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# Trends in Non-Performing Assets (NPAs), And Effectiveness of Recovery Mechanisms in the Indian Banking Sector

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## Abstract

**Purpose:** This study aims to outline trends related to non-performing assets (NPAs) and their recovery. It then assesses the effectiveness of recovery mechanisms in India and investigates the impact of NPA recovery on gross and net NPAs.

**Methodology:** Annual data was sourced from the Reserve Bank of India (RBI) website covering the period from 2003-04 to 2020-21. The data analysis involved applying time trend regression with Gretl, the Kruskal-Wallis test and Dunn-Bonferroni post hoc test using SPSS, and simple regression in E-Views. Additionally, the robustness of the regression results was assessed through the Breusch-Godfrey Serial Correlation LM test and the ARCH Heteroskedasticity test.

**Finding:** The findings highlight increasing trends in gross and net NPAs of banks operating in India. While NPA recoveries show an increasing trend, the recovery percentage is found to be declining, raising concerns for the banks in India. The study also found that the SARFAESI Act is more effective for NPA recovery than Lok Adalats and Debt Recovery Tribunals (DRTs), emphasising its efficiency as a debt recovery mechanism in recovering NPAs from the Indian banking sector. Research also revealed that increased NPA recovery is linked to a decline in the growth of gross and net NPAs in India's banking sector.

**Managerial Implications:** The study's findings emphasise the importance of the SARFAESI Act and advocate for improved efficiency in recovery mechanisms. Prioritising legislation like the SARFAESI Act is vital for increasing NPA recovery and strengthening the banking sector. The findings will benefit banks, policymakers, investors, and scholars in understanding NPA trends, recovery effectiveness, and the impact of the existing recovery mechanisms on NPAs within the Indian banking sector.

**Originality:** This research presents a distinctive approach by employing the index growth rate to evaluate the various NPA recovery channels on a comparable basis. Unlike other studies in the field, this analysis emphasises the differing operational levels of these channels, which have often been overlooked in existing literature.

**Keywords:** Debt Recovery Tribunals (DRTs); Gross NPA; Lok Adalats; Net NPA; NPA Recovery Mechanism; SARFAESI Act 2002.

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## Introduction

Non-performing assets (NPAs) pose significant challenges to the banking sector, impacting financial stability and economic growth (Das & Uppal, 2021; Dhananjaya, 2021). The alarming increase in NPAs in the banking sector has shattered worldwide economies (Dan, 2023). In 2021, the global average NPA stood at 5.92%, while India recorded an average NPA of 6.54%, placing it in the 34<sup>th</sup> position with the highest NPA among 122 countries (The World Bank, 2021). NPAs pose significant threats in India, affecting profitability, liquidity, and asset quality (Das, 2023). They ultimately jeopardise banks' survival and raise concerns about the overall financial health of the banking industry (Mani et al., 2023; Naili & Lahrichi, 2022). The rise of NPAs in India from Rs. 51556.66 crores in 2003-04 to Rs. 835051.42 crores in 2020-21 (Reserve Bank of India, 2021) can primarily be attributed to corporate distress, aggressive lending, poor management, and high debt at risk, particularly in Public Sector Banks (PSBs), which leads to deteriorating asset quality and profitability (Pramahender, 2022; Swami et al., 2022). The accumulation of NPAs can lead to reduced lending capacity, increased operational costs, and decreased bank profitability (Bajaj et al., 2024; Mani et al., 2023). NPAs also contribute to macroeconomic instability, hindering sustainable development efforts (Dan et al., 2024). In 2022, the gross NPAs of Indian banks reached ₹10.03 lakh crores, with PSBs accounting for 88.74% of the total (Kanimozhi & Ganesh, 2024). Effective management and recovery strategies are essential to mitigate the adverse effects of NPAs on banks' profitability and the broader economy (Dan et al., 2024). Recovery of NPAs involves prudent board policies, thorough pre-sanction borrower appraisals, and post-sanction forensic audits of large borrower disbursements. These measures can significantly help banks manage and reduce the impact of bad loans on their financial performance.

