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Managing NPAs: Exploring factors from the lens of Banks' Employees

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Abstract
This study takes bankers' perceptions and pulls information on the variables influencing particular NPA resolution tactics. Data was gathered from managers in several Indian banks, particularly those in the credit department, using a self-structured questionnaire. The validity and reliability of the questionnaire have been empirically validated. By employing EFA (exploratory factor analysis), Seven aspects of "management of NPAs" have been found and a comprehensive assessment of the viewpoint, conceptual, and empirical literature. Four criteria have been identified by the empirical research of these dimensions as being important for management. The current study provides useful recommendations for banking authorities on enhancing the asset quality of Indian banks and provides fresh perspectives on efficient credit management in banks.

Keywords: Bank; Non-Performing Assets; Perception; EFA; Factor Analysis; India.

1. Introduction

The issue of non-performing assets (NPAs) has drawn the interest of financial institutions around the globe (Barr & Siems, 1997; Reinhart & Rogoff, 2011). Many banking institutions have been insolvent as a result of it, causing a banking crisis (Barr & Siems, 1997; Hou, 2007). India's banking industry has undergone significant transformations since liberalization in order to become more responsible and interconnected with the world economy.

In recent years, the Indian banking industry has experienced a deterioration in profitability and asset quality. The gross non-performing assets (GNPAs) of the scheduled commercial banks increased to 11.6% of gross advances in 2017–18, resulting in losses of INR 324 billion. Public sector banks had greater losses and Gross Non-Performing Assets (GNPs), totalling INR 854 billion and 15.6% of gross advances, respectively (*Reserve Bank of India - Annual Report*, 2018). Growing bank losses and GNPAs have raised concerns about the viability of the banking industry, as per the Reserve Bank of India (*Reserve Bank of India - Index To RBI Circulars*, 2018a). The highest NPA was observed in 2018, as compared to 2011 to 2023. According to Woo et al., (2000) the intensity and duration of financial crises may increase if the NPL problem is not addressed.

The rising number of loan defaults is a key cause of stress for the banking industry (Gopalakrishnan, 2004; Heid & Krüger, 2011). Bank asset quality may be evaluated with the use of timely reporting on non-performing assets (Meeker & Gray, 1987). In

India, public sector banks have a significantly larger percentage of non-performing assets than private sector banks (Singh, 2013). A substantial portion of the variations in stress within the financial sector may be attributed to the growing non-performing assets in India's banking sector (Misra et al., 2016). As a result, the government launched a number of steps to rein in the NPAs. The major initiatives are (a) the execution of laws such as the Insolvency and Bankruptcy Code (IBC 2016)[i], Lok Adalats[ii], Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFRASI) Act 2002[iii], and the Banking Regulations Act. (b) using bargaining techniques including asset-bad loan sales and compromise settlements. The track record of NPA recoveries has been dismal, even with these steps taken. This begs the study issue of how helpful these initiatives are, in the banks' opinion, in lowering the NPA.

Many regulators were set up to present an accurate picture of non-performing assets. For example, the Asset Quality Review was started in April 2015, the Government of India pioneered the Indradhanush Programme in August 2015, and the Bank Board Bureau (BBB) was established in April 2016 to improve the PSBs' hiring practices for top management. According to a number of studies, these efforts aid in lowering systemic risk in the banking sector (Prasad & Mathur, 2022; Schwarcz, 1994). Since its introduction, the Securitisation Act, 2002 has proven to be a significant step taken by the Indian banks toward the recovery of NPAs (A. Jain & Shaardha, 2016; Samir & SRana, 2010).

In order to restore financial stability and trust in India's financial markets, managing non-performing assets in banks is crucial. Furthermore, there is a discrepancy between the government's initiatives and the banks' real performance, and the lack of studies explaining these variations in this area allows room for more investigation into the effectiveness of these government initiatives.

The present study collects the primary data from banks' managers by a structured questionnaire. Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) are used to fetch the relevant factors. The results of this study have the potential to greatly aid in rectifying the deviant situation of non-performing assets. The aim of the current study is to investigate the steps that may be used to manage NPAs, taking into account the perspectives of bankers actively engaged in lending decisions and credit risk management inside financial institutions.

Furthermore, information on the amount of problem loans in the future may be obtained, and more research into the crisis' impacts may be worthwhile.

The remainder of the study is structured as follows: Section 2 provides the literature evaluation, while Section 3 outlines the methodology and data. Section 4 delineates the results and debate, culminating in the conclusion presented in Section 5.

