

A Study of Non-performing Asset Management as a Strategic Approach to Ensure Sustainability among the Public Sector Banks in India

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ABSTRACT

The year 2019 marked the completion of 50 years of banking nationalisation in India. Since 1969 (first phase of nationalisation of banks), the banking system has grown in wealth, asset-base and size. However, such growth has left behind piles of Non-performing Assets (NPA), affecting its profitability and exposed management inefficiencies. Initiatives have been taken for recovering such loans from time to time, but without many upshots. The Asset Reconstruction Companies (ARCs) and the Debt Recovery Tribunals (DRTs) have failed over the years to recover such NPAs. Hence managing such NPAs became the most crucial challenge for the banks. The following study focuses on the individual practices of the banks to manage NPAs. This study formulates the strategies which would help them in managing their NPAs. The paper has focussed on the Public Sector Banks (PSBs) since they dominate the industry with their strong presence and huge market share. The uniqueness of the paper has been the formulation of strategies to control and manage NPAs, which would work as a complement to the Reserve Bank of India (RBI) policies.

Keywords: Non-performing assets, Basel, Public sector banks, Risk management, CAMELS

JEL Classification: E58, F65, G21

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INTRODUCTION

Recognition and identification of Non-performing Assets (NPA) took nearly 130 years to establish its menacing presence in the banking sector. The problem of NPA was first traced back in 1872 with the fall of the Negapatam branch of Bank of Madras.¹ Till the pre-independence phase, the country observed a total

of 482 bank failures in different states (*Pandey, 1968*). The post-independence phase evolved as a structured system of banking with the initiation of the nationalisation of banks. After nationalisation in 1969, there had hardly been any significant shift in the banking policy in the banking sector till 1992. It was only after 1992 that the restructuring became inevitable in the banking sector as NPA was identified to be

¹The Bank of Madras was established in 1843 as a joint-stock company, which was later consolidated with Bank of Bengal and Bank of Bombay to form the State Bank of India.

majorly responsible for the sluggish growth in the sector. The post-1992 period started with the vision to liberalise, privatise and globalise the Indian banking sector. It started its journey guided by the Narasimham Committee Recommendations.² Such initiative aimed at making the banking sector vibrant both at the national and international levels. However, in doing so, the initiative to reduce and manage NPA became inevitable. The government has taken up steps from time to time through the establishment of Debt Recovery Tribunals (DRTs) to make the distressed assets marketable, forcing the banks to implement proper risk management policies and implementation of Basel Regulations³.

On the other hand, the economy has fully opened itself up to the foreign participants after March 2009. It has made way for the foreign banks to set up their headquarters and operate in India. Such an initiative has poised severe competition among the domestic banks as they have to face the challenge and competition from internationally best-practiced banks.

The proposed research work is divided into two major focal points. The first one evaluates the performance of Public Sector Banks (PSBs) with the help of the CAMELS Model⁴ to identify the extent to which

NPAs are responsible for the deterioration in the performance of the banks. The second one deals with the identification and formulation of strategies that would help in the management of NPAs, thereby increasing the competitive strategies among the PSBs.

The external environment of PSBs is characterised by

- Product homogeneity—indicating the closeness of substitute to the industry's products
- Performance-based competition within the industry—concerning overall performance based on
- NPA and loan recovery
- Loan disbursement
- Cost-based competition
- Human resource training and development

The stronger the intensity of the above forces, the more limited a bank can control critical variables in its external environment. A significant product offered by a bank is its loans. An increase in NPA decreases a bank's lending capability. Therefore, the reduction and management of NPA would increase the competitiveness among the PSBs. Management and control of NPAs can ensure a more economically sustainable banking system through:

²To review the progress in the banking sector reform, the United Front Government appointed the former RBI Governor Sri. M. Narasimham to head a Committee on Banking Sector Reforms, commonly known as Narasimham Committee. The recommendation of the committee was submitted to union Finance Minister Sri. YashwantSinha in November 1991.

³The Basel Committee on Banking Supervision (BCBS) in Basel, Switzerland, published a set of minimum capital requirements for banks. This is also known as the 1988 Basel Accord and was enforced by law in the Group of Ten (G-10) countries in 1992.

⁴In the 1980s, the CAMEL rating system was first introduced by US supervisory authorities as a system of rating for on-site examinations of banking institutions. Under this system, each banking institution subject to onsite examination is evaluated based on five (now six) critical dimensions relating to its operations and performance, which are referred to as the component factors. These are Capital Adequacy, Asset Quality, Management, Earnings and Liquidity used to reflect the financial performance, financial condition, operating soundness and regulatory compliance of the banking institution. A sixth component relating to Sensitivity to market risk has been added to the CAMEL rating to make the rating system more risk-focused. Each of the component factors is rated on a scale of 1 (best) to 5 (worst). A composite rating is assigned as an abridgment of the component ratings and is taken as the prime indicator of a bank's current financial condition. The composite rating ranges between 1 (best) and 5 (worst) and also involves a certain amount of subjectivity based on the examiner's overall assessment of the institution given the individual component assessments.

- Ensuring growth and long-term profitability
- Creating a positive perception of the institution among its customers
- Improving management efficiencies
- Improving operational and financial efficiencies
- Maximising shareholders' value

Accordingly, the present study is a modest attempt to analyse how the management of NPAs and controlling their growth may be achieved through improvement in the banking governance policy. The research work focuses on the formulation of strategies that would ensure a reduction in the level of NPA and improve competitiveness among the banks.