The recovery of NPAs in India presents a significant challenge for commercial banks (Kumar et al., 2017). Miglionico (2019) argues that enhancing private arrangements for resolving distressed debts is essential—serving as an alternative to public support mechanisms like asset management companies and securitisation strategies. Such enhancements could facilitate a more effective reduction of NPA on banks' balance sheets. However, the average recovery percentage during the study period was not provided, and the effectiveness of amendments made post-2016 was not assessed (Sharma & Vagrecha, 2022). Furthermore, Pramahender (2022) highlights that despite various initiatives aimed at addressing this issue, including the recapitalisation of PSBs, the establishment of ARCs, the creation of DRTs for expedited recovery of bad loans, and the implementation of the IBC, there remains a substantial amount of work to be done. The research is limited to the period from 2008 to 2014, which may not adequately reflect the long-term impacts of the SARFAESI Act on NPA recovery, as both economic conditions and banking regulations can evolve significantly over time (Shardha & Jain, 2016).

A contrasting finding by Alamelumangai and Sudha (2019), Sharma and Vagrecha (2022), Chaki et al. (2019), Shardha and Jain (2016), Kumar et al. (2017a), Kumar et al. (2017), Kumar and Muralidhar (2020), Dey (2018), and Kumar et al. (2017b) regarding the status of NPA recovery and the efficiency of NPA recovery channels provides scope for further study to extend the period and compare the parameters of NPA recovery across different NPA recovery channels on similar grounds which earlier researcher fail to address. Hence, to address this research gap, the present study first examines the trends in NPA and its recovery in absolute and percentage. Second, to test the efficiency of NPA recovery channels, the study compares the recovery of NPAs by various NPA recovery channels. Then, the study examines the impact of NPA recovery on gross and net NPA. The Uniqueness of this research is that it uses a distinctive approach by employing the index growth rate to evaluate the various NPA recovery channels on a comparable basis. Unlike other studies in the field, this analysis emphasises the differing operational levels of these channels, which have often been overlooked in existing literature. The study has employed the research methods explained in section 3 of the article to achieve the above-stated objectives.

## Literature Reviews

Understanding the status and issues surrounding NPAs and their recovery in Indian banks is vital, as it directly influences the financial stability of the banking sector. Therefore, this section offers a comprehensive review of significant existing studies on the trends and status of NPAs and their recovery, the effectiveness of NPA recovery mechanisms, and the implications of NPA recovery, demonstrating the thoroughness of the research in this field.

## Trends in NPAs

Kankipati and Murty (2019) state that the NPA of selected banks is on an upward trend and requires management through suitable NPA recovery mechanisms. Sharma et al. (2019) emphasised the causes of NPAs, their statuses, and the sectors experiencing elevated NPAs. Their study finding revealed that loan siphoning and inadequate recovery and management skills contributed to the high NPAs in agriculture and allied sectors. Pandey and Trivedi (2020) found that the gross NPA ratio is rising across all scheduled commercial and private sector banks, following a discernible trend. They also noted that public sector banks have significant NPAs. A study by Fatima and Ashraf (2020) found that there has been a significant increase in NPA ratios from 2007 to 2018 for the scheduled commercial banks in India. Further study by Mishra et al. (2021) shows that the gross NPAs for Indian banks have nearly quadrupled from approximately USD 35 billion in March 2014 to over USD 150 billion in March 2018.

Existing studies by Kankipati and Murty (2019), Sharma et al. (2019), Pandey and Trivedi (2020), Fatima and Ashraf (2020), and Mishra et al. (2021) highlighted the increasing trend in NPAs over their study period. Alienating with the previous researcher, the present study proposes the following hypotheses **H<sub>1</sub>** to **H<sub>4</sub>** to measure the trend in gross and net NPAs in amount and percentage to understand better their respective magnitude, which other researchers fail to address as they have only focused on either gross or net NPAs and most of them have considered only NPA ratio.

