.59	6.80	6.83
23	157.32	178.78	217.68	271.78	346.25	381.19	506.13	558.65	657.75	696.00	888.00	106.60
24	0.85	1.06	1.51	2.16	2.21	2.34	2.96	3.40	5.36	6.00	8.00	0.42
25	11.79	12.54	11.30	11.36	11.05	11.15	11.68	13.53	14.03	13.74	12.54	13.55
26	7.75	5.72	3.06	1.39	1.81	1.47	1.08	0.94	0.58	0.91	0.98	1.54

Source: Statistical Table Relating to Banks in India – various issues.

3.8.2. Growth Rate (AAG) of Selected financial position indicators (2000-01 to 2010-12)

The growth of selected financial position indicators is explained in table no. 3.19.

Reserves and Surplus

A steady growth of reserves and surplus over the years is evident from the analysis. The overall growth indicated using AAG rate is 21.29% during the study period. Normally, reserves and surplus indicate the undistributed profit, hence, its growth indicates the growth of profitability of the bank.

Deposits

Deposit includes demand deposits, savings bank deposit and term deposits. The deposit provides funds for lending and investment. During the study period, the total deposit grew by an AAG rate of 18.09%. While the demand deposit grew by an AAG rate of 9.66%, the growth in saving bank deposits and term deposits was 18.88% and 18.26% respectively. In absolute terms, the total deposit grew from ₹115,727 million in 2000-01 to ₹714,6,98 million in 2011-12.

Borrowings

Banks borrow funds from other banks, the Reserve Bank of India and other financial institutions. The total borrowings of SBT grew significantly during the study period as may be observed from AAG rate of borrowings ie, 156.47% during the study period. In absolute terms, the borrowings increased from ₹378 million in 2000-01 to ₹76,073 million in 2011-12.

Investments

The total investment includes investment in government securities, other approved securities, shares, debentures and bonds, subsidiaries and other

investments. The total investment of the bank grew from ₹54,526 million in 2000-01 to ₹224,376 million in 2011-12, an AAG rate of 14.46% during the study period. The investment in government securities grew by an AAG rate of 13.37%, while investment in shares and debentures grew by an AAG rate of 16.91% and 41.20% respectively. In absolute terms, the growth of investment in government securities and debentures were significant.

Total Liabilities/Total Assets

Total liabilities/Total Assets of SBT increased from ₹144,826 million in 2000-01 to ₹859,493 million in 2011-12. The AAG rate of total liabilities/total assets is 17.31% during the study period.

Advances

The total advances of SBT grew from ₹63,975 million in 2000-01 to ₹553,460 million in 2011-12, an AAG rate of 21.82% during the study period. Based on type of loan, term loans recorded highest growth rate (AAG rate 30.42%), followed by bills purchased and discounted (AAG rate 21.40) and Cash credit, overdraft and loans (AAG rate 17.78). Based on security wise, secured loans recorded highest growth rate (AAG rate 25.15) followed by unsecured loans (AAG rate 23.13) and loans covered by government guarantees (AAG rate 9.77).

Interest earned

Interest earned from advances constitutes 78.73% of total interest income earned (based on 2011-12 results) and showed a growth rate of 16.36% during the study period. The total interest income earned on advances increased from ₹13,153 million in 2000-01 to ₹52,972 million during 2011-12.

Other Income

The other income of the bank increased from ₹1,942 million in 2000-01 to ₹6,483 million in 2011-12. Other income grew by an AAG rate of 16.69%

during the study period. The other income includes commission, exchange and brokerage income, profit from the sale of investment, miscellaneous income, etc.

Interest expense

Interest on borrowings constitute major cash outlay and reported an AAG rate of 15.10 during the study period. On an average 65% of total interest income is expenses for interest expenses (interest on borrowings). A notable feature of SCBs in India is the continuing importance of interest income. Banks abroad diversified their revenue portfolio's and reported higher growth rate of non-interest income in comparison to interest income. The total interest expended was ₹9,202 million in 2000-01 and increased to ₹49,984 million during the study period.

Net Interest Income

Net interest income increased from ₹3,951 million in 2000-01 to ₹18,304 million in 2011-12. The AAG rate of net interest income during the study period is 15.85%. On an average net income is reportedly 30% to 35% of total interest income during the study period.

Provisions and contingencies

Provisions and contingencies increased from ₹1,327 million in 2000-01 to ₹7,383 million in 2011-12. The AAG rate of provisions and contingencies during the study period is 22.711%. During the year ended 31st March 2012, the total provisions and contingencies was reportedly 40.33% of net interest income. A higher provisions and contingencies affect the income generating capacity of the bank.

Operating Profit

The operating profit of SBT increased from ₹2,302 million in 2000-01 to ₹12,488 million in 2011-12, an AAG rate of 18.82% during the study period.

During the year ended 31st March 2012, the operating profit was 18.28% of total interest income of the bank.

Net Profit for the year

The net profit (profit after tax) of the bank increased from ₹974 million during 2000-01 to ₹5,105 million during 2011-12, an AAG rate of 18.65% during the period. A further analysis indicates that total net profit constitute around 7.47% of interest income of the company.

Table 3.18 Growth Rate of Selected financial position indicators (2000-01 to 2011-12)

Assets and Liabilities	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	AAG
Capital	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Reserves and Surplus	20.55	20.11	30.09	23.39	18.67	20.89	7.66	31.88	26.85	22.32	11.80	21.29
Deposits	16.30	18.33	23.83	22.37	7.72	19.19	14.10	18.92	21.03	14.30	22.89	18.09
Borrowings	69.43	-24.31	458.98	-53.02	817.41	63.16	49.72	-71.65	302.37	76.19	32.84	156.43
Other liabilities & provisions	0.09	-1.01	32.13	12.91	-3.35	4.12	13.30	9.76	-43.12	46.29	-17.16	4.91
Cash in hand	38.36	-32.34	0.36	28.49	16.85	24.24	8.44	179.74	42.08	9.55	13.19	29.91
Balances with RBI	41.15	-15.63	16.35	119.09	-41.41	102.70	33.67	-34.04	49.64	38.41	0.50	28.22
Investments	16.86	26.15	34.08	-1.73	0.36	-10.05	18.73	16.55	19.75	13.14	25.16	14.46
Advances	16.23	23.34	21.39	33.38	27.06	31.38	13.52	16.26	17.58	19.72	20.20	21.82
Advances in India	16.23	23.34	21.39	33.38	27.06	31.38	13.52	16.26	17.58	19.72	20.20	21.82
Priority sectors	12.15	36.32	34.47	37.46	36.16	27.60	18.67	10.84	8.27	22.44	16.16	23.68
Public sectors	0.00	-27.98	25.85	45.44	8.52	10.54	-35.60	-28.02	128.24	-10.82	-3.54	11.26
Banks	0.00	—	361.41	-34.24	-94.75	41.24	-100.00	0.00	0.00	0.00	0.00	--
Fixed Assets	3.44	4.88	47.28	0.43	54.01	-2.60	3.65	3.23	18.21	9.15	9.91	13.78
Total Assets	13.88	15.40	26.11	20.29	10.35	19.24	15.53	12.68	20.21	19.38	21.10	17.65

Source: Statistical Table Relating to Banks in India – various issues.

Table 3.19 Growth Rate of Selected performance indicators (2000-01 to 2011-12)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	AAG
Interest Earned	10.53	8.98	9.81	15.43	14.45	23.22	21.25	20.06	6.18	19.43	30.60	16.36
Other Income	18.49	30.40	56.57	-13.07	-14.06	-36.79	97.72	30.62	-7.88	10.09	11.54	16.69
Total Income	11.56	11.91	17.26	9.37	9.63	15.27	26.81	21.26	4.47	18.42	28.69	15.88
Interest Expended	11.87	3.12	-0.48	5.27	20.80	26.42	45.83	14.69	4.84	18.63	41.49	17.50
Operating Expenses	-7.18	10.39	22.95	11.09	25.81	2.04	6.46	16.37	19.58	15.22	11.68	12.22
Net Interest Income	7.42	23.19	30.69	31.15	6.58	18.71	-15.57	33.98	9.17	21.13	7.92	15.85
Provi. & Contingencies	50.92	41.73	60.68	21.63	-25.18	-7.46	-15.93	38.84	-35.78	55.64	64.71	22.71
Operating Profit	39.54	41.63	54.02	14.44	-15.99	5.44	-0.19	48.96	-7.95	20.95	6.19	18.82
Profit (Loss)	24.04	41.46	42.98	1.04	4.67	26.14	18.34	57.42	12.57	6.35	-29.85	18.65

Source: Statistical Table Relating to Banks in India – various issues.

3.8.3. Movement of NPA variables

3.8.3.1. Gross NPA and Net NPA of SBT

A steady decline in Gross NPA and Net NPA is reported during post-millennium period until 2007. The recessionary pressures put excessive pressure on the quality of assets as indicated in the growth of NPA since 2007. The total Gross NPA was ₹7,579 million as at 31st March 2001 and reduced to ₹5,401 million on 31st March 2007. On 31st March 2012, the total Gross NPA is ₹14,887 million. Similar to the trend in Gross NPA, Net NPA also registered a declining trend in post-millennium period till 2007, from ₹4,959 million as at 31st March 2001 to ₹2,676 million in March 2007. On 31st March 2012, the total Net NPA is ₹8,535 million.

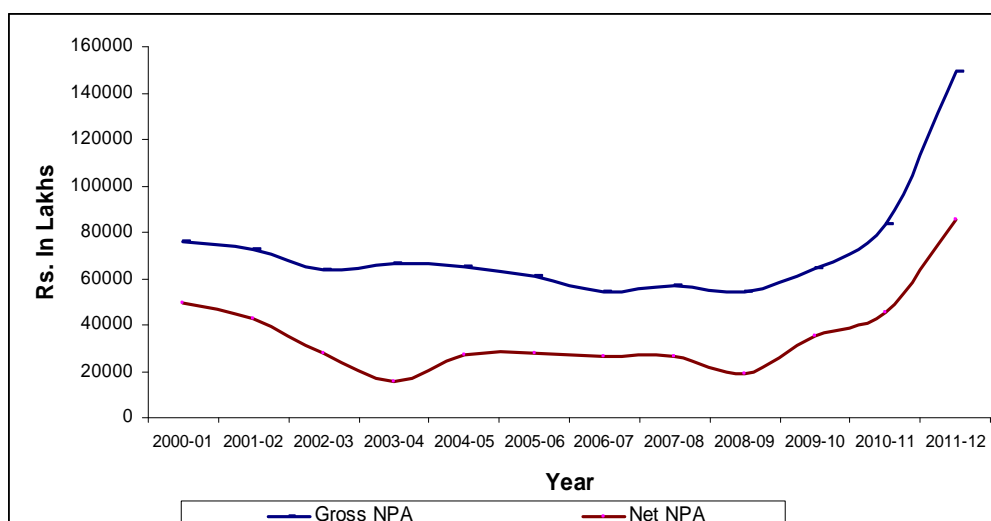


Figure 3.9 Gross NPA and Net NPA of SBT (2000-01 to 2011-12)

The analysis showed a moderate exponential growth rate of Gross NPA, ie, 2.53% during the study period, while the Net NPA reported a growth rate (EG value) of 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. Highlighting this significant relationship (F Value =63.751, Sig = 0.00), a regression equation is formulated as shown below.

$$\text{Net NPA} = 0.678 \text{ GNPA} \times (-13279.414)$$

3.8.3.2. Sector wise NPA

A sector wise analysis of the trend in the movement of NPA indicated that the increase of the NPA during the study period is mainly contributed by the 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 (comprised of agricultural sector, small scale sector and other priority sector) is 4.68, the contribution of non-priority sector increased by an AAG rate of 7.45% during the study period. The correlation study indicated that 90.5% of change in total NPA is contributed by the change in non-priority sector.

A regression study taking total NPA of SBT as dependent variable and non-priority sector NPA as an independent variable is done, to check the statistical significance of the relationship between the dependent and independent variable.

Table 3.20 Regression Analysis – Sector wise NPA

R	0.905
R Square	0.818
Adjusted R Square	0.798
F value	40.565
Sig	0.000

The regression study highlighted that NPA of the non priority sector is a statistically significant variable in explaining the movement of total NPA of State Bank of Travancore. Based on the analysis, the following regression equation is formed.

$$\text{Total NPA} = 0.833 \times (\text{non-priority sector NPA}) + 369.385.$$

3.8.3.3. Additions to NPA and Reductions to NPA

The total additions and reductions to NPA of SBT during 2000-01 was ₹2,563 million and ₹3,094 million respectively. Both indicators showed an increased trend and stood at ₹27,405 million and ₹20,869 million at the end of financial year 2011-12. A closer look on additions to NPA showed a declining trend since 2000-01 till 2005-06, thereafter registered considerable increase. A similar trend is observed on reductions to NPA during the study period. While the additions to NPA reported an exponential growth rate of 17.00% during 2000-01 to 2010-12, the growth was 12.5% with regard to reductions to NPA. It indicates accumulation of NPA particularly during the second half of the study period. A similar trend is observed when comparing the growth rate using AAG. The additions to NPA grew by 36.88%, while the reductions to NPA registered a growth rate of 32.77% during the study period.

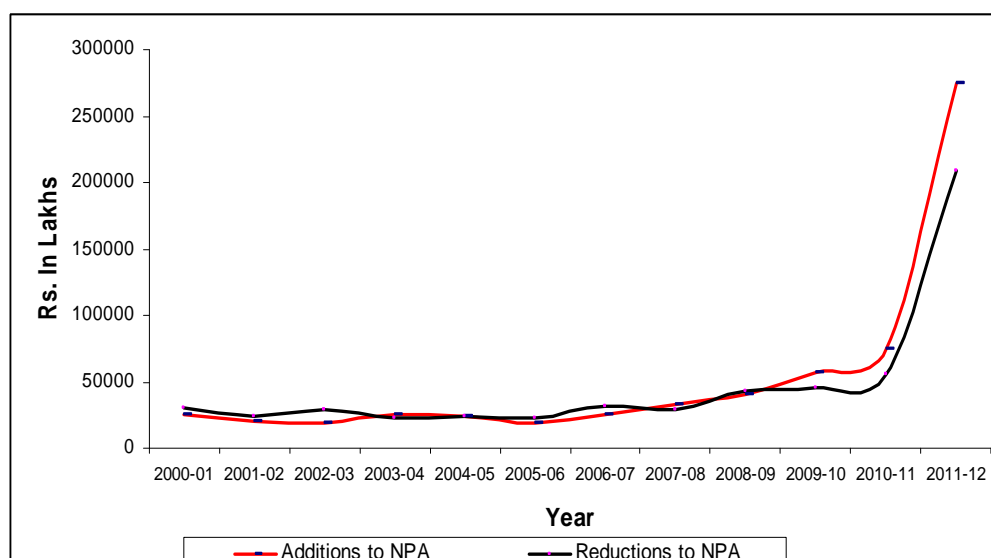


Figure 3.10 Additions to NPA and Reductions to NPA of SBT (2000-01 to 2011-12)

The figure no. 3.10 explains the movement of additions to NPA and reductions to NPA during the study period. As observed, both indicators registered similar movement. There exists a significant positive correlation ($r = 0.950$) between Additions to NPA and Reductions to NPA.

3.8.3.4. Provisions towards NPA

An increased trend is observed with regard to provisions towards NPA, i.e., an AAG rate of 39.21% during 2000-01 to 2011-12. The total provisions towards NPA was ₹935 million during 2000-01 and increased to ₹4,208 million during 2011-12. The provisions towards NPA and additions to NPA grew similarly, indicating that higher additions forces banks to increase their provisions towards NPA. Higher additions to NPA not only reduce the income generating capacity of banks, but also force the banks to provision from their current income.

3.8.3.5. Testing of Hypothesis

Is there any significant difference in the movement of NPA indicators of State Bank of Travancore with the different bank groups? In order to test the significance of differences in various NPA indicators of State Bank of Travancore with different bank groups, the following hypothesis is tested using Levene Statistic and One Way ANOVA.

H0: There exists no significant difference in the movement of NPA indicators of State Bank of Travancore with different bank groups in India.

H1: There exists a significant difference in the movement of NPA indicators of State Bank of Travancore with different bank groups in India.

Table 3.21 Hypothesis Testing

	Gross NPA	Net NPA	Additions to NPA	Reductions to NPA
Levene Stastic	8.045*	4.044*	8.099*	5.660*
Welch Statistic	51.873*	60.926*	18.723*	43.602*

Note: A single (*) asterisk indicates that the coefficients denote significant at 01% level of significance.

Based on Levene statistics, since the significance is less than 0.05, it is inferred that homogeneity of variances does not exist, hence Welch test is applied. Since the Welch statistic is significant with respect to all NPA indicators, it is inferred that there exist significant differences in movement of NPA indicators of State Bank of Travancore with different bank groups. A further post-hoc analysis revealed that the difference exists mainly between the bank and private sector and foreign banks.

3.9. Conclusion

The Indian banking sector has undergone significant transformations during post-liberalization period. Though, the measures taken showed significant improvement in the NPA management, the banking sector still holds sizeable NPA in their balance sheet. The recession pressures have put significant stress on the quality of the loan portfolio. The public sector banks hold more than 75% of total advances in Indian banking sector. Therefore, any deterioration in asset quality of public sector banks has significant impact on the performance of Indian banking sector.

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NON PERFORMING ASSETS – A THEORETICAL APPROACH

C o n t e n t s	4.1	Introduction
	4.2	Theoretical Perspective
	4.3	Classification of Loan Accounts
	4.4	Provisioning Norms for accounts classified as NPA
	4.5	Incidence of NPA
	4.6	Management of NPA
	4.7	Implications of NPA Account
	4.8	Conclusion

4.1. Introduction

The economic development of a country is accelerated by the efficient flow and allocation of financial resources, from surplus units to deficit units. The financial intermediation is necessary to shift funds for development activities. Many empirical studies have emphasized the importance of financial service sector development for the overall development of the economy (Koivu, 2002; Levine, 1997; Amaral and Quintin, 2007). Beck, T (2005), observed that financial sector development fosters economic growth and reduces poverty by widening and broadening the access to finance and allocating the society's savings more efficiently. The health of the financial sector is a matter of policy concern especially in developing countries where the failure of financial intermediation can critically disrupt the development process. Commercial banks are major constituents in the financial service sector. NPA poses a serious threat to the efficiency of the banking sector in allocating funds for development purposes. Rapid increase in NPA during the

last two decades resulted in the collapse of many banking institutions across the world. The significance of the NPA in banking sector crisis is stated in various national and international studies and expert committee reports (Narasimham Committee 1991, Verma Committee, 1998).

The transition from pre-liberalization period to post-liberalization period is characterized with a deviation from regulated to deregulated banking, not only in India but as well in various other transition economies including Turkey (Denizer, C. Dinc, M and Tarimcilar, M. 2000), Malaysia (Yee, C and Tan, E. 2009), etc. To mitigate the challenges of new world order and to improve the banking sector, many reformative measures have been introduced in Indian banking sector since 1991. Levine et al (1999) pointed out that the legal and accounting reforms that strengthened creditor rights, contract enforcement and accounting practices enhanced the financial development and accelerated the economic growth.

4.2. Theoretical Perspective

Lending is one of the principal functions of banks. Lending always carries a risk, usually known as credit risk, arises out of the inability of the borrower to satisfy their obligations to the financial institutions. The problem of bad loans (explained in banking terms as NPA) existed right from the days of Goldsmith banking in 17th Century England, where many Goldsmiths' failed because they could not fulfill their obligations due to non recovery of their loan amounts. The economic crises of many nations that were dominated by the banks in their financial structure began from the bad loans of banks.

According to Reserve Bank of India, an asset, including a leased asset, becomes non-performing when it ceases to generate income for the bank. In other words, NPA refers to a debt obligation where the borrower has not paid

any previously agreed upon interest and principal repayments to the designated lender for an extended period of time.

A ‘non-performing asset’ (NPA) is defined as a credit facility in respect of which the interest and/ or installment of principal has remained ‘past due’ for a specified period of time. The specified period was reduced in a phased manner as under:

Year ending March 31	Specified Period
1993	Four Quarters
1994	Three Quarters
1995 onwards	Two Quarters

With a view to move towards international best practices and to ensure greater transparency, it has been decided to adopt the ‘90 days’ overdue’ norm for identification of NPA, from the year ending March 31, 2004. Accordingly, with effect from March 31, 2004, a non-performing asset (NPA) is a loan or an advance where;

- i) Interest and/ or installment of principal remain overdue for a period of more than 90 days in respect of a term loan,
- ii) The account remains ‘out of order’, for a period of more than 90 days in respect of an Overdraft/Cash Credit (OD/CC),
- iii) The bill remains overdue for a period of more than 90 days in the case of bills purchased and discounted,
- iv) Interest and/or installment of principal remains overdue for two harvest seasons but for a period not exceeding two half years in the case of an advance granted for agricultural purposes, and
- v) Any amount to be received remains overdue for a period of more than 90 days in respect of other accounts.

(Source: RBI/2012-13/64 UBD.BPD.(PCB) MC No.3 /09.14.000/2012-13)

If any advance or credit facilities granted by banks to a borrower become non-performing, then the bank will have to treat all the advances/credit facilities granted to that borrower as non-performing without having any regard to the fact that there may still exist certain advances/credit facilities having performing status.

The Narasimham Committee (1991) identified NPA as one of the major causes/effects of the malfunctioning of banking institutions. The regulatory measures prior to 1990 which are often mentioned as “financial repression” (Roland, C. 2006) in nature resulted in lack of transparency and accountability and resulted in a rising burden of NPA (Reddy, 2002). The financial liberalization literature stressed that the removal of repressionist policies allowed the banking sector to better perform its functions of mobilizing savings and allocating capital what ultimately results in higher growth rates (Levine, 1997).

4.3. Classification of Loan Accounts

The assets (loans) are classified into;

- (i) Standard Assets
- (ii) Sub-standard Assets
- (iii) Doubtful Assets
- (iv) Loss Assets

The RBI guidelines direct commercial banks to classify the loan account into various categories taking into account the degree of well defined credit weaknesses and extent of dependence on collateral security for realization of dues.

4.3.1. Standard Assets

Standard Asset is one which does not disclose any problems and which does not carry more than normal risk attached to the business.

4.3.2. Sub-standard Assets

- (i) With effect from March 31, 2005 an asset is classified as substandard if it remained NPA for a period less than or equal to 12 months. In such case, the current net worth of the borrowers/ guarantors or the current market value of the security charged is not enough to ensure recovery of the dues to the banks in full. In other words, such assets have well defined credit weaknesses that jeopardize the liquidation of the debt and are characterized by the distinct possibility that the banks sustain some loss, if deficiencies are not corrected.
- (ii) An asset where the terms of the loan agreement regarding interest and principal have been re-negotiated or rescheduled after commencement of production is classified as substandard and remain in such category for at least 12 months of satisfactory performance under the re-negotiated or rescheduled terms. In other words, the classification of an asset should not be upgraded merely as a result of rescheduling, unless there is satisfactory compliance of the above mentioned conditions.

4.3.3. Doubtful Assets

An asset is classified as doubtful, if it had remained NPA for more than 12 months. A loan classified as doubtful has all the weaknesses inherent as that classified as substandard, with the added characteristic that the weaknesses make collection or liquidation in full, on the basis of currently known facts, conditions and values, is highly questionable and improbable.

4.3.4. Loss Assets

A loss asset is one where loss has been identified by the bank or internal or external auditors or by the Co-operation Department or by the Reserve

Bank of India inspection but the amount has not been written off, wholly or partly. In other words, such an asset is considered un-collectible and of such little value that its continuance as a bankable asset is not warranted although there may be some salvage or recovery value.

In respect of accounts where there are potential threats to recovery on account of erosion in the value of the security and existence of other factors such as, frauds committed by borrowers, it is not prudent for the banks to classify them first as sub-standard and then as doubtful after the expiry of 12 months from the date the account has become NPA. Such accounts are straight away classified as doubtful asset or loss asset as appropriate, irrespective of the period for which it has remained as NPA.

4.4. Provisioning Norms for accounts classified as NPA

RBI has directed banks to provide provisions in respect of NPA accounts on the basis of classification of assets into substandard, doubtful and loss assets. RBI states that the provisioning should be made taking into account the time lag between an account becoming doubtful of recovery, the realization of the security and the erosion over time in the value of security charged to the bank. The minimum amount of provision required to be made against a loan asset is different for different type of asset as follows;

4.4.1. Standard Asset

At present, no provision is required. However, banks are directed to provision a minimum of 0.25 percent against standard assets from the financial year ended 31st March 2000 onwards. In this regard, RBI clarified that;

- a) The general provision of 0.25 percent on standard assets is made on the global loan portfolio basis and not on domestic advances alone;

- b) The provisions towards standard assets need not be netted from gross advances but shown separately as “contingent provisions against standard assets” under “other liabilities and provisions-others” in Schedule V of the balance sheet; and
- c) Provisions for standard assets should not be reckoned for arriving at the net NPA.

4.4.2. Substandard Asset

A general provision of 10 percent of the total outstanding is required without making any further allowance for DICGC/ECGC guarantee cover and securities available against such advances.

4.4.3. Doubtful Assets

- a) A 100 percent is required of the extent to which the advance is not covered by the realizable value of the security to which the bank has a valid recourse. The realizable value is estimated on a realistic basis.
- b) With regard to the secured portion, provision is made at the rates ranging from 20 per cent to 100 per cent of the secured portion depending upon the period for which the asset has remained doubtful:

4.4.4. Loss Assets

- a) The entire assets is written off after obtaining necessary approval from the competent authority and as per the provisions of the Co-operative Societies Act/Rules. If the assets are permitted to remain on the books for any reason, 100 percent of the outstanding should be provided for.

- b) In respect of an asset identified as a loss asset, full provision at 100 percent should be made if the expected salvage value of the security is negligible.

The calculation of provision requirements can be determined by the following formula;

$$\text{Total provision} = [B-S (100-P)/100]*(1-C/100)$$

where;

- B Balance outstanding in NPA accounts.
S Realizable value of the security available.
P Percentage of provision required for the secured portion depending upon the age of doubtfulness of the account.
C Percentage of DICGC/ECGC cover available on total outstanding balance. Where limit for DICGC/ECGC cover is fixed, it should be converted into a percentage.

4.5. Incidence of NPA

NPA is considered as a major reason for bank failures (Estrella et al, 2000; Chijoriga MM, 2000; Ahmed et al, 2007). Santoni, A *et al* (2010) observed based on bank failures in US that the “real” component resulting from exposure to a high loans/assets ratio, combined with a heavy accumulation of NPA, is the main factor of ‘vulnerability’: 90% of the banks that failed in the U.S. in 2009 had a high level of NPA (over 4.7%). In India, enormous presence of NPA led to bank failures. Some banks exit to destiny (Ex: United Western Bank), while some other banks merged (Ex. Lord Krishna Bank) with other banks, since affected by high levels of NPA. Heffernan S (2000) pointed out that a firm is said to have failed if it is insolvent, that is, has a negative net worth. A bank is

deemed to have ‘failed’ if it is liquidated, merged with a healthy bank under government supervision, or rescued with state financial support.

Various reasons are cited for an account becoming NPA. In general, an asset becomes NPA when the borrower fails to repay the interest and/or principal on agreed terms. The reasons for NPA are classified differently; into the system and situational causes, (Istrate et al 2007) into overhang component and incremental component, (Poongavanam, S. 2000; Kumar, BS. 2005) into internal and external factors, (Misra and Dhal. 2010; Muniappan. 2002) into random and non-random factors, (Biswas and Deb, 2005) based on its effects (Islam, et al. 2005) into bank-specific business and institutional environment factors, (Boudriga et al, 2009) and into macro-economic (systematic) and debt and bank specific factors. (Louzis et al, 2012). The reasons classified into internal factors and external factors are more common in literatures.

Reddy, PK (2002) has listed the reasons for NPA into; (1) the legal impediments and time consuming nature of the asset disposal process, (2) the manipulation by the debtors and (3) the political tool - Directed Credit to SSI and Rural sectors. Shuklal, J and Bajpai, G (2010) classified the reasons for NPA into two components (1) the overhang component that is due to environmental reasons, business cycle etc. (2) the incremental component which is due to internal bank management, credit policy, terms of credit etc.

Biswas, PK and Deb, AT (2005) classified the reasons for NPA into random and non-random component. The random component which is stochastic in nature arises from the risk that the business confronts. These risks are translated into NPA through default. The nonrandom component arises when a loan is not paid even when it is possible for the borrower to repay it – a case of willful default.

Espinoza, R and Prasad, A (2010) emphasized that financial system shocks emanates from firm specific factors (idiosyncratic shocks) and from macroeconomic imbalances (systemic shocks). Fainstein, G (2011) classified reasons for NPA into macroeconomic, banking sector and also micro economic level variables. Gopalakrishnan, TV (2005) has classified the factors into political, economic, social and technological reasons. The economic causes are further classified in internal and external causes.

Further, Collins, NJ and Wanjau, K (2011) explained a direct relationship between interest rate and NPA. The interest rate spread affects the performance of loan portfolio as it increases the cost of loans charged to the borrowers. Sergio (1996) observed that an increase in risks of loan assets is rooted in the banks lending policy adducing to relative unselective and inadequate assessment of sectoral prospects. Giovanniz and Grimardx (2002) found that the bank specific indicators such as asset growth, the ratio of net worth to net assets, the ratio of operating costs of assets, exposure to personal loans and institutional characteristics such as credit growth, reserve adequacy and monetary expansion are major reasons for NPA of banks.

Muniappan, G (2002) classified the causes of NPA into several internal and external factors confronting the borrowers. The internal factors are diversion of funds for expansion/ diversification/modernization, taking up new projects, helping/promoting associate concerns, time/cost overruns during the project implementation stage, business (product, marketing, etc.) failure, inefficient management, strained labor relations, inappropriate technology/ technical problems, product obsolescence, etc., while external factors are recession, non-payment in other countries, inputs/power shortage, price escalation, accidents and natural calamities.

Raul, R.K and Ahmed, J.U (2005) observed that the banks since nationalization have diverted their attention from “class banking” to “mass banking” with little emphasis on profit element. But many problems cropped up such as inter-regional inequality in banks’ operations, non-recovery of loans, willful default, political interference, deterioration of customer services, red-tapism, neglect in the supervision of end use of credit, declining efficiency and profitability. All these factors adversely affected the quality of loan portfolio, thereby resulted in NPA.

Bhole, LM and Mahakud, J (2009) has noted that the high level of NPA in India is attributed to the following factors: (a) Diversion of funds, (b) Demand Recession, (c) Industrial Sickness, (d) Improper and Inadequate credit appraisal, (e) Poor post-loan supervision and follow-up, (f) Political compulsions and corruption, (g) The slow and inefficient legal system, (h) Moral degradation and the ethical deficit which afflict social fiber and value system, (i) The inefficient management, strained labor relations, product obsolescence etc, of the borrowing entity, (j) Time/Cost overrun during the project implementation stage, (k) Adverse changes in government policies such as excise duties, pollution control orders, and so on.