2. Literature Review

The current global financial crisis has sparked interest in identifying and controlling the factors that contribute to non-performing assets globally. Because of their unexpected economic effects, NPAs have been referred to as "financial pollution" in a number of studies (Barseghyan, 2010; Renda Gonzalez-Hermosillo, 1999; Zeng, 2012). As a result, academics have suggested that NPAs be adequately managed and included in an early warning system for impending financial crises (Agarwala & Agarwala, 2019; Barge, 2012; Batra, 2003; Bawa et al., 2019; Bhaskaran et al., 2016; Dhar & Bakshi, 2015; Gupta, 2012; Joseph & Prakash, 2014; Singh, 2013). Financial institutions need to make recoveries on a regular basis in order to maintain a high percentage of performing assets and a stable balance sheet.

Certain studies, such as the ground breaking research on US corporate bond defaults by E. I. Altman, (1989) have focused only on the recovery from bad loans. Research on recovery rates and the strength of the association between recovery rates and default frequencies comes next (Acharya et al., 2003; E. I. Altman, 1989; Frye, 2000b, 2000a; Frye et al., 2000). E. Altman et al., (2004) provided a comprehensive overview and in-depth discussion of the empirical data on recovery rate and its correlation with the likelihood of the debtor defaulting. Using 24 years of data gathered between 1970 and 1993, (Asarnow & Edwards, 1995) looked at 831 Citibank delinquent loans and found an average cumulative recovery rate of 65%. According to Carty & Lieberman, (1996) analysis of Moody's bank loans, the average recovery rate for a sample of 58 bank loans that had defaulted between 1989 and 1996 was 71%. The study was based on secondary market values. Felsovalyi & Hurt, (1998) examined 1,149 bank loan losses that occurred in Latin America between 1970 and 1996. Their stated recovery rate on average is 68.2%.

To provide a complete picture of NPAs, another body of literature has concentrated on macroeconomics and bank-specific issues. The research conducted by (Barr & Siems, 1997; Karim et al., 2010; Kwan, 2006) revealed a negative relationship between NPAs and efficiency. Using US bank data from 1985 to 1994, (Berger &

DeYoung, 1997) analysis found a relationship between an increase in non-performing loans and a decrease in cost-efficiency. Salas & Saurina, (2002) found that bank-specific attributes had a substantial impact on credit risk in the Spanish banking system after controlling for macroeconomic variables.

While (Taori, 2000) stresses the need for ongoing monitoring to identify and address early warning signs of a financial crisis, she also advocates for the recovery of non-performing assets through direct negotiations as opposed to litigation. Nonetheless, government activities have equal significance to the previously described issues. Various laws have been established by governments worldwide to regulate non-performing assets (C Fung et al., 2011; Ilgmann & van Suntum, 2009; Ingves & Goran, 1996) like Asset Management Company (AMC), Corporate Debt Restructuring (CDR), Debt Recovery Tribunals (DRTs) and National Asset Reconstruction Company Lt. (NARCL) known as Bad Bank.

Nevertheless, India being the second largest emerging economy also passed various legislation to curb the NPLs. Literature has vastly researched on the CDR, SARFAESI Act, DRTs[iv], Lok Adalat, IBC, and NARCL[v] (Bad Bank). These frameworks comprise the official Insolvency and Bankruptcy Code, 2016 as well as out-of-court workouts, or the restructuring of loans without significant judicial participation. Out-of-court exercises for high-value accounts are governed under the June 7, 2019, Prudential Framework for Resolution of Stressed Assets. As an alternative, banks may sell their non-performing loans to Asset Reconstruction Companies (ARCs) in accordance with the SARFAESI Act of 2002. ARCs then handle the restructuring process. The Legal Services for Authorities Act, 1987 established another structure known as "Lok Adalats" for the purpose of mediating or resolving conflicts between parties. Lok Adalats may frequently be an effective and alternative method of judicial resolution when there are a lot of cases pending in the courts. India is among the few nations that saw the introduction of a public sector bad bank following nearly two decades of solely private sector operations. The issue of market design becomes even more complicated with the establishment of the government-backed NARCL.

Recovery of assets through various channels such as the Lok Adalat, DRTs and SARFAESI Act was discussed by (Bhardwaj & Chaudhary, 2018; Murugan, 2018). Asset Reconstruction Companies play an active role in managing NPAs as they efficiently helped Indian banks in controlling and reducing their NPAs.

SARFAESI act efficiently aids the bank in recovery of the bad loans (Panigrahi & Chaudhury, 2019). Along with SARFAESI, Lok Adalats (Alamelumangai & Sudha, 2019), RDB(Gandhi, 2017), DRT (Rani, 2013) also helps in NPAs recovery however DRT's benefits can be increased if it can be improved as suggested by (Dwivedi & Raza, 2016); and (Unny, 2011). (Dey, 2018; Kumari et al., 2017; Rajeev & Mahesh, 2010; Rao & Patel, 2015; M. K. Sahoo & Majhi, 2022) analysed the secondary data on NPAs derived from RBI publications and their recovery via different mechanisms such as Debt Recovery Tribunals (DRTs) and the SARFAESI Act, across several years, and compared their performance based on recovery percentages during the study periods.