A BRIEF SURVEY OF EXISTING LITERATURE

A major part of the literature in this field is devoted to the concerns about the impacts of NPA in the banking industry, with special reference to the Indian context. Some of the significant publications covered are listed below in Table 1 and 2:

RESEARCH GAP

The literature review reveals a strong focus on the measures that were adopted from time to time to reduce the NPA ratio in the banking sector; this has subsequently shifted towards the role of credit risk

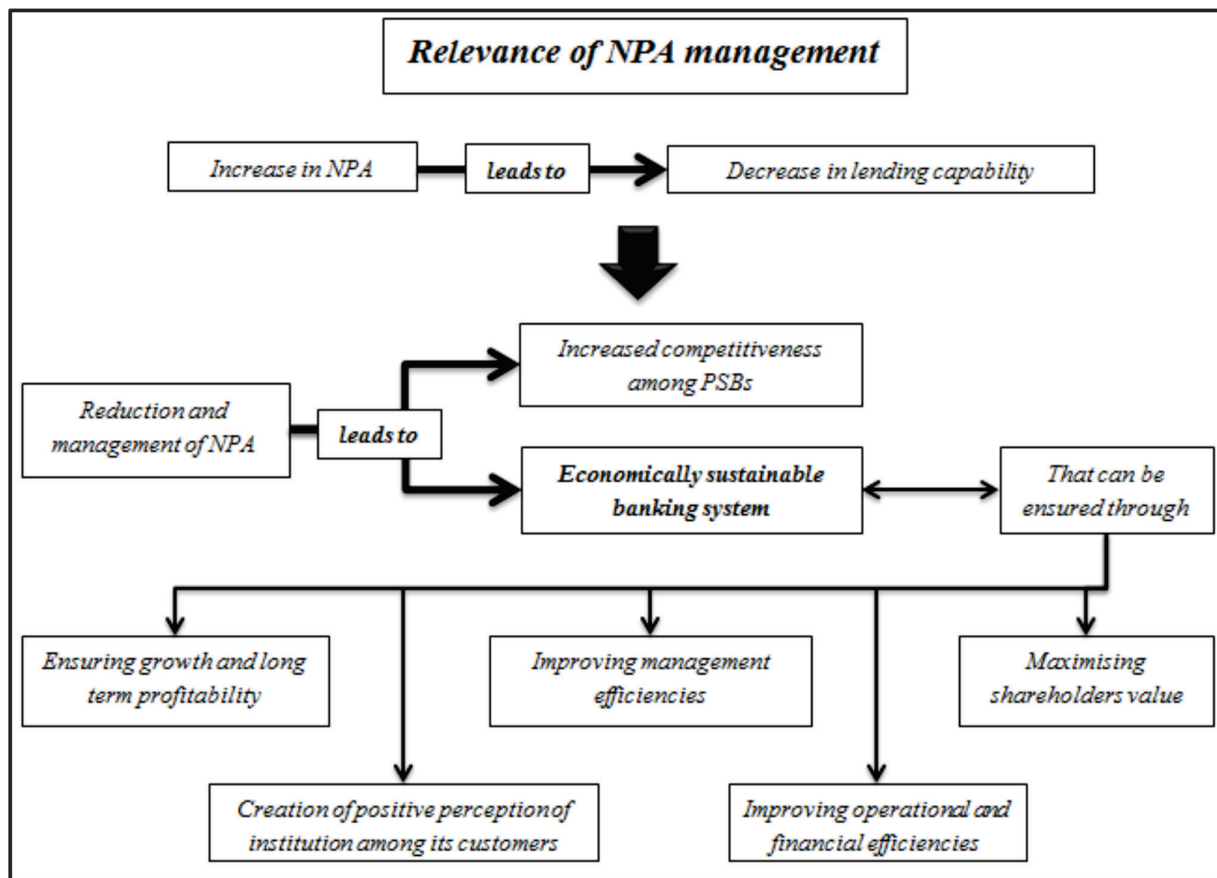


Figure 1: Management of NPAs and controlling their growth

Table 1: Concept Based Existing Literature

Name of the Book/ Report/Article	Author	Year	Review
Using Credit Risk Models for Regulatory Capital: Issues and Option	Hirtle, Beverly J., Levonian Mark, Saidenberg Marc, Walter Stefan, Wright David	2001	The book would allow the banks and supervisors to take advantage of the benefits of advanced risk-modelling techniques in setting capital standards for credit risk.
Credit Risk Management	S.N. Bidani, P.K. Mitra, Pramod Kumar	2004	This book tackles the subject of managing NPAs in its entirety, starting right from their stage of identification till the recovery of dues in such accounts.
Basel II Accord: Impact on Indian Banks	Gupta, V. Srinivasan	2005	It focuses on the approach of Reserve Bank of India (RBI) towards Basel II Accord. The RBI had set up a steering committee to draft guidelines for implementing new capital adequacy framework covering the guidelines of Basel II.
Risk Management and Financial Institutions	Hull, John. C.	2007	This book focuses on regulation and risk management and provides a practical approach to understanding the ways in which banks and other financial institutions measure market, credit and operational risk.
Banking: Theory, Law and Practice	Gordon, E., Natarajan, K.	2009	The book focuses on the recent developments in the field of banking emphasising on the passing of Securitisation Act, Management of Non-performing Assets, Credit Appraisal, Real time gross settlement and so on.

Table 2: Implementation/Operational Development

Name of the Book/ Report/Article	Author	Year	Review
Resolving Non-performing Assets of the Indian Banking System	Dong, He.	2002	This book reviews the nature of NPAs in the Indian banking system and discusses the key design features that would be important for the Asset Reconstruction Companies (ARCs) to play an effective role in resolving NPAs. It therefore helps in identifying the functions and roles of ARCs in reducing NPAs.
Credit Risk Management	S.N. Bidani, P.K. Mitra, Pramod Kumar	2004	The author(s) defined credit risk as possibility of losses associated with the diminution in the credit quality of borrowers or charter parties.
Management of NPAs: Country Experiences	Datta Chaudhuri, T	2007	The study has been focused on several countries with special emphasis on India.
Dynamics of Indian Banking: Views and Vistas	Sharma, M.	2008	This book identifies the transformations caused due to Banking Sector the reforms in India.
Dare to Lead: The Transformation of Bank of Baroda	Khandelwal, A.K.	2011	This book helps in knowing the strategies implemented in the banking operations of Bank of Baroda.

management and compliance mechanisms to foster financial discipline in PSBs.

The schedule of the proposed research work comprised three distinct themes that have not been systematically analysed in the earlier works included in the survey of the literature:

1. Importance of NPA management as a strategic variable influencing bank performance.
2. To establish the impact of NPA accumulation as a negative strategic variable leading to a loss of competitiveness and reputation.
3. NPA management as a positive strategic variable that can potentially increase the competitiveness of banks.

RESEARCH OBJECTIVES

The broad research objectives behind the work are as follows:

- To analyse the reasons for the substantial increase in the NPA ratio for the Indian PSBs
- To analyse the impact of the asset quality on the overall performances of the banks
- To identify the opportunities and challenges of the credit risk management policies in the Indian Banking Sector as a possible measure for high NPA levels
- To analyse alternative strategic approaches to NPA management by Indian banks to restrain itself from the accumulation of further bad loans

RESEARCH METHODOLOGY

Both primary data and secondary data have been used for the study. The primary survey has been conducted with the help of a structured questionnaire, and respondents are targeted from the risk management and the recovery departments of nine PSBs.