4.5.1. Internal factors

Diversion of funds is reported as a major reason for the NPA. Funds are diverted for purposes other than for its original purpose. Jain, V (2007) listed this as a major cause for NPA and observed that the diversion of funds occurs mostly for expansion, diversification/modernization/new projects of business or for promoting associate concerns. Bankers in a workshop conducted by Orissa Industries Federation (2002) have blamed diversion of funds as the major factor creating industrial sickness, thereby NPA. Even though various measures were

initiated to assure the utilization of funds for the purpose it is granted, the problem still persists and contribute to the generation of NPA in Indian banking sector.

The other major culprits for higher levels of NPA are willful default, mismanagement and lack of planning. Public money obtained from banks has been systematically siphoned away from the industries. Pandey and Kaur (2012) observed that the willful default is non-payment of dues despite having adequate cash flow and net worth, Signs of siphoning of funds by the borrower, falsification of records, disposal of securities without bank's approval, fraudulent practices etc., point out a default situation. Islam, MS *et al* (2005) noted the presence of willful default as a major reason for the NPA. Researches on NPA including Moni, M and Misra, S (2009) and Pathak, B.V (2009) also indicated the significance of willful default towards the incidence of NPA and stated the requirements for stringent legal measures like SARFAESI Act to mitigate the effects. In India, according to Reserve Bank of India (RBI) guidelines, a willful defaulter is a person or entity that has "defaulted in meeting its payment/repayment obligations to the lender even when it has the capacity to honor the said obligations". Any entity that has not utilized the money borrowed for the specific purpose for which it was raised from the lender and diverted it to other use is also a willful defaulter. Besides, an entity that has siphoned off funds, or has removed the fixed assets or property given by it for the purpose of securing a term loan without the knowledge of the lender, can be classified as a willful defaulter. RBI and banks initiated various measures to curtail the willful default in the banking sector.

The RBI, in consultation with the Central Government, constituted a Working Group on Willful Defaulters (WGWD) with Shri Kohli as Chairman.

Based on their recommendations, a default would be deemed to have occurred if any of the following events is noted;

- a) The unit has defaulted in meetings is payment/repayment obligations to the lender even when it has the capacity to honor such obligations.
- b) The unit has defaulted in meeting its payment/repayment obligations to the lender and has not utilized the finance from the lender for the specific purposes for which finance was availed, diverting the funds instead to other purposes, and
- c) Banks and FIs are required to form a committee of higher functionaries headed by the executive director for classification of accounts as willful defaulters and create the redressal mechanism in the form of a committee headed by the Chairman and Managing Director for giving a hearing to the borrowers who have grievances on their classification as ‘willful defaulters’. It has been pointed out that redressal of grievances after the event is not fair in view of the damage to the reputation that cannot be easily reversed. Therefore, an opportunity is provided to the defaulter to be heard before being declared as such.

Anup Roy, A and Rebello, J (2011) mentioned that according to RBI's norms, promoters of firms where banks and financial institutions have identified instances of funds being diverted, misrepresentation, falsification of accounts and fraudulent transactions are barred from institutional finance from banks and financial institutions for floating new ventures for five years. The Financial Express (2008) on Indian banking system shared the banker's view that a significant rise in default cases has led to a surge in the level of NPA in the banking sector. It was mentioned that the legal system to manage NPA is

not only archaic but also ambiguous and needs to reform to bring down NPA in the banking sector.

Misra, BM and Dhal, S (2010) explained that apart from the business cycle, the terms of credit variables play an important role with statistically significant effects on the banks' NPA in the presence of bank size induced risk preferences and macroeconomic shocks. The changes in the cost of credit in terms of higher interest rate induce rise in the NPA. As well, factors like maturity of credit, better credit culture and favorable macroeconomic and business conditions lead to lowering of the NPA. The business cycle has differential implications adducing to differential response of borrowers and lenders.

Studies have indicated the significance of credit culture assessed through lending standards, collaterals, etc in generating NPA of banks. McGoven (1993) observed that relaxed credit standards, unguaranteed credits etc cause NPA. Borbora (2007) indicated that a major cause for NPA is fixation of unrealistic repayment schedule. Repayment schedule may be fixed taking into account gestation or moratorium period, harvesting season, income generation, surplus available etc. If the repayment schedule is defective both with reference to quantum of installment and the period of recovery, assets have a tendency to become NPA. Ahmed JU (2010) cited the following reasons for an increase in NPA of commercial banks. It includes (1) Poor credit appraisal system, (2) Lack of vision/foresightedness while sanctioning/reviewing or enhancing credit limits, (3) Lack of proper monitoring, (4) Reckless advances to achieve budgetary targets, (5) Lack of sincere corporate culture, (6) Inadequate legal provisions on foreclosure and bankruptcy, (7) Change in economic policies/environment at macro level, (8) Non-transparent accounting policy

and poor auditing practices, (9) Lack of coordination between banks and their customers, and (10) Directed/Schematic lending to certain sectors.

Reddy, CS and Kalavathi, V (2004) quoted the comments of RBI study group on causes for NPA. It includes (1) diversion of funds, mostly for expansion/diversification of business or for promoting associate concern, (2) factors internal to business like product/marketing failure, inefficient management, inappropriate technology, labor unrest etc, (3) changes in macro environment like recession, infrastructural bottlenecks etc., (4) time/cost over runs during project implementation, (5) changes in government policies (6) deficiencies like delay in release of sanctioned funds by banks. Bloem and Gorter (2001) explained that the major cause for NPA is ‘wrong economic decisions’ by individuals and plain bad luck (inclement weather, unexpected price changes for certain products etc).

Rehman (2000) pointed out that that bank managers tend to be more influenced by the social structure of borrowers on the assumption that affluent citizens are likely to be more creditworthy and hence can be relied upon to repay their loans.

Some of the important reasons for NPA, mentioned in various literatures are summarized below;

- a) Willful defaults, siphoning of funds, fraud, disputes, management disputes, mismanagement, misappropriation of funds etc.,
- b) Lack of proper pre-appraisal and follow up.
- c) Improper selection of borrowers/activities.
- d) Inadequate working capital leading to operational issues. Under financing/untimely financing.

- e) Delay in completing the project.
- f) Non-compliance of sanction terms and conditions.
- g) Poor debt management by the borrower, leading to financial crisis.
- h) Excess capacities created on non-economic costs.
- i) Inability of the corporate to raise capital through the issue of equity or other debt instrument from capital markets.
- j) Business failures.
- k) Failures to identify problems in advance.
- l) Diversion of funds for expansion\modernization\setting up new projects\ helping or promoting sister concerns.
- m) Deficiencies on the part of the banks viz. In credit appraisal, monitoring and follow-ups, delay in the settlement of payments\ subsidiaries by government bodies etc.,
- n) Time involved in the legal process and realization of securities.

These are the major internal factors leading to poor asset quality and non performing assets.

4.5.2. External factors

The external factors indicate factors beyond the control of the borrower, created by economic, political, legal, technological and social systems existing in the country. The major external factors cited in various researches include;

- 1) Sluggish legal system -
 - a) Long legal tangles
 - b) Changes that had taken place in labor laws
 - c) Lack of sincere effort.

- 2) Scarcity of raw material, power and other resources.
- 3) Industrial recession.
- 4) Shortage of raw material, raw material\input price escalation, power shortage, industrial recession, excess capacity, natural calamities like floods, accidents.
- 5) Failures, non payment over dues in other countries, recession in other countries, externalization problems, adverse exchange rates etc.
- 6) Government policies like excise duty changes, Import duty changes etc.,

In addition to the above studies have mentioned other external factors that includes; (a) the failure in planning and organizing (mismanagement, lack of proper planning, (b) failure to bring required capital, (c) poor credit allocation, (d) heavy borrowing, too ambitious project, (e) cost escalations (unwanted expenses, imbalances of inventories, improper working capital management, diversion of funds) and (f) poor product management (lack of proper planning, dependence of single customers, poor quality management).

4.6. Management of NPA

In its annual report (2010) RBI noted that “management of NPA remains an area of concern, particularly, due to the likelihood of deterioration of the quality of restructured advances”. Murinde, V and Yaseen, H (2004) on management of NPA made it clear that the traditional approaches to bank regulation is not conducive for management of NPA. These approaches emphasized the view that the existence of capital adequacy regulation plays a crucial role in the long-term financing and solvency position of banks, especially in helping the banks to avoid bankruptcies and their negative externalities on the financial system. In general, capital or net worth serves as a buffer against losses

and hence failure. Rather than accommodating measures to combat the NPA issues, the traditional measures tried to protect the interests of deposits through maintaining adequate capital in liquid form. This has impacted the availability of funds for productive purpose, since banks were not able to lend it but are required to keep the fund as reserves.

Management of NPA is essential for bank's survival and growth. Credit risk is inherent in banking. It should be controlled through prudent risk management mechanisms, credit appraisal and follow-up. RBI has noted an improvement in NPA management process (annual report 2005-06), since banks in India have been able to contain their NPA to just two percent to their net advances in spite of adopting 90 days delinquency norms. The reasons put forward for this efficiency includes (1) The use of treasury by banks. (2) Recovery management measures significantly strengthened the lenders ability to enforce its right to collateral under the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002. (3) The corporate debt restructuring (CDR) system has also emerged as a time bound and transparent mechanism for arriving at a consensual financial arrangement between the creditor and the borrower. (4) The Credit Information Companies Act 2005 enables sharing of credit information which helps in reducing transactional costs of banks in extending credit to small and medium borrowers which again translates into lower NPA.

Measures to mitigate credit risk normally comprise clearly defined policies that express the bank's credit risk management philosophy and the parameters within which credit risk is to be controlled. Ideally a starting point for improving the prudential efficiency of monitoring of the banking system in the region must involve the identification of credit crunch.

Strengthening the financial systems has been one of the central issues facing emerging markets and developing economies. This is because of the fact that a sound financial systems serve as an important channel for achieving economic growth through the mobilization of financial savings, putting them to productive use and transforming various risks. Borbora, RR (2007) emphasized that the essential components of sound NPA management are i) quick identification of NPA, ii) their containment at a minimum level and iii) ensuring minimum impact of NPA on the financials. Panta, R (2007) noted that all kinds of lending involves three stages where discretion needs to be exercised (a) Evaluation and assessment of the proposal (b) Timely monitoring and evaluation and (c) Proper assessment of exit decision and modality.

Many authors have noted the importance to apply reasoning while exercising lending activity. Panta, R (2007) mentioned that mostly banks apply rule based approach that precludes reasonable application of mind. Evaluation of project idea and the management is something that most of the banks are least equipped for. This has lead to the bank acting too liberal on all projects insisting on collaterals without taking into consideration any other competencies of the project and the entrepreneur's capability. Further constant monitoring of major economic indicators which bears direct impact on the business is a must.

To manage NPA effectively, both proactive and curative measures are required. Proactive measures implies efficient loan appraisal and its management, while curative measures focus on realizing NPA accounts using minimum possible efforts. At the pre-disbursement stage, appraisal techniques of bank need to be sharpened. All technical, economic, commercial, organizational and financial aspects of the project need to be assessed realistically. Bankers should satisfy themselves that the project is technically feasible with reference to

technical know how, scale of production etc. The project should be commercially feasible and all background linkages by way of availability of raw materials at competitive rates and that all forward linkages by way of assured market are available. It should be ensured that the various assumptions mentioned in project report are realistic/achievable. Some projects are born sick because of unrealistic planning, inadequate appraisal and faulty implementation.

As the initiative to sanction or reject the project proposal is with the banker, the banker can exercise his judgment judiciously. The banker should at the pre-sanction stage not only appraise the project but also the promoter – the promoter's character and capacity. It is said that it is more prudent to sanction a 'B' class project with an 'A' class entrepreneur than vice-versa. The banker has to ensure that the borrower complies with all the terms of sanction before disbursement. At the post-disbursement stage, bankers should ensure that the advance does not become an NPA by proper follow-up and supervision to ensure both assets creation and asset utilization. Bankers can do either off-site surveillance or on site inspection to detect whether the unit / project is likely to become NPA. Instead of waiting for the mandatory period before classifying an asset as NPA, the banker should look for early warning signals of NPA.

NPA Management measures can be broadly classified into (1) Non-legal measures, and (2) Legal measures. The various measures under these two heads are detailed below;

4.6.1. Non – Legal measures

- 1) Preparation of 'know-your client' profile.
- 2) Reminder system
- 3) Seasonal/ Area based recovery drive

- 4) Follow up of Potential NPA
- 5) Review of NPA account
- 6) Preparation of village wise /Area wise list
- 7) Visit to Borrower's business premise/Residence
- 8) Allotment of NPA account to staff
- 9) Recovery camps/Settlement camp
- 10) Road shows
- 11) Appointment of professional Recovery Agents.
- 12) Rehabilitation of sick units
- 13) Corporate debt Restructuring
- 14) Lok adalat /lok nayalaya
- 15) Circulation of list of defaulters
- 16) Recalling of advances
- 17) Recovery through Recovery Branches
- 18) Up gradation of NPA
- 19) Cash Recovery
- 20) Recovery through compromise cases
- 21) Revival of failed compromise cases
- 22) Recovery of written-off cases
- 23) Restructuring / Rescheduling
- 24) Sale of financial Assets (Asset Reconstruction companies)
- 25) Write-off
- 26) Credit Rating System
- 27) Identification of watch-list/special category accounts
- 28) Measuring of early warning signals.

4.6.2. Legal Measures

- 1) Recovery through Judicial process (Filing of suit)
- 2) Execution of decreed cases
- 3) Debt Recovery Tribunals (DRT)
- 4) Securitization and Reconstruction of Financial assets and Enforceability of security interest Act 2002 (SARFAESI)
- 5) Other legal measures

Financial system liberalization need not bring operational efficiency. It calls for efficient and effective regulatory and non-regulatory measures to mitigate the challenges posed by globalization and financial sector liberalization. Hsiao et al (2010) observed that the banking system in many developing countries exhibited poor performance after liberalization. As rightly pointed by Bossone and Promisel (2010), financial sector reforms require not only setting rules, articulating standards, approving legislation and creating new institutions, but also a change in behavior of financial institutions. Thus NPA management requires a change in behavior of bankers towards loan portfolio in addition to the vast number of proactive and reactive measures to manage NPA.

4.7. Implications of NPA Accounts

Sethi, J and Bhatia, N (2007) on the implications of NPA accounts mentioned that Banks cannot credit income to their profit and loss account to the debit of loan account unless recovery thereof takes place. Interest or other charges already debited but not recovered have to be provided for and provision on the amount of NPA also to be made. All the loan accounts of the borrower would be treated as NPA, if one account is NPA. Many authors emphasized the straddling impact of NPA and stressed its impact on loan growth. A higher NPA force banks to invest in risk-free investments, thus

directly affect the flow of funds for productive purpose. (Tracey and Leon, 2011; Heid and Kruger, 2011 and O'Brien, 1992)

Bloem and Goter (2001) remarked that issues relating to NPA affect all sectors (in particular if parallel issues with defaulting trade credit is also considered). The most serious impact, however, is on the financial institutions, which tend to own large portfolios, indirectly; the customers of these financial intermediaries are also implicated; deposit holders, shareholders and so forth. Add to this, NPA is not only affecting the banks and its intermediaries, it has an impact on the development of the nation as well. For a bank, NPA means unsettled loan, for which they have to incur financial losses. The cost for recovering NPA is a loss for the bank.

Karunakar, M et al (2008) explained that NPA results in deleterious impact on the return on assets. It happens in the following ways;

- a) The interest income of banks will fall and it is to be accounted only on receipt basis.
- b) Banks profitability is affected adversely because of the provision for doubtful debts and consequent write off as bad debts.
- c) Return on Investment (ROI) is reduced.
- d) The capital adequacy ratio is disturbed as NPAS are entering into the calculation.
- e) The cost of capital will go up.
- f) The assets and liability mismatch will widen.
- g) The economic value additions (EVA) by banks gets upset because EVA is equal to the net operating profit minus cost of capital, and
- h) It limits recycling of the funds.

To sum up, the following are major implications on an NPA accounts.

- 1.) The NPA is the result of failure to repay principal and/or interest as per agreed terms between the bank and the client. Failure to receive interest will affect the profitability of the bank. Failure to receive the principal affects the availability of funds for further lending.
- 2.) Interest income cannot be booked on the loan declared as an NPA, and hence profit is affected. In addition, provisioning against assets creates further losses. Thus, financial institutions have a tendency to rollover non- performing loans. The borrower is given more loans to pay interest on past loans and repay whatever amount is possible.
- 3.) Banks redistribute losses to other borrowers by charging higher interest rates. Lower deposit rates and higher lending rates repress savings and financial markets, which hampers economic growth.
- 4.) Non performing loans represent bad investments. NPA misallocate credit from good projects, which do not receive funding, to failed projects. Bad investment ends up in misallocation of capital and, by extension, labor and natural resources. The economy performs below its production potential.
- 5.) Non performing loans may spill over the banking system and contract the money stock, which may lead to economic contraction.

These spillover effects can channel through illiquidity or bank insolvency;

- (a) When many borrowers fail to pay interest, banks may experience liquidity shortages .These shortages can jam payments across the country.

- (b) Illiquidity constraints bank in paying depositors.
- (c) Undercapitalized banks exceed the banks' capital base.

4.8. Conclusion

The non-performing assets have a direct impact on the profitability, productivity, liquidity and equity of banks and finally influence the outlook of the banks towards credit delivery and credit expansion. Many factors contributed to increase in NPA. Since 1991, many measures were initiated to improve the credit management process and recovery of NPA accounts. NPA being an important parameter for assessing financial performance of banks, should be managed in order to improve the quality of the asset portfolio of banks. The financial crisis that erupted worldwide have impacted the quality of asset portfolio and resulted higher NPA. The increase in NPA since 2007-08 is an area of concern for regulatory authorities and commercial banks. It hence requires a detailed analysis of NPA in the post millennium period to assess the trend in the movement of NPA and a critical evaluation based on expert feedback to critically analyze whether the NPA management is effective in Indian scheduled commercial banks.

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NON PERFORMING ASSETS IN INDIAN BANKING SECTOR

C o n t e n t s	5.1 Introduction
	5.2 Objective No. 1
	5.3 Objective No. 2
	5.4 Macroeconomic variables and bank group NPA
	5.5 Conclusion

5.1. Introduction

After having examined the theoretical framework on NPA and Indian banking sector, the present chapter elucidates the trend in the movement of NPA of Indian Public Sector Banks (PSBs) during post-millennium period. In addition to explaining the trend in the movement of the NPA, the chapter describes the moderating relationship of selected bank performance indicators on the relationship between advances and NPA of banks. The mediating role of selected macroeconomic variables on the relationship between NPA and advances of banks is also emphasized. While explaining the trend in the movement of NPA, an attempt is made to evaluate the effect of global financial crisis on the asset quality of banks in India. In order to establish the relative efficiency of the different bank groups in managing the NPA notably the PSBs, the analysis is done bank group wise based on ownership.

The analysis employed various statistical tools and techniques, that includes; (1) Exponential Growth Rate (EG value) - to explain the growth /decline of NPA variables, (2) Karl Pearson's correlation coefficient (r) – to

study the strength of relationship on movement of NPA variables among different bank groups, (3) Regression equation - to establish the relationship between various performance indicators and NPA, (4) Welch test, One way ANOVA and Levene Statistic - to test the various hypotheses employed in the research, (5) ANOVA with interaction effect – to study the statistical significance of the moderating role of selected bank performance indicators on the relationship between advances and NPA, and (6) Sobel test – to study the statistical significance of mediating role of selected macroeconomic variables on the relationship between advances and NPA.

5.2. Objective No. 1

To analyze the trend of the NPA in Public Sector Banks in India vis-à-vis State Bank of Travancore.

The trend in the movement of NPA of State Bank of Travancore is already explained in chapter three. Hence, the emphasis in this section is to critically analyze the trend in the movement of NPA of PSBs and to compare it with other bank groups.

5.2.1. Variables Used

The trend in the movement of the NPA is explained using the following variables.

Table 5.1 Variables Used

Variables	
1	Gross Non Performing Assets (Gross NPA)
2	Net Non Performing Assets (Net NPA)
3	Additions to NPA (Fresh NPA)
4	Reductions to NPA
5	Provision towards NPA
6	Net Additions to NPA
7	NPA Generation Rate

5.2.2. Gross Non Performing Assets (Gross NPA)

The gross NPA of PSBs showed a reduced trend during 2000-01 to 2006-07, but witnessed an increased trend thereafter. The analysis exhibited in table no. 5.2 highlighted a deterioration in the asset quality during the second half of the study period. Overall, the performance of PSBs is better when compared to the other bank groups. The financial crisis and recessionary pressures affected the quality of loan portfolio, as evidenced from the higher growth rate of gross NPA since 2007-08. The PSBs are more exposed to credit risk during the recessionary period as inferred from the higher growth of gross NPA (26.53%), compared to private sector banks (8.97%) and foreign banks (13.31%). Within PSBs, the SBI & associates registered the highest growth rate of gross NPA (27.96%).

Table 5.2 Growth of Gross NPA (2000-01 to 2011-12)

Bank Groups	2000-01 to 2006-07 (%)	2007-08 to 2011-12 (%)	2000-01 to 2011-12 (%)
SBI and associates	-8.37	27.96	5.61
Nationalized Banks	-4.94	25.59	2.36
Public Sector Banks	-6.12	26.53	3.55
Foreign Banks	-6.69	13.31	8.92
Private Sector Banks	0.66	8.97	8.40
All Scheduled Commercial Banks	-5.28	22.47	4.65

State Bank of Travancore registered an improvement in asset quality as evident from the exponential decay of -4.80% during 2000-01 to 2006-07. Similar to other bank groups, the gross NPA of SBT registered an exponential growth of 23.45% during 2007-08 to 2011-12. The overall performance of SBT is better compared to the different bank groups (EG value of 2.53%). The growth of gross NPA of all SCBs was 4.65% during the study period. The

analysis revealed the need to further strengthen the credit risk management system especially during the financial crisis and recessionary pressures.

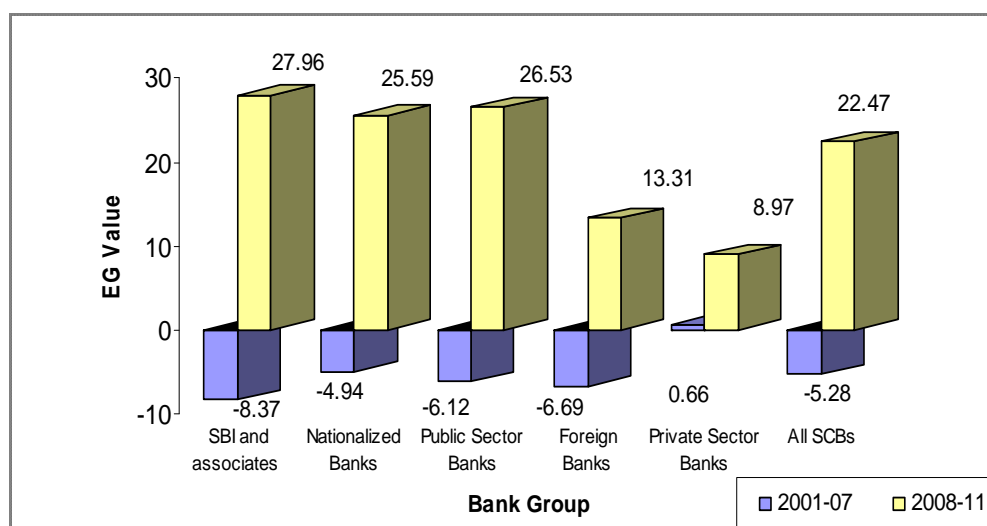


Figure 5.1 Growth of Gross NPA (2000-01 to 2006-07 and 2007-08 to 2011-12)

5.2.2.1 Test of Correlation

The Karl Pearson's correlation coefficient is calculated to verify the strength of relationship of gross NPA of different bank groups. Correlation coefficient (r) means a statistic representing how closely two variables co-vary. From the table no. 5.3, a significant positive correlation is observed between PSBs and all SCBs ($r = 0.983$), SBI & associates and all SCBs ($r = 0.989$) and between nationalized banks and all SCBs ($r = 0.949$). The analysis highlighted that ownership influences the relationship of gross NPA among the different bank groups. A significant correlation exists between SBI & associates and nationalized banks; and between private sector banks and foreign banks. At the same time, the correlation between the PSBs and the private sector banks is not very significant.

Table 5.3 Correlation Coefficient (based on Gross NPA statistics 2000-01 to 2011-12)

Bank Groups	Nationalized Banks	Public Sector Banks	Foreign Banks	Private Sector Banks	All SCBs
SBI & Associates	0.943*	0.983*	0.650**	0.685**	0.989*
Nationalized Banks		0.988*	0.455	0.516	0.949*
Public Sector Banks			0.552	0.602**	0.981*
Foreign Banks				0.880*	0.689**
Private Sector Banks					0.743*

Note: A single (*) asterisk indicates that the coefficients denote significant at the 01 % level of significance. A double (**) asterisk indicates that the coefficients denote significant at 05% level of significance.

5.2.2.2. Regression Study – Gross NPA of All SCBs as Dependent Variable

The statistical analysis using correlation study and EG value explained the significance of the PSBs in Indian banking sector. A regression equation considering the gross NPA of all SCBs as a function of gross NPA of SBI & associates and nationalized banks is undertaken. The regression equation formed is;

$$X_{ASCB} = f(X_{SBI}, X_{NAT})$$

Before running the regression equation, the multi-collinearity is tested using Tolerance (TOL) and Variance Inflation Factor (VIF). Cohen *et al* (2003) defined VIF as it “. . . provides an index of the amount that the variance of each regression coefficient is increased relative to a situation in which all of the predictor variables are uncorrelated”. In the current regression study, VIF is 9.081 and Tolerance is 0.110.

Table 5.4 Linear Multiple Regression Coefficients with Dependent variable as Gross NPA of all SCBs

Variables	
X _{SBI}	2.208*
X _{NAT}	0.318
Constant	15481*
Adjusted R Square	0.976
F Statistics	220.493*
Note: A single (*) asterisk indicates that the coefficients denote significant at the 01 % level of significance.	

The table no. 5.4 confirmed that the gross NPA of SBI & associate has a positive significant effect on the gross NPA of all SCBs. It is further evident from the study that the gross NPA of SBI & associate is a statistically significant explanatory variable for the behavior of the dependent variable, ie, the gross NPA of Indian banking sector. Even though the gross NPA of nationalized banks positively influences gross NPA of all SCBs, the relationship is not statistically significant ($p > 0.05$).

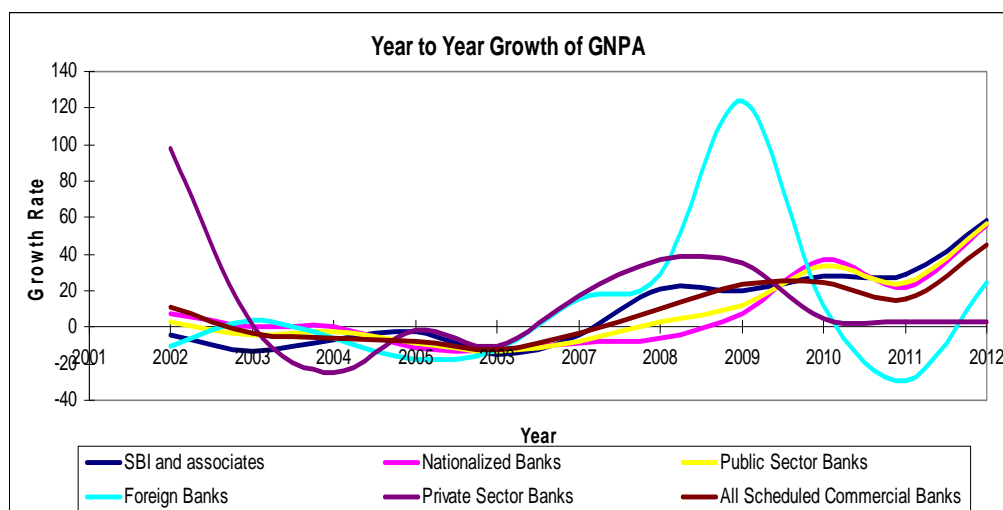


Figure 5.2 Year to Year Growth of Gross NPA – Bank Sector Wise

5.2.2.3 Testing of Hypothesis

In order to test the significance of differences in gross NPA among different bank groups in India, the following hypothesis is tested using Levene Statistic and One Way ANOVA.

H0: There exists no significant difference in the movement of gross NPA among different bank groups in India.

H1: There exists a significant difference in the movement of gross NPA among different bank groups in India.

Table 5.5 Hypothesis Testing – Significance of difference in the movement of GNPA among different bank groups in India

Tests applied : Levene’s Statistic and One Way ANOVA	
Levene Stastic	2.239
F value	34.968*
Note: A single (*) asterisk indicates the coefficients denote significant at the 01 % level of significance.	

The Levene statistics highlighted the existence of homogeneity of variances (Sig >0.05). Hence one way ANOVA is used. The results (F = 34.698; Sig = 0.000) showed that there exist statistically significant differences in the movement of gross NPA among different bank groups. A further post-hoc analysis revealed that the significant differences exist between SBI & associates and private sector banks, between SBI & associates and foreign banks, nationalized banks and private sector banks.

5.2.3. Net Non Performing Assets (Net NPA)

The table no. 5.6 explained that, among the different bank groups, the nationalized banks hold the lowest growth rate of net NPA (2.96%) and is followed by the private sector banks (3.32%). The PSBs net NPA trend, to a great extent, is influenced by the net NPA trends of SBI & associates. The SBI &

associates reported a comparatively higher rate of increase in net NPA ie., 7.08%. Similar to the observed trend in the gross NPA, the recessionary trends during financial crisis impacted the movement of net NPA of different bank groups.

Table 5.6 Growth of Net NPA (2000-01 to 2011-12)

Bank Groups	2000-01 to 2006-07	2007-08 to 2011-12	Overall (2000-01 to 2011-12)
SBI and associates	-7.76	20.67	7.08
Nationalized Banks	-14.70	35.84	2.96
Public Sector Banks	-12.13	29.94	4.57
Foreign Banks	0.04	6.65	9.44
Private Sector Banks	1.11	-9.16	3.32
All Scheduled Commercial Banks	-10.13	22.44	4.83

The net NPA of State Bank of Travancore registered a decay of -9.80% during 2000-01 to 2006-07. Similar to the different bank groups, the NPA of SBT registered an exponential growth of 31.92% during 2007-08 to 2011-12. The overall performance of SBT is better compared to the different bank groups (EG value of 3.16%) except the nationalized banks.

The inference based on the above analysis confirmed a comparatively better performance of nationalized banks and private sector banks in the management of net NPA. The performance of Indian banking sector is moderately influenced by higher growth of net NPA of SBI & associates. From ₹94,550 million in 2000-01, the net NPA of SBI & associates increased to ₹202,366 million in 2011-12. In the same period, the net NPA of nationalized banks grew from ₹180,194 million to ₹389,256 million. Among the different bank groups, the nationalized banks showed the maximum vulnerability to financial crisis, as evidenced in the growth rate of the net NPA ie., 35.84% during 2007-08 to 2011-12. In order to examine the gravity of

the issue, a comparison is undertaken between the growth rate of net NPA and growth rate of advances during the study period. As obvious from the table no. 5.7 the growth of total advances is higher than the growth of net NPA except during the periods of financial crisis.