. SARFAESI Act was the major contributing thing in the NPA's recuperation framework followed by DRT and Lok Adalat in India during study period from 2006-07 to 2016-17. The proficiency of Scheduled Commercial Banks (SCB) has recuperated more sum through the SARFAESI Act (Dheenadhayalan, 2019). Moreover, SARFAESI is superior to the other recovery channels (Banana & Chepuri, 2016) but its amendments are crucial to expedite the NPAs recoveries (A. Jain & Shaardha, 2016) and (Agrawal et al., 2017).

Other studies have examined the efficiency of IBC Code (Rajput & Prasad, 2023; Tensingh & Dr Suresha, 2019; Valecha & Xalxo), IBC emerged as a landmark piece of legislation (Valecha & Xalxo) that helps in increasing the profitability of banks with the reduction of NPAs levels (CRISIL 2019)(Rajput & Prasad, 2023) be it public or private sector banks (Tensingh & Dr Suresha, 2019). IBC not only improved the recovery rate but also increased the secured loans in the balance sheet (Ahmed, 2021; Mishra & Thakkar, 2017).

Moreover, IBC helped in improving the rank of India as per the Doing Business Report with average recoveries of 26% as compared to 35% of China and Russia (Thakkar et al., 2020).

However, Literature is not silent on the critics of govt initiatives for NPAs recoveries. (D. Jain & Sainib, 2015) posit that the rate of recovery of NPAs had declined under the SARFAESI Act and the performance of the Act is not remarkable in line with (M. Sahoo & Majhi, 2020). Other major studies have concluded that recovery channels (SARFAESI, DRT, OTS, and LOK Adalat) are not well contributing to the recovery of NPAs (Mohan & Das, 2021) especially from 2004 to 2011 period (Singh, Jasbir, 2013).

3. Data and Methodology

Data were obtained from bankers working at various banks in India (PSBs and private sector

banks), particularly those in the credit divisions of the institutions. The data was collected via multiple-stage sampling. To begin, the top 10 Indian Scheduled Commercial Banks (5 public and 5 private sector) were chosen as a sample based on their gross advances. These include State Bank of India, Punjab National Bank, Bank of Baroda, Canara Bank, Union Bank, HDFC Bank Ltd, ICICI Bank Limited, Axis Bank Limited, Kotak Mahindra Bank, and IndusInd Bank. As per RBI (2023),

the selected 10 banks contributed 37.92 % out of the total NPAs of the Indian Scheduled Commercial Banks (₹3,887,842 million out of ₹5,534,112). The results of any research are generalisable only when the sample of the study is large enough. According to (Krejcie & Morgan, 1970), for sizable populations, a sample size of approximately 385 is recommended to facilitate informed decisions concerning the population. This benchmark is detailed in the provided table. Consequently, for this study, a minimum sample size of 385 respondents from the banks was suggested. Given the presumption of an indefinitely large population for this research, the Cochran formula (Cochran, 1963:75) was utilized to ascertain the minimum sample size needed at a 5% significance level.

The data was collected through a structured questionnaire. Questionnaires were distributed through both online and offline methods, with participants providing authentic insights into the factors that manage Non-Performing Assets. Data collection involved responses from various bank personnel, including branch managers, loan officers, and credit analysts, among others. Since the calculated minimum sample size was 385 however for safe cushion, we distributed 400 questionnaires ensuring the robustness of the primary research objectives. After reviewing the responses, 300 questionnaires were deemed valid that can be taken for final analysis as this is 75% a good response rate because of follow-up through personal contact with the bankers. since the number of respondents should be at least five times of the number of items (Hair, 2009).

Exploratory Factor analysis is used to discover the key elements that influence the management of non-performing assets. This analytical approach requires input statements related to effectiveness as variables, from which hidden factors indicative of effectiveness will be identified.

4. FINDINGS AND RESULTS

In this study, data were analysed to explore the different factors influencing the management of non-performing assets in the banks based on primary data collected during the study. Exploratory Factor Analysis (EFA) has been conducted to understand the factors, which could affect managing the NPAs. For conducting EFA, confirming the reliability of the instrument is crucial. This research's reliability was tested based on the use of Cronbach's Alpha. This approach was employed to determine the internal consistency within a group of items, reflecting how closely related they are as a unit. Moreover, this reliability metric has been frequently applied in scholarly studies (Chowdhury et al., 2018; Nazaritehrani & Mashali, 2020). Significantly, the Cronbach's Alpha value obtained in this study suggests a strong reliability of the instrument. An instrument is considered reliable when the value of Cronbach's Alpha is at least 0.7 (Babatunde, 2022; Zheng et al., 2021). The Cronbach's Alpha coefficient for this study is found to be .989. This high value indicates that the items designed to measure various variables are doing so effectively. Consequently, the developed instrument has demonstrated high reliability and has been successfully used in this study. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity have been conducted to assess the suitability of the data for factor analysis. The results of these two metrics are displayed in Table 1.