**H<sub>1</sub>:** There is a significant increasing trend in the amount of gross NPA.

**H<sub>2</sub>:** There is a significant increasing trend in the gross NPA ratio.

**H<sub>3</sub>:** There is a significant increasing trend in the amount of net NPA.

**H<sub>4</sub>:** There is a significant increasing trend in the net NPA ratio.

## Trends and status of NPA recovery

A study by Alamelumangai and Sudha (2019) highlights a decline in the recovery of NPAs within Indian banks, revealing that the annual recovery rate fell to a low of 20.8% in the 2016-17 fiscal year. They also stated that the existing channels for recovery, such as the DRT, Lok Adalat, and the SARFAESI Act, have exhibited diminishing effectiveness throughout the study period. This finding is supported by Sahoo and Majhi (2020) and Kumar and Muralidhar (2020), who also found that the overall NPA recovery mechanism in the Indian banking

industry was unsatisfactory during their study period. Chaki et al. (2019) highlighted a contradictory finding: the Lok Adalat, SARFAESI Act, and DRTs facilitated recoveries when the banking sector in India experienced very high NPAs. Their study also revealed that the SARFAESI Act accounted for as much as 70% of recoveries, while DRTs managed only 26% in 2014. Additionally, research by Kumar et al. (2017a) and Kumar et al. (2017b) provided evidence that implementing the SARFAESI Act, used in conjunction with Lok Adalats and DRTs, has positively influenced the recovery of NPAs in India. Existing studies by Alamelumangai and Sudha (2019), Sahoo and Majhi (2020), and Kumar and Muralidhar (2020) highlighted a declining trend in NPA recovery, while studies by Chaki et al. (2019) Kumar et al. (2017a) and Kumar et al. (2017b) highlighted the margin improvements NPA recovery rate during their study period. Hence, to address this contradictory finding, the researcher proposes the neutral hypotheses **H<sub>5</sub>** and **H<sub>6</sub>** for measuring the trend in NPA recovery in amount and percentage.

**H<sub>5</sub>:** There is a significant trend in the amount of NPA recovered.

**H<sub>6</sub>:** There is a significant trend in the NPA recovery rate.

### **Effectiveness of NPA Recovery Mechanisms**

A study by Thakkar et al. (2023), Fatima and Ashraf (2020), Kumar et al. (2017), Hazarika (2019), Sahoo and Majhi (2020), Kumar et al. (2017a), Shaardha and Jain (2016) and Chaki et al., (2019) have identified the most important NPA recovery channels for Indian banks includes: Lok Adalats, DRTs, and SARFAESI Act. Hence, this section discusses the efficiency of these three NPA recovery channels. To begin with, a study by Sharma and Vagrecha (2022) reported that the average recovery percentage of NPAs through DRTs during their study period was just 7.4%, highlighting significant inefficacy in the recovery process, with only 9.1% of cases resolved within the desired timeframe. Shaardha and Jain (2016) conducted a study involving five public sector banks to compare the effectiveness of various methods for recovering NPAs, specifically Lok Adalats, DRTs, and the SARFAESI Act. Their findings revealed that the SARFAESI Act was significantly more effective in recovering NPAs than both Lok Adalats and DRTs from 2008 to 2014. Kumar et al. (2017) identified several factors contributing to NPAs, including deficiencies in bank credit appraisal processes and inefficiencies in the legal system. They noted a decline in recovery rates from Lok Adalats and DRTs over the years while asserting that the SARFAESI Act continues to play a vital role in the recovery of NPAs. Additionally, another study by Kumar et al. (2017a) and Kumar et al. (2017b) highlighted a statistically significant difference in the effectiveness of various recovery methods, such as Lok Adalats, DRTs, and the SARFAESI Act. This research provided evidence that implementing the SARFAESI Act, alongside the use of Lok Adalats and DRTs, has positively influenced the recovery of NPAs. Similar findings by Kumar (2017) state that DRTs, Lok Adalats, and the SARFAESI Act effectively recovered NPAs from Indian banks between 2006 and 2015. While Sahoo and Majhi (2020) found a significant difference in NPA recovery by Lok Adalats, DRTs and the SARFAESI Act, they further stated that India's overall NPA recovery mechanism is poor. Kumar and Muralidhar (2020) conducted extensive research to explore recovery management, revealing that Lok Adalats manage a significant volume of cases, which may indicate inefficiencies in the current recovery channels. Dey (2018) analysed the NPA recovery mechanism in India using three important recovery channels: Lok Adalats, DRTs and the SARFAESI Act from 2003-04 to 2016-17, and found that DRTs are better than others.