Table 5.7 Growth of Advances (2000-01 to 2011-12)

Bank Groups	2000-01 to 2006-07	2007-08 to 2011-12	Overall (2000-01 to 2011-12)
SBI and associates	19.76	16.22	20.17
Nationalized Banks	21.46	20.54	22.39
Public Sector Banks	20.87	19.19	21.66
Foreign Banks	17.83	8.78	16.26
Private Sector Banks	28.12	15.72	23.1
All Scheduled Commercial Banks	21.4	17.94	21.37

A disturbing trend noticeable from the analysis is the higher growth rate of net NPA of the PSB compared to the growth of its total advances in periods of financial crisis and recessionary pressure.

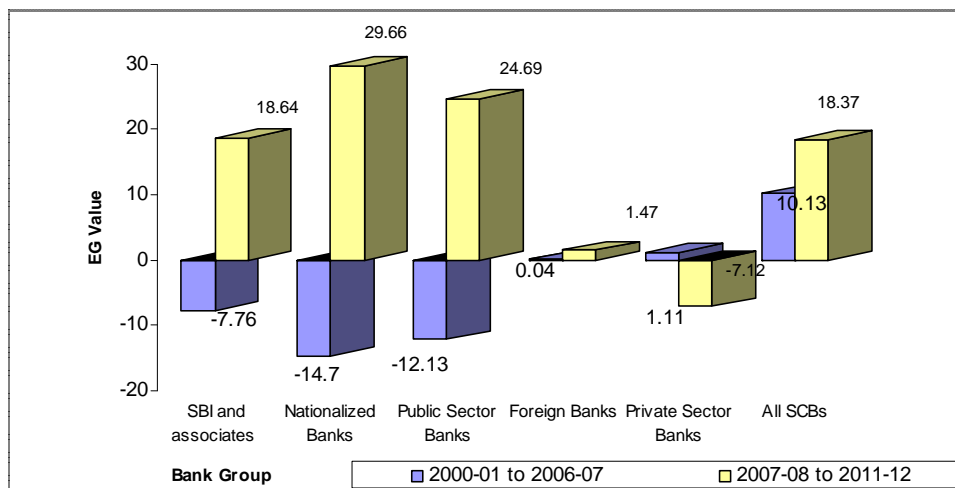


Figure 5.3 Growth of Net NPA (2000-01 to 2011-12)

To conclude, it is evident that the financial performance of the PSBs in general is affected by the recessionary pressures since 2007. Even though, many authors rated the effect of the financial crisis as marginal (Sinha, 2010), the analysis revealed a moderate effect of the financial crisis on asset quality of PSBs in India.

5.2.3.1. Test of Correlation

The table no. 5.8 confirmed a significant positive correlation between; nationalized banks and PSBs ($r = 0.986$), SBI & associates and all SCBs ($r = 0.969$), and PSBs and all SCBs ($r = 0.987$). A major inference from the analysis is the influence of bank ownership on the movement of net NPA, observed from the similarity of performance between SBI & associates and nationalized banks on one hand, and foreign banks and private sector banks on the other.

Table 5.8 Coefficient of Correlation - Net NPA Bank-Group wise

	Nationaliz ed Bank	Public Sector Banks	Foreign Banks	Private Sector Banks	All SCBs
SBI & Associates	0.877*	0.945*	0.431	0.236	0.969*
Nationalized Banks		0.986*	0.051	-0.047	0.954*
Public Sector Banks			0.184	0.050	0.987*
Foreign Banks				0.814*	0.329
Private Sector Banks					0.208

Note: A single (*) asterisk indicates that the coefficients denote significant at 01% level of significance. A double (**) asterisk indicates that the coefficients denote significant at 05% level of significance.

5.2.3.2. Regression Study – Net NPA of all SCBs as Dependent Variable

A regression analysis is undertaken considering the net NPA of all SCBs as a function of net NPA of SBI & associates and nationalized banks. The regression equation formed is;

$$X_{ASCB} = f(X_{SBI}, X_{NAT})$$

Table 5.9 Linear Multiple Regression Coefficients with Dependent variable as Net NPA of all SCBs

Independent Variables	
X_{SBI}	1.703*
X_{NAT}	0.685*
Constant	4078*
Adjusted R Square	0.983
F Statistics	318.414*
Note: A single (*) asterisk indicated that the coefficients denote significant at 01% level of significance.	

The table no. 5.9 confirmed the statistical significance of PSBs, ie, SBI & associates and nationalized banks on the net NPA of all SCBs. Further the analysis also confirmed that the net NPA of both SBI & associates and nationalized banks are statistically significant explanatory variables for the movement of the net NPA of all SCBs.

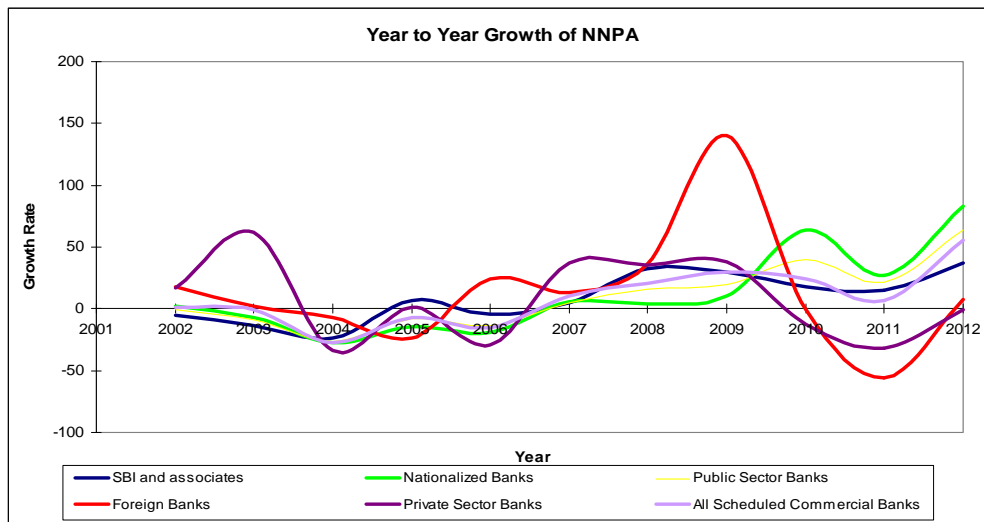


Figure 5.4 Year to Year Growth of Net NPA – Bank Groupwise

5.2.3.3. Testing of Hypothesis

In order to test the significance of differences in net NPA among the different bank groups, the following hypothesis is tested using Levene Statistic and Welch test.

H0: There exists no significant difference in the movement of net NPA among different bank groups in India.

H1: There exists a significant difference in the movement of net NPA among different bank groups in India.

Table 5.10 Hypothesis Testing – Significance of difference in the Net NPA among different bank groups in India

Tests applied : Levene's Statistic and Welch test	
Levene Stastic	6.591*
Welch Statistic	37.807*
Note: A single (*) asterisk indicates the coefficients denote significant at the 01 % level of significance.	

Since the significance level of Levene statistic is lower than 0.05, the assumption of equality of variance does not exist. Welch test is used to test the hypothesis. The analysis confirmed that there exist statistically significant differences in the net NPA among different bank groups in India. A further post-hoc analysis revealed that the differences exist among SBI & associates and foreign banks, SBI & Associates and private sector banks, nationalized banks and private sector banks and between nationalized banks and foreign banks.

5.2.4. Additions to NPA (Fresh NPA)

The table no. 5.11 explained the growth of additions to NPA during the study period. A higher growth of additions to NPA is not desirable as it

indicates an erosion of the quality of assets. Additions to NPA can be used to study the efficiency of credit appraisal systems, because more additions indicate that loan proposals are not judged diligently. Additions to NPA of the PSBs grew at a slightly higher rate, i.e. 15.00% as against the industry level of 14.58%. Among the bank groups, foreign banks reported higher growth of additions to NPA i.e., 17.57%, followed by SBI & associates i.e., 15.45%.

Table 5.11 Growth of Additions to NPA (2000-01 to 2010-11)

Bank Groups	2000-01 to 2006-07	2007-08 to 2011-12	2000-01 to 2011-12
SBI and associates	1.09	31.30	15.45
Nationalized Banks	4.12	34.34	14.72
Public Sector Banks	3.06	33.17	15.00
Foreign Banks	0.88	1.80	17.57
Private Sector Banks	0.95	1.31	10.62
All Scheduled Commercial Banks	2.11	25.68	14.58

The additions to NPA of State Bank of Travancore showed an increase of 0.40% and 48.66% during 2000-01 to 2006-07 and 2007-08 to 2011-12 respectively. The overall growth is 17.05% during the study period, which is comparatively higher than the other bank groups, except the foreign banks. The inference based on the analysis supported the previous findings that the asset quality is greatly influenced by the recessionary pressures during the financial crisis. All bank groups except private and foreign banks, reported a sharp increase in their fresh NPA since 2007-08. Further, a comparison is made on the growth rate of additions to NPA and the total advances. It is observed from the analysis that all bank groups except private sector banks reported higher growth of additions to NPA than its total advances since 2007-08. Whereas the advances of PSBs grew at a rate of 19.19%, the additions to NPA reported a growth rate of 33.17% since 2007. It further

reiterated the earlier findings on the weakness of the banking system towards the financial crisis. A better risk management strategy should be envisaged to predict chances of crisis and to reduce its effect on the banking sector.

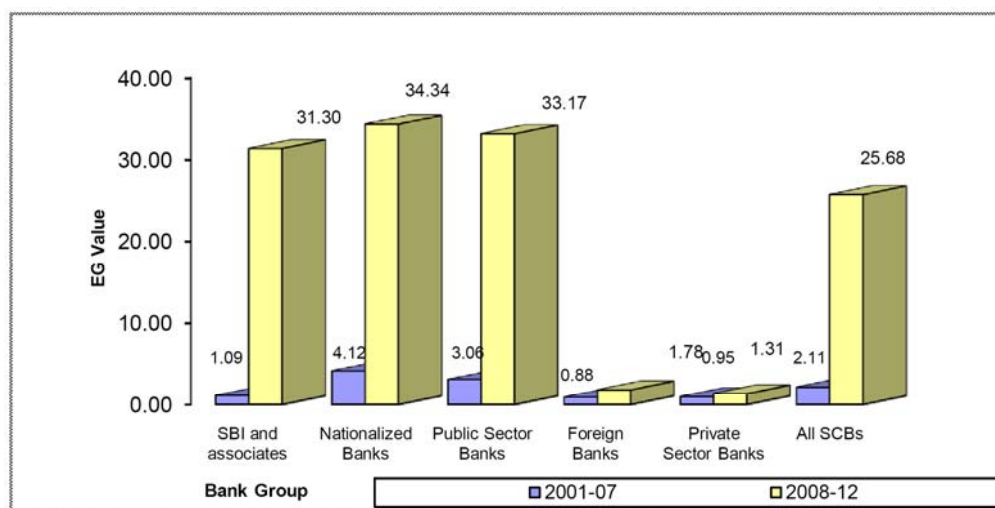


Figure 5.5 Comparison of Growth of Additions to NPA (2000-01 to 2006-07 and 2007-08 to 2011-12)

5.2.4.1. Test of Correlation

A correlation study is carried out to explain the significant relationship in movement of additions to NPA among various bank groups. From table no. 5.12, it may be observed that there exists a significant positive correlation between; the PSBs and all SCBs, SBI & associates and nationalized banks, and private sector banks and foreign banks. The results further signified the earlier observation that ownership of banks tends to significantly influence the trend in the movement of NPA. There exists a significant positive correlation between SBI & associates and all SCBs ($r = 0.981$), SBI & associates and nationalized banks ($r = 0.989$), nationalized banks and all SCBs ($r = 0.981$), nationalized banks and the PSBs ($r = 0.999$), SBI & associates and PSBs ($r = 0.996$) and between

foreign banks and private sector banks ($r=0.881$). The correlation remained significant for other bank groups and all SCBs.

Table 5.12 Correlation Coefficient - Additions to NPA

Bank Groups	Nationalized Banks	Public Sector Banks	Foreign Banks	Private Sector Banks	All SCBs
SBI & Associates	0.989*	0.996*	0.492	0.610**	0.981*
Nationalized Banks		0.999*	0.490	0.592**	0.981*
Public Sector Banks			0.492	0.600**	0.983*
Foreign Banks				0.881*	0.635**
Private Sector Banks					0.730*

Note: A single (*) asterisk indicates that the coefficients denote significant at 01% level of significance. A double (**) asterisk indicates that the coefficients denote significant at 05% level of significance.

5.2.4.2. Regression Study - Additions to NPA

A simple regression equation taking additions to NPA of all SCBs as a dependent variable and additions to NPA of SBI & associates and nationalized banks as independent variables is undertaken. The regression equation is;

$$X_{ASCB} = f(X_{SBI}, X_{NAT})$$

Table 5.13 Linear Multiple Regression Coefficients with Dependent variable as Additions to NPA of all SCBs

Independent Variables	
X_{SBI}	1.548
X_{NAT}	0.904
Constant	5598.65
Adjusted R Square	0.960
F Statistics	133.974*

Note: A single (*) asterisk indicates that the coefficients denote significant at 01% level of significance.

From table no. 5.13 it is inferred that 96% variability in the additions to NPA of all SCBs can be explained by the independent variables, ie, the

additions to NPA of SBI & associates and nationalized banks. The F statistics and its significance (F value = 133.974, Sig < 0.05) proved that the model is highly reliable in explaining the relationship between the independent variables and the dependent variable. Even though the statistical relationship is established, it is also found that the additions to NPA of SBI & associates and nationalized banks are not statistically significant explanatory variable for the movement of additions to NPA of all SCBs.

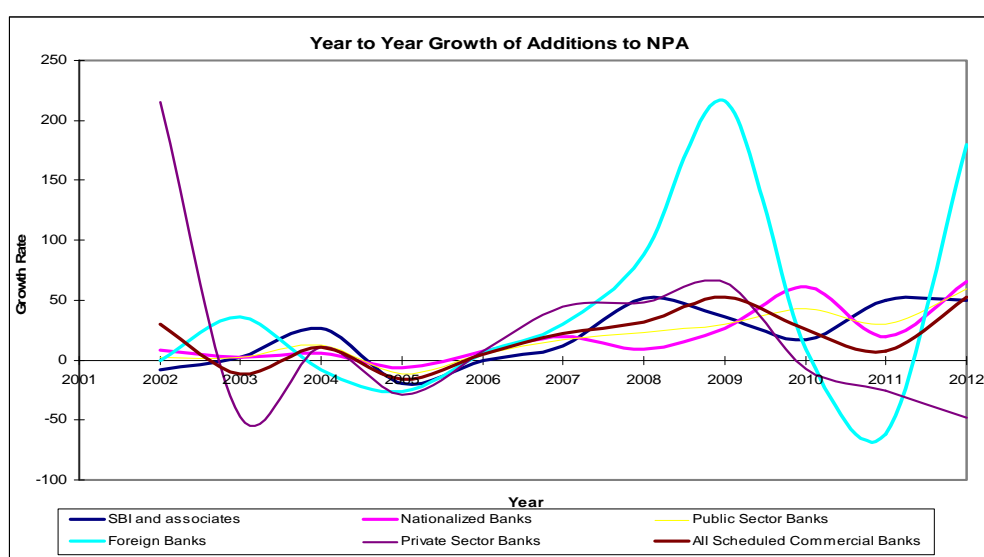


Figure 5.6 Year-to-Year Growth of Additions to NPA – Bank Sector Wise

5.2.4.3. Testing of Hypothesis

In order to test the significance of differences in movement of additional to NPA among different bank groups in India, the following hypothesis is tested using Levene test and Welch statistic.

H₀: There exists no significant difference in the movement of additions to NPA among different bank groups in India.

H₁: There exists a significant difference in the movement of additions to NPA among different bank groups in India.

Table 5.14 Hypothesis Testing – Significance of difference in movement of the additions to NPA among different bank groups in India

Tests applied : Levene's Statistic and Welch test	
Levene Stastic	5.934*
Welch Statistic	8.087*
Note: A single (*) asterisk indicates that the coefficients denote significant at 01% level of significance.	

Since the Levene's statistic is significant (Sig < 0.05), the assumption of equality of variance does not exist. Hence Welch test is used to determine whether there exist significant differences in the movement of additions to NPA among different bank groups in India. There exists a statistically significant difference among the different bank groups as can be inferred from the Welch Test (Sig < 0.05). A further analysis using a post - hoc test revealed the presence of significant difference between nationalized banks and private sector banks and nationalized banks and foreign banks.

5.2.5. Gross Non Performing Assets Generation Rate

The gross non performing assets generation rate has not been extensively used to evaluate the effectiveness of the NPA management. Many authors including Sharma, M (2008) explained that the asset quality of banks can be properly measured using the gross non performing assets generation rate. Instead of focusing attention on the accumulated portion of NPA, this rate utilizes fresh NPA, i.e., additions to NPA every year and evaluate how well the banks managed their asset quality over a period of time. It is calculated by dividing the additions to NPA by the total assets.

It may be observed from the table no. 5.15 that the gross non performing assets generation rate showed a declining trend in the first half of the study period. It indicated the efficiency in bringing down the bad loans in the bank's

balance sheet. From 2007-08 onwards, similar to other NPA indicators, the gross non performing assets generation rate also registered escalating trend, indicating a reduction in the asset quality. Among the bank groups, the asset quality of SBI & associates is most affected, as may be observed from the higher average gross non performing assets generation rate, i.e., 1.16%, followed by private sector banks (1.14%) and nationalized banks (1.07%). The PSBs registered a higher growth rate of gross NPA generation rate (1.10%) than all India average, ie, 1.09% The foreign banks stood on end showing comparatively lower levels of Gross Non Performing Generation Rate.

Table 5.15 Gross Non Performing Generation Rate –Bank Group wise

Year	SBI & associates	Nationalized Banks	Public Sector Banks	Foreign Banks	Private Sector Banks	All SCBs
2001	1.45	1.52	1.49	1.11	1.56	1.42
2002	1.20	1.46	1.36	1.00	3.00	1.56
2003	1.12	1.33	1.25	1.31	1.45	1.29
2004	1.27	1.21	1.23	1.02	1.29	1.23
2005	0.89	0.91	0.90	0.67	0.78	0.87
2006	0.81	0.84	0.83	0.54	0.63	0.77
2007	0.78	0.82	0.80	0.52	0.69	0.76
2008	0.94	0.73	0.80	0.73	0.82	0.80
2009	1.01	0.74	0.83	1.89	1.23	1.00
2010	1.07	0.98	1.01	2.11	1.01	1.09
2011	1.42	0.96	1.10	0.72	0.62	0.98
2012	1.93	1.38	1.54	0.77	0.59	1.29
<i>Average</i>	1.16	1.07	1.10	1.03	1.14	1.09

The relative efficiency of the PSBs was hampered by the increased gross NPA generation rate since 2007, as evident from table no. 5.15. Even though,

both bank groups registered a growth in gross NPA generation rate, a higher growth rate is reported by SBI & associates. The findings support the earlier observations that the asset quality of SBI & associates was most affected during the study period. Since the PSBs hold a sizeable share in total advances of Indian banking sector, it can be inferred that the asset quality of Indian banking sector was moderately affected by the financial crisis.

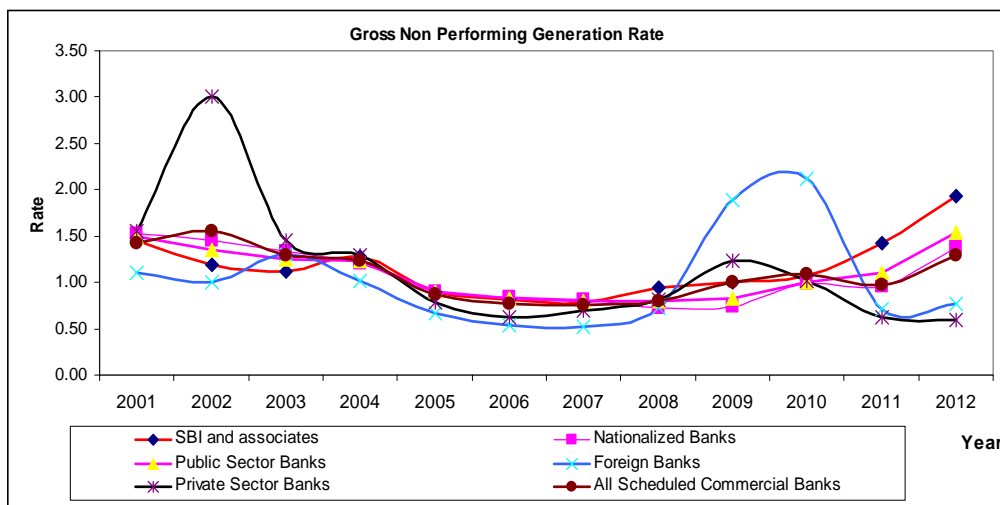


Figure 5.7 Gross Non Performing Asset Generation Rate - Bank Groupwise (2001-10)

5.2.6. Reductions to NPA

The reductions to NPA indicate the amount of NPA recovered every year. It highlights the efficiency of various recovery management measures. The SBI & associates showed a lowest EG rate of 6.36 during the period. The table no. 5.16 explained the growth of reductions to NPA during the study period. Among the bank groups, foreign banks recorded the highest growth rate of reductions to NPA, i.e., 16.58%, followed by private sector banks, i.e., 11.33%. While comparing the reductions to NPA with additions to the NPA, the SBI & associates is relatively inefficient compared to other bank groups. A

higher addition to NPA than its reductions led to accumulation of NPA accounts in SBI & associates.

Table 5.16 Growth of Reductions to NPA 2000-01 to 2011-12

Bank Groups	2000-01 to 2006-07	2007-08 to 2011-12	2000-01 to 2011-12
SBI and associates	2.64	17.86	6.36
Nationalized Banks	12.74	19.06	11.10
Public Sector Banks	9.14	18.59	9.36
Foreign Banks	5.77	11.53	16.58
Private Sector Banks	14.1	9.38	11.33
All Scheduled Commercial Banks	9.43	16.68	10.16

The reductions to NPA of State Bank of Travancore showed growth of - 0.50% (exponential decay) and 41.56% during 2000-01 to 2006-07 and 2007-08 to 2011-12 respectively. The overall growth is 12.56% during the study period, which is comparatively higher than the other bank groups, except the foreign banks. The PSBs registered lowest growth rate in reductions, indicating the fact that the recovery management in PSBs is time consuming. Once NPA occurs, it takes more time in comparison to other bank groups in recovering the NPA accounts. While the additions to NPA registered 15% growth rate during the period, the reductions to NPA grew only by 9.36%. In order to improve NPA management, the incidence of NPA should be reduced and also the disparity between the additions to NPA and its reductions every year should be minimized. It hence calls for effective recovery management measures. The legal impediments in the recovery of NPA accounts should be addressed and proper measures should be taken to reduce it. A time consuming recovery process also results loss of value, since the value of assets deteriorates over time.

The figure no. 5.8 summarized the growth of reductions to NPA during 2000-01 to 2006-07 and 2007-08 and 2011-12.

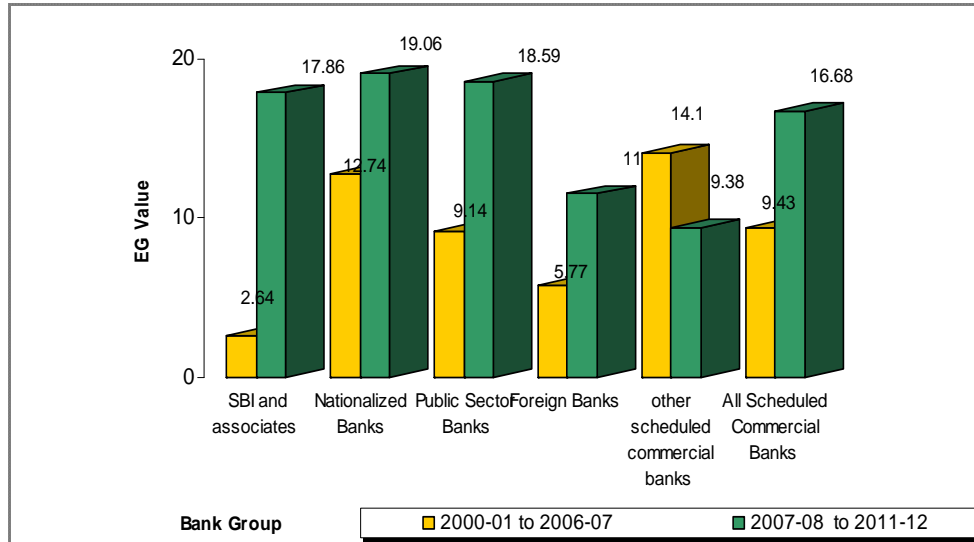


Figure 5.8 Exponential Growth Rate – Reductions to NPA 2000-01 to 2011-12

5.2.6.1. Test of Correlation

The relationship among different bank groups with regard to the movement of its reductions to NPA is explained in table no. 5.17. The analysis reported a significant positive relationship between; SBI & associates and nationalized banks ($r=0.864$), SBI & associates and private sector banks ($r=0.760$), SBI & associates and all SCBs ($r=0.923$), nationalized banks and all SCBs ($r =0.965$), SBI & associates and PSBs ($r =0.928$), PSBs and all SCBs (0.981), private sector banks and all SCBs ($r =0.8513$) and between foreign banks and all SCBs ($r =0.755$). The highest correlation is registered between PSBs and all SCBs which indicated that any movement in PSB’s performance will significantly influence the performance of all SCBs in India.

Table 5.17 Correlation Coefficient – Reductions to NPA Bank Group Wise

	Nationalized Banks	Public Sector Banks	Foreign Banks	Private Sector Banks	All SCBs
SBI & Associates	.864*	.928*	.562	.760*	.923*
Nationalized Banks		.989*	.646**	.658**	.965*
Public Sector Banks			.640*	.707*	.981**
Foreign Banks				.711*	.755*
Private Sector Banks					.813*

Note: A single (*) asterisk indicates that the coefficients denotes significant at 01% level of significance. A double (**) asterisk indicates that the coefficients denote significant at the 05 % level of significance.

5.2.6.2. Regression Study - Reductions to NPA

A regression equation considering the reductions to NPA of all SCBs as dependent variable and the reductions to NPA of SBI & associates and nationalized banks as independent variables is undertaken here. Since there exists multi-collinearity on account of correlation between the independent variables, standardized value is used for the study. The regression equation is;

$$X_{RSCB} = f(X_{RSBI}, X_{RNB})$$

Significance of Regression Equation

The table no. 5.18 illustrates the significance of regression equation used in the study.

Table 5.18 Linear Multiple Regression Coefficients with Dependent variable as Reductions to NPA of all SCBs

Independent Variables	
X_{SBI}	1.570**
X_{NAT}	1.160*
Constant	-204.559
Adjusted R Square	0.955
F Statistics	117.179*

Note: A single (*) asterisk indicates that the coefficients denote significant at the 01 % level of significance. A double (**) asterisk indicates that the coefficients denote significant at the 05 % level of significance.

R Square value is 0.955 indicating that 95.5% of the variability in the dependent variable i.e., reductions to NPA of all SCBs could be attributed to changes in the independent variables i.e., reductions to NPA of SBI & associates and nationalized banks. It implies that the reduction to NPA of SBI & associates and nationalized banks are the major explanation for the change in reductions to NPA of all SCBs. The F- test result proved that the regression equation between independent variables and the dependent variable is highly significant. Further, the t-test shows that nationalized Banks is a statistically significant predictor of variability of dependent variables at 1%.

5.2.6.3. Testing of Hypothesis

A hypothesis test is conducted to evaluate whether there exist significant differences in the movement of reductions to NPA among different bank groups. The following hypothesis is used for the study.

H0: There exists no significant difference in the movement of Reductions to NPA among different bank groups in India.

H1: There exists a significant difference in the movement of Reductions to NPA among different bank groups in India.

Table 5.20 Hypothesis Testing – Significance of difference in Reductions to NPA among different bank groups in India

Tests applied : Levene’s Statistic and Welch test	
Levene Stastic	3.972*
Welch Statistic	21.838*
Note: A single (*) asterisk indicates that the coefficients denote significant at the 01 % level of significance.	

Since the Levene’s statistic is significant (Sig < 0.05), the assumption of equality of variance does not exist. Hence Welch test is used to determine whether there exist significant differences in the reductions to NPA among

different bank groups in India. There exists a statistically significant difference between the bank groups as determined by Welch Test (Sig < 0.05). A further post-hoc analysis revealed the presence of significant differences among all bank groups ($p < 0.005$) except between foreign banks and private sector banks ($p > 0.005$).

5.2.7. Net Additions to NPA

The net additions to NPA is calculated by deducting reductions to NPA from additions to NPA. Ideally, the reductions should outweigh the additions. A higher additions to NPA results in erosion of the asset quality, hence is not desirable. The increase in NPA results from the net additions to NPA. If a net addition to NPA is negative, the NPA is reduced.

Table 5.21 Net Additions to NPA – Bank Groupwise

Year	(Amount in ₹ Million)					
	SBI & associates	Nationalized Banks	Public Sector Banks	Foreign Banks	Private Sector Banks	All SCBs
2001	8,194	9,204	17,398	4,674	12,590	34,662
2002	-8,568	26,842	18,274	-3,171	57,893	72,996
2003	-27,967	4,097	-23,870	3,590	5,880	-14,390
2004	-12,186	-13,337	-25,523	724	-14,271	-39,069
2005	-3,724	-41,088	-44,812	-4,575	-1,424	-50,811
2006	-23,140	-39,860	-63,000	-2,640	-7,446	-73,086
2007	1,359	-25,257	-23,898	3,352	20,213	-334
2008	28,011	-11,742	16,269	6,231	38,865	61,364
2009	30,494	20,175	50,669	39,611	45,261	135,540
2010	71,365	107,355	178,720	36,919	51,530	267,169
2011	115,258	95,405	210,664	-19,870	32,391	223,185
2012	188,411	261,047	449,458	12,313	24,991	486,762

As may be observed from table no. 5.2, the net additions to NPA stands positive in the majority of the years for SBI & associates and nationalized banks. It highlights the accumulation of NPA during the study period. In general, the analysis showed negative net additions (indicating higher reductions to NPA over additions to the NPA) during the first half of the last decade, while the net additions showed positive trend thereafter. The total net additions of all SCBs were ₹61,364 million during 2007-08 and increased to ₹486,762 million during 2011-12. While analyzing the share of different bank groups on net additions to NPA, it is found that PSBs contributed 92.34% of total net additions during 2011-12. Among PSBs, SBI & Associates contributed 38.71%, while the share of nationalized banks was 53.63%. The foreign banks contributed 2.53% of total net additions while the share of private sector banks was 5.13% during the period. Even though various NPA management measures were incorporated since the post-millennium period, the net additions to NPA showed a significant threat to the asset quality of commercial banks. It may be concluded based on the above that the regulatory authorities in general and banks in particular should incorporate various proactive and curative measures to reduce the net additions and improve the asset quality of financial institutions.

5.2.7.1. Testing of Hypothesis

A hypothesis test is conducted to verify whether there exist significant differences in the movement of net additions to NPA among different bank groups. A one way ANOVA is used for the study.