Table 1: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.957
Bartlett's Test of Sphericity	Approx. Chi-Square	20291.018
	df	630
	Sig.	.001

KMO evaluates how fit the data is for factor analysis, scoring between 0 and 1, higher scores indicate a greater appropriateness. In this instance, a KMO value of 0.957 is observed, signifying a very high suitability of the dataset for factor analysis. Typically, a value over 0.7 is deemed acceptable. Moreover, Bartlett's Test of Sphericity checks if the correlation matrix among the variables significantly deviates from an identity matrix, essentially, verifying the presence of correlations among variables. The test statistic follows a chi-square distribution. Analysis revealed that the Chi-Square value is 20291.018. The 'df' (degrees of freedom) is 630, reflecting the count of variables

analysed. 'Sig.' (significance), represents the p-value for Bartlett's Test. A p-value of .001 suggests not accepting the null hypothesis, which posits that the correlations among variables are statistically meaningful, endorsing the data's appropriateness for factor analysis. The analysis also found that the total variance explained by the extracted components was 87.166. Thus, this approach has been found effective in determining the underlying factors in the statements.

Exploratory Factor Analysis (EFA) employing Principal Component Analysis (PCA) with Varimax rotation was utilized on 36 statements concerning factors aiding the management of non-performing assets. Moreover, using PCA as the extraction method, the analysis showed that the commonality, which refers to the extent of shared variance between a specific variable and all other variables of each item is more than 0.5 (Annexure 1). This demonstrates every item's shared variance with the rest, confirming their interrelatedness, and further establishing that all items in the instrument were statistically significant. Furthermore, a factor analysis was performed, indicating that all items were carefully chosen for inclusion in the study.

The variance analysis in Table 2 reveals the four factors' solution, which is based on the standard criterion for retaining factors with Eigenvalues greater than 1.00. These four diverse factors collectively account for 87% of the variation in the effectiveness of non-performing asset (NPA) management. Specifically, the first component contributed 33% of the variance, followed by the second, third, and fourth factors, contributing 24%, 18%, and 12%, respectively.

Table 2: Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	26.399	73.331	73.331	26.399	73.331	73.331	11.840	32.888	32.888
2	2.340	6.500	79.831	2.340	6.500	79.831	8.714	24.206	57.094
3	1.551	4.307	84.138	1.551	4.307	84.138	6.358	17.661	74.755
4	1.090	3.028	87.166	1.090	3.028	87.166	4.468	12.411	87.166
5	.508	1.410	88.576						
6	.474	1.316	89.892						
7	.412	1.144	91.036						
8	.349	.970	92.005						
9	.300	.834	92.839						
10	.268	.745	93.584						
11	.254	.704	94.289						
12	.225	.625	94.914						
13	.201	.557	95.471						
14	.190	.527	95.998						
15	.141	.392	96.390						
16	.127	.352	96.742						
17	.119	.332	97.073						
18	.103	.285	97.358						
19	.100	.278	97.636						
20	.093	.259	97.895						
21	.083	.230	98.125						
22	.080	.221	98.346						
23	.076	.212	98.558						
24	.066	.185	98.742						
25	.063	.175	98.918						
26	.053	.149	99.066						
27	.050	.139	99.205						
28	.049	.135	99.340						
29	.043	.120	99.460						
30	.037	.104	99.563						
31	.034	.094	99.657						
32	.031	.087	99.745						
33	.027	.076	99.821						
34	.025	.070	99.891						
35	.020	.057	99.947						
36	.019	.053	100.000						

The number of factors to be included in the analysis is further established by Scree plot (figure 1). A Scree plot is a useful tool for visually presenting the outcomes of a factor analysis, which plots the number of components (statements) on the x-axis and their corresponding eigenvalues on

the y-axis. The commencement of the 'elbow' shape in the curve is critical, as it marks the cut-off point for extracting factors.