The secondary data has been collected from the RBI website, the annual reports of the PSBs, banking reports published by the Bank of International Settlements (BIS), Banking Regulations Act, 1949, SARFAESI Act, 2002, published articles and research papers from National Institute of Bank Management (NIBM), etc.

The period of the study includes a period from post-2001 to 2016. The choice of the contemporary period may be defended as follows: Post-2001 was the phase when Global Trust Bank was bankrupted owing to its aggressive lending policies. Mandatory implementation of Basel II after 31 March 2007. The opening up the banking sector towards the foreign participants after March 2009, thereby analysing the present status of the Indian banks. The 2009 to 2016 will mark the impact on the PSBs since they will be facing severe challenges not only from the foreign banks but also RBI's policy of adaptation of internationally best risk management practices making them more vibrant. The timeframe has been increased from 2012 to 2016 due to rapid transformations taking place in the banking sector and focussing on the adaptation of the more advanced Basel III Regulations.

RESEARCH DESIGN

Exploratory: A conceptual survey of the existing literature to achieve new insights into NPA detection and prevention.

Analytical: Analysis of available secondary information to make a critical evaluation of PSBs with the help of the CAMEL model. The following are the statistical tools have been used for the analysis:

- **Factor Analysis:** Factor analysis is an interdependence technique in that an entire set of interdependent relationships is examined without making the distinction between dependent and independent variables.

- The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy is an index used to examine the appropriateness of factor analysis.
- Barlett’s test of Sphericity is a test statistic used to examine the null hypothesis that the variables are uncorrelated in the population.
- Test for Normality: Here, H_0 is that the variable follows a normal distribution. If $p < 0.05$, we reject H_0 to claim that the variable doesn’t follow a Normal distribution.
- Spearman’s Rank Correlation Coefficient—used for Non-Normal Data

Empirical: A field study with valid conclusions relating to risk management strategies followed by the PSBs to reduce NPAs.

Growth of NPA in the Indian Banking Industry

NPA issue in the banking sector has been a weakness for all economies, including India. Reduction in NPA, therefore, would improve the functional efficiency of financial intermediaries. Although the value of NPA is reflected in the Balance Sheet, it has a huge macroeconomic impact. If these stressed assets are not recovered on time, the values will decrease with time and this would lead the banks to recover a negligible value. This, in the long run, affects the growth in the financial sector and a decrease in its competitiveness. Hence, the management of NPA forms an integral part of strategic decisions for the banks. Management of NPA is commonly addressed as credit risk management globally. Basel Committee on Banking Supervision came up with Basel Regulations as internationally accepted regulation on risk management. However, customised efficiency of different banks proved to be the most important factor for managing NPA in the banks.

In India, the development of a structured banking system started with the initiative of the nationalisation

of banks. The aggressive branch expansion, deposit mobilisation and loan maximisation led to the massive accumulation of NPA. Management of NPA remained an unaddressed area for years. This increased capital erosion and reduced growth and competitiveness among the PSBs. The operational risk was further encountered with the increase in the number of private sectors and foreign banks. After NPA was addressed as an essential issue for the decrease in the growth of the banks, several measures were taken as a strategic move, without many upshots. The growth of NPA and its effect on Indian Banks have been explained in the following Table 3.

The major drawback identified has been a high NPA ratio, poor asset quality and an improper risk management policy. However, RBI has taken up some policies and international best practices to analyse the performances of the banks and manages NPA.

Analysis of Impact of Asset Quality on Bank Performance using the CAMEL Approach

The Banking Regulation Act, 1949, empowers the RBI to inspect and supervise commercial banks. These powers are executed through on-site inspection and off-site surveillance. In 1995, the RBI established a working group under the chairmanship of Shri S. Padmanabhan to review the entire supervision system of the banking sector. On the base of recommendations and suggestions given by this committee on the adaptation of the ‘CAMEL’ model (based on an internationally adopted model), which was later modified as ‘CAMELS’ was introduced for banks from July 1998. Committee recommended that the banks should be rated on a five-point scale (1 to 5) based on the guideline of the international ‘CAMEL’ rating model in Table 4.

Such ratios, on the one hand, acted as the parameter to analyse the performance of the banks and, on the other hand, became an important tool to measure the

Table 3: Growth of NPA and its effect on Indian Banks

Time line	Events
1949	Banking Regulation Act
1955	<ul style="list-style-type: none"> State Bank of India Act Nationalisation of SBI
1969	Nationalisation of 14 PSBs
1976	Establishment of Regional Rural Banks (RRBs)
1980	Second phase of Nationalisation
1989	Basel I Accord came into force
1991–1992	<ul style="list-style-type: none"> Liberalisation Privatisation and Globalisation started in Indian Banking Sector Problem of NPA was first addressed
2002	<ul style="list-style-type: none"> SARFAESI Act came to force Failure of Debt Recovery Tribunals (DRTs) Failure of Global Trust Bank
2006	Basel II Accord came into force
2008-09	<ul style="list-style-type: none"> Full adaptation of Basel II⁵ Increase in NPA in PSBs owing to corporate loan default by Mr. Vijay Mallia Entry restrictions of the foreign banks were lifted up. They were allowed to set up their head quarters' in India
2014	<ul style="list-style-type: none"> SBI got merged with its associates RBI's granting of Banking licence to two more private banks Establishment of small banks Establishment of payment banks
2016	<ul style="list-style-type: none"> Demonetisation in Indian Economy Huge deposits received by the banks
2017	Introduction of Goods and Service Tax
2019	<ul style="list-style-type: none"> Mandatory adaptation of Basel III Proposed consolidation among the PSBs

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Table 4: Ratios under CAMEL Model

Capital adequacy (C)	Assets quality (A)	Management efficiency (M)	Earning quality (E)	Liquidity (L)
i. Capital Adequacy ratio ii. Debt-Equity ratio iii. Advance to Total Assets Ratio iv. Government Securities to Total Investments	i. Net NPAs to Total Assets ii. Net NPAs to Net iii. Total Investments to Total Assets iv. Percentage Change in NPA	i. Total Advances to Total Deposits ii. Profit per Employee iii. Business per Employee iv. Return to Net Worth	i. Operating Profit to Average Working Funds ii. Percentage Growth in Net Profit iii. Net Profit to Average Assets	i. Liquid Assets to Demand Deposits ii. Liquid Assets to Total Deposits iii. Liquid Assets to Total Assets iv. G-Sec to Total Assets v. Approved Securities to Total Assets

⁵In June 2004, the Basel Committee issued the final version of the New Basel Accord (Basel II), a framework for risk management with three pillars: capital adequacy, supervisory review and market disclosure.

