Ranking the Higher Influencing Factors that Cause NPAs in Public Sector Banks in Karnataka – using Factor Analysis

Nemani Varalakshmi, M. M. Shanmugapriya

Abstract ***The financial health of the banks regarding the performance and profitability speaks volumes of the economic growth of our Country. The banking system is considered as the backbone of overall growth of the country. The Indian banking industry has seen significant changes since the process of liberalization, but the presence of Non-Performing Assets has affected the overall performance and profitability of the banks. NPAs have become a huge concern and burden on the Nation's Economic growth. The banking sector needs to take measures to control the menace of NPAs. The reduction of NPAs assumes the highest importance. This paper explores and explains the ranking of the influencing factors that lead to the accumulation of Non-Performing Assets in Public sector Banks. The study shows the three significant areas, namely borrowers, banks and causes, and emphasizes the influencing factors of NPAs in Public sector banks using statistical tests like correlation analysis and factor analysis. The major influencing factors from the statistical study may be useful to reduce the NPAs which will improve the overall productivity and profitability of the banks.***

Keywords: Non-Performing Assets, Profitability, Public sector banks, Factor analysis, Economic Development.

I. INTRODUCTION

The social and economic development of India faces several roadblocks, the largest of which are the Non-performing Assets (NPAs) of Indian banks. Even today, the value of NPAs in the banking industry is much beyond the acceptable margin. This is detrimental to a bank's financial position and a difficult burden to bear. In order to decrease NPA levels, a more concentrated effort towards smarter risk management systems, stronger internal control and early warning signals by banks must be initiated to detect problems and deal with them effectively. A faster and cost-effective legal redressal system also needs to be given importance (Akkoc and Vatansever*et al*., 2013). Improper screening and verifying of applications, unsupervised distribution of credit and flaws in the recovery process have led to the degradation of a bank's asset quality. The development of the country has a direct relation with the performance of banks. So, it is necessary to ensure the efficient performance of the banking sector so that they contribute to a sustainable development in order to fulfill the allocation of assets and resources (Kumar *et al*., 2016). Flamini*et al*. (2009) have mentioned that the performance evaluation of firms is important to offer data about the operating performance of the firm and its net worth. Financial statement through analysis is helpful for decision making involving creditors, managers, Essential investors, regulatory agencies and stockholders. For the purpose of enhancing investments and mobilizing resources,the financial sector plays an indispensable part in the economic growth of a nation. These involve individual characteristics of banks which could be influenced by internal management decisions and a wide range of external factors (Nemanivaralakshmi and Shanmugapriya,2017). The significance of evaluating the performance of the banking sector hasbeen highlighted in the recent past as they are found to be a vital factor that is amalgamated with the economic, social, and political ameliorations (Rahman, 2016).Gilbert and Wheelock (2007) has mentioned the role of bank regulators and analysts in stabilizing NPAs. According to Adam (2014) although relevant and essential data about the financial performance of bank can be offered by financial ratios and accounting, estimating the link among several factors that are associated with theperformance of banks such as revenue, assets, market value, profit, investments, number of employees and satisfaction of customers can support in developing the productivity of banks. Financial performance could be estimated using some major measures which are essential to estimate the present financial performance and position. These are analytical and descriptive measures of financial performance and position. The descriptive measures involve total liabilities, total assets, total expenditure, total revenue, net income and stockholders'equity, the analytical measures of financial performance and position could involve efficiency, profitability, solvency and liquidity measures. So, it is essential to develop an effective analysis to improve the overall performance of the banking sector by reducing NPAs especially in Public sector banks (NemaniVaralakshmi and Shanmugapriya, 2017).

II. LITERATURE REVIEW

The assessment of the financial performance of the bank helps in numerous practices such as detection of bankruptcy, evaluation of the credit scores of banks, investment decisionsand planning for improving the overall performance criteria of the banking sector. In the recent past, several approaches were mentioned for evaluating the performance and they were further classified into two distinct categories such as statistics and computational intelligence(Mardaniet al., 2015).