Figure 1: Scree Plot

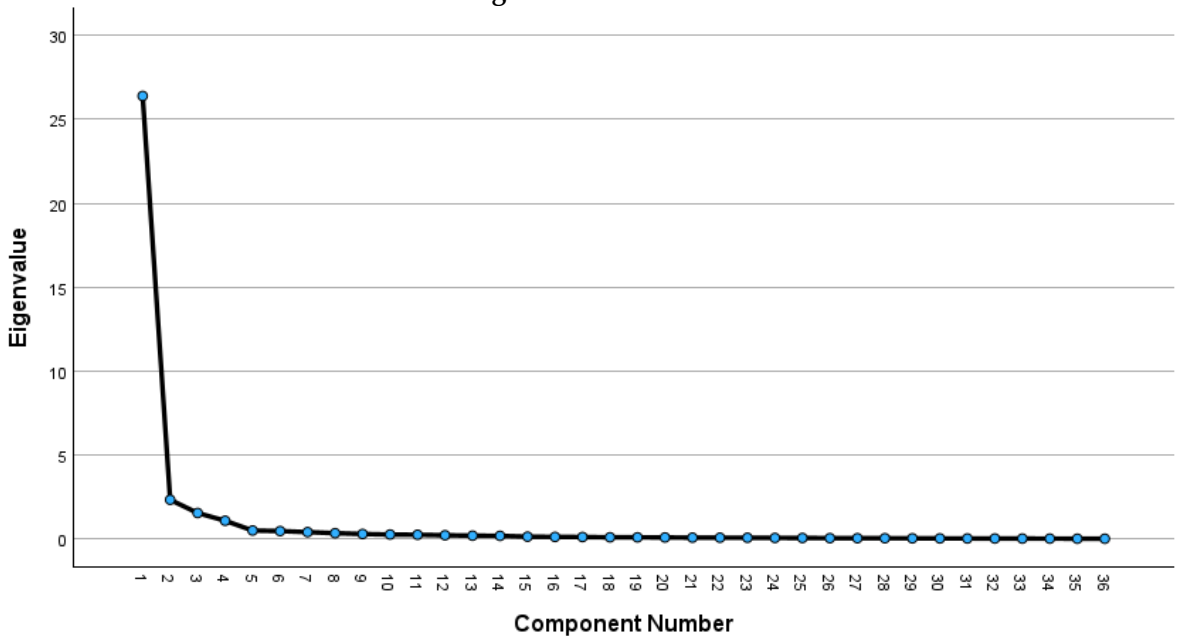


Figure 1 shows that the elbow begins at the 5th component, where the eigenvalue drops below one. Hence, the number of factors to be kept for the factor analysis is four, which is one less than the position of the elbow. The relevant labels have been assigned to these four distinctive factors, considering the factor loadings of the statements falling under the corresponding factors, namely "Regulatory mechanism", "Internal Control Supervision", "Internal control & Surveillance mechanism", and "Data analytics-enabled mechanism". The components (statements) categorised under four distinctive factors, along with their factor loadings, are presented in Table 3. Moreover, the factor loadings are more than the ideal value of 0.5 (Phakiti, 2018) for each factor.

Table 3: List of Factors Help in Managing Non-Performing Assets

S.No.	**Factors & Statements**	Factor Loading
Regulatory Mechanism		
1	the use of Lok Adalat helps to reduce the burden of NPAs	.723
2	Lok Adalat encourages borrowers and lenders to engage in negotiations	.749
3	Lok Adalat is more efficient and cost effective for resolving NPA cases than regular courts	.766
4	quick actions by Lok Adalat preventing further deterioration of NPA	.741
5	Lok Adalat success in managing NPAs relies on cooperation and willingness of all parties	.770
6	it provides an efficient and specialised forum for the speedy resolution of debt related cases	.724
7	it accelerates the recovery of outstanding debts and reduces burden on the banking	.759
8	reducing debt recovery backlogs in traditional courts frees up judicial resources	.754
9	DRTs play a crucial role in addressing cases of willful default and improving overall loan repayment discipline	.798
10	offer a cost effective and time efficient alternative to the traditional court for the debt recovery process	.790
11	reduces the burden on the judicial system by providing an alternative to litigation for NPA resolution	.707
12	facilitates the reduction of NPAs, thereby contributing to the overall stability and health of the banking sector	.685
13	it promotes the efficient utilisation of mortgage assets by allowing banks to take control and manage them effectively during the recovery process	.694