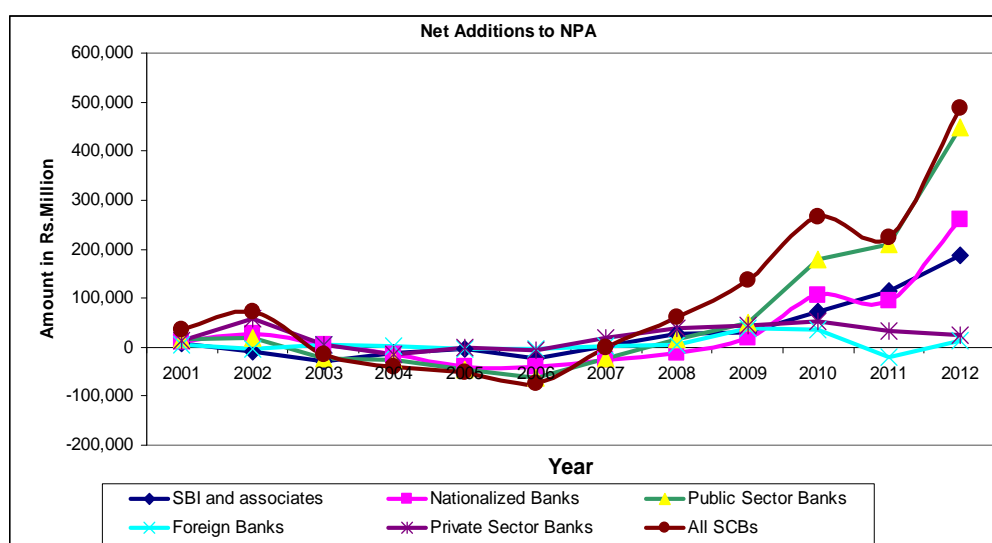
H₀: There exists no significant difference in the movement of net additions to NPA among different bank groups in India.

H₁: There exists a significant difference in the movement of net additions to NPA among different bank groups in India.

Table 5.22 Hypothesis Testing – Significance of difference in net additions to NPA among different bank groups in India

Tests applied : Levene's Statistic and Welch test	
Levene Stastic	4.781*
Welch Statistic	1.625
Note: A single (*) asterisk indicates the coefficients denote significant at the 01 % level of significance.	

Since the Levene's statistic is significant ($\text{Sig} < 0.05$), the assumption of equality of variance does not exist. Hence Welch test is used to test whether there exist significant differences in the movement of net additions to NPA among different bank groups in India. Based on the Welch test ($\text{Sig} > 0.05$), the null hypothesis is accepted and concludes that there exists no significant difference in the movement of net additions to NPA between groups ($\text{Sig} > 0.000$).

**Figure 5.9 Net Additions to NPA – Bank Sector Wise**

5.2.8. Provision towards NPA

The provision towards NPA is mandatory and should be provided based on the quality of assets/loan portfolio a bank holds. The loan accounts in banks are

classified into; Standard assets, Substandard assets, doubtful assets and loss assets. Out of the four categories, substandard assets, doubtful assets and loss assets are considered as NPA and is used in the calculation of provision towards NPA.

Table 5.23 Growth Rate - Provision towards NPA (2000-01 to 2011-12)

Bank Groups	2000-01 to 2006-07	2007-08 to 2011-12	2000-01 to 2011-12
SBI and its associates	-8.61	48.18	12.09
Nationalized Banks	-0.66	34.91	12.93
Public Sector Banks	-5.35	39.57	12.74
Foreign Banks	-12.54	-84.12	4.8
Private Sector Banks	-0.81	16.91	11.67
All Scheduled Commercial Banks	-4.85	30.11	13.9

The provisions towards NPA of State Bank of Travancore increased from ₹9,359 lakhs in 2000-01 to ₹42,087 lakhs IN 2011-12. The table no. 5.23 highlighted the growth of provisions towards NPA during the study period. Based on the analysis, an upsurge in provisions is observed except for foreign banks during the study period. Similar to the observed results on NPA indicators, a higher provision has been observed since 2007-08, when the financial crisis erupted the market. The PSBs reported an increase in their provisions towards NPA, ie, 12.74%, mainly due to the increase in provisions since 2007, ie, 39.57%. Among the PSBs, the SBI & associates reported higher growth of provisions, mainly because of higher levels of NPA since 2007. While there has been improvement in the management of the NPA as indicated in the reduced levels of provision towards NPA from 2000-01 to 2006-07, the provision towards NPA increased considerably during 2007-08 to 2011-12. Overall, the provisions to NPA increased by 13.9% during the study period and indicated a reduction in asset quality especially since 2007-08.

5.2.8.1. Test of Correlation

The correlation study showed a very significant and positive relationship between the PSBs and all SCBs. As observed from table no. 5.24, a significant positive correlation exists between; SBI & associates and nationalized banks ($r = 0.979$), SBI & associates and PSBs ($r = 0.992$), SBI & associates and all SCBs ($r = 0.909$), nationalized banks and PSBs ($r = 0.996$), nationalized banks and all SCBs ($r = 0.962$), PSBs and all SCBs ($r = 0.947$), private sector banks and all SCBs ($r = 0.901$), between private sector banks and SBI & associates ($r = 0.781$), private sector banks and nationalized banks ($r = 0.832$) and private sector banks and PSBs ($r = 0.817$). Thus the analysis indicated a strong association between all bank groups except foreign banks on the movement of provision towards NPA.

Table 5.24 Correlation Coefficient -Provision towards NPA (2000-01 to 2011-12)

Bank Groups	Nationalized Banks	Public Sector Banks	Foreign Banks	Private Sector Banks	All SCBs
SBI & Associates	.979*	.992*	-0.333	0.781**	0.909*
Nationalized Banks		0.996*	0.125	0.832*	0.962*
Public Sector Banks			0.065	0.817*	0.947*
Foreign Banks				0.368	0.376
Private Sector Banks					0.901*

Note: A single (*) asterisk indicates that the coefficients denote significant at the 01 % level of significance. A double (**) asterisk indicates that the coefficients denote significant at the 05 % level of significance.

5.2.8.2. Regression Study -Provision towards NPA

A regression equation considering provision towards NPA of all SCBs as a dependent variable and provision towards NPA of SBI & associates and nationalized banks as independent variables is undertaken here.

$$X_{PSCB} = f(X_{PSBI}, X_{PNB})$$

Table 5.25 Linear Multiple Regression Coefficients with Dependent variable as Provision towards NPA of all SCBs

Independent Variables	
X_{SBI}	-2.430**
X_{NAT}	3.618*
Constant	-1243.735
Adjusted R Square	0.943
F Statistics	91.375*
Note: A single (*) asterisk indicates that the coefficients denote significant at the 01 % level of significance. A double (**) asterisk indicates that the coefficients denote significant at the 05 % level of significance.	

The F-test result showed that the regression equation is highly significant in explaining the relationship between the dependent and independent variables. The R square value indicates that 94.3% of the variability in the dependent variable i.e., provision towards NPA of all SCBs is attributed to changes in the independent variables i.e., provision towards NPA of SBI & associates and nationalized banks. The t-test further highlighted that the provision 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.

5.2.8.3. Testing of Hypothesis

A hypothesis test is conducted to verify whether there exists a significant difference in the movement of provision towards NPA among different bank groups. Statistics relating to provision towards NPA during post-millennium period is used to test the hypothesis.

H0: There exists no significant difference in the movement of provision towards NPA among different bank groups in India.

H1: There exists a significant difference in the movement of provision towards NPA among different bank groups in India.

Table 5.26 Hypothesis Testing – Significance of difference in provisions towards NPA among different bank groups in India

Tests applied : Levene's Statistic and Welch test	
Levene Stastic	3.513**
Welch Statistic	4.579**
Note: A single (*) asterisk indicates that the coefficients denote significant at 05% level of significance. A double (**) asterisk indicates that the coefficients denote significant at 05% level of significance.	

Since the levene statistic is significant (Sig < 0.05), the assumption of equality of variance does not exist. Hence Welch test is used to determine whether there exist significant differences in the provision towards NPA among different bank groups in India. There exists a statistically significant difference in the movement of provision towards NPA as may be observed from Welch Test (Sig <0.05). A further post-hoc analysis revealed the presence of significant difference among nationalized banks and private sector banks (p = 0.012) and nationalized banks and foreign banks (p = 0.005).

5.2.9. Asset Quality – Classification of Advances

Asset quality is a main indicator of potential credit risk. Research on bank failure found that the asset quality is a statistically significant predictor of insolvency (Hou, 2007; Dermirgue-Kunt, 2000; Barr and Siems, 1994). A major reason for bank failures is the erosion in the asset quality explained by the level of NPAs. Often, the quality of advances determines the extent of non-performing assets, provision and profitability of banks.

The advances are classified into standard assets, sub-standard assets, doubtful assets and loss assets. The gross NPA is the total of sub standard assets, doubtful assets and loss assets. In other words, the standard advances reflect total advances minus gross NPA. As observed from the analysis of various NPA indicators, banks

in India showed improvements in asset quality during 2001-07, a thereafter sign of deterioration of quality of assets is witnessed due to recessionary pressures affecting the economy. It is evident in the increase of substandard assets, doubtful assets and loss assets during this period. A trend line is drawn based on the absolute figures on different asset classification and EG value is calculated.

Table 5.27. Growth Rate - Quality of Asset (2000-01 to 2011-12)

Bank group	Standard Assets	Substandard Assets	Doubtful Assets	Loss Assets
Public sector banks	21.06	10.10	-0.60	-0.39
Private sector banks	22.23	8.07	4.88	16.42
Foreign banks	16.37	14.00	5.31	0.67
All SCBs	20.94	10.54	0.39	-0.03

The analysis based on the table no.5.27 revealed an improvement in asset quality, as observed from the higher growth rate of standard assets. There exists a reduction in loss assets during the study period, while the substandard assets and doubtful assets reported an increased trend. The growth of substandard assets, doubtful assets and loss assets is a reason to worry since it affects the income generating capacity of banks. Among the bank groups, private sector banks and foreign banks showed a higher increase of substandard, doubtful and loss assets. Since their level of advances is notably lower than PSBs, which holds approximately 80% of total advances, its effect on banking sector is comparably less.

5.2.9.1. Test of Correlation – Public Sector Banks

The correlation study highlighted few significant relationships among the selected variables. The standard assets and substandard assets showed a significant positive relationship ($r = 0.841$, $\text{Sig}=0.000$). It is inferred from the

analysis that both standard advances and substandard advances increase along with an increase in the total advances. The substandard asset on the other hand significantly influence gross NPA of banks, indicated in their correlation ($r = 0.940$, $\text{Sig} = 0.000$).

Table 5.28 Correlation Coefficient – Asset Quality of Public Sector Banks

	Substandard Asset	Doubtful Assets	Loss Assets	Gross NPA	Total Advances
Standard Asset	0.841*	0.212	-0.565	0.634	1.000*
Substandard Asset		0.662**	-0.183	0.940*	0.849*
Doubtful Asset			0.553	0.878*	0.226
Loss Assets				0.143	-0.555

Note: A single (*) asterisk indicates that the coefficients denote significant at the 01 % level of significance. A double (**) asterisk indicates that the coefficients denote significant at the 05 % level of significance.

Table 5.29 Growth Rate of Standard Assets, Gross NPA and Total Advances – Bank Group Wise (2000-01 to 1011-12)

Year	Public Sector Banks			Private Sector Banks			Foreign Banks			All Sch. Commercial Banks		
	Standard Assets	Gross NPAs	Total Advances	Standard Assets	Gross NPAs	Total Advances	Standard Assets	Gross NPAs	Total Advances	Standard Assets	Gross NPAs	Total Advances
2001	18.54	2.78	16.33	22.05	23.24	22.15	21.45	18.97	21.28	19.23	5.13	17.43
2002	16.91	3.16	15.21	67.84	91.95	69.90	13.13	-10.64	11.50	23.29	10.93	21.87
2003	15.65	-4.28	13.44	20.51	14.28	19.91	6.30	4.03	6.17	15.79	-0.90	14.05
2004	16.56	-4.71	14.57	26.94	-22.43	22.40	17.24	3.73	16.54	18.54	-7.70	16.16
2005	35.03	-9.59	31.55	29.55	-15.97	26.90	22.38	-24.77	20.10	33.03	-11.33	29.84
2006	24.90	-11.20	22.97	36.76	334.63	34.94	32.63	-7.40	31.43	27.71	-10.95	25.81
2007	29.71	-7.14	28.29	29.26	-75.54	28.99	29.60	17.30	29.34	29.61	-2.20	28.50
2008	24.07	3.07	23.48	20.06	40.44	20.54	27.48	27.16	27.48	23.47	11.14	23.14
2009	24.09	11.18	23.79	9.45	30.14	10.02	1.59	133.97	4.12	19.56	22.47	19.63
2010	19.42	30.12	19.64	12.81	2.94	12.49	-1.30	-2.28	-1.34	16.96	19.92	17.03
2011	21.74	24.07	21.79	25.94	3.38	25.27	21.17	-28.94	19.04	22.46	15.05	22.27
2012	15.03	58.26	16.03	20.69	1.91	20.23	17.59	24.23	17.75	16.19	45.66	16.89
Average	21.80	7.98	20.59	26.82	35.75	26.14	17.44	12.95	16.95	22.15	8.10	21.05

Table 5.30 Ratio of Asset to Total Advances – 2000-01 to 1011-12 (Asset Group wise)

Year	Public Sector Banks				Private Sector Banks				Foreign Banks				All SCBs			
	Standard Assets	Sub-Standard Assets	Doubtful Assets	Loss Assets	Standard Assets	Sub-Standard Assets	Doubtful Assets	Loss Assets	Standard Assets	Sub-Standard Assets	Doubtful Assets	Loss Assets	Standard Assets	Sub-Standard Assets	Doubtful Assets	Loss Assets
2001	85.98	4.30	8.03	1.68	91.53	3.67	4.04	0.75	93.01	2.93	2.13	1.93	87.21	4.12	7.08	1.59
2002	87.61	3.33	7.57	1.48	91.46	3.63	4.31	0.60	93.15	1.93	2.65	2.28	88.55	3.26	6.76	1.43
2003	88.91	3.10	6.61	1.39	90.35	3.92	5.41	0.32	94.51	1.69	1.98	1.82	89.58	3.14	6.05	1.23
2004	90.64	2.58	5.60	1.18	90.80	2.55	5.87	0.77	94.62	1.85	1.76	1.78	90.94	2.52	5.38	1.15
2005	92.21	2.55	4.34	0.89	94.17	1.76	3.60	0.47	95.19	1.58	1.75	1.48	92.81	2.33	4.02	0.85
2006	94.65	1.24	3.44	0.66	96.14	0.98	2.48	0.40	97.00	0.95	1.29	0.76	95.09	1.18	3.12	0.62
2007	96.14	1.06	2.32	0.48	97.44	0.79	1.46	0.31	97.89	0.96	0.71	0.45	96.52	1.00	2.03	0.45
2008	97.20	1.02	1.45	0.33	97.64	1.11	1.00	0.24	98.08	1.07	0.49	0.36	97.35	1.04	1.30	0.31
2009	97.67	0.99	1.12	0.22	97.25	1.54	0.94	0.26	98.09	1.20	0.47	0.24	97.61	1.12	1.04	0.23
2010	97.90	0.93	0.99	0.18	96.75	2.03	0.97	0.26	95.70	3.46	0.59	0.25	97.55	1.29	0.96	0.20
2011	97.72	1.10	0.98	0.20	97.03	1.48	1.12	0.37	95.74	2.94	0.86	0.45	97.49	1.26	1.00	0.24
2012	97.68	1.10	1.04	0.18	97.55	0.60	1.47	0.39	97.46	0.94	1.06	0.55	97.64	1.00	1.12	0.24

5.2.10. Composition of Total NPA

The total NPA of scheduled commercial banks may be further classified into the priority, non-priority and the public sector NPA. The statistical data on NPA showed the contribution of both priority and non priority sector, whereas a decline is observed in the case of public sector NPA. The priority sector is further classified into NPA belonging to the agriculture sector, small-scale sector, and other priority sectors. Various studies on NPA in Indian banking have stressed the role of priority sector and blamed excessive control of government in priority sector lending as the major culprit for the incidence of NPA. Here, an analysis based on growth rate and regression study is undertaken in order to judge the relative role of the different sectors on the total NPA of banks.

Table 5.31 Composition of Total NPA – Exponential Growth Rate (2000-01 to 2011-12)

Bank Group	Agri-culture	Small Scale	Others	Priority Sector	Public Sector	Non-Priority Sector
SBI and Associates	1.28	-2.88	11.66	3.78	-32.06	0.72
Nationalized Banks	3.39	0.91	3.91	2.89	-7.72	-4.65
Public Sector Banks	2.62	-0.25	7.01	3.2	-14.49	-2.56
Private Sector Banks	19.59	-3.08	11.79	8.61	--	7.39
Foreign Banks	--	52.73	30.44	35.43	--	20.18
All SCBs	4.32	-0.26	8.11	4.06	-13.03	-3.64

The analysis given in table no.5.31 highlighted the growth of NPA in the priority sector, while the NPA in non priority sector showed a declining trend during the study period. The growth rate of NPA in priority sector is 4.06% while the non-priority sector NPA reduced by 3.64%. Among the priority sector, the 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 (-0.26%) in post-millennium period, except for nationalized banks. With respect to the foreign banks, though the increase of NPA is comparably less in absolute terms, the EG value showed a higher increase of NPA in the priority sector (EG value 35.43%). With regard to the SBI & associates, both priority sectors (EG value 3.78%) and non-priority sector NPA (EG value 0.72%) increased during the study period. The contribution of priority sector is considered to be significant. In the case of nationalized banks, the priority sector NPA (EG value 2.89%) showed an increased trend, while the non priority sector NPA (EG value -4.65%) declined during the study period.

A notable observation made based on the analysis of growth rate is the relevance of other sector (other than agriculture and SSI) on the total NPA of banks. The contribution of priority sector towards total NPA of banks showed a positive EG value for all bank groups with the highest being the foreign banks (EG value 35.43%) and lowest for PSBs (EG value 2.89%). The inference based on the analysis supported the observation in the earlier researches which stressed the role of priority sector on total NPA of banks. The non priority sector showed exponential decay in the case of nationalized banks (EG value -4.56%) and PSBs (EG value -2.56%), while an exponential growth is observed for SBI & associates (EG value 0.72%), private sector banks (EG value 7.39%) and foreign banks (EG value 20.18%).

5.2.10.1. Regression Study – Priority Sector on Total NPA

A simple linear regression equation is formed considering total NPA as independent variable and priority sector NPA as independent variable. The equation is given in table no. 5.32.

Table 5.32 Regression Equation – Priority Sector NPA and total NPA

SBI & Associates	$X_{NPAT} = -1186 + (X_{NPAP}) \times 1.957$
Nationalized Banks	$X_{NPAT} = 1492 + (X_{NPAP}) \times 1.826$
<i>Public Sector Banks</i>	$X_{NPAT} = 1078 + (X_{NPAP}) \times 1.889$

The explained relationship between priority sector NPA and total NPA given in table 5.33 showed that 83.9% of variability in the total NPA of SBI & associates can be explained from the variation of the priority sector NPA. The R^2 value indicated that 97% of variability in total NPA of nationalized banks can be explained from the variation of the priority sector NPA. With regard to PSBs, 91.6% of the variability in total NPA can be explained from the variation of the priority sector NPA.

Table 5.33 Explained Relationship between priority sector NPA and total NPA

	SBI & Associates	Nationalized Banks	Public Sector Banks
R	0.916	0.985	0.957
R Square	0.839	0.970	0.916
Adjusted R Square	0.823	0.967	0.908
R Square Change	0.829	0.970	0.916
Standard Error	4718	1660	6039

The F test, given in table no. 5.34, confirmed that the regression model is highly significant in explaining the behavior of the independent variable.

Table 5.34 Significance of Regression Equation

	SBI & Associates	Nationalized Banks	Public Sector Banks
F Value	51.973	323.255	109.733
<i>Significance</i>	<i>0.000</i>	<i>0.000</i>	<i>0.000</i>

The significance of the impact of priority sector NPA of PSBs on total NPA is analyzed using t-test. The analysis is detailed in table 5.35. The result showed that the regression coefficient is highly significant and implies thereby

that the priority sector NPA can be taken as a significant explanatory variable for examining the behavior of total NPA of the selected bank groups.

Table 5.35 Significance of the impact of priority sector NPA on total NPA

	SBI & Associates		Nationalized Banks		Nationalized Banks	
	t-	Sig	t-	Sig	t-	Sig
X_{NPAP}	7.209	0.000	17.979	0.000	10.475	0.000

5.2.11. Credit Deposit Ratio

Credit necessarily involves taking risks. While the focus on the NPA and credit risk is necessary for banking growth and survival, it should not lead to risk aversion through a reduction in lending and advances and investment in risk free securities. This will hinder the development needs of the economy. The credit is deployed by commercial banks based on the deposits mobilized from the public after making allowances for statutory requirements prescribed by RBI from time to time. In order to maximize the credit flow and to ensure better deployment of credit, a monetary tool known as Credit Deposit Ratio (CDR) was introduced by RBI. The CDR has become more important after the nationalization of banks to assess the credit deployment by commercial banks to benefit the economy in general and the targeted group in particular.

The Credit-Deposit Ratio shows the proportion of loans generated by banks from the deposits received. The table no. 5.36 explained the CD ratio of different bank groups during the study period. A gradual increase in the CD ratio is observed from the analysis, even though the pace of growth was hampered slightly by the recessionary pressures. While the CD ratio of nationalized banks stood at 75.79 which is below the industry level ie, 78.63, all other bank groups reported a higher CD ratio during 2011-12 The inference

supported the view that the recessionary pressures have not affected the credit disbursement of scheduled commercial banks in India.

Table 5.36 Credit Deposit Ratio (2000-01 to 2011-12)

Year	State Bank of India & its Associates	National ized Banks	Private Sector Banks	Foreign Banks	All Scheduled Commercial Banks
2001	48.18	48.28	49.80	72.64	49.45
2002	46.88	51.17	68.71	75.39	53.19
2003	48.39	52.32	66.65	75.27	54.53
2004	50.94	51.92	63.45	75.50	54.82
2005	56.31	61.27	70.48	87.07	62.69
2006	68.52	68.01	73.04	85.77	70.07
2007	76.16	70.38	75.14	83.78	73.46
2008	76.72	71.65	76.80	84.29	74.61
2009	73.43	72.17	78.13	77.25	73.83
2010	77.45	71.34	76.87	68.64	73.58
2011	79.80	73.89	79.53	81.24	76.52
2012	81.99	75.79	82.28	82.96	78.63

It is observed from the table no. 5.36 that there has been an increase in credit deposit ratio for all bank groups during the study period. With regard to SBI & Associates, it grew from 48.18% during 2000-01 to 81.99% during 2011-12. With regard to nationalized banks, the ratio grew 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 sell their NPA accounts.

The post-liberalization period showed a drastic reduction in credit-deposit ratio as indicated by Gopalakrishnan TV (2004) mainly due to apprehension of credit risk which forces the banks to invest their funds in risk

free government securities. The trend has reversed in the post millennium period, especially after 2004 when RBI introduced strict norms for the management of NPA.

5.2.11.1. Testing of Hypothesis

In order to analyze whether there exist significant differences in credit deposit ratio among different bank-groups, a one way ANOVA is used. The hypothesis is;

H₀: There exists no significant difference in the Credit-Deposit Ratio among different bank groups in India.

H₁: There exists a significant difference in the Credit-Deposit Ratio among different bank groups in India.

As inferred from the table 5.37, the F Value is 5.526 and p value is .001 ie, $p \leq 0.05$. Hence we reject the null hypothesis and accept that there exist significant differences in credit-deposit ratio between the bank-groups during the post millennium period.

Table 5.37 Significance of One Way ANOVA – Credit Deposit Ratio

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1724.644	3	574.881	5.526	0.003
Within Groups	4577.577	44	104.036		
Total	6302.221	47			

A post hoc test is conducted to identify the bank group with significant differences. The test showed that there exists a significant difference between SBI and associates and foreign banks, and nationalized banks and foreign banks.

5.3. Objective 2

To analyze the moderating and mediating effect of selected bank specific and macroeconomic variables on NPA of Public Sector Banks.

The relationship between variables are often more complex than simple bivariate relationships between a predictor and a criterion. Rather these relationships may be modified by, or informed by, the addition of a third variable. Examples of a third variable include suppressors, confounders, covariates, mediators and moderators (MacKinnon, *et al*, 2000). Here, the analysis is done in two parts. The first part evaluates the moderating role of selected bank performance indicators on the relationship between advances and NPA. The second part evaluates the mediating role of selected macroeconomic indicators on the relationship between advances and NPA.

5.3.1. Variables used in the study

Table 5.38 Variables Used in the Study

Bank- Specific Performance Indicators	Macro- Economic Indicators
Total Advances	GDP at factor cost
Advances – Sector Wise	Consumption of Fixed Capital
Capital	NDP at factor cost
Reserves and Surplus	Indirect tax less subsidies
Deposits	GDP at market prices
Borrowings	NPP at market prices
Investments	Net factor income from abroad
Total Assets	GNP at factor cost
Interest Earned	NNP at factor cost
Other Income	GNP at market price
Total Income	NNP at market price
Interest Expended	Personal Disposable Income
Operating Expenses	GDP of public sector
Provision and Contingencies	NDP of public sector
Total Expenses	Gross Domestic Capital Formation
Profit (loss))	Net Domestic Capital Formation
	Gross Domestic Saving
	Net Domestic Saving

5.3.2. The moderating role of bank performance indicators on the relationship between advances and NPA

The NPA is primarily a function of advances. Such a relationship is not static, but is always influenced by both the bank performance indicators and macroeconomic variables. The influence of bank performance indicators is considered as moderating in nature. A moderator is a qualitative or quantitative variable that affects the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable (Baron and Kenny, 1986). For instance, it may be hypothesized that higher borrowings force the banks to restrict their advances to sensitive sectors and high risk projects, which indirectly brings down the level of NPA. Higher deposits on the other hand increases the lending and at times results in relaxed lending policy which may result in higher levels of NPA.

The level of advances in a bank is mainly influenced by their capital, reserves and surplus, deposits, borrowings, investments and total assets. The NPA influence the level of interest income, total income, operating expenses, provision and contingencies and net profit. The moderation analysis is significant for policy makers as the influence of these variables can be utilized while evaluating the effectiveness of NPA management. The linear relationship that highlights the moderation effect is explained below.

$$Y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 (x_1 \times x_2)$$

The moderation can be better explained by interaction. In moderated regression analysis, the effect of a new interaction predictor is analyzed. One of the problems with such an equation is the multicollinearity. The new interaction coefficient term will be correlated with the two main effects term used to calculate it. To solve this problem, two major approaches are available.

It includes centering and standardization. Here, the standardization approach is used to reduce the multicollinearity.

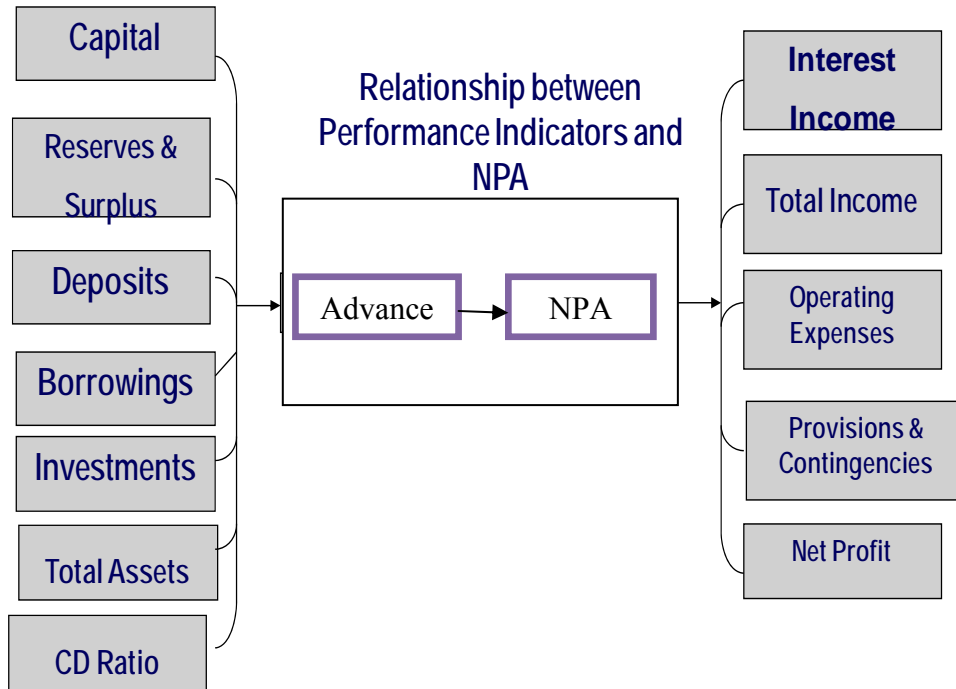


Figure 5.10 Relationship between Bank Performance Indicators and NPA

Before undertaking the moderation analysis, a correlation study is conducted to highlight the relationship between bank performance indicators and the NPA variables.