Pursuant to the acceptance of M. Narasimham Committee reports, the Banks were under obligation to implement all those recommendations which were presented to them under directing guideline from RBI.

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The Banks had accumulated on their back very huge NPAs without any clarity on direction to manage them. In such a backdrop, the Narasimham Committee report was a challenging task for the management of PSBs in India(Narasimham, 1995).

K.M. Shajahan in his article, "Non-Performing Assets of Banks Have They Really Declined? And on Whose Account?" has very intelligently considered critical scrutiny of both system procedure and figures. As a matter of fact, RBI, when it came up with its report card showing a drastic reduction with an NPA figure of about 50%, it was obvious that the author's suggestions wouldcomprehensively analyze the number crunching to determine as to how as large as 50% reduction was achieved in a single year. Thus, the reduction achieved represented a very low portion of actual recovery from borrowers,but a major portion was corresponding to liquidation of Government guarantee like DICGC/ ECGC, over and above the increased provision available from the Banks' profit and loss account.

BanambarSahoo in his article titled "Rating of Banks on NPA Management" has considered all critical parameters and relevant ratios to evaluate banks with respect to non-performing assets. Based on the findings of the ratios, as also its implications on the health of the organization, the author has come up with the suggestion to allocate marks variable from parameter to parameter, and aggregate sum up of marks will place their organization on a scale ranging between A+ (excellent) and grade (Very poor). This is indeed a very nice and quality judgmental formula in placeto focuson and ratesuch organizations. Such an exercise would not only prove to be an effective tool for the management of NPA but also improve liquidity, profitability, cleanness in the balance sheet and ultimately place the organization in the pink of health. Unfortunately, this proposition may have remained either unexpected or unimplemented and there is no literature unfolding NPA rated Banks or NPA rated branches.

2. Fuzzy AHP Approach

From the exhaustive literature review it is found that several mathematical models can be utilized to prioritize the influencing factors for Non-Performing assets in determining the weights such as AHP, SWARA, Expert method, Eigenvalue method, Entropy method, etc. As one of the most widely utilized MCDM techniques, Fuzzy AHP Approach is found to overcome the limitations and solve complex MCDM problems involving qualitative decisions. The AHP analyzes diverse hierarchical relations between different decision levels of the banking sectors without considering interrelations among factors or alternatives. Generally, the decision makers are considered to classify the decision process into sub-parts such as objectives, factors, and alternatives. Therefore, this study will integrate the FST and AHP, which is commonly known as FAHP model, in order to deal with the ambiguity of the decision makers.

In this process the FAHP analysis will convert the linguistic judgments obtained from the questionnaires into Triangular Fuzzy Numbers (TFNs). Triangular fuzzy number (TFN) are generally defined as a class of fuzzy numbers considering the real numbers, and expressed as (p, q, r). The triangular fuzzy numbers are represented as follows:

$$\mu_A = \begin{cases} \dfrac{x-y}{z-y}, y \le x \le z \\ \dfrac{q-x}{q-y}, z \le x \le y \\ 0, otherwise \end{cases}$$

These matrices will be then considered to determine the significance of the weights concerning alternatives' ranking. The questionnaires developed will comprise the expert ranking of the criteria, and will be utilized for comparison as per the requirement of the research pattern. The importance of the criteria is determined from the expert opinion, and they are collected with the help of the questionnaire, and the results obtained are processed analytically to generate the weights. In the decision-making conditions, the dimensions of optimism, pessimism and the values are mapped in the triangular fuzzy numbers, and these fuzzy comparison matrices are defined as:

$$\tilde{B} = \begin{bmatrix} 1 & \tilde{b}_{12} & .. & \tilde{b}_{1n} \\ \tilde{b}_{21} & 1 & .. & \tilde{b}_{2n} \\ \tilde{b}_{31} & \tilde{b}_{32} & 1 & \tilde{b}_{2n} \\ .. & ... & \tilde{b}_{nn-1} & 1 \end{bmatrix}$$