Researchers such as Shaardha and Jain (2016), Kumar (2017), Kumar et al. (2017), Kumar et al. (2017a), Kumar et al. (2017b), Dey (2018), Kumar and Muralidhar (2020), and Sahoo and Majhi (2020) identified the significant difference in NPA recovery by Lok Adalats, DRTs and SARFAESI Act NPA recovery channels. Further, Shaardha and Jain (2016), Kumar et al. (2017), Kumar et al. (2017), Kumar et al. (2017a), and Kumar et al. (2017b) supported that SARFAESI Act is better than the DRTs and Lok adalats in recovering NPAs for Indian banks during their study period. Dey (2018) argues that DRTs are better than Lok Adalats and the SARFAESI Act. Kumar and Muralidhar (2020) further argue that Lok Adalats is better than the SARFAESI Act and DRTs. To address this contradictory finding, the researcher proposes the following neutral hypotheses **H<sub>7</sub>** to **H<sub>10</sub>** to compare the efficiency of three NPA recovery channels.

**H<sub>7</sub>:** There is a significant difference in the index growth rate in the number of NPA cases referred by the SARFAESI Act, DRTs, and Lok Adalats.

**H<sub>8</sub>:** There is a significant difference in the index growth rate in the amount involved in NPA cases referred by the SARFAESI Act, DRTs, and Lok Adalats.

**H<sub>9</sub>:** There is a significant difference in the index growth rate in NPA amount recovered by the SARFAESI Act, DRTs, and Lok Adalats.

**H<sub>10</sub>:** There is a significant difference in the NPA recovery rate of the SARFAESI Act, DRTs, and Lok Adalats.

### **Understanding the Impact of NPA Recovery**

Bajaj et al. (2024) examined the determinants of NPAs and compared recovery rates and asset quality between public and private sector banks. Their research concluded an inverse relationship between collateral and recovery, particularly noting that illiquid collateral tends to yield low recovery rates. Additionally, they found

that private-sector banks outperform public ones regarding recovery. Pramahender (2022) identified several key factors contributing to the increase in bad loans in Indian banks, including inadequate recovery measures, insufficient credit and risk management systems at the bank level, wilful defaults by borrowers, a lack of stringent regulation, poor corporate governance, and the misuse of funds by borrowers. Bajaj et al. (2024) explored the interplay of idiosyncratic and systematic factors affecting the recovery rates of NPAs in India's private sector banks, adding to the comparative framework for understanding their asset recovery performance. A study by Dan et al. (2024) stated that recovery of NPAs is vital as it enhances lenders' operating cash flow, stabilises financial health, and helps mitigate macroeconomic instability. Pandey (2019) examined the high bids and low recovery rates associated with NPA auctions in India in a related investigation. Through the development of a Vector Autoregressive (VAR) model and simulations, the study concluded that the bids proposed by ARCs do not accurately reflect the recoverable value of these assets. Pandey (2019) further expressed concerns about using auction bids as indicators of fair value on banks' financial statements. The study also provides targeted recommendations to address the challenges posed by flawed auction designs. Notably, it finds that ARCs in India frequently overbid for NPA, resulting in the misrepresentation and inflation of asset values in nearly 70% of cases.

Rajput et al. (2011) underscored the necessity of managing NPAs in PSBs by stringent asset classification standards. The study posits that robust management and recovery frameworks are crucial for Indian banks to recover NPAs effectively. A study by Kaur and Saddy (2013) examines the management of NPAs in PSBs in India, evaluating the effects of asset classification norms and recovery procedures. Malepati (2013) underscores the importance of managing NPAs in PSBs by addressing asset classification norms, identifying NPAs, and provisioning against advances. Ranjini (2013) explored the NPA management strategies utilised by public and private banks, focusing on their respective recovery mechanisms. This investigation uncovered that public banks typically employed more aggressive recovery strategies, while private banks leaned towards more conservative approaches in Bangalore City.