Table 5.39 SBI & Associates - Correlation between NPA indicators & selected performance variables (2000-01 to 2011-12)

	Additions to NPA		Reductions to NPA		Provisions towards NPA		Gross NPA		Net NPA	
	r	Sig	r	Sig	r	Sig	r	Sig	r	Sig
Interest earned	0.957	0.000	0.861	0.000	0.840	0.001	0.823	0.001	0.907	0.000
Other income	0.814	0.001	0.757	0.004	0.722	0.008	0.618	0.032	0.740	0.006
Spread	0.964	0.000	0.880	0.000	0.873	0.000	0.839	0.001	0.877	0.000
Total Income	0.950	0.000	0.857	0.000	0.834	0.001	0.806	0.002	0.895	0.000
Interest expended	0.931	0.000	0.829	0.001	0.800	0.002	0.794	0.002	0.903	0.000
Operating expenses	0.936	0.000	0.822	0.001	0.832	0.001	0.787	0.002	0.866	0.000
Provisions & contingencies	0.952	0.000	0.914	0.000	0.914	0.000	0.843	0.001	0.848	0.000
Total expenses	0.940	0.000	0.834	0.001	0.815	0.001	0.799	0.002	0.901	0.000
Profit (loss)	0.870	0.000	0.804	0.002	0.725	0.008	0.678	0.015	0.791	0.002
Capital	0.185	0.565	0.051	0.876	0.056	0.862	0.053	0.870	0.141	0.663
Reserves and Surplus	0.900	0.000	0.791	0.002	0.753	0.005	0.723	0.008	0.835	0.001
Deposits	0.910	0.000	0.806	0.002	0.779	0.003	0.735	0.006	0.847	0.001
Borrowings	0.910	0.000	0.795	0.002	0.781	0.003	0.743	0.006	0.862	0.000
Investments	0.857	0.000	0.807	0.002	0.753	0.005	0.688	0.013	0.788	0.002
Total Assets	0.906	0.000	0.799	0.002	0.774	0.003	0.728	0.007	0.844	0.001

Table 5.40 Nationalized Banks - Correlation between NPA indicators & selected performance variables (2000-01 to 2011-12)

	Addition to NPA		Reductions to NPA		Provisions towards NPA		Gross NPA		Net NPA	
	r	Sig	r	Sig	R	Sig	r	Sig	r	Sig
Interest earned	0.961	0.000	0.955	0.000	0.933	0.000	0.679	0.015	0.679	0.015
Other income	0.833	0.001	0.846	0.001	0.848	0.000	0.516	0.086	0.482	0.113
Spread	0.941	0.000	0.979	0.000	0.931	0.000	0.670	0.017	0.638	0.026
Total Income	0.956	0.000	0.951	0.000	0.932	0.000	0.669	0.017	0.666	0.018
Interest expended	0.957	0.000	0.932	0.000	0.922	0.000	0.674	0.016	0.687	0.014
Operating expenses	0.934	0.000	0.970	0.000	0.922	0.000	0.642	0.025	0.616	0.033
Provisions & contingencies	0.961	0.000	0.972	0.000	0.958	0.000	0.738	0.006	0.690	0.013
Total expenses	0.949	0.000	0.932	0.000	0.911	0.000	0.649	0.022	0.659	0.020
Profit (loss)	0.883	0.000	0.930	0.000	0.885	0.000	0.542	0.069	0.514	0.087
Capital	0.661	0.019	0.585	0.046	0.728	0.007	0.798	0.002	0.762	0.004
Reserves and Surplus	0.931	0.000	0.967	0.000	0.898	0.000	0.606	0.037	0.595	0.041
Deposits	0.928	0.000	0.948	0.000	0.907	0.000	0.601	0.039	0.598	0.040
Borrowings	0.929	0.000	0.958	0.000	0.893	0.000	0.622	0.031	0.606	0.037
Investments	0.934	0.000	0.957	0.000	0.921	0.000	0.632	0.028	0.607	0.036
Total Assets	0.926	0.000	0.952	0.000	0.902	0.000	0.597	0.040	0.591	0.043

Table 5.41 PSB's - Correlation between NPA indicators & selected performance variables (2000-01 to 2011-12)

	Addition to NPA		Reductions to NPA		Provisions towards NPA		Gross NPA		Net NPA	
	r	Sig	r	Sig	R	Sig	r	Sig	r	Sig
Interest earned	0.964	0.000	0.955	0.000	0.902	0.000	0.758	0.004	0.775	0.003
Other income	0.830	0.001	0.850	0.000	0.804	0.002	0.573	0.051	0.576	0.050
Spread	0.955	0.000	0.980	0.000	0.909	0.000	0.757	0.004	0.746	0.005
Total Income	0.958	0.000	0.952	0.000	0.899	0.000	0.746	0.005	0.761	0.004
Interest expended	0.955	0.000	0.930	0.000	0.887	0.000	0.748	0.005	0.778	0.003
Operating expenses	0.940	0.000	0.959	0.000	0.890	0.000	0.717	0.009	0.718	0.009
Provisions and contingencies	0.962	0.000	0.985	0.000	0.940	0.000	0.806	0.002	0.775	0.003
Total expenses	0.949	0.000	0.932	0.000	0.878	0.000	0.731	0.007	0.757	0.004
Profit (loss)	0.889	0.000	0.921	0.000	0.839	0.001	0.619	0.032	0.626	0.030
Capital	0.694	0.012	0.634	0.027	0.785	0.003	0.806	0.002	0.769	0.003
Reserves and Surplus	0.928	0.000	0.945	0.000	0.853	0.000	0.676	0.016	0.690	0.013
Deposits	0.927	0.000	0.935	0.000	0.865	0.000	0.679	0.015	0.699	0.011
Borrowings	0.927	0.000	0.937	0.000	0.855	0.000	0.689	0.013	0.704	0.011
Investments	0.925	0.000	0.938	0.000	0.877	0.000	0.695	0.012	0.695	0.012
Total Assets	0.924	0.000	0.935	0.000	0.859	0.000	0.673	0.017	0.691	0.013

5.3.3. The Moderating relationship of bank performance indicators on the relationship between Advances and GNPA

5.3.3.1. Relationship between Bank Performance Indicators and GNPA

The table no. 5.42 highlighted a positive correlation between gross NPA and advances of PSBs. The adjusted R² shows that 48% of variability in the dependent variable, i.e., the gross NPA, can be explained by the changes in total advances for SBI & associate, whereas the same is 35.3% and 39.6% with respect to nationalized banks and PSBs respectively. It is also evident from the analysis that the explained relationship is statistically significant (p value < 0.05).

Table 5.42 Relationship between Advances and GNPA (2000-01 to 2011-12)

	SBI & Associates	Nationalized Banks	PSBs
X _{ADV}	0.730*	0.008**	0.671**
Constant	1.280E-16	26827.467	-1.962E-16
Adjusted R ²	0.486	0.353	0.396
F Statistics	11.389*	5.461**	8.198**
Note: A single (*) asterisk indicates that the coefficients denotes significant at the 1 % level. A double asterisk indicates that the coefficient denotes significant at the 5 % level.			

In order to judge whether the bank performance indicators moderate the above explained relationship, a regression analysis is undertaken considering the bank performance indicators and its interaction with advances as separate independent variables with the following hypothesis.

H0: The selected bank performance indicators do not moderate the relationship between advances and Gross NPA.

H1: The selected bank performance indicators moderate the relationship between advances and Gross NPA.

5.3.3.2. SBI & Associates

From the table no. 5.43, it is evident that the relationship between advances and NPA becomes highly significant when the bank performance indicator is included in the equation as a moderating variable.

Table 5.43 Linear Multiple Regression Coefficients, X_{GNPA} as Dependent Variable And X_{ADV} , X_{IND} and X_{INT} as Independent Variables

Independent Variables	Borrowing	Investments	Reserves & Surplus	Deposits	Capital	Total Assets
X_{ADV}	1.011	0.123	0.328	0.609	1.188*	0.873
X_{IND}	-0.824	0.140	-0.060	-0.376	-0.662	-0.638
X_{INT}	0.970*	0.918*	0.890*	0.914*	3.058	0.923*
Constant	-0.885*	-0.783*	-0.811*	-0.835*	-0.863	-0.844*
Adjusted R^2	0.973	0.923	0.993	0.982	0.936	0.979
F Statistics	131.42*	44.97*	512.58*	200.27*	54.99*	174.77*

Note: A single (*) asterisk indicates that the coefficients denotes significant at the 1 % level. A double asterisk indicates that the coefficient denotes significant at the 5 % level.

In the table no. 5.43,

X_{ADV} denotes the advances.

X_{IND} denotes the selected bank performance indicator.

X_{INT} denotes the interaction effect of performance indicator and the advances.

It may be observed from the table no.5.43 that the adjusted R^2 increased significantly to more than 90% when the interaction effect is included in the equation. It indicates that more than 90%of the variability in the gross NPA of SBI & associates can be explained by the changes in the selected independent variables. The effect of moderation is statistically significant even though the

effect of advances is not found to be statistically significant except when moderated by capital. Based on the analysis, the null hypothesis is rejected and conclude that the selected bank performance indicators moderate the relationship between advances and gross NPA of SBI & associates.

5.3.3.3. Nationalized Banks

Table 5.44 Linear Multiple Regression Coefficients, X_{GNPA} as Dependent Variable And X_{ADV} , X_{IND} and X_{INT} as Independent Variables

Independent Variables	Borrowing	Investments	Reserves & Surplus	Deposits	Capital	Total Assets
X_{ADV}	-0.486	-1.35**	-0.979	-1.216	0.103	-3.185
X_{IND}	-0.400	1.296**	0.925	1.108	0.473	3.086
X_{INT}	0.927*	0.906*	0.899*	0.977*	0.273	0.972*
Constant	-0.840*	-0.823*	-0.823*	-0.895*	-0.129	-0.891*
Adjusted R^2	0.947	0.960	0.948	0.945	0.599	0.951
F Statistics	66.509*	88.609*	67.975*	64.119*	6.479**	71.955*

Note: A single (*) asterisk indicates that the coefficients denote significant at the 1 % level. A double asterisk indicates that the coefficient denote significant at the 5 % level.

The analysis given in table no. 5.44 supported the observation that that the selected bank performance indicators moderate the relationship between advances and gross NPA of nationalized banks. The adjusted R^2 showed that more than 90% of the variability in the gross NPA can be explained by the selected bank performance indicators except when the capital is considered as a moderating variable. The regression model is statistically significant (F value is significant at 0.05 level). Similar to observed results of SBI & associates, the influence of advances is not statistically significant while the moderation effect is a statistically significant predictor in explaining the movement of gross NPA. Based on the analysis, the null hypothesis is rejected and conclude

that the selected bank performance indicators moderate the relationship between advances and gross NPA of SBI & associates.

5.3.3.4. Public Sector Banks

Table 5.45 Linear Multiple Regression Coefficients, X_{GNPA} as Dependent Variable And X_{ADV} , X_{IND} and X_{INT} as Independent Variables

Independent Variables	Borrowing	Investments	Reserves & Surplus	Deposits	Capital	Total Assets
X_{ADV}	0.028	-0.553	1.024	-0.261	0.227	-0.329
X_{IND}	0.018	0.627**	1.117**	0.312	0.437	0.386
X_{INT}	0.919*	0.898*	0.881*	0.930*	0.247	0.930*
Constant	-0.837*	-0.809*	-0.806*	-0.852*	-0.118	-0.852*
Adjusted R^2	0.971	0.971	0.990	0.973	0.667	0.972
F Statistics	122.449*	121.941*	365.786*	133.590*	8.348*	126.099*

Note: A single (*) asterisk indicates the coefficients denote significant at the 1 % level. A double asterisk indicates the coefficient denote significant at the 5 % level.

As the PSBs is comprised of both SBI & associates and nationalized banks, the result observed in table no. 5.43 and 5.44 is also valid for PSBs. Upon including moderating variables in the equation, the adjusted R^2 becomes significantly positive, i.e., > 90%. From table no. 5.45, it is observed that the regression equation is highly reliable in explaining the NPA of PSBs. A notable remark from the analysis is the statistical significance of moderation effect, observed from the t-test statistic.

Summary

It is found from the table no. 5.43, 5.44 and 5.45 that all the selected bank performance indicators significantly moderate the relationship between advances and gross NPA of banks. Hence, it is concluded that;

- a) Borrowing is a significant moderating variable in the relationship between advances and gross NPA.
- b) Investment is a significant moderating variable in the relationship between advances and gross NPA.
- c) Reserves and Surplus is a significant moderating variable in the relationship between advances and Gross NPA.
- d) The deposit is a significant moderating variable in the relationship between advances and Gross NPA.
- e) Capital is a significant moderating variable in the relationship between advances and Gross NPA.
- f) Total Asset is a significant moderating variable in the relationship between advances and Gross NPA.

5.3.4. The Moderating relationship of bank performance indicators on relationship between Advances and additions to NPA

5.3.4.1. Relationship between Bank Performance Indicators and incidence of fresh NPA

It is observed from the table no.5.46 that there exists a significant positive correlation between advances and additions to NPA (fresh NPA). The regression model is statistically significant as evidenced from the F-test and its significance. Further, it is confirmed that the advance is a statistically significant predictor in explaining the behavior of fresh NPA, observed from the t-test.

Table 5.46 Relationship between Advances and Additions to NPA

	SBI & Associates	Nationalized Banks	Public Sector Banks
X _{ADV}	0.907*	0.017*	0.019*
Constant	-2.022E-17	1173.389	581.182
Adjusted R ²	0.805	0.844	0.839
F Statistics	46.405*	60.334*	58.502*
Note: A single (*) asterisk indicates that the coefficients denote significant at the 1 % level. A double asterisk indicates that the coefficient denote significant at the 5 % level.			

In an attempt to evaluate whether bank performance indicators moderate the relationship between advances and fresh NPA, a regression analysis is undertaken considering fresh NPA as a dependent variable and bank performance indicators including advance as independent variables. The following hypothesis is used.

H0: The selected bank performance indicators do not moderate the relationship between advances and additions to NPA.

H1: The selected bank performance indicators moderate the relationship between advances and additions to NPA.

5.3.4.2. SBI & Associates

The results of regression analysis is given in table no. 5.47.

Table 5.47 Linear Multiple Regression Coefficients, X_{ANPA} as Dependent Variable And X_{ADV} , X_{IND} and X_{INT} as Independent Variables

Independent Variables	Borrowing	Investments	Reserves & Surplus	Deposits	Capital	Total Assets
X_{ADV}	1.419*	0.510**	0.673	0.633	1.185*	0.786
X_{IND}	-0.852*	0.138	-0.041	-0.021	-0.395*	-0.175
X_{INT}	0.605*	0.517*	0.529*	0.545*	1.881*	0.553*
Constant	-0.552*	-0.441*	-0.482*	-0.498*	-0.531*	-0.506*
Adjusted R^2	0.987	0.937	0.981	0.981	0.972	0.980
F Statistics	275.327*	55.781*	187.087*	191.846*	128.62*	181.042*

Note: A single (*) asterisk indicates that the coefficients denote significant at the 1 % level. A double asterisk indicates that the coefficient denote significant at the 5 % level.

From the table no.5.47, few major inferences were drawn regarding SBI& associates. The first and foremost inference is based on adjusted R^2 which highlighted the presence of significant positive correlation ($> 90\%$) between additions to NPA and the selected bank performance indicators. The regression

model is statistically significant, observed from the F statistics and its significance. The borrowing is found to influence additions to NPA significantly compared to the other performance indicators. In all the equations formed, the moderating effect is a statistically significant predictor in explaining the behavior of fresh NPA of SBI & associates.

5.3.4.3. Nationalized Banks

The relationship between advances and fresh NPA strengthened when selected bank performance indicators were included in the regression equation along with its moderation effect on advances. The adjusted R² showed that there exists a significant positive correlation between additions to NPA and selected bank performance indicators.

Table 5.48 Linear Multiple Regression Coefficients, X_{ANPA} as Dependent Variable And X_{ADV}, X_{IND} and X_{INT} as Independent Variables

Independent Variables	Borrowing	Investments	Reserves and Surplus	Deposits	Capital	Total Assets
X _{ADV}	0.568	0.232	0.158	0.729	0.727*	0.396
X _{IND}	0.047	0.389	0.475	-0.124	0.155	0.216
X _{INT}	0.422	0.419*	0.407*	0.445*	0.131	0.439*
Constant	-0.383*	-0.381*	-0.373	-0.408*	-0.062	-0.40*
Adjusted R ²	0.973	0.976	0.977	0.973	0.876	0.973
F Statistics	133.4*	151.6*	158.2*	133.3*	26.9*	132.7*
Note: A single (*) asterisk indicates that the coefficients denote significant at the 1 % level. A double asterisk indicates that the coefficient denote significant at the 5 % level.						

From the table no.5.47, it is obvious that the regression equation formed is statically significant in explaining the behavior of additions to NPA. The moderation of bank performance indicators is statistically significant based on t-statistics, except when borrowing and reserves and surplus is used as independent

variables. It is concluded that bank performance indicators are a significant predictor variables and moderates the relationship between advances and additions to NPA of nationalized banks.

5.3.4.4. Public Sector Banks

The analysis further strengthens the observation and enable the researcher to conclude that the bank performance indicators and its moderating effect is significantly influence fresh addition to NPA every year.

Table 5.49 Linear Multiple Regression Coefficients, X_{ANPA} as Dependent Variable And X_{ADV} , X_{IND} and X_{INT} as Independent Variables

Independent Variables	Borrowing	Investment	Reserves & Surplus	Deposits	Capital	Total Assets
X_{ADV}	0.807**	0.351	-0.451	0.882	0.698*	0.984
X_{IND}	-0.205	0.271	1.083*	-0.276	0.174	-0.370
X_{INT}	0.472*	0.454*	0.446*	0.475*	0.154	0.470*
Constant	-0.430*	-0.409*	-0.408*	-0.435*	-0.074	-0.431*
Adjusted R^2	0.985	0.983	0.996	0.985	0.896	0.984
F Statistics	243.7*	209.1*	1004.2*	237.4*	32.6*	229.9*

Note: A single (*) asterisk indicates that the coefficients denote significant at the 1 % level. A double asterisk indicates that the coefficient denote significant at the 5 % level.

Based on table no. 5.49, the following inferences are drawn.

- The adjusted R^2 showed that more than 90% of variability in additions to NPA can be explained by the independent variables except when capital is considered as an independent variable.
- 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.

5.3.4.5. Summary

Using F –test the hypothesis is tested. It is found from the table that all the selected bank performance indicators are significant (Sig < 0.05). Hence, the alternative hypothesis is accepted and conclude that;

- a) Borrowing is a significant moderating variable in the relationship between advances and additions to NPA.
- b) Investment is a significant moderating variable in the relationship between advances and additions to NPA.
- c) Reserves and Surplus is a significant moderating variable in the relationship between advances and additions to NPA.
- d) Deposit is a significant moderating variable in the relationship between advances and additions to NPA.
- e) Capital is a significant moderating variable in the relationship between advances and additions to NPA.
- f) Total Asset is a significant moderating variable in the relationship between advances and addition to NPA.

5.3.5. Influence of Additions to NPA as a moderating variable in the relationship between interest income and net profit

The fresh NPA (additions to NPA) is a significant moderating variable in the relationship between interest income and net profit of PSBs. In order to test the significance of additions to NPA as moderating variable, a centered approach is considered. This is because of the significance of the correlation existing between additions to NPA and interest income. The study is based on the following hypothesis.

H0: The additions to NPA is not a moderating variable in the relationship between interest income and net profit of public sector banks.

H1: The additions to NPA is a moderating variable in the relationship between interest income and net profit of public sector banks.

Table 5.50 Linear Multiple Regression Coefficients Additions to NPA as moderating variable

Independent Variables	SBI & Associate	Nationalized Banks	PSB
X _{INTI} - Coefficient	1.153*	1,189*	1.182*
X _{MOD} - Coefficient	-0.170*	-0.188*	-0.182
Constant	0.149	0.165**	0.161**
Adjusted R ²	0.962	0.971	0.975
F Statistics	138.426*	182.990*	219.323*

Note: A single (*) asterisk indicates that the coefficients denote significant at the 01 % level of significance. A double asterisk indicates that the coefficient denote significant at the 05 % level of significance

Based on the F-statistic (Sig < 0.05), the null hypothesis is rejected and thereby concludes that that 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.

5.3.6. Influence of gross NPA as a moderating variable in the relationship between interest income and net profit

The influence of gross NPA as a moderating variable in the relationship between interest income and net profit of PSBs is tested here. The study is based on the following hypothesis.

H0: Gross NPA is not a moderating variable in the relationship between interest income and net profit of public sector banks.

H1: Gross NPA is a moderating variable in the relationship between interest income and net profit of public sector banks.

The analysis is given in table no. 5.51. It is concluded based on the regression study that the gross NPA is a moderating variable in the relationship between interest income and net profit.

Table 5.51 Linear Multiple Regression Coefficients Gross NPA as a moderating variable

Independent Variables	SBI & Associate	Nationalized Banks	PSB
X _{INTI}	0.133*	0.140*	0.137*
X _{MOD}	-525.120	-2143.584*	-2245.014*
Constant	-767.113	-2143.584	-2819.815
Adjusted R ²	0.949	0.970	0.970
F Statistics	103.984*	177.341*	179.123*
Note: A single (*) asterisk indicates that the coefficients denote significant at the 01 % level of significance.			

5.4. Objective 2.2

The Mediating Role of macroeconomic indicators on the relationship between Advances and NPA of banks

The banking system is an important constituent of the financial system and contribute significantly for the development of Indian economy. Swamy, V (2012) observed that banking institutions facilitate economic development through performing its three key functions simultaneously: (1) efficient and smooth facilitation of the inter-temporal allocation of resources from the surplus economic units to the deficit economic units; (2) managing the forward looking financial risks with appropriate pricing; and (3) to be prepared all the time to absorb the financial and real economic surprises and shocks. As a prominent player in maintaining economic stability and development, the banking sector reflects the changes in economic indicators. The change in economic indicators such as inflation, GDP growth etc, affects the performance of the bank

as well. For example, in a period of recession, the bank's earning and quality of assets will be affected.

Although the non-performing assets are a permanent phenomenon in the balance sheets of the financial institutions, its movement is affected by the changes in the economy as well. Researches on NPA in India and abroad have stressed the role of economic variables that include GDP (Lis et al, 2000; Earnest & Young, 2001; Klein, N.2013), Inflation Rate, etc, on the bank's performance and quality of assets. Most of these studies utilized the correlation study in order to explain the relationship between NPA and macroeconomic indicators. Such an analysis has some major limitations. While the gross NPA and net NPA include the overhang component which is carried forward from the previous years, it may not really indicate the exact correlation with economic variables. The NPA movements in a particular year can be explained more accurately by the addition to NPA and the reduction to NPA. Thus, a more meaningful comparison can be generated if analysis also includes additions to NPA and reduction to NPA. Also, the effect of macroeconomic indicators on NPA is mediating in nature. It mediates the relationship between advances and NPA of banks.

This part reviews the impact of selected macro economic indicators on asset quality of PSBs. The various macroeconomic indicators are selected based on previous studies.

5.4.1. Variables Used

The economic variables used in this study include;

Table 5.52 List of Variables and their Codes

SL No	Variables used	Codes
1	GNPA of SCBs	X_{GNP}
2	GDP at factor cost	X_{GDPF}
3	Consumption of Fixed Capital	X_{FC}
4	NDP at factor cost	X_{NDPF}
5	Indirect tax less subsidies	X_{IT}
6	GDP at market prices	X_{GDPM}
7	NPP at market prices	X_{NDPM}
8	Net factor income from abroad	X_{NFI}
9	GNP at factor cost	X_{GNPF}
10	NNP at factor cost	X_{NNPF}
11	GNP at market price	X_{GDPM}
12	NNP at market price	X_{NNPM}
13	Personal Disposable Income	X_{PDI}
14	GDP of public sector	X_{GDPPS}
15	NDP of public sector	X_{NDPPS}
16	Gross Domestic Capital Formation	X_{GDCF}
17	Net Domestic Capital Formation	X_{NDCF}
18	Gross Domestic Saving	X_{GDS}
19	Net Domestic Saving	X_{NDS}
20	Per capita GNP at factor cost (Rs)	X_{PCGNPF}
21	Per capita NNP at factor cost (Rs)	X_{PCNNPF}

5.4.2. Test of Correlation – SBI & Associates

The table no. 5.53 highlighted the correlation between various NPA indicators and macroeconomic indicators during the study period. The results obviously led to the conclusion that economic variables are important factors that explain the movement of NPA of banks. All the selected variables possess

a significant correlation with additions to NPA. Except the net factor income from abroad, all the other indicators showed a very significant and positive correlation with addition to NPA. A significant correlation exist between GDP at factor cost and additions to NPA ($r = 0.927$, Sig = 0.000), between GDP at market price and additions to NPA ($r = 0.928$, Sig = 0.000), GDP of public sector and additions to NPA ($r = 0.948$, Sig = 0.000), Personal Disposable Income and additions to NPA ($r = 0.935$, Sig = 0.000), Per Capita GNP at factor cost and additions to NPA ($r = 0.922$, Sig = 0.000) etc. A significant negative correlation exist between Net Factor Income from abroad and additions to NPA ($r = -0.941$, Sig = 0.000). A major observation drawn from the analysis is the higher level of correlation between additions to NPA and economic indicators in comparison to other NPA indicators.

With regard to reductions to NPA, all economic variables (except Net Domestic Capital formation, NDP of public sector and Net Domestic Saving) showed significant correlation with reduction to NPA. While net factor income from abroad showed a significant negative correlation with reduction to NPA ($r = -0.845$, Sig = 0.001), other variables are positively correlated to reduction to NPA. Significant correlation include, between GDP at factor cost and reductions to NPA ($r = 0.817$, Sig = 0.001), between GDP at market price and reductions to NPA ($r = 0.818$, Sig = 0.001), between GNPA at market prices and reductions to NPA ($r = 0.817$, Sig = 0.001), between NNPA at market prices and reductions to NPA ($r = 0.81$, Sig = 0.001), between NDP at market price and reductions to NPA ($r = 0.819$, Sig = 0.001) etc.

With regard to the gross NPA, significant correlation, both positive and negative, may be observed. While Net Factor Income from abroad showed negative correlation with GNPA ($r = -0.871$, Sig = 0.000), most of the other variables showed positive correlation with GNPA such as GDP at factor cost

($r = 0.759$, Sig = 0.004), Consumption of Fixed Capital ($r = 0.749$, Sig = 0.005), GDP at market prices($r = 0.760$, Sig = 0.004), NDP at factor cost ($r = 0.760$, Sig = 0.004), Per capita GNP at factor cost ($r = 0.750$, Sig = 0.005) and Per Capital NNP at factor cost ($r = 0.751$, Sig = 0.004). A few economic variables which are supposed to influence NPA of SCBs that includes Gross Domestic Capital Formation, Gross Domestic Savings, Personal Disposable Income etc did not highlight significant correlation with GNPA. With regard to NNPA, significant correlation is observed with GDP at factor cost ($r = 0.854$, Sig = 0.000). GDP at market price ($r = 0.852$, Sig = 0.000), NNP at factor cost ($r = 0.853$, Sig = 0.000), NNP at market price ($r = 0.851$, Sig = 0.000), Consumption of Fixed Capital ($r = 0.848$, Sig = 0.000), personal disposable income ($r = 0.776$, Sig = 0.005) etc. A significant negative correlation exist between net factor income from abroad and NNPA ($r = -0.880$, Sig = 0.000).

Table 5.53 The correlation between NPA Indicators & Selected Macroeconomic Indicators of SBI & Associates (2001-2012)

	Addition to NPA		Reduction to NPA		Provisions towards NPA		Gross NPA		Net NPA	
	R	Sig	r	Sig	r	Sig	r	Sig	r	Sig
GDP at factor cost X_{GDPF}	.927	0.000	0.817	0.001	0.805	0.002	0.759	0.004	0.854	0.000
Consumption of Fixed Capital X_{FC}	.919	0.000	0.809	0.001	0.793	0.002	0.749	0.005	0.848	0.000
NDP at factor cost X_{NDPF}	.927	0.000	0.818	0.001	0.806	0.002	0.760	0.004	0.854	0.000
Indirect tax less subsidies X_{IT}	.903	0.000	0.791	0.002	0.79	0.002	0.745	0.005	0.789	0.002
GDP at market prices X_{GDPM}	.928	0.000	0.818	0.001	0.806	0.002	0.760	0.004	0.852	0.000
NPP at market prices X_{NDPM}	.929	0.000	0.819	0.001	0.807	0.002	0.761	0.004	0.852	0.000
Net factor income from abroad X_{NFI}	-.941	0.000	-0.845	0.001	-0.916	0.000	-0.871	0.000	-0.880	0.000
GNP at factor cost X_{GNPF}	.925	0.000	0.816	0.001	0.802	0.002	0.757	0.004	0.852	0.000
NNP at factor cost X_{NNPF}	.926	0.000	0.817	0.001	0.803	0.002	0.758	0.004	0.853	0.000
GNP at market price X_{GDPM}	.927	0.000	0.817	0.001	0.804	0.002	0.758	0.004	0.851	0.000
NNP at market price X_{NNPM}	.927	0.000	0.818	0.001	0.805	0.002	0.759	0.004	0.851	0.000
Personal Disposable Income X_{PDI}	.935	0.000	0.707	0.015	0.677	0.022	0.607	0.048	0.776	0.005
GDP of public sector X_{GDPPS}	.948	0.000	0.713	0.014	0.719	0.013	0.647	0.031	0.793	0.004
NDP of public sector X_{NDPPS}	.907	0.000	0.457	0.184	0.033	0.352	0.255	0.478	0.589	0.073
Gross Domestic Capital Formation X_{GDCF}	.875	0.000	0.616	0.044	0.578	0.062	0.496	0.121	0.689	0.019
Net Domestic Capital Formation X_{NDCF}	.857	0.000	0.591	0.055	0.553	0.078	0.467	0.147	0.666	0.025
Gross Domestic Saving X_{GDS}	.865	0.000	0.615	0.044	0.572	0.066	0.471	0.144	0.664	0.026
Net Domestic Saving X_{NDS}	.838	0.000	0.585	0.059	0.539	0.087	0.428	0.190	0.626	0.029
Per capita GNP at factor cost (Rs) X_{PCGNPF}	.922	0.000	0.811	0.001	0.796	0.002	0.750	0.005	0.848	0.000
Per capita NNP at factor cost (Rs) X_{PCNNPF}	.922	0.000	0.812	0.001	0.797	0.002	0.751	0.005	0.849	0.000

A major indicator that explains the movement of NPA of scheduled commercial banks is the net additions to NPA. A positive addition indicates the deficiency of credit risk management. A higher growth of net addition over the growth of advances is alarming and indicates demands corrective actions.

Table 5.54 Correlation Coefficient - Net Additions to NPA Selected Macroeconomic Indicators of SBI & Associates (2001-2012)

	Net Addition to NPA	
	R	Sig
GDP at factor cost X_{GDPF}	0.925	0.000
Consumption of Fixed Capital X_{FC}	0.919	0.000
NDP at factor cost X_{NDPF}	0.926	0.000
Indirect tax less subsidies X_{IT}	0.904	0.000
GDP at market prices X_{GDPM}	0.926	0.000
NPP at market prices X_{NDPM}	0.927	0.000
Net factor income from abroad X_{NFI}	-0.933	0.000
GNP at factor cost X_{GNPF}	0.924	0.000
NNP at factor cost X_{NNPF}	0.924	0.000
GNP at market price X_{GDPM}	0.925	0.000
NNP at market price X_{NNPM}	0.926	0.000
Personal Disposable Income X_{PDI}	0.904	0.000
GDP of public sector X_{GDPPS}	0.919	0.000
NDP of public sector X_{NDPPS}	0.839	0.002
Gross Domestic Capital Formation X_{GDCF}	0.865	0.001
Net Domestic Capital Formation X_{NDCF}	0.852	0.001
Gross Domestic Saving X_{GDS}	0.853	0.001
Net Domestic Saving X_{NDS}	0.831	0.002
Per capita GNP at factor cost (Rs) X_{PCGNPF}	0.921	0.000
Per capita NNP at factor cost (Rs) X_{PCNNPF}	0.921	0.000

The observed result from table no. 5.54 indicates the presence of significant correlation between net additions to NPA and economic variables selected. 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. The effect of the economy on NPA variables can be controlled through exercising effective credit risk management system.

5.4.3. Test of Correlation – Nationalized Banks

Similar to the observations on SBI & associates, the additions to NPA showed significant correlation with selected macroeconomic indicators. All selected variables except net factor income from abroad showed significant positive correlation with the additions to NPA. The highest correlation exists between addition to NPA and GDP of public sector ($r = 0.963$, Sig = 0.000). Significant correlation exists between addition to NPA and GDP at market price ($r = 0.919$, Sig = 0.000). with GDP at factor cost ($r = 0.918$, Sig = 0.000), with consumption of fixed capital ($r = 0.913$, Sig = 0.000), with NDP at factor cost ($r = 0.919$, Sig = 0.000), with NDP at market price ($r = 0.920$, Sig = 0.000) and with Personal Disposable Income ($r = 0.942$, Sig = 0.000). There exists a significant negative correlation with the additions to NPA and net factor income from abroad ($r = -0.928$, Sig = 0.000).