Where, b_{ij}^{a} , b_{ij}^{b} , b_{ij}^{c} are the parameters representingthe dimensions of optimism, and the process of calculation of fuzzy weights are simplified by using the crisp matrix to simplify the process of calculation of the fuzzy weights following crisp matrix $\tilde{B}$ thus:

$$\tilde{b}_{ij} = \left(b_{ij}^{a} \quad b_{ij}^{b} \quad b_{ij}^{c}\right)$$

III. METHODOLOGY

The data wererecollected through the quantitative research methodology which collects the primary data as per the study. The data were collected by running a structured questionnaire from banking officials and authorities. The researcher considered several sources such as journals, books, online websites and the articles related to financial aspects of banking for the collection of secondary data. The sample was collected from the bank employees with their gender, educational qualification, designation, annual income, years of experience etc. This research involved 50 respondents comprising authorities who are aware of the NPAs in banking sector.In this article, the number of respondents had been selected and questionnaire prepared on the basis of a number of factors influencing the creation of NPAs namely diversion of funds, gestation period, unwanted expenses, incomplete appraisal/weak credit appraisal, delay in loan sanction, unforeseen circumstances etc. The quantitative data gathered were analyzed using the SPSS software.

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IV. ANALYSIS

In this section the quantitative questionnaire collected from 50 people in bank have been tabulated and analyzed to identify the factors which are the primary sources of NPAs in banks. It is noted that the results obtained from both the correlation analysis and factor analysis are in sync with each other.

4.1. Descriptive Analysis

4.1.1. Age

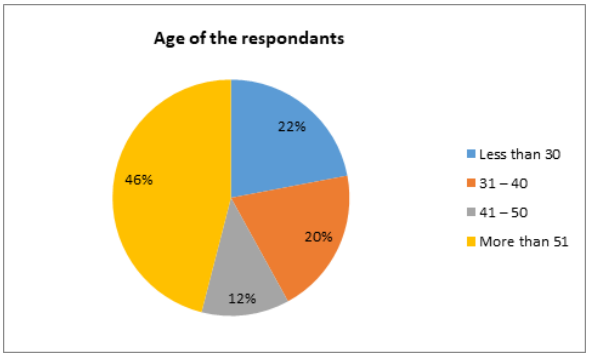

Fig 4.1.1 - represent the pie chart for age.

From the Fig.4.1.1 we conclude that out of 50 respondents, 22.0% are of less than 30 years, 20.0 % are 31 – 40 years, 12.0% are 41 – 50 years and 46.0 % are of more than 51 years. Out of total 50, 78% are males and 22% are females.

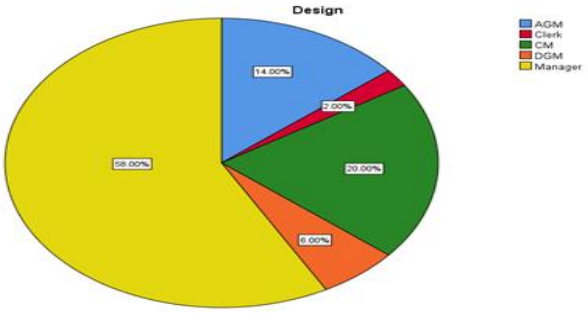

Fig 4.1.2- represent the pie chart for designation.

4.1.2. Total years of experience and designation

From the below table 4.1.2 and chart 4.1.2 we conclude that 60% are managers, 20% are chief managers,14% are Assistant General Managers and the remaining are Deputy General Managers(6%) and Clerks(2%). 36% of the employees have more than 30 years of experience in banking sector, 20% between 21 to 30 years of experience, and 10% between 11 to 20 years of experience. The remaining 34% have less than 10 years of experience.