Table 5: The Basel II regulations currently in practice incorporated three main pillars

Basel II		
Pillar I Minimum capital requirement*	Pillar II Supervisory review process	Pillar III Market discipline
The main objective of Pillar I is to introduce greater risk sensitivity in the design of capital adequacy ratios and, therefore, more flexibility in the computation of banks' individual risk. This will lead to better pricing of Risks.	Pillar II aimed at improving supervisory review process and stressed on supervisory review as a critical complement to capital requirement and market discipline.	Pillar III relates to market discipline or public disclosures. The potential of market discipline to reinforce capital regulation was dependent on the disclosure of reliable and timely information in order to make well-founded risk assessments.

NPA and the credit risk management efficiency for the banks. The CAMELS model has been in tune with the risk management parameters, as suggested by the Basel Committee from time to time in Table 5.

Capital Adequacy Ratio signifies the amount of regulatory capital to be maintained by a bank to account for various risks inherent in the banking system.

The Capital Adequacy ratio is measured as;

$$\text{Total Regulatory Capital (unchanged) / (Credit Risk + Market Risk + Operational Risk)}$$

$$= \text{Bank's Capital (minimum 9\% as per Basel II and minimum 11.5\% as per Basel III)}$$

The CAMELS Model has, therefore, proved itself not only as a tool to analyse the performance of the banks, but also a mechanism of measuring credit risk in the banks. Hence, CAMELS Model has been chosen as the standard contrivance in analysing the performance of the PSBs, emphasising the credit risk management policy.

The first four components of the CAMELS model, that is, C, A, M, E and L, are quantifiable. Hence, the ratios under CAMEL are calculated over the last 5 years, and the effects of NPA on each of the parameters have been drawn. The following hypotheses have been tested in the present study. A represents the asset quality. The ratios under A represent the level of NPA. The hypothesis has been drawn showing the effect of A on C, M, E and L.

1. H0: Capital Adequacy Ratio and NPA are not related.
H1: Higher the Capital Adequacy Ratio, lower will be the NPA.
2. H0: Management Efficiency and NPA are not related.
H1: With the increase in Management Efficiency, NPA decreases
3. H0: Earning quality and NPA are not related.
H1: Lower the NPA, higher will be the earning quality.
4. H0: There is no relationship between NPA and liquidity.
H1: There is a relationship between NPA and Liquidity.

The statistical software SPSS [version 20] has been used for the analysis.

An alpha level of 5% has been taken, that is, if any $p < 0.05$, it has been considered as significant. Alpha level of 5% is the conventional criterion of the probability of Type I error, i.e., when there is no effect in the population.

To analyse the collected data, correlation and multiple regression are the most appropriate tools, subject to the assumption that the data follows a normal distribution.

The different tests that have been carried out are listed below, along with their results:

Test for Normality

The normality assumption is a prerequisite to conducting parametric tests on the collected data for analysis purposes. The factor score has been generated and checked for Normality using the Shapiro–Wilk test, which is based on the correlation between the data and the corresponding normal scores. This test compares the scores in a sample to a normally distributed set of scores with the same mean and standard deviation. The test is considered non-significant if $p > 0.05$ and vice versa. When $p < 0.05$, it infers that the distribution in question is significantly different from a normal distribution.

Here,

H0: The variable follows a normal distribution.

H1: The variable does not follow a normal distribution.

If $p < 0.05$, H0 is rejected, and it is concluded that the variable does not follow a Normal distribution.

Table 6: Tests of normality

	Shapiro–Wilk	
	Statistic	<i>p</i>
Capital adequacy	0.913	<0.001
Asset quality	0.890	<0.001
Management efficiency	0.888	<0.001
Earning quality	0.956	<0.001
Liquidity	0.605	<0.001

From the above Table 6, it is obtained that none of the factor scores were following normality since the $p < 0.001$ for each of them. Therefore, multiple regression analysis could not be carried out. Instead, factor analysis is conducted on the data, after checking its appropriateness. For data reduction and

summarisation, factor analysis is carried out. Factor analysis is an interdependence technique by which an entire set of interdependent relationships is examined without making the distinction between dependent and independent variables.

FACTOR ANALYSIS

KMO and Bartlett's Test of Sphericity. The variables must be correlated for the appropriateness of factor analysis. Formal statistics available for testing the appropriateness of the factor model is Bartlett's Test of Sphericity, which is based on a chi-square transformation of the determinant of the correlation matrix. The null hypothesis is that the variables are uncorrelated, that is, the population matrix is an identity matrix; each variable correlates perfectly with itself ($r=1$), but has no correlation with the other variables ($r=0$). Higher values would lead to rejection of the null hypothesis.

KMO measure of sampling adequacy is yet another useful statistic that makes a comparison between the correlation coefficients and the partial correlation coefficients. For the appropriateness of the factor analysis, values greater than 0.5 are desirable. Small values of KMO statistic indicate that the correlations between the variable pairs are not explained by other variables.

KMO measure of sampling adequacy and Bartlett's Test of Sphericity was carried out while generating a one-factor solution using factor analysis to get the overall factors Capital Adequacy, Asset Quality, Management Efficiency, Earning Quality and Liquidity in Table 7.

The approximate chi-square statistics for all the variables are large. All the *p* values of the Bartlett's Test of Sphericity are <0.001 and hence the test results are significant to reject the null hypothesis that the

Table 7: Bartlett's Test of Sphericity

KMO And Bartlett's Test-Capital adequacy		
KMO Measure of Sampling Adequacy.		0.569
Bartlett's Test of Sphericity	Approx. Chi-square	86.960
	df	6
	p Value	<0.001
KMO and Bartlett's Test-Asset quality		
KMO Measure of Sampling Adequacy.		0.573
Bartlett's Test of Sphericity	Approx. Chi-square	242.747
	df	6
	p Value	<0.001
KMO and Bartlett's Test-Management efficiency		
KMO Measure of Sampling Adequacy.		0.562
Bartlett's Test of Sphericity	Approx. Chi-square	43.445
	df	6
	p Value	<0.001
KMO and Bartlett's Test-Earning quality		
KMO Measure of Sampling Adequacy.		0.647
Bartlett's Test of Sphericity	Approx. Chi-square	49.995
	df	3
	p Value	<0.001
KMO and Bartlett's-Test liquidity		
KMO Measure of Sampling Adequacy.		0.568
Bartlett's Test of Sphericity	Approx. Chi-square	215.516
	df	10
	p Value	<0.001

variables are uncorrelated in the population. All the KMO values are more than 0.5. This indicates that factor analysis is appropriate for analysing the given data.