The reductions to NPA also showed significant correlation with selected macroeconomic variables. The most significant among them is the correlation between reductions to NPA and indirect tax and subsidies ($r = 0.973$, Sig = 0.000). Other significant correlations exist between GDP at market prices and reductions to NPA ($r = 0.958$, Sig = 0.000), with NDP at market prices ($r = 0.959$, Sig = 0.000), GNPA at market prices ($r = 0.957$,

Sig = 0.000), with GDP at factor cost ($r = 0.954$, Sig = 0.000). with consumption of fixed capital ($r = 0.950$, Sig = 0.000) etc.

On the other hand, both gross NPA and net NPA did not show any significant correlation (at 0.01 level) with selected macro indicators. One major reason is that both GNPA and NNPA include the overhang component brought forward from the previous years. Thus, both GNPA and NNPA does not really reflect the movement of NPA for a particular year. Based on the above, it may be concluded that additions to NPA and reductions to NPA must be considered as major indicators to highlight the quality of assets during a particular year.

Table 5.55 The correlation between NPA Indicators & Selected Macroeconomic Indicators of Nationalized Banks (2001-2012)

	Additions to NPA		Reductions to NPA		Provision towards NPA		Gross NPA		Net NPA	
	r.	Sig	r.	Sig	r.	Sig	r.	Sig	r.	Sig
GNPA of SCB (X_{GNP})	0.918	0.000	0.954	0.000	0.890	0.000	0.577	0.049	0.569	0.054
GDP at factor cost (X_{GDPC})	0.913	0.000	0.950	0.000	0.883	0.000	0.565	0.056	0.557	0.060
Consumption of Fixed Capital (X_{FC})	0.919	0.000	0.955	0.000	0.890	0.000	0.579	0.049	0.570	0.053
NDP at factor cost (X_{NDPC})	0.895	0.000	0.973	0.000	0.851	0.000	0.594	0.042	0.567	0.054
Indirect tax less subsidies (X_{IT})	0.919	0.000	0.958	0.000	0.890	0.000	0.580	0.048	0.570	0.053
GDP at market prices (X_{GDPM})	0.920	0.000	0.959	0.000	0.890	0.000	0.582	0.047	0.572	0.052
NPP at market prices (X_{NDPM})	-0.928	0.000	-0.931	0.000	-0.923	0.000	-0.765	0.004	-0.746	0.005
Net factor income from abroad (X_{NFI})	0.917	0.000	0.953	0.000	0.888	0.000	0.575	0.051	0.566	0.055
GNP at factor cost (X_{GNPC})	0.917	0.000	0.954	0.000	0.889	0.000	0.576	0.050	0.567	0.054
NNP at factor cost (X_{NNPC})	0.918	0.000	0.957	0.000	0.888	0.000	0.577	0.049	0.568	0.054
GNP at market price (X_{GDPM})	0.919	0.000	0.958	0.000	0.889	0.000	0.579	0.049	0.569	0.053
NNP at market price (X_{NNPM})	0.942	0.000	0.932	0.000	0.838	0.001	0.141	0.680	0.142	0.676
Personal Disposable Income (X_{PDI})	0.963	0.000	0.937	0.000	0.872	0.000	0.212	0.532	0.199	0.558
GDP of public sector (X_{GDPPS})	0.916	0.000	0.905	0.000	0.721	0.019	-0.333	0.346	-0.292	0.413
NDP of public sector (X_{NDPPS})	0.888	0.000	0.937	0.000	0.760	0.007	0.009	0.979	0.014	0.967
Gross Domestic Capital Formation (X_{GDCFC})	0.871	0.000	0.934	0.000	0.739	0.009	-0.022	0.948	-0.016	0.963
Net Domestic Capital Formation (X_{NDCFC})	0.877	0.000	0.939	0.000	0.753	0.007	-0.006	0.986	-0.012	0.972
Gross Domestic Saving (X_{GDS})	0.851	0.001	0.933	0.000	0.724	0.012	-0.048	0.889	-0.057	0.868
Net Domestic Saving (X_{NDS})	0.913	0.000	0.951	0.000	0.883	0.000	0.566	0.055	0.558	0.059
Per capita GNP at factor cost (X_{PCGNPC})	0.913	0.000	0.952	0.000	0.884	0.000	0.567	0.055	0.559	0.059

With regard to net additions to NPA, the correlation study shows few significant correlations at 0.01 level. The analysis is given in table no. 5.56.

Table 5.56 Correlation Coefficient - Net Additions to NPA Selected Macroeconomic Indicators of Nationalized Banks (2001-2012)

	Net Addition to NPA	
	r.	Sig
GNPA of SCB (X_{GNP})	0.802	0.002
GDP at factor cost (X_{GDPF})	0.796	0.002
Consumption of Fixed Capital (X_{FC})	0.802	0.002
NDP at factor cost (X_{NDPF})	0.745	0.005
Indirect tax less subsidies (X_{IT})	0.800	0.002
GDP at market prices (X_{GDPM})	0.801	0.002
NPP at market prices (X_{NDPM})	-0.837	0.001
Net factor income from abroad (X_{NFI})	0.800	0.002
GNP at factor cost (X_{GNPF})	0.801	0.002
NNP at factor cost (X_{NNPF})	0.799	0.002
GNP at market price (X_{GDPM})	0.799	0.002
NNP at market price (X_{NNPM})	0.697	0.017
Personal Disposable Income (X_{PDI})	0.729	0.011
GDP of public sector (X_{GDPPS})	0.528	0.117
NDP of public sector (X_{NDPPS})	0.597	0.052
Gross Domestic Capital Formation (X_{GDCF})	0.571	0.067
Net Domestic Capital Formation (X_{NDCF})	0.575	0.064
Gross Domestic Saving (X_{GDS})	0.535	0.090
Net Domestic Saving (X_{NDS})	0.795	0.002
Per capita GNP at factor cost (Rs) (X_{PCGNPF})	0.796	0.002

The net additions to NPA showed significant positive correlation with GDP at factor cost ($r = -0.802$, Sig = 0.002), with GDP at market prices ($r = 0.800$, Sig = 0.002). with NDP at factor cost ($r = 0.802$, Sig = 0.002), with consumption of fixed capital ($r = 0.796$, Sig = 0.002) and with NNP at factor

cost ($r = 0.801$, Sig = 0.002). The net addition to NPA showed significant negative correlation with net factor income from abroad ($r = -0.837$, Sig = 0.001). It may be concluded based on the correlation study that the additions to NPA, reductions to NPA and net additions to NPA reflect the real movement of NPA during a particular year.

5.4.4. The Mediation Effect of Macro Variables on NPA

A lot of research studies have been undertaken to evaluate the effect of macroeconomic variables on the asset quality of banks. These literatures identified various macroeconomic variables that affect NPA of SCBs. NPA is primarily influenced by the level of advances. The economic variables exercise influence on the relationship between the advances and NPA. During periods of economic growth, the advances grew at a faster rate than the growth of NPA, while in a period of economic recession; the growth rate of advances will be comparatively less than the growth rate of NPA. Bock and Demyanets (2012) observed that lower economic growth, an exchange rate depreciation, weaker terms of trade and a fall in debt-creating capital inflows reduce credit growth while loan quality deteriorates. Thus it is right to remark that the economic variables exercise a mediating effect on the relationship between NPA and advances.

Preacher and Leonardelli (2012) observed that a variable may be considered a mediator to the extent to which it carries the influence of a given independent variable (IV) to a given dependent variable (DV). Generally speaking, mediation can be said to occur when (1) the IV significantly affects the mediator, (2) the IV significantly affects the DV in the absence of the mediator, (3) the mediator has a significant unique effect on the DV, and (4) the effect of the IV on the DV shrinks upon the addition of the mediator to the model.

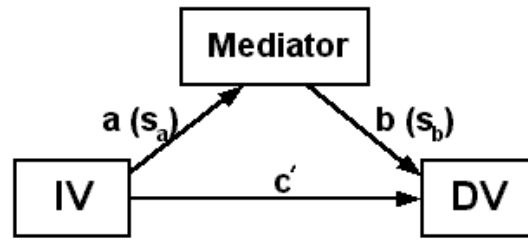


Figure 5.11 Mediation effect of variable on IV and DV

In this research, the effect of macroeconomic variables is considered as mediating in nature. An analysis is undertaken using Sobel test using the following hypothesis.

H0: The selected economic variables do not mediate the relationship between advances and NPA of public sector banks.

H1: The selected economic variables mediate the relationship between advances and NPA of public sector banks.

Sobel test is applied to SBI & Associates, nationalized banks and PSBs. The decision criterion is p-value. If the p value is less than 0.05, the null hypothesis is rejected and concludes that the relationship between advances and NPA of SCBs is mediated by the selected macroeconomic variable. In order to undertake the study both GNPA and Additions to NPA is used.

5.4.4.1. SBI & Associates – Gross NPA, Additions to NPA and Advances

The table no.5.57 explains whether the selected macroeconomic variables mediate the relationship between advances and the gross NPA of public sector banks. Based on Sobel test, it is found that among the selected macroeconomic variables GDP at factor cost, NDP at factor cost, GNP at factor cost, NNP at factor cost, Personal Disposable Income, GDP of public sector, Gross Domestic Capital Formation, Net Domestic Capital Formation,

Gross Domestic Saving and Net Domestic Saving are mediating variable that influence the relationship between Gross Advances and gross NPA of SBI & associates ($p < 0.05$).

Table 5.57 Test of mediating effect of selected variables on relationship between Advances and GNPA of SBI & Associates

Economic Variable	Unstandardized Coefficient		Sobel Test			Hypothesis
	Constant	Std Error	Test Statistic	Std Error	p value	
X _{GDPF}	-0.173	0.071	-1.999	0.002	0.046	Rejected
X _{FC}	-0.162	0.098	-1.494	0.002	0.135	Accepted
X _{NDPF}	-0.171	0.069	-3.466	0.111	0.001	Rejected
X _{IT}	0.007	0.019	0.366	0.000	0.714	Accepted
X _{GDPM}	-0.129	0.065	-1.726	0.002	0.083	Accepted
X _{NDPM}	-0.123	0.063	-1.705	0.002	0.088	Accepted
X _{NFI}	-0.003	0.009	-0.332	0.000	0.740	Accepted
X _{GNPF}	-0.178	0.770	0.002	0.002	0.050	Rejected
X _{NNPF}	-0.176	0.074	1.967	0.002	0.049	Rejected
X _{GDPM}	-0.130	0.069	-1.659	0.002	0.092	Accepted
X _{NNPM}	-0.124	0.067	-1.636	0.002	0.102	Accepted
X _{PDI}	-0.970	0.050	-3.444	0.006	0.001	Rejected
X _{GDPPS}	-0.530	0.024	-3.457	0.003	0.001	Rejected
X _{NDPPS}	-0.008	0.020	-0.397	0.000	0.691	Accepted
X _{GDCF}	0.068	0.029	1.948	0.001	0.050	Rejected
X _{NDCF}	0.058	0.022	2.106	0.001	0.035	Rejected
X _{GDS}	0.063	0.022	2.216	0.001	0.027	Rejected
X _{NDS}	0.052	0.016	2.382	0.000	0.017	Rejected
X _{PCGNPF}	-0.181	0.097	-1.647	0.002	0.100	Accepted
X _{PCNNPF}	-0.181	0.093	-1.701	0.002	0.089	Accepted

The table no. 5.58 explains whether the selected macroeconomic variables mediate the relationship between advances and additions to NPA of SBI & associates.

Table 5.58 Test of mediating effect of selected variables on relationship between Advances and Additions to NPA of SBI & Associates

Economic Variable	Unstandardized Coefficient		Sobel Test			Hypothesis
	Constant	Std Error	Test Statistic	Std Error	p value	
X _{GDPF}	-0.100	0.034	2.746	0.001	0.006	Rejected
X _{FC}	-0.090	0.052	-1.688	0.001	0.091	Accepted
X _{NDPF}	-0.990	0.330	-2.794	0.008	0.005	Rejected
X _{IT}	0.013	0.010	1.282	0.000	0.200	Accepted
X _{GDPM}	-0.740	0.032	-7.277	0.002	0.000	Rejected
X _{NDPM}	-0.071	0.031	-2.194	0.001	0.028	Rejected
X _{NFI}	0.009	0.005	1.752	0.000	0.080	Accepted
X _{GNPF}	-0.104	0.037	-2.639	0.001	0.008	Rejected
X _{NNPF}	-0.104	0.036	-2.703	0.001	0.007	Rejected
X _{GDPM}	-0.075	0.034	-2.120	0.001	0.034	Rejected
X _{NNPM}	-0.072	0.033	-2.099	0.001	0.036	Rejected
X _{PDI}	-0.050	0.024	-2.010	0.001	0.044	Rejected
X _{GDPPS}	-0.019	0.012	-1.551	0.000	0.121	Accepted
X _{NDPPS}	0.008	0.009	0.883	0.000	0.377	Accepted
X _{GDCF}	0.046	0.016	2.692	0.000	0.007	Rejected
X _{NDCF}	0.042	0.012	3.184	0.000	0.001	Rejected
X _{GDS}	0.041	0.013	2.917	0.000	0.004	Rejected
X _{NDS}	0.036	0.010	3.259	0.000	0.001	Rejected
X _{PCGNPF}	-0.112	0.048	-2.232	0.001	0.026	Rejected
X _{GDPF}	-0.111	0.045	-2.348	0.001	0.019	Rejected

With regard to the mediating role of macro economic indicators on the relationship between advances and additions to NPA, 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 reveals that both gross NPA and additions to NPA and its relationship with advances is mediated by similar economic variables.

5.4.4.2. Nationalized Banks – Gross NPA, Additions to NPA and Advances

A major inference drawn from the analysis given in table no. 5.59 is that none of the economic variables mediate the relationship between Gross NPA and advances of Nationalized Banks. This is due to the higher levels of overhang component in the gross NPA accumulated from the previous years.

Table 5.59 Test of mediating effect of selected variables on relationship between Advances and GNPA of Nationalized Banks

Economic Variable	Unstandardized Coefficient		Sobel Test			Hypothesis
	Constant	Std Error	Test Statistic	Std Error	p value	
X _{GDPF}	0.138	0.079	1.315	0.001	0.188	Accepted
X _{FC}	0.134	0.053	1.568	0.001	0.116	Accepted
X _{NDPF}	0.133	0.082	1.259	0.001	0.207	Accepted
X _{IT}	0.004	0.012	0.329	0.000	0.742	Accepted
X _{GDPM}	0.086	0.072	1.025	0.001	0.305	Accepted
X _{NDPM}	0.074	0.071	0.924	0.001	0.355	Accepted
X _{NFI}	-0.007	0.007	-0.894	0.000	0.371	Accepted
X _{GNPF}	0.139	0.071	1.399	0.001	0.162	Accepted
X _{NNPF}	0.136	0.073	1.363	0.001	0.173	Accepted
X _{GDPM}	0.093	0.067	1.165	0.001	0.244	Accepted
X _{NNPM}	0.083	0.067	1.053	0.001	0.292	Accepted
X _{PDI}	0.014	0.055	0.253	0.000	0.801	Accepted
X _{GDPPS}	-0.063	0.022	-1.640	0.000	0.101	Accepted
X _{NDPPS}	-0.022	0.013	-1.292	0.000	0.196	Accepted
X _{GDCF}	0.038	0.011	1.731	0.000	0.083	Accepted
X _{NDCF}	0.031	0.009	1.730	0.000	0.084	Accepted
X _{GDS}	0.031	0.010	1.681	0.000	0.093	Accepted
X _{NDS}	0.024	0.008	1.664	0.000	0.096	Accepted
X _{PCGNPF}	0.153	0.054	1.634	0.001	0.102	Accepted
X _{GDPF}	0.153	0.057	1.604	0.001	0.109	Accepted

The table no. 5.60 explains whether the selected macroeconomic variables mediate the relationship between advances and additions to NPA of nationalized banks.

Table 5.60. Test of mediating effect of selected variables on relationship between Advances and Additions to NPA of Nationalized Banks

Economic Variable	Unstandardized Coefficient		Sobel Test			Hypothesis
	Constant	Std Error	Test Statistic	Std Error	p value	
X _{GDPF}	0.088	0.048	1.792	0.001	0.073	Accepted
X _{FC}	0.084	0.033	2.438	0.001	0.015	Rejected
X _{NDPF}	0.085	0.049	1.700	0.001	0.089	Accepted
X _{IT}	0.014	0.007	1.947	0.000	0.052	Rejected
X _{GDPM}	0.058	0.043	1.332	0.001	0.183	Accepted
X _{NDPM}	0.052	0.043	1.197	0.001	0.231	Accepted
X _{NFI}	0.009	0.004	2.175	0.000	0.030	Rejected
X _{GNPF}	0.088	0.043	1.990	0.001	0.047	Rejected
X _{NNPF}	0.086	0.045	1.865	0.001	0.062	Rejected
X _{GDPM}	0.061	0.040	1.501	0.001	0.133	Accepted
X _{NNPM}	0.056	0.040	1.381	0.001	0.167	Accepted
X _{PDI}	0.017	0.027	0.628	0.000	0.530	Accepted
X _{GDPPS}	-0.020	0.011	-1.778	0.000	0.075	Accepted
X _{NDPPS}	0.003	0.008	0.375	0.000	0.708	Accepted
X _{GDCF}	0.028	0.006	4.091	0.000	0.000	Rejected
X _{NDCF}	0.025	0.005	4.310	0.000	0.000	Rejected
X _{GDS}	0.026	0.005	4.436	0.000	0.000	Rejected
X _{NDS}	0.023	0.004	4.763	0.000	0.000	Rejected
X _{PCGNPF}	0.096	0.034	2.680	0.001	0.007	Rejected
X _{GDPF}	0.096	0.035	2.610	0.001	0.009	Rejected

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.

5.4.4.3. Public Sector Banks – Gross NPA, Additions to NPA and Advances

With regard to the relationship between the gross NPA and advances, among the selected economic variables, GDP of public sector, Gross Domestic Capital Formation, Net Domestic Capital Formation, Gross Domestic Saving and Net Domestic Saving are mediating variables.

Table 5.61 Test of mediating effect of selected variables on relationship between Advances and GNPA of Public Sector Banks

Economic Variable	Unstandardized Coefficient		Sobel Test			Hypothesis
	Constant	Std Error	Test Statistic	Std Error	p value	
X _{GDPF}	0.034	0.131	0.259	0.002	0.796	Accepted
X _{FC}	0.143	0.098	1.312	0.001	0.189	Accepted
X _{NDPF}	0.030	0.131	0.228	0.002	0.819	Accepted
X _{IT}	0.006	0.014	0.424	0.000	0.671	Accepted
X _{GDPM}	0.004	0.097	0.041	0.001	0.967	Accepted
X _{NDPM}	-0.006	0.092	-0.065	0.001	0.948	Accepted
X _{NFI}	-0.006	0.007	-0.824	0.000	0.410	Accepted
X _{GNPF}	0.069	0.126	0.539	0.002	0.590	Accepted
X _{NNPF}	0.054	0.127	0.421	0.002	0.674	Accepted
X _{GDPM}	0.024	0.096	0.249	0.001	0.803	Accepted
X _{NNPM}	0.013	0.092	0.141	0.001	0.888	Accepted
X _{PDI}	-0.039	0.067	-0.571	0.001	0.568	Accepted
X _{GDPPS}	-0.061	0.022	-2.036	0.000	0.042	Rejected
X _{NDPPS}	-0.017	0.015	-1.060	0.000	0.289	Accepted
X _{GD CF}	0.049	0.014	2.278	0.000	0.023	Rejected
X _{ND CF}	0.040	0.011	2.314	0.000	0.021	Rejected
X _{GDS}	0.041	0.012	2.254	0.000	0.024	Rejected
X _{NDS}	0.033	0.009	2.322	0.000	0.020	Rejected
X _{PCGNPF}	0.167	0.109	1.364	0.001	0.172	Accepted
X _{GDPF}	0.155	0.112	1.257	0.001	0.209	Accepted

With regard to the relationship between additions to NPA and advances, among the variables, Net Factor Income from abroad, Gross Domestic Capital Formation, Net Domestic Capital Formation, Gross Domestic Saving and Net Domestic Saving are mediating variables.

Table 5.62 Test of mediating effect of selected variables on relationship between Advances and Additions to NPA of Public Sector Banks

Economic Variable	Unstandardized Coefficient		Sobel Test			Hypothesis
	Constant	Std Error	Test Statistic	Std Error	p value	
X _{GDPF}	0.017	0.075	0.227	0.001	0.821	Accepted
X _{FC}	0.086	0.057	1.490	0.001	0.136	Accepted
X _{NDPF}	0.005	0.075	0.067	0.001	0.947	Accepted
X _{IT}	0.014	0.008	1.721	0.000	0.085	Accepted
X _{GDPM}	0.004	0.055	0.073	0.001	0.942	Accepted
X _{NDPM}	-0.002	0.052	-0.038	0.001	0.969	Accepted
X _{NFI}	0.009	0.004	2.189	0.000	0.029	Rejected
X _{GNPF}	0.037	0.073	0.506	0.001	0.613	Accepted
X _{NNPF}	0.028	0.073	0.383	0.001	0.702	Accepted
X _{GDPM}	0.015	0.055	0.273	0.001	0.785	Accepted
X _{NNPM}	0.009	0.052	0.288	0.001	0.773	Accepted
X _{PDI}	-0.010	0.033	-0.303	0.001	0.762	Accepted
X _{GDPPS}	-0.019	0.011	-1.699	0.000	0.089	Accepted
X _{NDPPS}	0.004	0.008	0.499	0.000	0.618	Accepted
X _{GDCF}	0.036	0.007	4.523	0.000	0.000	Rejected
X _{NDCF}	0.031	0.006	4.539	0.000	0.000	Rejected
X _{GDS}	0.031	0.006	4.539	0.000	0.000	Rejected
X _{NDS}	0.027	0.005	4.695	0.000	0.000	Rejected
X _{PCGNPF}	0.094	0.064	1.452	0.001	0.147	Accepted
X _{GDPF}	0.086	0.066	1.291	0.001	0.197	Accepted

5.5. Conclusion

The analysis highlighted three major aspects. (1) trend in movement of NPA variables, (2) the moderating role of bank performance indicators on the relationship between NPA and advances, and (3) the mediating role of macroeconomic variables on the relationship between NPA and advances. The analysis revealed that even though many NPA management measures were implemented during the study period, there has been an increase in NPA especially since 2007 when the global financial crisis and recessionary pressures influenced the economy. Even though the PSBs were influenced by the crisis, their performance remains comparatively better than other bank groups. The bank performance indicators moderate the relationship between advances and NPA. As well, few macroeconomic variables mediate the relationship between advances and NPA.

It may be concluded based on the analysis that banks and regulatory authorities shall incorporate the effect of bank performance indicators and macroeconomic indicators while taking measures to manage the credit risk. As well, if the asset quality during the financial crisis is a measure of the real quality of assets, then the regulatory authorities in general and banks in particular need to consider implementing more proactive measures to manage NPA. Based on the analysis, it is recommended that in addition to gross NPA and net NPA ratios, banks and regulatory authorities shall utilize gross NPA generation rate, net additions etc, in order to evaluate the effectiveness of NPA management.

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INCIDENCE OF NPA – CAUSES, IMPACT & MANAGEMENT

C o n t e n t s	6.1	Introduction
	6.2	Organization of the Chapter
	6.3	Survey Instrument Validity
	6.4	Demographic Profile of Respondents
	6.5	Incidence of NPA
	6.6	Impact of NPA
	6.7	Management of NPA
	6.8	Conclusion

6.1. Introduction

The analysis in chapter five revealed that the NPA is a significant threat to the very existence of commercial banks in India. Even though, most of the recommendations mentioned in previous researches are already incorporated in the banking sector, the NPA still remains a reason to worry about. Hence a review of various facets of the NPA is found necessary to explain the incidence of NPA, its impact and management of NPA. To achieve this objective, the primary data are collected from the staff of the banks, with special reference to officers working with State Bank of Travancore (SBT). The bankers are the best judge to evaluate the various facets of NPA since they are closely involved in lending/advances and its follow-up on a day to day basis.

The data collected using a structured questionnaire are analyzed using statistical tools and techniques and packages like Microsoft Excel, SPSS and Amos. In specific terms, the analysis is carried out to explore the banker's

perceptions on NPA and their suggestions to further strengthen the NPA management in the Indian banking sector.

6.2. Organization of the Chapter

The chapter is structured into six sections. The first section brief the analysis of demographic profile of the respondents. The second section details the factor analysis applied in the study. The third section examines the various causes of NPA. The various causes identified through literature review are validated and their significance is assessed using Z-value. The fourth section briefs the various impacts of NPA on banks; profitability, liquidity, loan growth, cost of funds, etc. The fifth section appraises the effectiveness of various NPA management measures. This section also explains the bankers' view on best practices to manage NPA. The last section verifies the significance of various observations on bank's NPA which came across during the conduct of this research.

6.3. Survey Instrument Validity

The purpose of a survey instrument validity is to measure the degree to which the survey (or a subset of a survey) is measuring what it claims to be measuring. It is measured using one or more of the validity strategies: face validity, criterion-related validity, content validity, construct validity and design validity (Brown, J.D, 2001).

6.3.1. Content Validity

The content validity is ensured using the following measures;

- 1) An extensive literature survey,
- 2) Interaction with both academic and industry experts,
- 3) A pilot study,
- 4) Using items which are validated in previous studies.

In the present study, the questionnaire is initially framed based on Item 1, 2 and 4 and is subjected to a pilot study. The feedback received from Item 2 and 3 were incorporated in the questionnaire after deliberations in order to ensure the content validity.

6.3.2. Construct Validity

Connaway, L.S and Powell, R.R (2010) explained that the construct validity represents the extent to which an instrument measures the construct that it is intended to measure. The Cronbach's alpha test is used to determine the construct validity.

6.3.3. Reliability Testing

Joppe (2000) defined reliability as the extent to which the results are consistent over time and an accurate representation of the total population under study. If the results of a study can be reproduced under a similar methodology, then the research instrument is considered to be reliable. Carmines and Zeller (1979) observed that the reliability concerns the extent to which an experiment, test or any measuring procedure yields the same results on repeated trials. The more consistent the results given by repeated measurements, the higher the reliability of the measuring procedure; conversely the less consistent the results the lower the reliability. Reliability is defined as the proportion of the variability in the responses to the survey that is the result of differences in the respondents (Funk et al, 2007). To sum up, reliability defines the ability of a tool to measure a concept in a consistent manner.

Cronbach's alpha is used to assess the internal consistency and reliability of a multiple item instrument. A multiple item instrument is internally consistent if its items are highly correlated. Cronbach's alpha is computed as the ratio of the true variation to the total variation (Dukes, K. A. 2005). The other methods used

to assess the reliability includes test-retest method, equivalent forms, split halves method etc. Researchers distinguish among “test-retest” reliability, “intra-rater” and “inter-rater” reliability, and “internal consistency”. In this research, the internal consistency is measured using reliability test Cronbach's alpha. Nunnally (1978) and Straub, D et al (2004) have indicated that Cronbach Alpha scores of 0.60 to be an acceptable reliability coefficient. Funk et al (2007) supported the above view and indicated that some items might carry low alphas, but are predictive of the key outcomes in the study. Cronbach alpha is calculated for each segment of questionnaire separately. The questions used were classified into three groups, namely the causes of NPA, impact of NPA and the management of NPA. The item total correlation and the corrected correlation if an item is deleted were calculated. SPSS 17 is used to study the reliability of the survey instrument. All the factors as well as the overall scale were seen to have Cronbach alpha above the acceptable threshold of 0.6 and above.

Table 6.1. Test of Reliability – Cronbach Alpha

Sl No	Area	No. of Questions	Questions	Cronbach Alpha
1	Reasons for NPA	17	A5 –A15[9]	0.807
2	Impact of NPA	7	B17-B23	0.823
3	Management of NPA	13	C25-C37	0.686
	Overall	37		0.838

Source: SPSS Output – Data Analysis

Regarding the ‘reasons for NPA’, the internal reliability of 17 questions was assessed using the Cronbach alpha technique. The scale produced an alpha of 0.807. With regard to the ‘impact on NPA’, the internal reliability of 7 item scale was assessed using the Cronbach alpha technique. The scale produced an alpha of 0.823. Two questions (B15_5 and B15_6) have not been considered since the question is repeated differently in another section. It is observed that

the Cronbach Alpha in the area ‘management of NPA’ is less than 0.7, ie, 0.686. It is mainly because of Question No. 27 which elucidate on the existing level of follow up of project/loans. Also, this question does not carry five point likert scales. Regular follow-up and evaluation is an important proactive measure to identify and manage NPA in banks. Since the question is relevant to the research and the Cronbach Alpha Score is close to 0.7, it is included.

6.4. Demographic profile of respondents

In order to achieve the stated objectives, the primary data are obtained from officers in a managerial position, classified into lower level management, middle level management and senior management level. This classification enables better understanding on NPA. In this research, the respondents were selected from various branches, regional offices, Stressed Assets Resolution Centre (SARC) and the corporate office. The data are obtained from 160 managers selected using multi-stage sampling. The exposure of managers in dealing loans/advances is considered to select sample for the study.

6.4.1. Level of Management

The table No. 6.2. Illustrate the profit of sample of respondents.

Table 6.2 Levels of Management

Levels of Management	Number	Percentage
Senior Management	20	12.50
Middle Level Management	132	82.50
Lower Level Management	8	5.00
Total	160	100.00

Source: Primary Data

Of the respondents, 12.5% belongs to senior management level. The highest percentage of respondents (82.50) belongs to middle level management. 5% of the total sample belongs to lower levels of management.

6.4.2. Experience

The table No. 6.3 highlights that the highest percentage of respondents (64.38%) belong to group '15-25 years'. The second highest group of respondents (18.75%) belongs to the group '10-15 years'. 8.12% of respondents belong to the group 'more than 25 years'.

Table 6.3 Experience

Experience	Number	Percentage
Less than 5 years	0	0.00
5-10 years	14	8.75
10-15 years	30	18.75
15-25 years	103	64.38
More than 25 years	13	8.12
Total	160	100.00

Source: Primary Data

6.5. Incidence of NPA

Based on the previous research studies and the interaction with academic and industry experts, various factors were identified for the incidence of NPA. The significance of these factors for the incidence of NPA is assessed using (1) Factor analysis – to identify and validate whether there exists a relationship between the observed variables and their underlying latent constructs, (2) Ranking based on mean score – to identify the importance of each variable, and (3) Z value – in order to validate whether the variable identified is statistically significant reason for NPA.

6.5.1. Confirmatory Factor Analysis

Confirmatory Factor Analysis (CFA) is a type of structural equation modeling which deals specifically with measurement models, that is the relationship between observed measures or indicators (e.g. test items, test

scores etc) and latent variables or factors. A fundamental feature of CFA is its hypothesis-driven nature. The CFA allows the researcher to test the hypothesis that a relationship between the observed variables and their underlying latent construct(s) exists.

6.5.1.1. Test of Sampling Adequacy and Exploratory Factor Analysis

The selected variables were analyzed using principal component analysis (PCA-varimax) method from SPSS to test its sampling adequacy. Prior to performing PCA, the suitability of data for factor analysis was assessed. An inspection of the correlation matrix highlighted the presence of many coefficients of 0.3 and above. Field (2000) explained two important observations on correlation matrix. The variables have to be inter-correlated, but they should not correlate too highly (extreme multicollinearity and singularity) as this would cause difficulties in determining the unique contribution of the variables to a factor. Kaiser, Meyer and Olkin have developed the "measure of sampling adequacy" (KMO) test, which has become the standard test procedure for the factor analysis. The Kaiser-Meyer-Olkin measure of sampling adequacy tests whether or not the partial correlations among variables are small. Kaiser (1974) recommends accepting values greater than 0.5 as acceptable.