Table4.1.2 - represent the designation and experience

Experience	Designation					Total
	AGM	Clerk	CM	DGM	Manager	
Less than 5 years	0	0	0	1	5	6
6-10	0	0	0	0	11	11
11-20	0	0	3	0	2	5
21-30	1	0	4	1	4	10
More than 30	6	1	3	1	7	18
Total	7	1	10	3	29	50

V. CORRELATION ANALYSIS

5.1 Correlation between NPAs attributed to Borrowers of criteria A and B

As seen in table5.1, the comparison for the criteria A variables and criteria B variables which are attributed to borrowers using correlation analysis technique is furnished below:

Interpretation: From the below table in the comparison of NPA attributed to borrowers of criteria A and B, a few variables are positively correlated, in which unwanted expenses and wastage of resources (0.648) are highly correlated compared to other variables, and the diversion of funds is correlated to other two variable like improper maintenance of records/books and lack of expertise, which are also similar to factor analysis.

Table 5.1: Correlation values between NPA attributed to Borrowers of criteria A and B.

Sl. No	Criteria A Variable	Criteria B Variable	Correlation value
1	Unwanted expenses	Wastage of resources	0.648
2	Diversion of funds	Improper maintenance of records/unaudited books	0.563
3	Diversion of funds	Wastage of resources	0.555
4	Unwanted expenses	Over trading	0.535
5	Longer gestation period	Lack of proper planning	0.495
6	Diversion of funds	Lack of expertise	0.461

5.2 Correlation between NPA attributed to Banks of criteria A and B

As seen in table5.2, the comparison for the criteria A variables and criteria B variables which are attributed to banks using correlation analysis technique are given below:

Interpretation: From the below table in the comparison of NPA attributed to banks of criteria A and B,

a few variables are positively correlated in which lack of motivation of employees and lack of trained staff(0.769) is highly correlated and variables like incomplete appraisal and poor credit appraisal(0.511) are with low correlation. Moderate correlation is observed between two factors such as no proper follow up on irregular payments and lack of trained staff (0.629).

Table 5.2: Correlation values between NPA attributed to Banks of criteria A and B.

Sl. No	CriteriaA Variable	CriteriaB Variable	Correlation value
1	Lack of motivation of employees	Lack of trained staff	0.769
2	Wrong selection of borrowers	Poor credit appraisal	0.768
3	No proper follow up on irregular	Lack of commitment to recovery	0.732
4	Lack of technical ability to identify irregularities	Lack of personal zeal and technical knowledge	0.635
5	No proper follow up on irregular payments	Lack of trained staff	0.629
6	Incomplete appraisal	Non-inspection of units and improper documentation	0.615
7	Too much flexibility even during adverse conditions	Too flexible attitude	0.613
8	Wrong selection of borrowers	Lack of trained staff	0.611
9	Weak Credit appraisal	Poor credit appraisal	0.599
10	Lack of technical ability to identify irregularities	Lack of trained staff	0.545
11	Incomplete appraisal	Poor credit appraisal	0.511

5.3 Correlation between NPA attributed to other causes of criteria A and B

As seen in table5.3, the comparison for the criteria A variables and criteria B variables which are attributed to other causes using correlation analysis technique is shown below:

Interpretation: From the below table in the comparison of NPA attributed to other causes of criteria A and B, are positively correlated in which sluggish legal system and lack of legal reforms(0.745) is highly correlated, whereas lack of infrastructure and fast changing technology (0.655) are having moderate correlation. Fluctuating interest rates and inflexible banking terms and conditions are having low correlation (0.534).