Hazarika (2019) highlights that, despite various initiatives from the Government of India (GOI) and the RBI aimed at reducing and recovering NPAs, the results have been inadequate, reflecting ongoing challenges within the banking sector. Researchers such as Alamelumangai and Sudha (2019), along with Kumar and Muralidhar (2020), investigated the recovery of NPAs through various channels. Their findings revealed a decline in annual recoveries, highlighting the urgent need for timely and effective measures to improve recovery efforts. Meher et al. (2020) identified essential strategies for the proactive management of NPAs, emphasising the importance of raising awareness about preventive measures, pinpointing root causes, recognising early warning signals, addressing implementation challenges, advocating for policy support, and evaluating the effectiveness of preventive strategies and government intervention. Thakkar et al. (2020) proposed the establishment of an exchange market as a viable solution to manage NPAs effectively. The study concluded that developing an exchange market could significantly mitigate NPAs in India, thereby enhancing the efficiency of debt recovery legislation. Additionally, Saini (2020) explored the role of the RBI in managing NPAs, emphasising the RBI's guidelines and initiatives pertinent to this issue.

Researchers such as Rajput et al. (2011), Dan et al. (2024), Ranjini (2013), and Kaur and Saddy (2013) stated that effective NPA recovery management would assist banks in reducing the level of NPAs. Meanwhile, researchers such as Hazarika (2019), Alamelumangai and Sudha (2019), and Kumar and Muralidhar (2020) highlighted that current NPA recovery rates fail to address the level of NPAs. However, neither of these studies has practically examined the impact of NPA recovery on the level of NPAs in banks. Therefore, this research seeks to investigate the impact of NPA recovery on gross and net NPAs within the Indian banking sector. Given that many previous studies support the notion that effective NPA recovery management is likely to lower the NPA level, the current study proposes the following hypotheses, **H<sub>11</sub>** and **H<sub>12</sub>**, to assess the impact of NPA recovery on gross and net NPAs.

**H<sub>11</sub>:** NPA recovery is likely to reduce the level of gross NPAs.

**H<sub>12</sub>:** NPA recovery is likely to reduce the level of net NPAs.

## **Research Methods**

The study analyses data from all scheduled commercial banks in India, using annual figures collected from the RBI from April 1, 2003, to March 31, 2021. The SARFAESI Act 2002 was implemented in July 2002. Hence, the researchers chose the study period from 2003-04 to 2020-21, considering the data's uniformity compared to the other NPA recovery channels operating in India during this period. The researcher has used the same study period across all objectives to ensure uniformity in the present study.

Moreover, the researcher offered a compelling and detailed overview of the methodology specifically crafted to address each objective, setting the stage for the following discussion.

Firstly, the study examines gross and net NPA and NPA recovery trends. Gross NPAs denote the total value of loans and advances that a bank categorises as non-performing (Mani et al., 2023; Das, 2023; Das & Uppal, 2021). Net NPAs represent the actual burden of NPAs on a bank after accounting for provisions (Das, 2023; Das & Uppal, 2021; Gupta & Sharma, 2023; Swami et al., 2022). As per RBI guidelines, NPA recovery reduces NPAs during the year. The trend in NPAs and their recovery has been analysed using time trend analysis, employing the Ordinary Least Squares (OLS) technique. In this analysis, the time trend is an independent (dummy) variable representing the study period, while NPAs and NPA recovery are dependent variables. The study utilises absolute and percentage values of NPAs and their recovery to better understand these trends' magnitude. The absolute values of Gross NPAs, net NPAs, and NPA recovered are Rs. in crores, while ratios of gross NPAs, net NPAs, and NPA recovery rate are in percentage form calculated using Eq. (1) to Eq. (3).

$$\text{Eq. (1)} \quad \text{Gross NPA Ratio} = \frac{\text{Gross NPAs}}{\text{Total Advance}} * 100$$

$$\text{Eq. (2)} \quad \text{Net NPA Ratio} = \frac{\text{Net NPAs}}{\text{Net Advance}} * 100$$

$$\text{Eq. (3)} \quad \text{NPA Recovery Rate} = \frac{\text{Amount of NPA recovered}}{\text{Gross NPAs}} * 100$$

Eq. (4) to Eq. (9) explain the regression equation used for examining the time trends analysis for the OLS regression models 1 to 6, as shown in Table 2.