Table 6.4. Measure of Sampling Adequacy

	Reason for NPA
KMO Measure of Sampling Adequacy.	.542
Bartlett's Test of Sphericity –Chi	2830.609
Df	136
Sig.	<0.001

Source: Primary Data

The Kaiser-Meyer-Okin value for all the variables is found to be exceeding the recommend value of 0.5 and the Barlett's Test of Sphericity reached statistical significance, supporting the factorability of the correlation matrix. EFA is used to evaluate the suitability of the variables considered for the factor analysis and to identify how far the sub variables (or questions) coming under each of the main variables measures them correctly. This is done by utilizing communality of each variable. Communality is the extent to which an item correlates with all other items. Higher communalities are better. The variable with low communalities i.e., between 0.0 – 0.4, are removed from the analysis.

6.5.1.2. Model Fit

According to the usual procedures, the goodness of fit is assessed by checking the statistical and substantive validity of estimates (i.e. that no estimates falls out of the admissible range, as the case is for negative variances or correlations larger than one, and that no estimates lack a theoretical interpretation, as the case is for estimates of unexpected sign), the convergence of the estimation procedure, the empirical identification of the model, the statistical significance of the parameters, and the goodness of fit to the covariance matrix. Since the complex models are inevitably misspecified to a certain extent, the standard test of the hypothesis of perfect fit to the population covariance matrix is given less importance than measures of the degree of approximation between the model and the population covariance matrix. The *root mean squared error of approximation* (RMSEA) is selected as such a measure. The following table gives the recommended fit indices for a CFA.

Table 6.5 Recommended Model Fit

Fit Index	Acceptable Threshold Levels	Description
χ^2	$p > 0.05$	Low χ^2 relative to degrees of freedom with an insignificant p value
Normed χ^2	< 3	Adjusts for Sample Size
RMSEA	Values less than 0.05	
GFI	> 0.90	Scaled between 0 and 1, with higher values indicating better model fit.
AGFI	> 0.90	Adjust the GFI based on the number of parameters in the model
NFI	> 0.90	Values for this statistic range from 0 and 1. Assesses the fit relative to a baseline model which assumes no covariance's between the observed variables.
TLI (NNFI)	> 0.95	Non-normed. Values can fall outside the 0-1 range. Favors parsimony.
CFI	> 0.90	Normed, 0-1 range.
RMR	< 1	Residual based.

Source: Hooper et al (2008).

With regard to The Goodness-of-fit Index, Miles and Shevlin (1998) mentioned that GFI above 0.90 indicate ‘good’ model fit. Related to GFI is the AGFI (Adjusted Goodness-of-fit Index) which adjust the GFI based upon the degrees of freedom, which more saturated models reducing fit (Taabachnick and Fidell, 2007). It is generally accepted that a AGFI value of more than 0.90 indicate well fitting models. Another indicator explaining the recommended model fit is NFI, which stands for Normed-fit Index. Values for this statistic range from 0 and 1. Bentler and Bonnet (1980) recommend values greater than 0.90 to indicate good model fit. RMR stands for Root Mean Square and SRMR indicate Standardized Root Mean Square Residual. Hooper et al (2008) explained that both RMR and SRMR indicate the square root of the difference

between the residuals of the sample covariance matrix and the hypothesized covariance model. Values for SRMR range from 0 to 1, with well fitting models obtaining values less than 0.07. Hu and Bentler (1999) observed that the values as high as 0.08 are deemed acceptable.

Table 6.6 Model Fit – Reason for NPA

Fit Index	Reasons for NPA
χ^2	165.357
Df	64
<i>P</i>	<.001
Normed χ^2	2.584
GFI	0.947
AGFI	0.873
NFI	0.943
TLI	0.964
CFI	0.963
RMR	0.048
RMSEA	0.07

Source: Primary Data

6.5.1.3. Final Model – Reasons for NPA

For the analysis initially an input model was developed using AMOS-7 graphics. The rectangle represents observed factors, Ovals in drawn in the diagram represents an unobserved variable. The curved double headed arrows represent correlations or co-variances among the unobserved variables and the straight headed arrows represent the factor loadings of the observed variables. The small circles with arrows pointing from the circles to the observed variables represent errors /unique factors, which are also known as squared multiple correlation of the standard error. This initial model is refined to reach the final model.

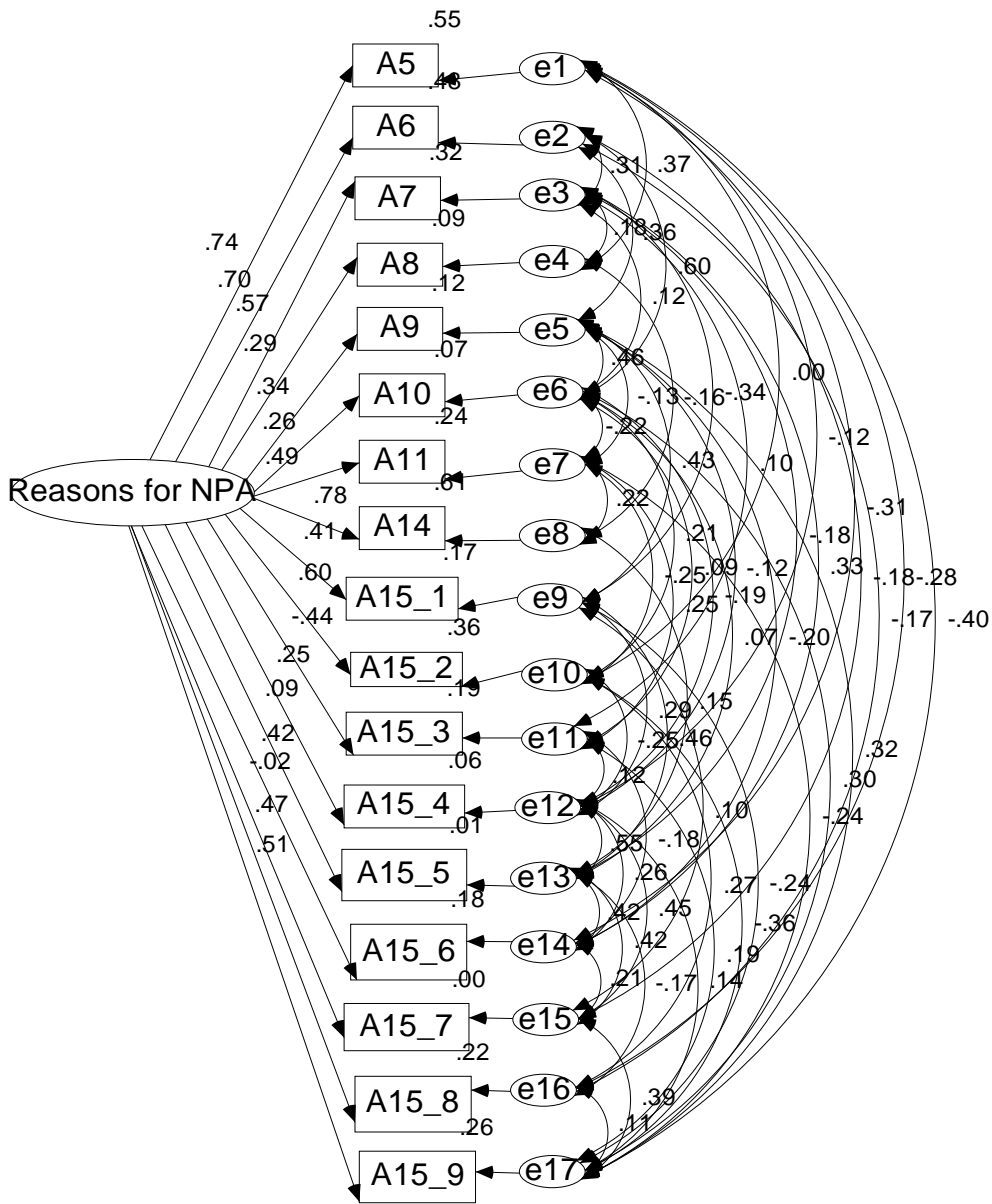


Figure 6.1. Full Measurement Model for Reasons for NPA

6.5.2. Incidence of NPA – Ranking of Major Reasons

An understanding of the various reasons for NPA is necessary in order to take appropriate measures to manage it. The table no. 6.7 highlighted the ranking of various reasons for NPA based on respondents' feedback.

Table 6.7 Ranking of major reasons for NPA

Sl No	Reasons for NPA	Mean Scores	Rank
1	Willful default by the clients or customers	5.5625	1
2	Diversification of funds for other purposes	5.4875	2
3	Lack of supervision and follow up	5.0253	3
4	Inadequate or defective credit appraisal	3.5000	4
5	Economic slowdown leading to recessionary trends	3.1500	5
6	Political influence	2.9744	6
7	Higher rates of interest	2.5000	7

Source: Primary Data

It is generally perceived and reported in literatures that the major causes for NPA are willful default, diversion of funds, lack of proper credit appraisal, sluggish legal system, change in government policies, political influence, economic slow down, etc. The analysis revealed that willful default by the clients is the most significant reason for the incidence of NPA with a mean score of 5.56. The diversification of funds for other purposes is ranked second with a mean score of 5.48. An important inference based on the analysis is that the customer-specific reasons are considered as the major reasons for the NPA. The lack of supervision and follow-up is ranked third with a mean score of 5.02. The fourth major reason is the inadequate or defective credit appraisal system followed by the banks. The economic slowdown and recessionary trends, political influence and higher rates of interest were ranked fifth, sixth and seventh in the order respectively. A major inference drawn from the analysis is that the incidence of the NPA is contributed by a mix of bank specific, customer specific and macroeconomic factors. An understanding of these actors is necessary for effective management of NPA.

A further classification of the causes of NPA based on the management levels is indicated here.

Table 6.8 Management wise Classification of major reasons for NPA

SI No	Reasons	Senior Management		Middle Management		Junior Management	
		Mean	Rank	Mean	Rank	Mean	Rank
1	Willful default by the clients or customers	6.50	1	5.64	1	2.00	5
2	Diversification of funds for other purposes	6.50	1	5.30	2	6.00	2
3	Lack of supervision and follow up	3.78	3	5.20	3	5.00	3
4	Inadequate or defective credit appraisal	3.11	4	3.34	4	7.00	1
5	Economic slowdown & recessionary trends	4.30	2	3.10	5	1.00	6
6	Political influence	2.22	5	3.02	6	4.00	4
7	Higher rates of interest	1.67	6	2.46	7	5.00	3

Source: Primary Data

The senior and middle level management ranked willful default and diversification of funds as the main reason for the NPA. On the other hand, the lower level management staff rated inadequate credit appraisal standards as the main cause for the NPA. The lower level management ranked diversification of funds as second most important reasons for the NPA. The senior management ranked economic slowdown and recessionary pressures as the second most important reasons for the NPA. The financial crisis resulted in a great leap on NPA and affected the quality of assets significantly. The observations of senior management rating economic slowdown as a major reason for NPA support findings of Siraj, KK and Pillai, PS (2011) and the comments of Sinha (2011), Deputy Governor RBI that the fallout of financial crisis contributed to up-trending of NPAs and was amplified by the aggressive lending during the boom period.

6.5.3. Contribution of different sectors on total NPA

It is apparent from the secondary data analysis that NPA in priority sector has increased by 4.06% during the study period, while the non priority sector NPA declined by -3.64% for all SCBs in India. The table no.6.9 highlighted the perception of bankers on the contribution of priority sector and non-priority sector on the incidence of NPA. The highest percentage of respondents (66.3%) stated equal contribution of priority and non-priority sector on the incidence of the NPA. 26.3% of respondents viewed advances to priority sector as a major reason for NPA, while 7.5% stated that advances to non-priority sector contribute a major portion of the NPA. The results of the study supported the view that priority sector is a major cause of the NPA in Indian banks including Uppal RK (2009) who rated priority sector lending as a major reason for PSBs NPA. As well, it was observed by the Committee on Banking Sector Reforms that the priority sector or directed lending contributed significantly to total NPA and was found major impediment to quality of the assets.

Table 6.9 Contribution of different sectors on total NPA

Sectors	Frequency	Percent	Valid Percent	Cumulative Percent
Priority Sector	42	26.3	26.3	26.3
Non priority Sector	12	7.5	7.5	33.8
Both	106	66.3	66.3	100.0
Total	160	100.0	100.0	

Source: Primary Data

A further analysis revealed similarity in the viewpoints of senior management and middle management on the significance of both priority and non-priority sector towards generation of the NPA in banks. 100% of senior management and 65.2% of middle level management remarked that both sectors are equally responsible for NPA contribution in banks. The junior

management differs in their views and pointed out that priority sector advances contribute more towards NPA of banks.

6.5.4. Contribution of priority sector NPA

Priority sector lending may be further classified into agriculture, small scale and public sector lending. The table no. 6.10 highlighted the perception of bankers on the contribution of different priority sectors in the incidence of NPA. The highest percentage respondents (55%) emphasized that SSI contribute significantly in priority sector NPA. 21.3% of respondents remarked that the agriculture sector is significant in the total priority sector NPA. 20% of respondents remarked that public sector lending is significant in the total priority sector NPA.

Table 6.10 Contribution of different priority sectors on total NPA

	Frequency	Percent	Valid Percent	Cumulative Percent
Agriculture sector	34	21.3	21.3	21.3
Small Scale sector (SSI)	88	55.0	55.0	76.3
Public Sector lending	32	20.0	20.0	96.3
Agriculture and SSI	6	3.8	3.8	100.0
Total	160	100.0	100.0	

Source: Primary Data

A further classification on the contribution of different priority sectors according to the management level wise is given in table no. 6.11. Among the senior management, 30% of the respondents agreed that agriculture sector holds the highest contribution in the priority sector NPA. The other 30% of respondents commented that public sector contributes for higher NPA in priority sector. 57.6% of middle management ranked SSI sector as a key contributor of priority sector NPA, while agriculture ranked second place, i.e.,

21.2%. 100% of the respondents belonging to junior management ranked SSI as a major contributor towards priority sector NPA.

Table 6.11 Contribution of Priority Sector on NPA – Management Level Wise

Management	Agriculture		SSI		Public Sector		Agriculture and SSI		Total
	No	%	No	%	No	%	No	%	
Senior Management	6	30	4	20	6	30	4	20	20
Middle Management	28	21	76	57	26	19	2	1	132
Junior Management	0	0	8	100	0	0	0	0	8
Total	34	21	88	55	32	20	6	3.8	160

Source: Primary Data

6.5.5. The significance of various reasons for NPA

The literatures on asset quality in banking sector identified various explanations for NPA which can be classified to (1) borrower/customer specific; (including ineffective feasibility, studies, time and cost overruns, diversion of funds, etc.) (2) lender/bank specific (inefficient credit appraisal, lack of follow-up, etc.), and (3) economy specific factors (recessionary pressures, change in rules and regulations, etc.). Using Z-value, the statistical significance of these reasons is identified. The hypothesis used is;

H0: The mean score is equal to 3.75.

H1: The mean score is greater than 3.75.

- a) **Time/Cost overrun while implementing the project:** Since the calculated Z value is -3.571 which is less than the table value, the reason is not statistically significant and concludes that time and cost overrun is not a significant factor leading to NPA.
- b) **Delay in release of limits, delay in the settlement of payments/subsidies by government bodies:** Since the calculated Z value is 7.503 which is greater than the table value, the reason is statistically

significant and concludes that the delay in release of limits and payment of subsidies by government bodies is a significant factor leading to NPA.

- c) **Willful default or misappropriation of funds:** Since the calculated Z value is 32.281 which is greater than the table value, the reason is statistically significant and concludes that willful default and misappropriation of funds is a significant factor leading to NPA.
- d) **Inefficient management, strained labor relations:** Since the calculated Z value is 18.271 which is greater than the table value, the reason is statistically significant and concludes that inefficient management and strained labor relations is a significant factor leading to NPA.
- e) **Ineffective feasibility studies on market/industry leading to business failure:** Since the calculated Z value is 7.206 which is greater than the table value, the reason is statistically significant and concludes that the ineffective feasibility study is a significant factor leading to NPA.
- f) **Inappropriate technology/technical problems:** Since the calculated Z value is .226 which is less than the table value, the reason is not statistically significant and concludes that inappropriate technology and technical issues are not significant factors leading to NPA.
- g) **Government policies like excise, import duty changes, deregulation, pollution control orders etc:** Since the calculated Z value is 5.305 which is greater than the table value, the reason is statistically significant and concludes that change in government policies is a significant factor leading to NPA.

- h) **Lack of Working Capital:** Since the calculated Z value is 11.611 which is greater than the table value, the reason is significant and concludes that lack of working capital is a significant factor leading to NPA.
- i) **Higher rates of interest limiting repayment capacity:** Since the calculated Z value is -.478 which is less than the table value, the test is not statistically significant and concludes that higher rates of interest limiting repayment capacity is not significant factors leading to NPA.

The Statistical results leading to above results are further displayed in the table no. 6.12.

Table 6.12 The significance of various reasons for the NPA

No	Significance of Various Causes for NPA	Mean	S.D.	Mean % Score	Z value	Significance
1	Time/Cost overrun in implementing the project	3.2875	1.064	65.75	-3.571	Not Significant
2	Delay in release of limits, settlement of payments and/or subsidies.	3.8000	.7152	76.00	7.503	Significant
3	Inefficient management, strained labor relations.	4.2500	.734	85.00	18.271	Significant
4	Inappropriate technology/technical problems.	3.5125	.988	70.25	.226	Not Significant
5	Ineffective feasibility studies	3.8500	.868	77.00	7.206	Significant
6	Government policies like excise, import duty changes, deregulation, pollution control orders etc.	3.7625	.885	75.25	5.305	Significant
7	Lack of necessary working capital	3.9875	.751	79.75	11.611	Significant
8	Higher rates of interest limiting repayment capacity	3.4750	.936	69.50	-.478	Not Significant

Source: Primary Data

6.5.6. Adequacy of Credit Appraisal Standards

Khan, M.Y. (2004) emphasized the need to improve the quality of their credit portfolios by focusing on the underlying business processes and the skill sets of human resources in the credit function. Many literatures stressed the need for effective credit processing as proactive measures to curb the menace of NPA. Kumar, R (2010), an expert in banking with key positions in the banking sector that includes Vigilance Commissioner, Chairperson and Managing Director of Indian Bank emphasized the significance of inadequate credit appraisal in the generation of NPA. There was no in-depth appraisal at all and in a large number of accounts, people were being judged based on the fact that they were well known or that their company was well known. Banking is not like that. The author emphasized the need for an in-depth analysis at all stages of credit appraisal.

Table 6.13 Adequacy of present credit appraisal system

	Frequency	Percent	Mean % Score	Z Value
Strongly Agree	12	7.5	61.00	-7.243
Agree	56	35.0		
Neither Agree nor Disagree	26	16.3		
Disagree	60	37.5		
Strongly Disagree	6	3.8		
Total	160	100.0		

Source: Primary Data

The respondents view on the statement “whether the current credit appraisal system is inadequate in modern environment” is summarized in table no. 6.13. 35% of the respondents commented that the present credit appraisal is not adequate in the modern banking environment. 7.5% of respondents strongly agree with the comment on the mismatch of current credit appraisal standards for effective appraisal of loan applications. The highest percentage of respondents (37.5%) disagreed to this opinion that the current credit appraisal standards are not

adequate in the modern banking environment. It may be observed that the credit appraisal standards require fine tuning considering the challenges in the modern banking environment. The appraisal of loan should strictly adhere to international standards and guidelines and should incorporate best practices from the international banking environment. The inference based on Z value, i.e., -7.243 highlighted that the factor is not statistically significant for occurrence of NPA.

6.5.7. Impact of competitive pressure on credit standards and NPA

It may be observed that the competitive pressure on banking increased significantly in the post - reform period. More private banks and foreign banks entered the market. It is felt that the competitive pressure forced banks to aggressively market their products. Since interest income remains the major source of income, the competitive pressure has influenced the quality of credit appraisal. The respondent's remarks on the question "Do you feel that the present competitive pressure in the banking sector leading to the emergence of more local banks and branches of international banks in the country leads to relaxing the credit norms and thereby more NPA" is summarized in the table no. 6.14. 38.8% of the respondents observed that the competitive pressure has forced banks in general to relax credit appraisal standards and thereby contributed to more NPAs. 38.8% of the respondents refuted this statement.

Table 6.14 Impact of competitive pressure on credit standards and NPA

	Frequency	Percent	Mean Score	Z Value
Strongly agree	18	11.30	62.00	-5.903
Agree	62	38.80		
Neither Agree Nor Disagree	8	5.00		
Disagree	62	38.80		
Strongly Disagree	10	6.30		
Total	160	100.00		

Source: Primary Data

This result is evidenced by the trend in the movement of NPA variables in Indian banking. While nationalized banks and SBI & Associates were able to bring down NPA, private sector banks and foreign banks reported higher growth rate of NPA variables. Its susceptibility towards financial crisis is also high compared to other banking groups. It supports the fact that in order to capture the market and increase their business, bankers sometimes relax their credit standards. The inference based on Z value, i.e., -5.903 highlighted that the factor is not statistically significant for occurrence of NPA.

6.5. 8. Availability of skilled staff in credit portfolio

Swamy, V (2012) remarked that counterparty risk is an outcome directly related to NPA of a financial institution. The counterparty risk should be properly assessed before lending to minimize the occurrence of NPA. Thus the efficiency and effectiveness of credit portfolio management can be compared with the level of NPA. The staff productivity declines as more manpower would be allocated to preparing returns, statements, compliance of audit and filing of cases.

Table 6.15 Availability of Skilled Staff in credit portfolio

	Frequency	Percent	Mean Score	Z Value
Strongly agree	6	3.80	67.00	-2.611
Agree	98	61.30		
Neither agree nor disagree	8	5.00		
Disagree	42	26.30		
Strongly Disagree	6	3.80		
Total	160	100.00		

Source: Primary Data

Inference based on above table showed that the highest percentage of respondents (61.3%) considered the existing staff strength in credit portfolio as

inadequate to support the tasks assigned. 3.8% of respondents strongly supported the statement. They identified non-availability of skilled staff as a reason for sanctioning loan to non-credit worthy customers. 26.3% refuted to this statement. Two major suggestions were put forwarded based on the analysis. It includes the appointment of more staff in credit division and continuous training and development facilities. The inference based on Z value, i.e., -2.611 highlight that the factor is not statistically significant for occurrence of NPA.

6.5.9. Existence of Market Intelligence System

A strong market intelligence system is beneficial for bankers to know about market condition, industry prospects, credit worthiness of applicant etc. Respondents remarks on the statement “The banks does not have a strong market intelligence system to know more about the market condition, industry prospects, the credit worthiness of the applicant, etc.” is summarized in table no. 6.16.

Table 6.16 Availability of market intelligence system

	Frequency	Percent	Mean Score	Z Value
Strongly agree	20	12.5	60.75	-6.893
Agree	44	27.5		
Neither agree nor disagree	32	20.0		
Disagree	50	31.3		
Strongly Disagree	14	8.8		
Total	160	100.0		

Source: Primary Data

The highest percentage of respondents (31.3%) commented that the bank possess a strong market intelligence system to facilitate proper deployment of credit. 8.8% strongly agreed to the above opinion. 27.5% of the respondents

commented that the banks in India do not possess a strong market intelligence system to facilitate proper deployment of credit. 12.5% of respondents strongly supported the view.

Based on the analysis, it is suggested that the banks should improve the market intelligence system. The market intelligence system can be two fold – a centralized system to pass on information on the market, economic prospects, etc., and a bank specific information system to generate information about the location, customer profiles, their credit worthiness, etc. The inference based on Z value, i.e., -6.893 highlight that the factor is not statistically significant for occurrence of NPA.

6.5.10. Dissemination of Credit Information among banks

Many countries have adopted a system of information sharing through the central bank or through other means to support decision making. Such measures were helpful for effective credit monitoring and identification of risky credit portfolios. The feedback on the statement used “There is an inadequate mechanism available in the banking sector to gather and disseminate credit information amongst commercial banks” is summarized table no. 6.17.

47.5% of respondents observed that dissemination of credit information among banks is present in Indian banking and found it very important to manage a credit portfolio efficiently. 3.8% strongly supported the above view. On the other hand, 35% of respondents remarked that the dissemination of credit information among banks is not effective and currently inadequate. 5% of respondents strongly agreed with this view. 8.8% of respondents neither agreed nor disagreed with the statement.

Table 6.17 Dissemination of credit information among banks

	Frequency	Percent	Mean Score	Z Value
Agree	56	35.0	58.00	-9.928
Strongly agree	8	5.0		
Neither agree nor disagree	14	8.8		
Disagree	76	47.5		
Strongly Disagree	6	3.8		
Total	160	100.0		

Source: Primary Data

A major conclusion derived from the analysis is the significance of a strong market intelligence system and dissemination of credit information among banks. The inference based on Z value, i.e., -6.893 highlight that the statement is not statistically significant.

6.5.11. The Overhang component of NPA

It is observed and often supported by bankers that effective recovery of the 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. The highest percentage of respondents (63.8%) strongly supported and remarked that this is always a significant problem affecting banking sector. 36.3% of respondents also supported this view but reserved their opinion stating that it happens sometimes.

Table 6.18 The Overhang component of NPA

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes, always	102	63.80	63.80	63.80
Yes, some time	58	36.30	36.30	100.00
Total	160	100.00	100.00	

Source: Primary Data

The overhang component of NPA contributes for higher NPA of banks. This view is supported by the senior management. 60.6% of respondents from middle management and 25% of respondents from junior management also shared the opinion. It calls for effective legal measures to improve recovery of overhang components of the NPA accounts in order to reduce the NPA in bank accounts.

Table 6.19 The overhang component of NPA – Management Level wise

Levels of Management	Yes, always		Yes, some time		Total
	No	%	No	%	
Senior Management	20	100%	0	0	20
Middle Management	80	60.6%	52	39.4%	132
Junior Management	2	25.0%	6	75.0	8
Total	102	63.8%	58	36.3%	160

Source: Primary Data

A Chi-Square test is used to assess whether there exists a significant relationship among the levels of management, regarding their views on the impact of overhang component on NPA.

Table 6.20 Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	34.270	2	<.001

Source: Primary Data

The p value < .001 indicate that there exist a significant relationship in viewpoints among different levels of management regarding the impact of overhang component on total NPA.

6.5.12. Corporate Governance Practices

Organizations that practice corporate governance are less prone to financial distress. Hence banks should ensure that the organizations that they deal with practice corporate governance practices.

Table 6.21 Corporate Governance practices among borrowing institutions

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes, most of them	96	60.0	60.0	60.0
Yes, but only a few of them	54	33.8	33.8	93.8
No	10	6.3	6.3	100.0
Total	160	100.0	100.0	

Source: Primary Data

The highest percentage of respondents (60%) commented that most of the companies whom they deal with practice corporate governance. 33.8% of the respondents remarked that only a few institutions practice corporate governance in their organizations.

Table 6.22 Corporate Governance practices among borrowing institutions – Management wise

Levels	Yes, most of them		Yes, but only a few of them		No		Total
	No	%	No	%	No	%	
Senior Management	10	50%	10	50%	0	0%	20
Middle Management	80	60.6%	42	31.8%	10	7.6%	132
Junior Management	6	75%	4	25%	0	0%	8
Total	96	60%	54	33.8%	10	6.36%	160

Source: Primary Data

50% of respondents belonging to senior management, 60.6% respondents belonging to middle management and 75% respondents belonging to junior management observed that most of the companies whom they deal with practice corporate governance. Only 20% of the middle level management remarked that the companies do not practice any corporate governance in their organizations.

Table 6.23 Chi-Square Tests

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	9.806	1	.002

Source: Primary Data

The p value .002 indicate that there exist significant relationship in viewpoints among different levels of management regarding the presence of corporate governance practices among the borrowing institutions.

6.5.13. Effect of Financial Crisis

Often, the financial crisis put excessive pressure on quality of loan portfolio held by the bank. It has virus effect affecting the industrial growth and thereby influences the level of NPA of banks. The effect of the financial crisis on different economies varies in accordance with. Indian Banking sector reported higher credit growth in the post - millennium period.

The observed results from table no. 6.24 supported the views expressed by Siraj.K.K and Pillai, P.S. (2011) that asset quality and performance of commercial banks were affected moderately by the recessionary pressures of global financial crisis. 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. 6.3% of respondents reserved their comments. A further investigation into the impact of financial crises explained by different levels of management showed diverging viewpoints among different levels of management.

Table 6.24 Effect of Financial Crisis

	Frequency	Percent	Valid Percent	Cumulative Percent
It affected NPA in severely	46	28.8	28.8	28.8
It affected NPA moderately	88	55.0	55.0	83.8
It affected NPA but minor influence	16	10.0	10.0	93.8
Not sure	10	6.3	6.3	100.0
Total	160	100.0	100.0	

Source: Primary Data

6.5.14. Summary

In spite of the significant improvement in the banking sector and the accelerated reforms during this period, NPA still poses a threat to the banking sector. Even though there were remarkable improvement in NPA management which is evident from the decline in NPA since post-liberalization, NPA still average around 3% of total advances of all SCBs in India. There are still concerns about asset quality of banks, which is evident from the reduction in asset quality during recessionary periods. A sound management of NPA should start with strengthening the internal systems through improved credit assessment, more staffs in the loan department, regular follow-up and assessment of loan, etc. Even though external factors such as recessionary pressures etc affect the quality of assets, it can be minimized if banks improve the internal efficiency on credit management.

6.6. Impact of NPA

This section evaluates banker's the feedback on the various impacts of NPA. It is rightly said that the NPA has virus effect on the economy. It affects borrowers, lenders, society and economy as a whole. As rightly pointed out by Prasad and Veena (2011), the efficiency of a bank is not always reflected only by the size of its balance sheet but also the level of return on its assets. The non performing assets result in corrosion in asset quality, reduce the income generating capacity of banks, increase requirement for provisioning towards credit losses, force banks to go for high interest bearing funds for operations, etc. In a nutshell, the NPA affects the overall functioning of the bank and finally the psychology of the bankers in respect of their disposition towards credit delivery and credit expansion.

6.6.1. Rating of various Impact of NPA on Banks

NPA affects banks differently. Six major impacts of NPA identified through literature are utilized and rating is obtained on their importance. The

rating is done based on weighted mean. The observations based on the analysis revealed that the primary effect of NPA is on the profitability of banks (Mean = 5.3291). A higher NPA reduces the profit of the bank, since it reduces the income-generating assets of the bank.

A higher NPA forces the banks to maintain higher provisions, which is considered as second major impact (Mean = 5.3200) of NPA on bank's functioning. According to the RBI guidelines and Basel standards, banks need to reserve funds against the NPA accounts depending on its status – substandard assets, doubtful assets, loss assets. The bankers rated increase in intermediation cost as the third major impact of NPA (Mean = 3.1067) followed by the increasing spread (Mean = 2.8816), declining reserves and surpluses (Mean = 2.7200) and increase market borrowings (Mean = 1.8533).