Table 5.3: Correlation values between NPA attributed to other causes of criteria A and B

SI. No	Criteria A Variable	Criteria B Variable	Correlation value
1	Sluggish legal system	Lack of Legal reforms	0.745
2	Fluctuating interest rates	Inflexible repayment capacity	0.725
3	Lack of commitment of Government	Complex government policies	0.678
4	Lack of infrastructure	Fast changing technology	0.655
5	Changes in consumer preferences for loans and repayment conditions	Inflexible banking terms and conditions	0.643
6	Changes in consumer preferences for loans and repayment conditions	Inflexible repayment capacity	0.569
7	Civil commotion	Complex government policies	0.567
8	Fluctuating interest rates	Inflexible banking terms and conditions	0.534

5.4 Correlation between NPA of borrowers and anks of Criteria A

Table5.4 provides the correlation values between NPA of borrowers and Banks of Criteria A

Interpretation: From the below table in the comparison of NPA attributed to borrowers and banks of criteria A, the diversion of funds/too ambitious project and wrong selection of borrowers are positively correlated respectively.

Table 5.4: Correlation values between NPA of borrowers and Banks of Criteria A

SI. No	Criteria A Variable Borrowers	Criteria A Variable Banks	Correlation value
1	Diversion of funds	Wrong selection of borrowers	0.455
2	Too ambitious project	Wrong selection of borrowers	0.434

5.5 Correlation between NPA of borrowers and Banks of Criteria B

5.7 Correlation among highly influenced variables – General

In table 5.7, the combined correlation results from above tables from table 5.1 to table 5.6 which are classified from three major components namely borrowers, banks and other causes are shown-

Interpretation: From the below consolidated report, all the variables in table 5.7 play a vital role as a major indicating factor influencing NPAs. As per the classification based on correlated values, the lack of trained staff and proper follow up on irregular

It is given in table5.5, the calculated correlated values between NPA of borrowers and banks of criteria B

Interpretation: From the below table in the comparison of NPA attributed to borrowers and banks of criteria B, the lack of proper planning and too flexile attitude are positively correlated.

Table 5.5: Correlation values between NPA of borrowers and Banks of Criteria B

SI. No	Criteria_AVariable_Borrowers	Criteria_A Variable Banks	Correlation value
1	Lack of proper planning	Too	0.469

5.6. Correlation between NPA of borrowers and other causes of Criteria A

Table5.6gives the calculated correlated values between NPA of borrowers and other causes of criteria A.

Interpretation: From the below table the calculated positive correlated values show between weak credit appraisal and changes in consumer preferences for loans and repayment conditions, and also positive correlation is found between too much flexibility even during adverse conditions and lack of Infrastructure.

SI. No	Criteria AVariable Borrowers	Criteria A Variable Banks	Correlation value
1	Weak Credit Appraisal	Changes in consumer preferences for loans and repayment conditions	0.578

Table 5.7: Correlated values among highly influenced variables

Sl. No	Highly influenced variables attributed to borrowers, banks and other causes		Correlation value
1	Lack of trained staff	No proper follow up on irregular payments	0.629
2	Poor credit appraisal	Lack of trained staff	0.613
3	No proper follow up on irregular payments	Poor credit appraisal	0.482
4	Poor credit appraisal	No proper follow up on irregular payments	0.482
5	Diversion of funds	Lack of expertise	0.461

payments is moderately correlated with the value of 0.629, and diversion of funds and lack of expertise are low-correlated with the value of 0.461.

VI. FACTOR ANALYSIS

6.1 Criteria A. With respect to "NPAs attributed to Borrowers"

To understand if the responses from the sample are suitable for analysis, a measure of sampling adequacy by Kaiser-Meyer-Olkin (KMO)is used, which stands at 0.645 i.e. highly acceptable in order to continue with factor analysis.