14	The bound nature of IBC's resolution process has positively influenced the effectiveness of NPA management	.609
15	providing incentives for loan officers to reduce fraud	.724
	Internal Control Supervision	
1	it has encouraged a culture of responsible lending among financial institutions	.759
2	framework encourages transparency and accountability in the resolution process	.686
3	insolvency procedures have encouraged negotiations and restructuring to avoid NPAs	.839
4	early detection reduces losses and facilitates timely resolution	.813
5	early detection improves bank portfolio asset quality	.797
6	early detection improves risk management and financial stability	.839
7	early identification helps banks manage risks on time	.706
8	enhance the accuracy in identifying NPAs	.763
9	improve data accuracy, monitoring, and early warning system	.658
	Internal control & Surveillance mechanism	
1	implementing robust internal controls and regular audits	.600
2	banks need to improve consumer identification verification	.603
3	frequent risk evaluations help banks avoid fraud	.787
4	lack of skilled personnel and technology	.571
5	recovery is very complicated and time-consuming	.824
6	economic downturns increase NPAs and make management tougher	.749
7	customer refusal to repay loans worsens the NPA problem	.711
	Data analytics-enabled mechanism	
1	allow banks to take proactive measures to prevent loan defaults therefore reducing the incidence of bad loans	.610
2	the introduction of IBC has reduced the incidence of evergreening loans	.548
3	it makes the monitoring and reporting of NPAs easier & transparent	.595
4	it is a cost-efficient approach to managing NPAs	.558
5	encourage borrowers to repay loans quickly so banks enforce their security interests	.587

Regulatory Mechanism

The first factor that emerged was based on regulatory mechanisms in managing Non-Performing Assets (NPAs) in the banking sector, which explains around 33 % of the total variance. This factor loads the components such as (i) Lok Adalat, which plays a significant role, showing strong positive impacts in reducing the NPA burden and encouraging negotiations between borrowers and lenders. Also, it offers a more efficient and cost-effective way than regular judiciary settlement in resolving NPA cases and is crucial in preventing the deterioration of NPAs. (ii) Debt Recovery Tribunals (DRTs) are highlighted as a crucial component in managing non-perming assets. This could happen because DRTs aid in addressing wilful default cases and improving loan repayment discipline. The efficiency of mortgage asset utilisation during recovery and the bound nature of the (iii) Insolvency and Bankruptcy Code's resolution process is also positively noted. Overall, the data advocates for the benefits of alternative dispute resolution mechanisms over traditional judicial processes and suggests the need for policy reforms in the banking and financial sectors, while also acknowledging the necessity of further research.

Internal Control Supervision

The factor labelled implementation of Internal Control Supervision explains 24.2% of the total variance. This approach emphasises transparency and accountability, notably towards resolving financial disputes connected to NPA management. Key to this framework is the early detection of potential risks, which aids in reducing losses and facilitates timely and effective resolutions. Moreover, the focus on enhancing accuracy in identifying NPAs, improving data accuracy, and developing robust monitoring and early warning systems underscores the comprehensive nature of internal control supervision. This approach, therefore, plays a crucial role in maintaining the health and stability of the banking sector, highlighting its importance in contemporary financial management practices.

Internal Control & Surveillance Mechanism

The third factor the Internal Control and Surveillance mechanism, explains 17.661% of the total variance. It is a critical framework designed to mitigate risks and manage Non-Performing Assets. Key components of this mechanism include the implementation of robust internal controls and regular audits, essential for identifying and addressing potential vulnerabilities. Enhancing consumer identification verification processes is another crucial aspect,

helping to prevent fraud and misuse of financial services. However, this mechanism faces significant challenges, such as the lack of skilled personnel and advanced technology, which can impede effective risk monitoring and management. The recovery of assets, especially NPAs, is often a complex and time-consuming process, further strained by economic downturns that can lead to an increase in NPAs and complicate their management. Additionally, customer reluctance or refusal to repay loans exacerbates the NPA problem, highlighting the multifaceted nature of challenges in the banking sector's risk management and NPA resolution efforts.