Method of Factor Analysis

The two basic approaches of factor analysis are principal component analysis and common factor analysis. The total variance is considered in the principal component analysis. This approach is adopted when the primary objective is to derive the minimum

number of factors that are responsible for the maximum variance in the data. The factors are known as principal components. Principal component analysis extracts the main factors that lead to variance out of the huge number of variables available in the data. There is no limit to the number of principal factors. However, for summarising the information within the data, a smaller number of factors should be extracted. Several approaches are there for such extraction, of which the extraction method based on eigenvalue is applied. The eigenvalue represents the total variance associated with each factor.

The following Tables 8 show the extraction of the most important component in each of the sets of variables. The components are the ratios for every parameter previously identified as C, A, M, E and L.

Table 8: Extraction of the most important component CAPITAL ADEQUACY

Total Variance Explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.840	46.009	46.009	1.840	46.009	46.009
2	0.980	24.495	70.504			
3	0.852	21.298	91.801			
4	0.328	8.199	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
Capital adequacy ratio (%)	0.318
Debt/equity	-0.680
advance/total assets (%)	0.867
Govt. securities/total investments (%)	0.725

Extraction Method: Principal Component Analysis.

^a1 component extracted.

The factor explains 46% of the total variation in the data. The (Table 9) most important component is Advance/Total Assets (%), followed by Govt. securities/Total Investments (%).

Table 9: Asset Quality of the total variation in the data

Total Variance Explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.924	48.108	48.108	1.924	48.108	48.108
2	1.076	26.911	75.019			
3	0.922	23.050	98.069			
4	0.077	1.931	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
Net NPAs/total assets (%)	0.980
Net NPAs/net advances (%)	0.936
Total investment/total assets (%)	0.292
% Change in NPAs	-0.033

Extraction Method: Principal Component Analysis.

^a 1 components extracted.

The factor explains 48% of total variation in the data. The most (Table 10) important component is Net NPAs/Total Assets (%) followed by Net NPAs/Net Advances (%).

Table 10: Management Efficiency Total Variance Explained

Total Variance Explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.637	40.928	40.928	1.637	40.928	40.928
2	1.053	26.335	67.263			
3	0.785	19.628	86.891			
4	0.524	13.109	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
Total advances/total deposits (%)	0.595
Profit per employee	0.819
Business per employee (IN CR.)	0.061
Return on net worth	0.781

Extraction Method: Principal Component Analysis.

^a 1 components extracted.

The factor explains 41% of total variation in the data. The most important component is Profit per employee followed by Return on Net Worth in Table 11.

Table 11: Earning Quality Total Variance Explained

Total Variance Explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	1.755	58.499	58.499	1.755	58.499	58.499
2	0.677	22.561	81.059			
3	0.568	18.941	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
Operating profit/average working funds (%)	0.776
% Growth in net profit	0.727
Net profit/average assets	0.790

Extraction Method: Principal Component Analysis.

^a 1 components extracted.

The factor explains 58% of total variation in the data. The (Table 12) most important component is Net Profit/Average Assets followed by Operating profit/Average working funds (%).

Table 12: Liquidity Total Variance Explained

Total Variance Explained

Component	Initial eigenvalues			Extraction sums of squared loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.148	42.968	42.968	2.148	42.968	42.968
2	1.220	24.395	67.362			
3	0.881	17.620	84.982			
4	0.625	12.493	97.476			
5	0.126	2.524	100.000			

Extraction Method: Principal Component Analysis.

Component Matrix^a

	Component
	1
Liquid Assets (LA)/demand deposits	0.403
LA/total deposits	0.928
LA/total assets	0.871
Govt. Securities/total assets (%)	0.136
Approved securities/total assets (%)	0.589

Extraction Method: Principal Component Analysis.

^a 1 components extracted.

The factor explains 43% of the total variation in the data. The most important component is Liquid Assets/ Total Deposits, followed by Liquid Assets/Total Assets in Table 13.

Net NPAs/Total Assets have the highest eigenvalue out of the other factors. This represents Asset Quality as the most important factor to influence the performance of the bank among the other factors in

Table 13: The factor analysis above is summarised as follows:

CAMEL model	Important component	Value as per component matrix	% of total variation in the data
Capital adequacy	Advances/total assets	0.867	46.009
Asset quality	Net NPAs/Total Assets	0.980	48.108
Management efficiency	Profit per employee	0.819	40.928
Earning quality	Net profit/average assets	0.790	58.499
Liquidity	Liquid assets/total deposits	0.928	42.968

the CAMELS Model.

Spearman's Rank Correlation Coefficient: Spearman's Rank Correlation Coefficient was used to check the association of Asset Quality with Capital Adequacy, Management Efficiency, Earning Quality and Liquidity, respectively.

Spearman's Rank Correlation Coefficient—used for Non-Normal Data: The correlation coefficient shows the strength of linear relationships between two variables. It measures the goodness of fit between two sets of data and tells us if there exists a linear relationship (symbolised by r) between two variables x and y . If the fit is poor, r will be close to 0. If the fit is good, r will be close to 1. The range of r is between +1 to -1.

- 'Zero' correlation implies there exists no relationship between x and y .
- 'Negative' correlation occurs when large values of X go with small values of y and vice versa alternatively,
- 'Positive' correlation occurs when large values of X go with large values of Y , and small values of X go with small values of y .

r is the most widely used measure of the strength of linear relationships between two or more variables. It tells us whether or not there exists a linear relationship between x and y . r values do not necessarily imply a cause-effect relationship. It is thus always safer, to

interpret correlation coefficients, as measures of association rather than causation in Table 14.