Another indicator of how strong a relationship between two or more variables is will be the results acquired from the Bartlett's test of Sphericity. The Bartlett's result is of great significance at 0.000, thus the correlation matrix cannot be an identity matrix.The rotation method is used, wherein a concept is applied to decrease the number of factors which may have heavy loading on the variables being investigated. The concept of rotation will not change results, but merely make data analysis and interpretation less complicated. Based on the table given below, it is observed that DM_CRTA_7, DM_CRTA_5 and DM_CRTA_8 are in Component

1 and DM_CRTA_3, DM_CRTA_1, DM_CRTA_6, DM_CRTA_2 are in Component 2 and DM_CRTA_4 is in component 3.

The Principle Component Analysis applies an extraction method and a rotation method in varimax with Kaiser Normalization is employed.

Table 6.1a

KMO and Bartlett's Test		
KMO Measure of Sampling Adequacy.		.645
Bartlett's Test of Sphericity	Approximately Chi-Square	73.963
	Df	28
	Sig.	.000

Table 6.1b

Rotated Component Matrix

	Component		
	1	2	3
DM_CRTA_7	.901		
DM_CRTA_5	.712		.391
DM_CRTA_8	.699	.312	-.322
DM_CRTA_3		.716	
DM_CRTA_1		.657	.393
DM_CRTA_6	.343	.588	-.459
DM_CRTA_2	.384	.421	
DM_CRTA_4			.863

Note: *DM_CRTA_1- Failure to bring in required capital; DM_CRTA_2 – Too ambitious project; DM_CRTA_3 – Longer gestation period*
DM_CRTA_4 – Dependence on single customer;DM_CRTA_5 – Diversion of Funds;DM_CRTA_6 – Poor credit collection
DM_CRTA_7 – Diversion of funds;DM_CRTA_8 – Unwanted expenses

6.2 Criteria B with respect to "NPAs attributed to Borrowers"

To understand if the responses from the sample are suitable for analysis, a measure of sampling adequacy by Kaiser-Meyer-Olkin (KMO) is used, which stands at 0. i.e. highly acceptable to continue with factor analysis. An indicator of how strong a relationship between two or more variables is will be the results acquired from the Bartlett's test of Sphericity. The Bartlett's result is 0.000 which denotes the result to be significant; so, the correlation matrix cannot be an identity matrix. The rotation method is used, wherein a concept is applied to decrease the number of factors which may have heavy loading on the variables being investigated. The concept of rotation will not change results, but merely make data analysis and interpretation less complicated. Based on the table given below, it is observed that DM_CRTA_5, DM_CRTA_4 and DM_CRTA_6, DM_CRTA_1 are in Component 1 and DM_CRTA_7, DM_CRTA_8 are in Component 2 and DM_CRTA_3, DM_CRTA_2 is in component 3. The rotation is converted into 4 iterations.

Table 6.2a

KMO and Bartlett's Test

KMO Measure of Sampling Adequacy.		0.671
Bartlett's Test of Sphericity	Approximately Chi-Square	79.895
	Df	28
	Sig.	0

Table 6.2b

Rotated Component Matrix

	Component		
	1	2	3
DM_CRTB_5	.764		
DM_CRTB_4	.718		
M_CRTB_6	.669		
DM_CRTB_1	.584		
DM_CRTB_7		.917	
DM_CRTB_8		.835	
DM_CRTB_3			.846
DM_CRTB_2			.834

Note:
DM_CRTB_1- Non-maintenance of margin requirement; DM_CRTB_2 – Lack of expertise; DM_CRTB_3 – Lack of proper planning;DM_CRTB_4 – Lack of expansion of services/products; DM_CRTB_5 – Improper maintenance of records/unaudited books
DM_CRTB_6 – Improper working capital management;DM_CRTB_7 – Overtrading;DM_CRTB_8 – Wastage of resources

6.3. Criteria A. With respect to "NPAs attributed to Banks"

To understand if the responses from the sample are suitable for analysis, a measure of sampling adequacy by Kaiser-Meyer-Olkin (KMO)is used, which stands at 0.776 i.e. highly acceptable to continue with factor analysis