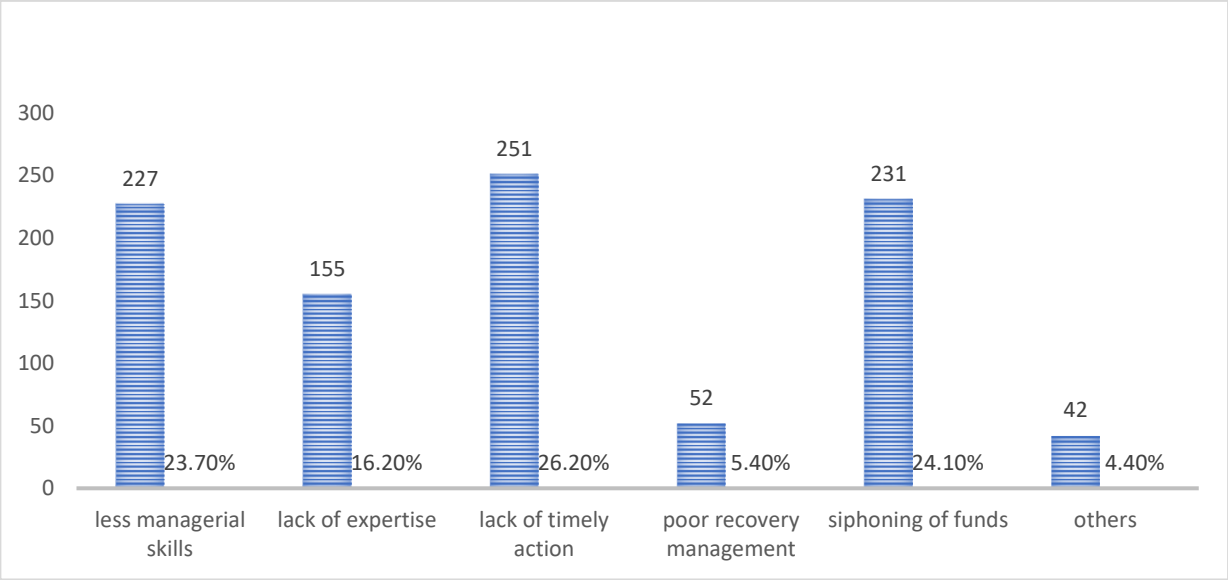
Data Analytics-Enabled Mechanism

The final factor that emerged is based on integrating the data analytics mechanisms in the banking sector, which explains 12.411% of the total variance. This technology-driven approach enables banks to initiate proactive measures to identify and mitigate potential loan defaults, thereby, reducing the incidence of bad loans. The implementation of the Insolvency and Bankruptcy Code (IBC), aided by data analytics, has been effective in curtailing the practice of evergreening loans. Additionally, data analytics enhances the ease and transparency of monitoring and reporting NPAs and empowers banks to enforce security interests more effectively, encouraging borrowers to repay loans timely. Overall, the data analytics mechanism in banking provides a comprehensive solution that streamlines NPA management and improves the overall health and stability of the sector's loan portfolio.

Findings from reasons of NPAs based on respondents' responses:

Apart from the s36 question included in the EFA to analyse the factors influencing the management of NPAs in banks, we also asked respondents to give the reasons which caused the rise of NPAs in the banks. Figure A2 presents the summary reasons for NPAs in this connection. The highest number of respondents indicate that 'lack of timely action' is one of the important reasons for the rise of NPAs in banks. Significantly, the 'siphoning of funds' and 'less managerial skills' emerged as the critical reasons for NPAs. Moreover, 155 responses recorded 'lack of expertise' as a reason for NPAs, whereas 52 responses 'poor recovery management' as a reason for NPAs.

Figure 1: Reason for NPAs based on respondent's responses:



5. Conclusion

The issue of non-performing assets has been a long-standing issue in the Indian banking industry, hindering regular lending and making it challenging to address. Therefore, it is imperative that the banking sector be made sound again right away in order to prevent NPAs from developing into another crisis that might impede economic growth in the future. In order to construct mitigation methods and get a banker's understanding of the problem, the current study has attempted to investigate and validate the numerous elements that contribute to the management of non-performing assets. The study offers a comprehensive strategy for NPA management structures as bankers' viewpoints may greatly alleviate this problem at the gross-rote level.

In the present study, based on the bankers' perceptions the analysis showed that the main way

that NPAs can be reduced is if regulators step in and put in place a regulatory mechanism that has a significant positive influence on lowering the NPA burden and promoting borrower-lender negotiations. It also provides a more effective and economical means of resolving NPA cases than standard court settlements, and it is essential in halting the NPAs' decline. Furthermore, according to the bankers, the Internal Control Supervision for Resolution of Stressed Assets, 2019 plan is designed to offer a framework for the early identification, timely reporting, and resolution of stressed assets. Furthermore, the emphasis on strengthening data quality, detecting non-performing assets (NPAs) with greater precision, and creating reliable early warning and monitoring systems highlights how all-encompassing internal control oversight is. Furthermore, a crucial foundation for managing non-performing assets and reducing risk is internal control and surveillance. This technique includes conducting frequent audits and putting in place strong internal controls, both of which are crucial for locating and correcting possible risks. Improving customer identity verification procedures is another essential component that contributes to the prevention of financial service abuse and fraud. But there are a lot of obstacles this mechanism has to overcome, such a lack of highly qualified staff and cutting-edge technology, which can make it difficult to monitor and manage risks effectively.

Moreover, bankers strongly believe that the technology-driven Data Analytics-Enabled Mechanism approach allows banks to take proactive steps to detect and minimize possible loan defaults, therefore lowering the frequency of bad loans. Furthermore, data analytics makes it easier and more transparent to monitor and disclose non-performing assets (NPAs). It also gives banks the ability to more effectively enforce security interests, which incentivizes borrowers to make timely loan repayments. All things considered, the banking industry's data analytics system offers a complete solution that simplifies NPA management and enhances the general stability and health of the loan portfolio. Therefore, it can be inferred that the following factors can also be crucial in keeping the same under control: regulatory mechanisms showing strong positive impacts in reducing the NPA burden; Internal Control Supervision combined with prompt resolution and mitigate risks; timely follow-up based on up-to-date knowledge of NPA accounts; and the implementation of corporate governance practices at the borrowers' end.