From the above table, it is evident that Asset Quality has a significant ($p < 0.001$) negative correlation with

Table 14: Correlations of the strength of linear relationships

		Asset quality
Spearman's rho		
Capital adequacy	Correlation coefficient	-0.155
	p	0.078
Management efficiency	Correlation coefficient	-0.429
	p	<0.001
Earning quality	Correlation coefficient	-0.426
	p	<0.001
Liquidity	Correlation coefficient	0.046
	p	0.601

Management Efficiency and Earning Quality. This rejects the Null Hypothesis and concludes with the increase in Management Efficiency, NPA decreases, and Lower the NPA, higher will be the earning quality.

However, the correlation coefficient between Capital Adequacy and Asset Quality, even though it is negative, is not significant at 5% level as the p -value is higher 0.05.

Hence we accept H_0 to claim that CAR does not affect the level of NPA.

However, the correlation coefficient between Liquidity and Asset Quality is not significant at 5% level as the p -value is 0.601 is higher 0.05.

Hence we accept H_0 to claim that Liquidity does not affect the level of NPA.

Overall Ranking

The mean of all the Banking parameters for each bank over the years was calculated, and the mean of these averages for each bank was used to rank the banks.

From the high (Table 15) ranking based on the performance, a sample of 9 banks has been collected out of 26. The extraction of the sample of nine banks is as follows:

- Three out of the top five performing banks (based on the accessibility in the risk management or recovery department):
 - Dena Bank
 - Bank of Maharashtra
 - Syndicate Bank
- Three out of the worst five performing banks (based on the accessibility in the risk management or recovery department):
 - UCO Bank
 - Central Bank of India
 - United Bank of India
- Three out of the sixteen banks in the middle
 - State Bank of India (Since it is the largest bank in India)
 - Bank of Baroda (based on the accessibility in the risk management or recovery department)
 - Allahabad Bank (based on the accessibility in the risk management or recovery department)

Alternative Strategic Approaches to Non-performing Asset Management

The nationalisation of banks marked an important milestone for the PSBs with a vision to transform the banking system into a vibrant system that would mainly concentrate on social and economic development. The shares were held by the government, and profit maximisation acquired the final position in the priority list. Over the last 50 years after nationalisation (1969–2019), there has been a major shift in the priority with the environment becoming

Table 15: Banking parameters for each bank

Bank	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Indian Overseas Bank	11.44	20.68	64.66	86.72	1.76	2.88	26.14	76.60	78.98	0.03	13.32	15.52	1.77	2.90	0.32	2.19	0.13	0.11	22.16	26.53	22.74	1.00
Dena Bank	11.50	12.18	63.31	80.58	1.24	2.00	29.72	60.53	70.46	5.75	14.59	15.06	1.80	22.44	0.67	1.03	0.09	0.07	23.27	23.45	21.99	2.00
Bank of Maharashtra	12.12	1.22	64.72	81.40	0.90	1.62	28.01	88.21	77.34	3.63	13.35	6.66	1.94	25.88	0.49	0.60	0.07	0.05	22.37	0.23	21.54	3.00
Syndicate Bank	12.05	1.54	68.57	87.86	0.97	1.35	22.27	55.49	93.56	6.99	13.69	15.51	1.71	22.28	0.80	1.08	0.08	0.07	19.21	0.19	21.26	4.00
State Bank of Hyderabad	12.44	0.86	67.40	91.92	1.76	2.54	25.03	77.34	81.79	7.39	13.20	14.92	1.98	-10.12	0.93	0.76	0.07	0.06	23.78	0.22	20.71	5.00
State Bank of Bikaner & Jaipur	12.08	1.23	68.69	92.59	1.83	2.56	20.80	65.25	84.72	5.76	9.37	14.82	2.05	10.30	0.91	1.40	0.10	0.07	19.33	0.26	20.71	6.00
Andhra Bank	11.60	1.46	65.87	88.53	1.94	2.71	27.02	105.57	77.49	5.37	12.32	10.11	2.09	-27.47	0.76	1.31	0.07	0.06	23.18	0.25	20.51	7.00
Indian Bank	13.00	0.47	65.28	82.80	1.39	2.28	25.78	74.70	77.24	7.55	13.66	13.34	2.09	3.17	1.04	1.52	0.07	0.06	22.73	0.23	20.42	8.00
Corporation Bank	12.31	1.47	61.42	79.21	1.22	1.96	29.85	92.25	72.00	6.47	19.50	11.16	1.74	-13.85	0.97	2.72	0.08	0.07	23.55	0.25	20.22	9.00
State Bank of India	13.08	1.50	65.96	106.58	1.61	2.35	27.38	38.63	82.38	5.42	10.12	12.25	1.87	6.35	0.74	1.14	0.12	0.08	25.23	0.28	20.15	10.00
State Bank of Travancore	11.59	1.71	65.62	84.08	1.59	2.45	26.81	78.92	78.49	3.70	11.75	8.99	1.42	-5.05	0.59	2.06	0.07	0.06	22.81	0.23	19.89	11.00
Punjab National Bank	12.27	1.42	63.13	80.25	1.68	2.56	26.91	59.24	78.24	7.27	12.15	12.35	2.34	6.64	0.79	1.40	0.08	0.08	23.03	0.26	19.60	12.00
Punjab & Sindh Bank	12.10	0.48	61.50	80.41	1.87	2.83	29.17	92.51	70.31	4.03	14.71	5.75	1.07	-12.77	0.45	1.41	0.07	0.06	23.42	0.27	19.48	13.00
IDBI Bank	11.83	2.81	60.65	70.35	1.19	2.17	32.47	51.70	85.17	9.62	25.51	7.23	1.99	-5.25	0.62	0.56	0.06	0.05	21.66	0.28	19.03	14.00
Bank of Baroda	13.17	0.98	61.57	83.26	2.37	1.37	57.21	32.13	70.51	0.13	17.89	15.13	1.93	2.93	0.04	2.56	0.21	0.57	16.46	0.17	19.03	15.00
Oriental Bank of Commerce	11.66	24.20	49.84	75.77	1.38	2.62	22.38	28.24	72.31	7.12	13.91	12.13	2.29	0.69	1.00	1.11	0.07	0.06	24.17	27.14	18.90	16.00
State Bank of Patiala	10.99	2.11	66.51	94.37	1.85	2.63	22.11	53.52	85.12	3.82	11.21	11.35	1.53	-19.80	0.56	1.51	0.08	0.07	21.27	0.22	18.55	17.00
Allahabad Bank	11.41	1.01	63.71	78.00	2.49	3.76	28.91	48.00	71.67	5.30	13.36	12.60	1.86	0.93	0.69	1.47	0.08	0.07	22.95	0.24	18.43	18.00
Bank of India	10.81	1.64	64.96	81.00	1.29	2.18	20.74	47.98	78.12	0.06	17.86	13.70	1.65	0.03	0.58	2.71	0.14	0.11	22.38	0.21	18.41	19.00
State Bank of Mysore	11.56	1.22	66.83	84.65	1.97	2.94	26.07	47.52	80.96	3.00	10.34	7.72	1.84	-3.81	0.49	0.95	0.06	0.06	21.55	0.23	18.31	20.00
Vijaya Bank	11.30	4.02	60.78	81.15	1.09	1.59	31.13	26.94	67.58	0.04	15.77	10.42	1.12	-0.52	0.48	1.60	0.74	0.57	25.43	24.72	18.30	21.00
Union Bank	11.84	1.51	65.96	76.68	1.42	2.18	26.81	34.15	83.72	5.74	13.10	11.83	2.10	6.27	0.68	0.84	0.07	0.05	19.82	0.23	18.25	22.00
UCD Bank	13.30	1.66	63.67	83.25	1.64	2.82	27.86	23.73	76.31	5.77	14.22	12.08	2.19	0.19	0.66	0.83	0.08	0.07	23.06	0.26	17.68	23.00
Central Bank of India	11.74	1.41	62.26	82.01	2.23	3.49	28.78	109.48	75.05	0.80	10.42	-1.84	1.24	-76.69	0.14	1.02	0.06	0.05	23.50	0.24	16.77	24.00
United Bank	11.56	1.05	58.11	78.14	3.06	5.60	33.14	51.05	65.22	2.77	10.56	2.94	1.78	-19.08	-0.43	1.25	0.12	0.10	26.44	0.30	16.68	25.00
Canara Bank	11.56	0.91	63.49	85.45	1.26	1.98	28.37	26.38	71.10	6.67	14.38	10.91	1.61	-18.23	0.71	2.43	0.11	0.08	24.04	0.27	16.67	26.00