$$\text{Eq. (4)} \quad \text{Gross NPA (Rs. in crores)} = \beta_0 + \beta_1. \text{Time trend} + U_i$$

$$\text{Eq. (5)} \quad \text{Gross NPA ratio} = \beta_0 + \beta_1. \text{Time trend} + U_i$$

$$\text{Eq. (6)} \quad \text{Net NPA (Rs. in crores)} = \beta_0 + \beta_1. \text{Time trend} + U_i$$

$$\text{Eq. (7)} \quad \text{Net NPA ratio} = \beta_0 + \beta_1. \text{Time trend} + U_i$$

$$\text{Eq. (8)} \quad \text{NPA Recovered (Rs. in crores)} = \beta_0 + \beta_1. \text{Time trend} + U_i$$

$$\text{Eq. (9)} \quad \text{NPA Recovery rate} = \beta_0 + \beta_1. \text{Time trend} + U_i$$

In the equations (Eq. (4) to Eq. (9)) *Gross NPA*, *Net NPA*, and *NPA recovery* are dependent variables in absolute and percentage form.  $\beta_0$  is the constant value of dependent variables irrespective of independent variables.  $\beta_1$  is a coefficient of slope representing the change in time trend (independent variable) leading to a change in dependent variables.  $U_i$  is the error term representing the unexplained variation in the dependent variable.

The above time trend regression equations (Eq. (4) to Eq. (9)) have been tested using the hypotheses (**H<sub>1</sub>** to **H<sub>6</sub>**) in Table 2.

Secondly, this study compares NPA recovery across different NPA recovery channels. The section below shows the presence of NPA recovery channels in India.

#### **Indian NPA Recovery Mechanism consists of:**

- **The Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002.**: This Act helps banks and other financial institutions to improve asset quality in multiple ways (Parakkott, 2024; Thakkar et al., 2023; Pramahender, 2022; Fatima & Ashraf, 2020; Chaki Sunita et al., 2019a; Shaardha & Jain, 2016). The Act provides three methods for the recovery of NPAs:
  - ✓ **Firstly**, the securitisation of assets means converting less liquid financial assets into marketable securities (Goswami, 2022; Shaardha & Jain, 2016; Oyetade et al., 2020; Yamuna & Subramanian, 2019; Chaki Sunita et al., 2019a; Abdelsalam et al., 2022).
  - ✓ **Secondly**, the reconstruction of financial assets means converting a bad or non-performing asset into a performing asset by selling it to the asset's reconstruction companies (Goswami, 2022; Yamuna & Subramanian, 2019; Chaki Sunita et al., 2019a).
  - ✓ **Thirdly**, giving the power to enforce security interests to the secured creditors (banks and financial institutions) to recover the bad loans by exercising powers to take possession or sell the secured asset without the court's intervention (Parakkott, 2024; Thakkar et al., 2023; Pramahender, 2022; Shaardha & Jain, 2016; Chaki Sunita et al., 2019a).
- **One-Time Settlement (OTS)**: This scheme is a compromise settlement executed by banks or financial institutions to recover NPAs. In the OTS scheme, the borrower who defaulted proposes to settle all outstanding balances in one go, and the banks or financial institutions agree to accept a lesser amount than the original amount due (Shaardha & Jain, 2016; Kumar et al., 2017).
- **Lok Adalats**: These are the dispute redressal mechanisms, where disputes/cases pending in the court of law or at the pre-litigation stage are settled or compromised cordially. Lok Adalats help banks settle loans by compromising between bankers and defaulters of bad loans (Goswami, 2022; Thakkar et al., 2023; Fatima &

Ashraf, 2020; Chaki Sunita et al., 2019a; Hazarika, 2019; Chepuri et al., 2017; Shaardha & Jain, 2016; Baxi & Upendra, 2011; Nagaraj, 2010; Galanter & Krishan, 2004).