Looking ahead the study's findings would likely affect the regulation and oversight of NPAs in the Indian banking sector as high NPA levels divert bank employees' focus away from regular banking tasks that might result in lost business opportunities. Because non-performing assets must be managed quickly, banks should carefully consider which NPA management model best suits their needs, develop their staff, and accumulate resources well in advance (Pandey et al., 2013). This calls for strict measures to handle the current problem as soon as possible. A bank that addresses its NPA issue early in the market will have a relatively good chance of emerging from the crisis, recovering faster than the other banks in the competition, and experiencing more approach to capital.

Future research areas will gain from a thorough comprehension of the formation and management of NPAs, necessitating an interdisciplinary approach that transcends macroeconomic and bank-specific analytical dimensions. In conclusion, efforts should be taken to prevent abrupt rises that trigger micro-level negative feedback loops as long as NPAs remain a permanent feature of banks. Thus, in further research, it may be possible to look at feedback loops at the microeconomic level.

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Annexure 1: Communalities of each item

Communalities		
	Initial	Extraction
the use of Lok Adalat helps to reduce the burden of NPAs	1.000	.855
Lok Adalat encourages borrowers and lenders to engage in negotiations	1.000	.868
Lok Adalat is more efficient and cost effective for resolving NPA cases than regular courts	1.000	.867
quick actions by Lok Adalat preventing further deterioration of NPA	1.000	.889
Lok Adalat success in managing NPAs relies on cooperation and willingness of all parties	1.000	.897
it provides an efficient and specialised forum for the speedy resolution of debt related cases	1.000	.823
it accelerates the recovery of outstanding debts and reduces burden on the banking	1.000	.868
reducing debt recovery backlogs in traditional courts frees up judicial resources	1.000	.883
DRTs play a crucial role in addressing cases of willful default and improving overall loan repayment discipline	1.000	.850
offer a cost-effective and time-efficient alternative to the traditional court for the debt recovery process	1.000	.854
reduces the burden on the judicial system by providing an alternative to litigation for NPA resolution	1.000	.767
facilitates the reduction of NPAs, thereby contributing to the overall stability and health of the banking sector	1.000	.807
encourage borrowers to repay loans quickly so banks enforce their security interests	1.000	.888
allow banks to take proactive measures to prevent loan defaults therefore reducing the incidence of bad loans	1.000	.905
it promotes the efficient utilisation of mortgage assets by allowing banks to take control and manage them effectively during the recovery process	1.000	.904
the introduction of IBC has reduced the incidence of evergreening of loans	1.000	.876
the item bound nature of IBC's resolution process has positively influenced the effectiveness of NPA management	1.000	.900
it has encouraged a culture of responsible lending among financial institutions	1.000	.887
framework encouages transparency and accountability in the resolution process	1.000	.896
insolvency procedures have encouraged negotiations and restructuring to avoid NPAs	1.000	.920
early detection reduces losses and facilitates timely resolution	1.000	.887
early detection improves bank portfolio asset quality	1.000	.917
early detection improves risk management and financial stability	1.000	.850
early identification helps banks manage risks on time	1.000	.861
enhance the accuracy in identifying NPAs	1.000	.847
improve data accuracy, monitoring, and early warning system	1.000	.882
it makes the monitoring and reporting of NPAs easier & transparent	1.000	.912
it is a cost-efficient approach to managing NPAs	1.000	.882
implementing robust internal controls and regular audits	1.000	.864
providing incentives for loan officers to reduce fraud	1.000	.897
banks need to improve consumer identification verification	1.000	.896
frequent risk evaluations help banks avoid fraud	1.000	.876

lack of skilled personnel and technology	1.000	.782
recovery is very complicated and time consuming	1.000	.910
economic downturns increase NPAs & make management tougher	1.000	.885
customer refusal to repay loans worsens the NPA problem	1.000	.828

[i] https://www.mca.gov.in/Ministry/pdf/TheInsolvencyandBankruptcyofIndia.pdf
[ii] https://nalsa.gov.in/lok-adalat
[iii] https://drat.tn.nic.in/Docu/Securitisation-Act.pdf
[iv] https://financialservices.gov.in/beta/en/page/debts-recovery-tribunals-debts-recovery-appellate-tribunals
[v] https://pib.gov.in/PressReleseDetail.aspx?PRID=1755511