1. Capital Adequacy Ratio (%); 2. Debt Equity; 3. Advance Total asset (%); 4. Govt. securities/ Total investment (%); 5. Net NPAs/ Total Asset (%); 6. Net NPAs/Net Advance (%); 7. Total Investment / Total Assets (%); 8. % Change in NPAs; 9. Total Advances / Total Deposits (%); 10. Profit per employee; 11. Business per employee (INCR); 12. Return on NET WORTH; 13. Operating profit / Average working funds (%); 14. % Growth in Net Profit; 15. Net Profit / Average Assets; 16. Liquid Assets (LA) Demand Deposits; 17. LA / Total Deposits; 18. LA / Total Assets; 19. Govt. Securities / Total Assets (%); 20. Approved Securities / Total Assets (%); 21. Average; 22. Rank

more competitive. Dilution of ownership from government to the public hands had forced the PSBs to maximise shareholders' wealth. Liability for disclosing operational efficiencies became inevitable for the PSBs in their annual reports. This has forced them to disclose NPA as a balance sheet item and take the necessary steps to manage them to increase competitiveness. The strategic move towards NPA management has forced the banks to:

- Disclose all material information through their annual reports
- Disbursement of loans based on
- CIBIL (Credit Bureau)⁷ score for individuals
- Report on credit rating agencies for corporate houses
- Enable cybersecurity and information technology risk management
- Regulate interest rate risk
- Manage credit risk

The implementation of strategies, however, varies from bank to bank. The survey has been conducted with 9 out of 26 PSBs (35% of the total population) in the way mentioned in the previous chapter to formulate alternative strategies for NPA management. The result has been analysed with the help of descriptive statistics because the selected sample size was small. The questionnaire has been designed in terms of the Likert 5-point scale targeted only towards the AGM or DGM or GM of either the risk management or recovery department of the banks. The qualitative aspect has

mostly been the outcome of the response. The summary of the findings are as follows:

1. The Indian banking system had not followed a proper risk management policy till the 1991 wave of LPG, and that is has been a reason for the increase in the growth of NPA.
2. The banks have been practicing disbursing loans as per over the mandate quotas and directive lending. This has been a factor for the increase in NPA among the banks.
3. The ARCs and DRTs have been struggling to recover the bad loans owing to poor asset qualities. This has been an important factor leading to the non-recovery of the stressed assets.
4. The RBI took the initiative to implement the internationally accepted Basel regulations from time to time. However, owing to a high level of NPA, it became difficult for the PSBs to implement stringent regulations of Basel Accord.
5. The increase in NPA has been backed by wilful defaults made by the corporate houses. The amount involved in the lending is high in the case of corporate lending, and a default made by them leads to huge growth in NPAs.
6. The government has initiated loan weaver schemes for the farmers on several occasions, leading to an increase in NPA.
7. Lack of employee strength to recover the loans has been a challenge for the PSBs branches (mainly operating in the rural and semi-urban areas). This has led to an increase in NPA in those branches.

⁶The average rate of Gross NPA for Indian Banks for the last 5 years has been 2% as per RBI reports.

⁷Trans Union CIBIL Limited (Formerly: Credit Information Bureau (India) Limited) is India's first Credit Information Company (CIC) founded in August 2000. It collects and maintains records of an individual's payments about loans and credit cards. These records are submitted to TransUnion CIBIL by member banks and credit institutions every month. This information is then used to create Credit Information Reports (CIR) and credit scores, which are provided to credit institutions to help evaluate and approve loan applications. CIBIL plays a major role in India's financial system by helping banking institutions better manage their business and be helping customers secure credit on fair terms. CIBIL is also referred to as the Credit Bureau. It is licensed by the RBI.