Table 6.3a

KMO and Bartlett's Test		
KMO Measure of Sampling Adequacy.		.776
Bartlett's Test of Sphericity	Approximately. Chi-Square	121.184
	df	28
	Sig.	.000

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Table 6.3b

Rotated Component Matrix[a]

	Component		
	1	2	3
EFF_CRTA_7	.856		
EFF_CRTA_5	.768		
EFF_CRTA_2	.732		.391
EFF_CRTA_1	.645	.464	

Note:

EFF_CRTA_1 – Wrong selection of borrowers;EFF_CRTA_2 – Incomplete appraisal;EFF_CRTA_3 – Too much flexibility even during adverse conditions;EFF_CRTA_4 – Weak credit appraisal;EFF_CRTA_5 – Lack of motivation of employees;EFF_CRTA_6 – Delay in sanction;EFF_CRTA_7 – No proper follow up on irregular payments;EFF_CRTA_8 – Lack of technical ability to identify irregularities

The rotation method is used, wherein a concept is applied to decrease the number of factors which may have heavy loading on the variables being investigated. The concept of rotation will not change results, but merely make data analysis and interpretation less complicated. Based on the table given below, it is observed that DM_CRTA_7, DM_CRTA_5, DM_CRTA_2, DM_CRTA_1 are in Component 1 and DM_CRTA_6, DM_CRTA_8 and DM_CRTA_4 are in Component 2 and DM_CRTA_3 is in component 3.

An indicator of how strong a relationship between two or more variables is will be the results acquired from the Bartlett's test of Sphericity. The Bartlett's result is 0.000 which denotes the result to be significant, thus the correlation matrix cannot be an identity matrix.

6.4 Criteria B. With respect to "NPAs attributed to Banks"

To understand if the responses from the sample are suitable for analysis, a measure of sampling adequacy by Kaiser-Meyer-Olkin (KMO)is used, which stands at 0.731 i.e. highly acceptable to continue with factor analysis

An indicator of how strong a relationship between two or more variables is will be the results acquired from the Bartlett's test of Sphericity. The Bartlett's result is 0.000 which denotes the result to be significant, thus the correlation matrix cannot be an identity matrix.

Table 6.4a

KMO and Bartlett's Test		
KMO Measure of Sampling Adequacy.		.731
Bartlett's Test of Sphericity	Approximately. Chi-Square	93.867
	Df	28
	Sig.	.000

Note:

EFF_CRTB_1 – Poor credit appraisal; EFF_CRTB_2 – Non-inspection of units and improper documentation; EFF_CRTB_3 – Too flexible attitude; EFF_CRTB_4 – Undue pressure to speed up sanction process; EFF_CRTB_5 – Lack of trained staff; EFF_CRTB_6 – Lack of planning in work; EFF_CRTB_7 – Lack of commitment to recovery; EFF_CRTB_8 – Lack of personal zeal and technical knowledge

The rotation method is used, wherein a concept is applied to decrease the number of factors which may have heavy loading on the variables being investigated. The concept of rotation will not change results, but merely make data analysis and interpretation less complicated. Based on the table given below, it is observed that DM_CRTA_5, DM_CRTA_8, DM_CRTA_1, DM_CRTA_6 and DM_CRTA_4 are in Component 1 and DM_CRTA_2, DM_CRTA_7 are in Component 2 and DM_CRTA_3 is in component 3.

The rotation is converged in 7 iterations.

Table 6.4b

	Component		
	1	2	3
EFF_CRTB_5	.816		
EFF_CRTB_8	.767		
EFF_CRTB_1	.725	.370	
EFF_CRTB_6	.663		.331
EFF_CRTB_4	.592		

6.5. Criteria A. With respect to "NPAs attributed to Other Causes"

To understand if the responses from the sample are suitable for analysis, a measure of sampling adequacy by Kaiser-Meyer-Olkin (KMO)is used, which stands at 0.662 i.e. highly acceptable to continue with factor analysis

An indicator of how strong a relationship between two or more variables is will be the results acquired from the Bartlett's test of Sphericity. The Bartlett's result is 0.000 which denotes the result to be significant, thus the correlation matrix cannot be an identity matrix.