Table 6.25 Impact of NPA – Rank based on Weighted Mean

	Mean	Rank
Erosion of Profit	5.3291	1
Increasing Provisions	5.3200	2
Increasing intermediation cost	3.1067	3
Increasing Spread	2.8816	4
Declining reserves and surpluses	2.7200	5
Increase market borrowings	1.8533	6

Source: Primary Data

6.6.2. Management Perception on Different Impact of NPA

The observations on the impact of NPA according to different levels of management indicated similarities in their view points except on a few aspects. The senior management rated erosion of profit and increasing reserve as number one, observed from the mean scores. Contrary to summative table, declining reserves and surplus were rated as the second major impact of NPA.

The ratings of middle level management and junior management is quite similar to the general observations made.

Table 6.26 Management Perception on Different Impact of NPA

Level	Senior Management		Middle Management		Junior Management	
	Mean	rank	Mean	rank	Mean	Rank
Erosion of Profit	5.50	1	5.28	2	5.75	1
Increasing Provisions	5.50	1	5.30	1	5.25	2
Increasing intermediation cost	3.00	3	3.18	3	2.75	4
Increasing Spread	1.40	5	3.10	4	3.25	3
Declining reserves & surpluses	3.30	2	2.64	5	2.50	5
Increase market borrowings	2.30	4	1.80	6	1.50	6

Source: Primary Data

To sum up, the effect of NPA on banking is many folded. It affects the liquidity, solvency, credibility, income generating capacity and repayment capacity of banks.

6.6.3. Impact on liquidity and Cost of funds

NPA affects the liquidity of banks and its income-generating capacity. This often forces banks to depend on high interest bearing funds for its operations. The table no. 6.27 highlighted that the highest percentage of respondents (67.5%) supported the disturbing role of NPA on the liquidity of banks. 15% of the respondents strongly supported the statement. 12.% respondents do not consider NPA as a major cause for liquidity crisis is banks. The inference based on Z value, i.e., 5.041 highlights that the relationship is statistically significant.

Table 6.27 Perceived Importance of Impact of NPA on Liquidity and cost of Funds

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	24	15.0	75.50	5.041
Agree	108	67.5		
Neither agree nor disagree	2	1.3		
Disagree	20	12.5		
Strongly Disagree	6	3.8		
Total	160	100.0		

Source: Primary Data

6.6.4. Impact on Interest Rates

The table no.6.28 summarized the respondents' feedback on the effect of NPA on interest rates of banks. As observed by Deputy Governor RBI, Chakarabarthi, K.C (2012), the persistently high level of NPAs and increase in restructured accounts continues to pose a significant constraint on banks' abilities to reduce lending rates, thereby, in a sense, penalizing the honest borrowers.

The observations based on feedback on bankers revealed the significant role of NPA on interest rates charged by banks. 22.5% respondents rated its very significant and considered that higher NPA force banks to maintain a higher interest rates, while 43.8% of respondents rated it as a significant impact of NPA on banks. The inference based on Z value(0.742) indicate that the relationship explained is not statistically significant.

Table 6.28 Impact of NPA on Interest Rates

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	36	22.5	71.00	0.742
Agree	70	43.8		
Neither agree nor disagree	6	3.8		
Disagree	42	26.3		
Strongly Disagree	6	3.8		
Total	160	100.0		

Source: Primary Data

6.6.5. Impact on Credit Growth

The banker's outlook towards fresh credit proposals is affected to a marked extent by the level of NPA that they hold. A higher NPA may adversely affect credit growth since the banker's prime focus become zero percent risk and as a result turn lukewarm to fresh credit. The responses from the bankers supported the view that NPA affects the credit growth. Rather than focusing on fresh credit, the banks with higher NPA focus more on recovering its existing NPA accounts. The analysis is summarized in table no. 6.29. 12.5% of respondents highlighted strong implication of NPA on fresh credit. 53.8% of respondents as well supported the statement and indicated that NPA impacts the credit growth of financial institutions. 28.8% of respondents refuted the statement and claimed that the NPA has no bearing on the credit growth of commercial banks.

Table 6.29 Perceived Impact of NPA on Credit Growth

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	20	12.5	69.00	-0.808
Agree	86	53.8		
Neither agree nor disagree	4	2.5		
Disagree	46	28.8		
Strongly Disagree	4	2.5		
Total	160	100.0		

Source: Primary Data

The inference based on Z value (-0.808) highlighted that the relationship explained is not statistically significant. This is also evident from the secondary data analysis which highlighted the increase in the total advances during the period of financial crisis as well.

6.6.6. Impact of NPA on investment of banks

Another key impact of NPA discussed and deliberated by academicians, researchers and bankers across the world is the impact of NPA on the nature of

investment of banks. Often, the NPA force banks to invest in risk free government securities and other types of investment. The highest percentage of respondents (33.8%) refuted to the statement and indicated that the NPA have no effect on the nature of investment of banks. 30.0% viewed that higher NPA impacted the nature of investment of commercial banks, which is strongly supported by another 3.8% of respondents.

Table 6.30 Impact of NPA on nature of Investment of Banks

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	6	3.8	55.25	-11.638
Agree	48	30.0		
Neither agree nor disagree	30	18.8		
Disagree	54	33.8		
Strongly Disagree	22	13.8		
Total	160	100.0		

Source: Primary Data

The inference based on Z value (-0.808) highlighted that the relationship is not statistically significant. This is also evident from the secondary analysis as well.

6.6.7. Restructuring potential NPA accounts

The restructuring of a loan enables a bank to avoid an account from falling into the NPA category. The banks opt restructuring when they feel that the customer's account may turn into NPA or bad loan. The table no. 6.31 summarized the observation of bankers' on restructuring NPA accounts. 42.50% of respondents agreed that the restructuring of the NPA account enables the borrower to repay it. 51.30% of respondents also agreed with this statement.

Table 6.31 Restructuring potential NPA accounts

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	68	42.50	86.25	19.751
Agree	82	51.30		
Neither agree nor disagree	2	1.30		
Disagree	8	5.00		
Strongly Disagree	0	0.00		
Total	160	100.0		

Source: Primary Data

The inference based on Z value (19.75) highlighted that the relationship explained is statistically significant.

6.6.8. Impact of provision on Investor Sentiments

In order to mitigate the risk of the NPA accounts, the RBI has put various guidelines that include provisioning towards NPA accounts. Normally, a higher NPA results in higher provisioning. Banker’s feedback on whether the provision affects investor sentiments towards bank is summarized in table no. 6.32. The highest percentage of respondents (62.5%) supported the statement and observed that higher provisions impacts the investor sentiments towards the bank. 8.8% of respondents strongly support this statement. While 3.8% of respondent reserved their comments, 25.1% refuted the above statement. The inference based on Z value (-0.953) highlighted that the explained relationship is not statistically significant.

Table 6.32 Impact of Provision on Investor Sentiments

	Frequency	%	Mean % Score	Z Value
Strongly agree	14	8.8	68.75	-0.953
Agree	100	62.5		
Neither agree nor disagree	6	3.8		
Disagree	22	13.8		
Strongly Disagree	18	11.3		
Total	160	100.0		

Source: Primary Data

6.6.9. NPA and high cost of borrowings

A higher NPA may force banks to depend on subordinated debt at high cost to supplement the capital requirements. Banks at present need to maintain capital based on the quality of assets (CRAR).

Table 6.33 NPA and high cost of borrowings

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	8	5.0	68.75	-1.196
Agree	96	60.0		
Neither agree nor disagree	14	8.8		
Disagree	42	26.3		
Strongly Disagree	0	0		
Total	160	100.0		

Source: Primary Data

The analysis is summarized in table no. 6.33. The highest percentage of respondents (60.00%) supported the view and remarked that the higher levels of NPA force banks to depend on subordinated debt to meet its legal and operational requirements. 5% of the respondents agreed to the statement. On the other hand, 26.3% of respondents refuted to this statement and commented that the relationship between NPA and cost of borrowings is not significant. The inference based on Z value (-1.196) highlighted that the explained relationship is not statistically significant.

6.7. Management of NPA

The post-liberalization period saw many remarkable changes in the regulatory framework which is intended to improve the efficiency of the banking sector and to upgrade it with international standards. The management of NPA requires both proactive and curative measures. The proactive measures

include a sound and effective credit risk management system, effectiveness in loan assessment, follow up and supervision etc, which intends to reduce the instances of NPA. While the curative measures concentrate of reducing NPA in balance sheet using various modes of recovery.

6.7.1. Rating of Various Management measures

How best NPA can be managed? The researches on the management of NPA across the globe identified various measures to reduce NPA and to recover the NPA accounts. The major among them are subjected to ranking based on respondents' feedback. The results are summarized in table no. 6.34.

Table 6.34 Ranking of Various NPA management mechanisms

NPA management measures	Mean	Rank
Risk Assessment & Risk Management Mechanism	4.3973	1
Credit Information Bureau	4.2055	2
Release of willful defaulters list	4.1375	3
Increasing the collateral requirements	3.1507	4
Compromise Settlements Schemes	2.9041	5
Reporting frauds to RBI	2.5890	6

Source: Primary Data

The risk assessment and risk management mechanism is the most powerful method for managing NPA, as may be observed from the analysis (mean = 4.3973). The second major requirement for sound credit risk management is an effective credit information bureau. (Mean =4.2055). In many developed markets, Credit Information Bureau's share information among banks regarding credit worthiness of clients, etc. This mechanism enable banks to rate the borrowers based on their credit worthiness.

The third important measure for management of NPA is the release of willful defaulters list (Mean = 4.1375), followed by increasing collateral

requirements (Mean = 3.1507). Compromise Settlement Schemes were ranked fifth while reporting frauds to RBI (Mean =2.5890) is considered as 6th major mechanism to manage NPA in banks. It may be concluded from the feedback that bank specific measures such as improvement of credit risk assessment system and provision for information dissemination among banks are major measures which can improve the quality of credit risk assessment and management of NPA.

6.7.2. Importance of Loan Appraisal and Evaluation System

The summary of feedback on the statement “NPA can be controlled if banks improve the system of loan appraisal” is given in table no. 6.35. The highest percentage of respondents (76.30%) supported the statement. Out of this, 12.50% of respondents strongly commented that NPA can be controlled through improving the present credit appraisal system. 8.80% of respondents reserved their comments.

Table 6.35 Importance of Loan Appraisal and Evaluation System

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	20	12.50	74.75	4.919
Agree	102	63.80		
Neither agree nor disagree	14	8.80		
Disagree	24	15.00		
Strongly Disagree	0	0.00		
Total	160	100.00		

Source: Primary Data

The inference based on Z value (4.919) highlighted that the explained relationship is statistically significant. This feedback supported the observation of RBI “Banks need to, not only utilize effectively, the various measures put in place by the Reserve Bank and the government for the resolution and recovery

of bad loans, but also have to strengthen their due diligence, credit appraisal and post-sanction loan monitoring systems to minimize and mitigate the problem of increasing NPA." (Trend and Progress of Banking 2011-12)

6.7.3. Customer Relationship Management

The feedback on the statement “The problems of NPA can be reduced to a great extent by maintaining a continuous rapport/relationship with borrower customers” is summarized in table no. 6.36.

Table 6.36 Significance of Better Clients Relationship for managing NPA

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	64	40.00	88.00	32.812
Agree	96	60.00		
Neither agree nor disagree	0	0.00		
Disagree	0	0.00		
Strongly Disagree	0	0.00		
Total	160	100.00		

Source: Primary Data

40% of respondents strongly agreed to the statement and considered it as very important to reduce the 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. The inference based on Z value (32.812) highlighted that the explained relationship is statistically significant.

6.7.4. Regular review of Loan portfolio

Literature on banking stressed the need to regularly review existing loan portfolios in order to identify the strengths or weaknesses of the project/business, indicating the chances of performance of loan in the future. The respondent’s remarks on whether such practices are followed in Indian banking sector is summarized in table no. 6.37.

Table 6.37 Regular review of Loan portfolio

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes at regular intervals	110	68.80	68.80	68.8
Yes, but occasionally	48	30.00	30.00	98.8
Yes, but only when the loan repayment is disturbed	2	1.30	1.30	100.0
Not reviewed at all	0	0.00		
No comments	0	0.00		
Total	160	100.00	100.0	

Source: Primary Data

The highest percentage of respondents (68.80%) commented that they review the loan portfolio at regular intervals in order to appraise the changes in scenario. 30.00% of respondents commented that they occasionally review the loan portfolio.

6.7.5. Do banks understate their NPA?

There is a widespread allegation that banks understate their loans (Chipalkatti and Rishi, 2007; Topalova, 2004). 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 non performing loans” is summarized in table no. 6.38.

Table 6.38 Regular review of Loan portfolio

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	20	12.50	72.00	2.749
Agree	74	46.30		
Neither agree nor disagree	52	32.50		
Disagree	14	8.80		
Strongly Disagree	0	0.00		
Total	160	100.0		

Source: Primary Data

Surprisingly, the highest percentage of respondents (46.30%) commented that the NPA figures are understated. 12.50% of respondents strongly agreed to the statement. While 32.50% reserved their comment on the statement, 8.80% refuted the statement. The inference based on Z value (2.749) highlighted that the explained relationship is not statistically significant.

6.7.6. Legal impediments, procedural requirements & NPA

The bankers often complain about the legal impediments and time consuming procedural requirements to recover NPA accounts. They consider the delays as a major reason for the overhang component of NPA in banks. Even though the RBI has initiated several legal measures including SARFAESI Act to speed up the NPA recovery process, still the legal requirements pose a challenge to the speedy recovery of NPA accounts. The respondent’s observation on this issue is summarized in table no.6.39.

Table 6.39 Legal impediments, procedural delays and NPA

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	34	21.30	82.25	17.300
Agree	118	73.80		
Neither agree nor disagree	0	0.00		
Disagree	8	5.00		
Strongly Disagree	0	0.00		
Total	160	100.0		

Source: Primary Data

As may be observed from the above table, 21.30% of respondents strongly agreed to the observation and consider that legal impediments still pose a significant obstacle in speedy recovery of the NPA accounts. 73.80% of respondents also agreed to this opinion. 5.00% of the respondents refuted to the observation. The inference based on Z value (17.300) highlighted that the explained relationship is statistically significant.

6.7.7. Customizing the terms and conditions for loan

The respondents remarks on the statement “Do you feel that securitization of loan, fixing interest rates, processing charges etc should depend on individual loan proposal based on the quality of borrower (assessed through the reports), nature of business, etc” is summarized in table no. 6.40.

Table. 6.40 Customizing the conditions for loan

	Frequency	Percent	Valid Percent	Cumulative Percent
Yes, it is currently applied in the banks	72	45.00	45.00	45.00
Yes, but it is not currently applied in the banks	54	33.80	33.80	78.80
No, a common rate for all borrowers in sufficient	20	12.50	12.50	91.30
No opinion	14	8.80	8.80	100.00
Total	160	100.00	100.00	

Source: Primary Data

45.00% of the respondents agreed to the comment and mentioned that it is currently applied in the banks. 33.80% of respondents also supported the statement but remarked that it is not currently applied in banks. 12.50% of respondents commented for a uniform rate for all borrowers, while 8.80% of respondents reserved their comments.

6.7.8. Relevance of Corporate Governance Practices

The corporate governance in organizations can improve the conduct of business, thereby conduct of accounts. By promoting corporate governance practices in organizations that have dealings with bank; the NPA level can be reduced. The respondent’s feedback on this statement is summarized in the following table no. 6.41.

Table 6.41 Relevance of Corporate Governance Practices

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	34	21.30	81.00	14.685
Agree	106	66.30		
Neither agree nor disagree	14	8.80		
Disagree	6	3.80		
Strongly Disagree	0	0.00		
Total	160	100.0		

Source: Primary Data

21.30% of respondents asserted the relevance of corporate governance practices in reducing the NPA. 66.30% respondents also agreed to the significance of corporate governance practices. 8.80% of respondents reserved their comment while 3.80% of respondents refuted to the statement. It may be summarized based on the analysis that corporate governance practices can improve the efficiency of the organizations, thereby enable to reduce the level of NPA. The inference based on Z value (14.685) highlighted that the explained relationship is statistically significant.

6.7.9. Involvement of Industrial Bodies in Decision making

The respondent’s remark on the statement “NPA can be reduced if bank involve chamber of commerce, federation of industries, etc in decision making forums” is table no. 6.42.

Table 6.42 Involvement of Industrial Bodies in Decision Making

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	14	8.80	62.50	-6.838
Agree	46	28.80		
Neither agree nor disagree	46	28.80		
Disagree	54	33.80		
Strongly Disagree	0	0.00		
Total	160	100.0		

Source: Primary Data

The highest percentage of respondents (33.80%) disagreed to the statement. 8.80% of respondents agreed to the statement and commented that the association will reduce the NPA of banks. 28.80% strongly agreed to this statement. 28.80% reserved their comment. The inference based on Z value (-6.838) highlighted that the explained relationship is not statistically significant.

6.7.10. Incentives to Staff in loan department

The respondents opinion on the statement “Incentives to staff in the loan department will improve their involvement in loan accounts and thereby can reduce the instances of NPA to a considerable extent” is summarized in the table no.6.43.

Table 6.43 Incentives to Staff in Loan department and NPA

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	18	11.3	63.50	-4.789
Agree	64	40.0		
Neither agree nor disagree	22	13.8		
Disagree	40	25.0		
Strongly Disagree	16	10.0		
Total	160	100.0		

Source: Primary Data

11.3% of the respondents strongly agreed to the statement and considered staff incentives as a way to motivate managing NPA accounts. 40.00% of respondents also agreed to the statement. 13.8% of respondents reserved their comment, while 25% disagreed to the opinion. The inference based on Z value (-4.789) highlighted that the explained relationship is not statistically significant.

6.7.11. Credit Reference Agency

The presence of a credit rating and dissemination agency among banks can help in managing NPA by sharing information about the clients. At present, CIBIL (Credit Information Bureau of India Limited) maintains a data

base of borrowers that bank and financial institutions may easily access. In addition to this, the RBI also plays its part by circulating willful defaulters of banks and financial institutions and of borrowers facing law suits for recovery, to caution the industry against issuing fresh loans to the concerned companies, their promoters or directors. With regard to the credit reference agency, respondent's observations are summarized in table no.6.44.

Table 6.44 Credit Reference Agency and NPA

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	64	40.0	88.00	32.812
Agree	96	60.0		
Neither agree nor disagree	0	0.00		
Disagree	0	0.00		
Strongly Disagree	0	0.00		
Total	320	100.0		

Source: Primary Data

40% of respondents strongly agreed to the of credit reference agency in management of NPA. The view is supported by the remaining respondents, i.e., 60%. It may be concluded from the discussion that the scope of credit reference agency must be improved and should compass all banking institutions. The inference based on Z value (32.812) highlighted that the explained relationship is statistically significant.

6.7.12. Adding more staff in the credit appraisal process and loan department

It is often remarked that the staff strength in the loan department in banks is inadequate considering the volume of transactions involved. Such shortage of staff impact the efficient handling of different functions involved such as credit appraisal, follow up, etc. the respondent's comments on the statement "The bank requires more expertise staff, experienced in the industry, to look after the credit appraisal process" is summarized in table no. 6.45.

Table 6.45 Relevance of adding more staff to credit division in managing NPA

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	54	33.80	84.25	18.136
Agree	92	57.50		
Neither agree nor disagree	8	5.00		
Disagree	6	3.80		
Strongly Disagree	0	0.00		
Total	160	100.0		

Source: Primary Data

The highest percentage of respondents (57.50%) considered that it is important to add more staff to the credit department to improve the management of NPA accounts. 33.80% of respondents strongly supported the observation. Only 3.80% of respondents refuted this statement. The inference based on Z value (18.136) highlighted that the explained relationship is statistically significant.

6.7.13. Training and development for staff in loan department

Do the staff working in loan department need more training and development facilities to improve their skills and expertise? With changes in information technology, the bankers need more training so that new techniques may be employed to screen loan applications, grade investment projects, etc. The respondents' remark on the statement is summarized in table no. 6.46.

Table 6.46 Training and Development for staff in loan department

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	110	68.80	93.50	42.453
Agree	48	30.00		
Neither agree nor disagree	2	1.30		
Disagree	0	0.00		
Strongly Disagree	0	0.00		
Total	160	100.0		

Source: Primary Data

The feedback clearly indicates the need for ongoing training and development facilities for staffs working in the loan department. 68.80% of respondents strongly supported this requirement, while 30% agreed to it. No respondent disagreed with the statement. The inference based on Z value (42.453) highlighted that the explained relationship is statistically significant.

6.7.14. Role of SARFAESI Act in Managing NPA

The Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 is considered as a milestone in managing the NPA of Indian SCB. It allows the banks and financial institutions to auction properties (residential and commercial) when borrowers fail to repay their loans. It enables banks to reduce their non-performing assets by adopting measures for its recovery. The respondents' feedback on the importance of SARFAESI Act is summarized in table no. 6.47.

Table 6.47 Role of SARFAESI Act in Managing NPA

	Frequency	Percent	Mean % Score	Z Value
Strongly agree	54	33.8	74.50	3.203
Agree	52	32.5		
Neither agree nor disagree	22	13.8		
Disagree	20	12.5		
Strongly Disagree	12	7.5		
Total	160	100.0		

Source: Primary Data

The highest percentage of respondents (66.3%) considered the implementation of SARFAESI Act as an important step in the management of the NPA in commercial banks. The inference based on Z value shows that the explained relationship is statistically significant. This result supports the interpretations of Siraj and Pillai (2012) that the SARFAESI Act provided the much needed momentum for NPA management in banks.

6.7.15. Feedback on various remarks on NPA

During the course of this research, few notable remarks on NPA are observed from the literatures and feedback from experts. Are those observations statistically significant? The various observations were tested using the mean percentage score and Z value. The following conclusions were made based on the analysis.

- a) **Reduction of NPA ratios and fresh additions to NPA:** The opinion “The reduction in NPA ratio’s does not indicate a reduction of fresh NPA every year” is verified. Since the calculated Z value is -28.44 which less than the table value, the statement is not statistically significant and hence disproved.
- b) **Higher lending and NPA:** The opinion “NPA ratios are low mainly because of the higher level of lending over the years” is disproved as the calculated Z value is -24.56 which less than the table value.
- c) **Recovery process and NPA:** The opinion “The recovery process of NPA becomes more effective over the years” is verified. Since the calculated Z value is -42.06 which is less than the table value the statement is not statistically significant and hence disproved. Inference based on this result necessitates improvements in the recovery process of NPA accounts.
- d) **Regulatory measures and NPA:** The opinion “The regulatory measures are not very effective in managing the instances of fresh NPA every year” is verified. Since the calculated Z value is -27.40 which is less than the table value the statement is not statistically significant and hence disproved.

- e) **NPA and Advances:** The opinion “There are new additions to NPA every year, which is growing at a faster rate than the growth in advances” is verified. Since the calculated Z value is -20.893 which is less than the table value the statement is not statistically significant and hence disproved.
- f) **NPA Management:** The opinion “Most of the measures in managing NPA are reactive, focused on managing NPA once it occurs” is verified. Since the calculated Z value is 11.611 which is greater than the table value the test is found to be statistically significant. Based on analysis, it is inferred that more proactive measures are required in order to curtail the menace of NPA in banking sector.
- g) **Regulatory authorities and borrower sentiments:** The opinion “The regulatory authorities are more concerned on the borrower sentiments. For containing NPA, the borrowers have to be made more accountable for NPA” is verified. Since the calculated Z value is 32.718 which is greater than the table value, the opinion is found to be statistically significant.
- h) **The time taken to recover NPA accounts:** The comment “The recovery of NPA is a time consuming process and carries legal impediments and procedural requirements” is verified. Since the calculated Z value is 17.300 which is greater than the table value, the test is found to be statistically significant.

The statistical result supporting the above interpretation is shown in the table 6.48.

Table 6.48 Significance of Various Remarks on NPA

Observations	Mean	S.D	Mean % Score	Z value	Significance
The reduction in NPA ratios does not indicate a reduction of fresh NPA every year.	1.950	.974	39.00	-28.44	Not Significant
The NPA ratio's were low mainly because of the higher level of lending over the years	2.0875	1.0286	41.75	-24.56	Not Significant
The recovery process of NPA becomes more effective over the years	1.9875	.64315	39.75	-42.06	Not Significant
The regulatory measures are not very effective in managing the instances of fresh NPA every year.	2.0250	.96295	40.50	-27.40	Not Significant
There are new additions to NPA every year, which is growing at a faster rate than the growth in advances.	2.2000	1.11305	44.00	-20.893	Not Significant
Most of the measures in managing NPA are reactive, focused on managing NPA once it occurs.	3.9875	.75107	79.75	11.611	Significant
The regulatory authorities are more concerned on the borrower sentiments. For containing NPA, the borrowers have to be made more accountable.	4.5750	.58775	91.50	32.718	Significant
The recovery of NPA is time consuming process and carries legal impediments & procedural requirements.	4.1125	.63332	82.25	17.300	Significant

Source: Primary Data

6.8. Conclusion

The analysis highlighted banker's perception on the incidence of NPA and its management. The analysis indicates the need to incorporate more proactive measures in managing NPA. The regulatory authorities have introduced significant measures in the post-millennium period that includes SARFAESI Act etc. Even though these measures are significant and to a greater extent helped the banks to reduce their level of NPA, the generation of fresh NPA particularly its increased trend during financial crisis highlights the need for effective credit risk management mechanism.

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FINDINGS, RECOMMENDATIONS & CONCLUSION

C o n t e n t s	7.1	Introduction
	7.2	Findings of the Study
	7.3	Recommendations and Managerial Implications and Suggestions
	7.4	Scope of Further Research
	7.5	Implication of this study to the theory and practice

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 India 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

-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 ($r = 0.969$, Sig =0.000) and nationalized banks and all SCBs ($r = 0.954$, 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 R^2 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 7.1 Details of Hypothesis Testing

No	Hypothesis	Test Applied	Test Result	Result
1	H0: There is no significant difference in Gross NPA of different bank groups in India.	Oneway ANOVA	F = 34.698; Sig = 0.000	Rejected H ₀
2	H0: There is no significant difference in Net NPA of different bank groups in India.	Oneway ANOVA	Welch Statistic 37.807 Sig = 0.000	Rejected H ₀
3	H0: There exists no significant difference in Additions to NPA among different bank groups in India.	Oneway ANOVA	Welch Statistic 8.087 Sig = 0.001	Rejected H ₀
4	H0: There exists no significant difference in Reductions to NPA among different bank groups in India.	Oneway ANOVA	Welch Statistic 21.838 Sig = 0.000	Rejected H ₀
5	H0: There exists no significant difference in Net additions to NPA among different bank groups in India.	Oneway ANOVA	Welch Statistic 1.625 Sig = 0.212	Accepted H ₀
6	H0: There exists no significant difference in Provisions towards NPA among different bank groups in India.	Oneway ANOVA	Welch Statistic 4.579 Sig = 0.013	Rejected H ₀
7	H0: There is no significant relationship between GNPA and Gross Advances of SBI & Associates	Oneway ANOVA	F = 81.264; Sig = 0.000 t- value = 6.512 Sig = 0.000	Rejected H ₀
8	H0: There is no significant relationship between GNPA and Gross Advances of Nationalized Banks.	Oneway ANOVA	F = 42.407; Sig = 0.000 t- value = 9.015 Sig = 0.000	Rejected H ₀
9	H0: There is no significant difference Credit-Deposit Ratio among different bank groups.	Oneway ANOVA	F value = 5.526 Sig = 0.003	Rejected H ₀
10	H0: There is no significant difference in Credit-Deposit Ratio during pre-crisis period and post-crisis period.	Oneway ANOVA	Welch Statistic 22.194 Sig = 0.000	Rejected H ₀
11	H0: There exists no significant difference in the movement of gross NPA of State Bank of Travancore with different bank groups in India.	Oneway ANOVA	Welch Statistic 51.873 Sig = 0.000	Rejected H ₀
12	H0: There exists no significant difference in the movement of net NPA of State Bank of Travancore with different bank groups in India.	Oneway ANOVA	Welch Statistic 60.926 Sig = 0.000	Rejected H ₀
13	H0: There exists no significant difference in the movement of additions to NPA of State Bank of Travancore with different bank groups in India.	Oneway ANOVA	Welch Statistic 18.723 Sig = 0.000	Rejected H ₀
14	H0: There exists no significant difference in the movement of additions to NPA of State Bank of Travancore with different bank groups in India.	Oneway ANOVA	Welch Statistic 43.602 Sig = 0.000	Rejected H ₀

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.

- 4) 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.
- 5) 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.
- 6) 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.
- 7) 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.

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Sl No	Article Title	Name of Journal	Vol No & Year	ISSN No	Page No
1	The Moderating Role of Bank Performance Indicators on Credit Risk of Indian Public Sector Banks	Research Journal of Finance and Accounting (IC Impact Factor 6.2)	Vol.4 (17) 2013	2222-1697	219-226
2	Study on the Mediating Effect of GDP on the relationship between NPA and Gross Advances in Indian SCBs	Research Journal of Finance and Accounting (IC Impact Factor 6.2)	Vol.4 (3). 2013	2222-1697	55-63
3	Efficiency of NPA Management In Indian SCBs – A Bank-Group Wise Exploratory Study	Journal of Applied Finance and Banking	Vol. 3(2), 2013	1792-6580	123-137
4	Comparative Study on Performance of Islamic Banks and Conventional Banks in GCC Region	Journal of Applied Finance and Banking	Vol.2(3), 2012.	1792-6580	123-161
5	Defining Graduate Attributed as a Prerequisite For Incorporating Activity Based Learning in Accounting Education,	Romanian Journal for Multi-Dimensional Education	No.9, 2012.	2066 -7329	30-41
6	Management of NPAs in Indian SCBs: Effectiveness of SARFAESI Act, DRT & Lok Adalat during 2004-2011	International Journal for Business and Management Tomorrow	Vol.2(4), 2012.	2249-9962	1-10
7	A Study on the performance Of Non Performing Assets (NPAs) of Indian Banking During Post-Millennium Period	International Journal of Business and Management Tomorrow	Vol.2 (3), 2012.	2249-9962	1-12
8	Asset Quality and Profitability of Indian Scheduled Commercial Banks during Financial Crisis	International Research Journal of Finance and Economics	Issue 80 2011	1450-2887	55-65

CONFERENCE ATTENDED

Sl No	Conference Details	College/University and Country	Date	No. of Papers presented
1	Managing in the New World Order: Strategies for Sustainable Business Development	Sur College of Applied Sciences, Ministry of Higher Education, Sultanate of Oman.	21-22 February 2010	-
2	63 rd All India Commerce Conference	All India Commerce Association, University of Goa.	1-4 October, 2010.	1
3	64 th All India Commerce Conference	All India Commerce Association, University of Pondicherry.	13-15 December 2011.	2
4	Inspiring Oman towards New Horizons of Growth	Ibra College of Technology, Ministry of Manpower, Sultanate of Oman.	March 4, 2012,	2
5	Emerging International Business Order	Cochin University of Science and Technology, Kerala.	March 2012,	1
6	First International Conference on Business Management 2013, Sultanate of Oman.	Dhofar University, Sultanate of Oman.	17-18 April 2013	1