8. With the increase in management efficiency, NPA decreases, and Lower the NPA; higher will be the earning quality.
9. CAR and Asset Quality are negatively correlated, and Liquidity and asset quality are not related.
10. Valuation of the mortgaged assets has been a problem with the banks, and in most cases, the value of the asset reduces by the time the matter is settled in the court.
11. It is the default in corporate lending that has been responsible mainly for the increase in NPA.
12. Many of the government projects for which loans are issued are stopped midway, leading to non-repayment of the loan.
13. Branch-wise, NPA has increased to a considerable level due to the unscrupulous practice among the managers to infuse money into the accounts turning to be NPA and defuse such money through a reversal entry on the next day or join hands with the borrowers and instruct them to pay a minimum amount just before the completion of 90 days (period of non-repayment of loan which would turn an account to NPA). The conversion of a loan account to NPA is a system generated process. The system will recognise the above transaction as a payment made against the outstanding loan, and this would restrict the account from not turning to NPA for the next 90 days, and the borrower would avail of an extended repayment period.
14. New banking license and permission to grant license to payment banks by RBI are gradually affecting the small borrowers since they are switching over their preferences to the above banks. The worth mentioning, in this case, has been Bandhan Bank, a pioneer in micro-finance lending. The chance of these accounts turning to NPA is low, and since the amount is also less, the

accumulation of bad loans is negligible compared to corporate defaults.

15. Imbalance in the deposit and lending period is identified as one of the reasons for growing NPA. Deposits collected are of the shorter period compared to lending, which even ranges to a maximum of 30 years.

Based on the findings, the following recommendations have been made:

1. The loans whose repayment falls due for more than 60 days to be tracked and proceedings should be made for such payments before it turns to NPA.
2. Proper valuation to be done for the mortgaged assets as in case of default, the bank could recover an amount equivalent to the outstanding amount of loan.
3. Corporate clients need to be financed through syndicate loans, which would act as a tool to diversify credit risk among the consortium.
4. Banks should come up with the agency systems as it is a useful device to track whether the loans are being properly utilised. This acts as an effective device, especially for the small and medium scale finances.
5. The SARFAESI Act needs to be framed in such a way, which would give early decisions to recover the bad loans. Further, such an act should not be countervailed by any other acts.
6. Management efficiencies in the PSBs need to be increased as it would lead to a reduction in NPA.
7. Basel II and Basel III (upcoming) have been concentrating more on improvement in the CAR. However, according to the CAMELS parameter, the banks should improve upon the management efficiency and the earning quality to improve the asset quality.

8. Government mandate quotas for granting loans should strictly be stopped as it would give the banks freedom to disburse loans according to the viability of the projects, and this, on the other hand, would help in generating and maximising shareholders' wealth.
9. Information technology, which has been used by the banks as a tool for decreasing risk through unbiased internal control and internal check system decreases operational risk. Enhanced technology and even implementation of artificial intelligence at the branch level would act as a device to restrict unethical practices at the branch level.
10. Syndication of corporate lending (which many of the banks have already started) would help in diversification of risk hence minimising it.
11. PSB balance sheets are prepared according to the Banking Regulation Act, 1949. The valuation of collaterals is not disclosed in the statement or does not form a mandatory disclosure requirement in the annual reports. An added clause to the act would mandatorily allow the banks to disclose the mortgage valuation in the annual reports. This would help in the assessment of loan amounts due to the valuation of mortgaged assets.
12. Sensitivity to market risk, the 'S' in CAMELS⁸ is a complex and evolving measurement area addressing interest rate risk, the sensitivity of all loans and deposits to relatively abrupt and unexpected shifts in interest rates. In India, the interest rate is regulated but RBI, but it is not managed. The interest rate risk arises owing to the reasons like floating interest rates regulated by RBI

and the difference in deposit and lending period, mentioned in the above point.

13. Strategic alliances in the form of mergers would enable the banks to frame best policies leading to the recovery and management of NPA.

LIMITATIONS

- Only the PSBs have been considered, private sector, and the foreign banks have been excluded from the sample due to the non-availability of the required data and restriction in the entry at their risk management and debt recovery departments.
- The audited annual figures of the banks have been considered for performance analysis, which might not always reflect the prevailing reality.
- The opinions of the managers from the recovery and in the risk management department of the banks are perceptual, and hence, not free from bias.

SCOPE FOR FURTHER STUDY

The banking sector in India is undergoing a major transformation. It unfolds different areas in which the above study can be extended.

- The private sector banks and the foreign banks operating in India may be included in the study. Foreign banks follow the best practices of risk management globally. However, such institutions like HSBC, Standard Chartered, Royal Bank of Scotland have reduced Indian operations and are winding up their businesses from eastern India due to high NPAs. This aspect would further help in formulating the best NPA management practices for the banks operating in India.

⁸It was added in 1995 by the Office of the Comptroller of the Currency (OCC) and the Federal Deposit Insurance Corporation (FDIC) primarily to address interest rate risk, the sensitivity of all loans and deposits to relatively abrupt and unexpected shifts in interest rates. In 1995 they were also interested in banks' lending to farmers and the sensitivity of farmers' ability to make loan repayments as specific crop prices fluctuate. Unlike classic ratio analysis, which most of the CAMELS system was based on, which relies on relatively certain, historical, audited financial statements, this forward look approach involved examining various possible future price and rate scenarios and then modelling their effects.

- The proposed bank merger, as announced by RBI, might come up with certain policies relating to recovery of NPA as all the banks are suffering from high NPA, and consolidation among them would lead to a consolidated NPA figure in the bank Balance Sheet. Indian Banking system is heading towards Basel III implementation. The consolidation has been in the cards of the PSBs for long. It would improve the asset base; the banks will also grow in size. Therefore, managing credit risk will turn out to be an important factor for the banks in the future.
- The performance analysis has been considered until 2016. The study can further be extended considering the recent years.

led to an increase in NPA in the banks. There have been several initiatives from RBI to implement international best practices to reduce NPA. But the above study proves that the banks have been following their practices and strategies in reducing and managing NPAs. In many cases, the policies and practices imposed by RBI in recovering bad loans have proved to be a failure. The above study has formulated some of the strategies which, in general, would help in the reduction and management of NPAs. It is concluded that NPA are bank-specific problems and should be addressed by formulating individual policies of the banks. Imposition and restrictions from the regulatory bodies would restrict the banking operations, rather than reducing NPAs. To expand, disbursement of the loan is an important parameter as it would lead to an increase in the overall business. The above strategies would help the banks to manage the risk out of such lending and reduce the growth of NPAs in the future.

CONCLUSION

The series of reforms in the Indian Banking Sector has led to overall development and growth, but it also

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How to cite this article: Ray, S. (2020) 'A Study of Non-performing Asset Management as a Strategic Approach to Ensure Sustainability among the Public Sector Banks in India', IIMS Journal of Management Science, Vol. 11, No. 1, pp. 16-34.