The rotation method is used, wherein a concept is applied to decrease the number of factors which may have heavy loading on the variables being investigated. Based on the table given below, it is observed that DM_CRTA_4, DM_CRTA_2, DM_CRTA_7, DM_CRTA_6 are in Component 1 and DM_CRTA_8, DM_CRTA_1, DM_CRTA_3 are in Component 2 and DM_CRTA_5 is in component 3.Rotation is performed using 7 iterations.

Note:

PER_CRTA_1 – Lack of infrastructure; PER_CRTA_2 – Lack of commitment of government;PER_CRTA_3 – Changes in consumer preferences for loans and repayment conditions; PER_CRTA_4 – Civil commotion; PER_CRTA_5 – Sluggish Legal system

PER_CRTA_6 – Changes related to banking amendments; PER_CRTA_7- Unforeseen circumstances; PER_CRTA_8 – Fluctuating interest rates

To understand if the responses from the sample are suitable for analysis, a measure of sampling adequacy by Kaiser-Meyer-Olkin (KMO)is used, which stands at 0.596 i.e.

highly acceptable to continue with factor analysis

An indicator of how strong a relationship between two or more variables is the results acquired from the Bartlett's test of Sphericity. The Bartlett's result is 0.000 which denotes the result to be significant, thus the correlation matrix cannot be an identitymatrix

Table 6.5a

KMO and Bartlett's Test

KMO Measure of Sampling Adequacy.		.662
Bartlett's Test of Sphericity	Approximately Chi-Square	54.329
	Df	28
	Sig.	.002

Table 6.5b

Rotated Component Matrix[a]

	Component		
	1	2	3
PER_CRTA_4	.723		
PER_CRTA_2	.631		.322
PER_CRTA_7	.609		
PER_CRTA_6	.549	.365	.448
PER_CRTA_8		.738	
PER_CRTA_1		.677	
PER_CRTA_3	.408	.629	
PER_CRTA_5			.841

6.6. Criteria B. With respect to "NPAs attributed to Other Causes"

given below, it is observed that DM_CRTA_3, DM_CRTA_8, DM_CRTA_1 are in Component 1 and DM_CRTA_7, DM_CRTA_4, DM_CRTA_2 are in Component 2 and DM_CRTA_6, DM_CRTA_5 is in component 3.

Table 6.6b

Rotated Component Matrix

	Component		
	1	2	3
PER_CRTB_3	.839		
PER_CRTB_8	.783		
PER_CRTB_1	.740		
PER_CRTB_7		.796	
PER_CRTB_4		.755	
PER_CRTB_2		.623	.426
PER_CRTB_6			.821

VII. CONCLUSION

Public sector banks in India are finding huge accumulation of NPAs affecting their overall growth leading to slower economic development of the country. The study attempted an analysis of factors that influence NPAs through statistical data. It appears that there are parameters in case of borrowers like unwanted expenses and improper maintenance of records leading to increase of NPAs. The factors attributed to banks emphasize lack of commitment of recovery. In respect of other causes sluggish legal system and Political hostility contributed to the rise in NPAs. Based on statistical analysis the most influencing factors leading to NPAs are diversion of funds, lack of expertise and proper follow up on irregular payments, poor credit appraisal and lack of trained staff. The banking management needs to pay attention to improve on these factors to bring down NPAs to a larger extent.

Note: *conditions; PER_CRTB_4 – Political hostility; PER_CRTB_5 – Lack of legal reforms; PER_CRTB_6 – Sluggish legal system*

PER_CRTB_1 – Fast changing technology; PER_CRTB_2 – Complex government policies; PER_CRTB_3 – Inflexible banking terms and

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