- **Debt Recovery Tribunal (DRTs) and Debts Recovery Appellate Tribunals (DRAT):** These were constituted under the provisions of the DRT Act to establish tribunals for speedy settlement and recovery of debts due to banks and financial institutions and related matters. DRT has also been given the authority to judge the applications filed by the borrower/mortgagor against the action of the secured creditor initiated under the Securitization and SARFAESI Act 2002 (Goswami, 2022; Visaria, 2009; Kumar et al., 2020; Fatima & Ashraf, 2020; Chaki Sunita et al., 2019a; Hazarika, 2019; Katara & Shastri, 2014; Shaardha & Jain, 2016; Thakkar et al., 2023).
- **Assets Reconstruction Companies (ARC):** ARCs purchase NPAs from banks and take action to pursue repayment from the debtors (Goswami, 2022; Kaur & Khanna, 2022; Bhagwati et al., 2017; Shaardha & Jain, 2016).
- **Corporate Debt Restructuring (CDR):** The mechanism covers only multiple banking accounts and syndication/conglomerate accounts, where all banks and institutions have an outstanding collective exposure of Rs. 10 lakhs and above. The cases of restructuring of standard and a sub-standard class of assets are covered in Category-I, whereas cases of doubtful assets are included under Category-II (Goswami, 2022; Shaardha & Jain, 2016; Okoye et al., 2020).
- **Credit Information Bureau (CIB):** Established in 2000 under the Credit Information Bureau of India Limited (CIBIL), this organisation specialises in disseminating credit information, particularly corporate credit. By analysing the consumer's information from CIBIL, banks and financial institutions can check the consumer's past behaviour and anticipate credit while making lending decisions (Shaardha & Jain, 2016; Jayadeva & Padma, 2020).
- **The Insolvency and Bankruptcy Code (IBC):** This is the bankruptcy law of India that seeks to consolidate the existing framework by creating a single law for insolvency and bankruptcy. The objective of the above code is the re-organisation and insolvency resolution of corporate, partnership, and individual persons for maximisation of the worth of assets of such persons and to promote entrepreneurship, accessibility of credit, and to balance the interests of all stakeholders (Chaki Sunita et al., 2019a; Goswami, 2022; Vidit & Ali, 2022; Baxi, 2023; Pramahender, 2022; Arora & Saurabh, 2022; Mukhopadhaya, 2020; Bose et al., 2021).

Among the various NPA recovery channels, this study selected the SARFAESI Act, DRTs, and Lok Adalat due to their significant role in recovering NPAs within the Indian banking sector. This is further supported by researchers such as Fatima and Ashraf (2020), Kumar et al. (2017), Hazarika (2019), Sahoo & Majhi (2020), Kumar et al. (2017a), Shaardha & Jain (2016), and Chaki et al. (2019). Another reason for selecting only these three NPA recovery channels is the availability of authentic data from regulators, such as the RBI. The efficiency of recovering NPAs across three channels was assessed using the nonparametric Kruskal-Wallis test due to the non-normal distribution of certain variables (see Table 3). Significant results were further analysed with the Dunn-Bonferroni post hoc test, as shown in Tables 4, 5, and 6. Both tests were conducted using SPSS, focusing on four parameters: the number of NPA cases referred, the amount of NPA involved, the amount of NPA recovered, and the NPA recovered rate by each channel. To ensure uniformity in comparability, three absolute variables were transformed into index growth rates using a base value of 100 for 2003-04. The index growth rate for 2004-05 to 2020-21 has been calculated using equations Eq. (10) to Eq. (12) for three variables: the number of NPA cases referred, the amount of NPA involved, and the amount of NPA recovered. The NPA recovery rate is the ratio of the amount of NPA recovery to the amount involved in NPA cases.

$$\text{Eq. (10) Index growth rate in Number of NPA cases referred} = \frac{\text{Current year value}}{\text{Base year value for 2003-04}} * 100$$

$$\text{Eq. (11) Index growth rate in amount involved in NPA cases} = \frac{\text{Current year value}}{\text{Base year value for 2003-04}} * 100$$

$$\text{Eq. (12) Index growth rate in amount of NPA recovered} = \frac{\text{Current year value}}{\text{Base year value for 2003-04}} * 100$$

$$\text{Eq. (13) NPA recovery rate} = \frac{\text{Amount of NPA recovered}}{\text{Amount involved in NPA cases}} * 100$$

Thirdly, the study examined the impact of NPA recovery on gross and net NPAs using equations Eq. (11) and Eq. (12) for testing hypotheses  $H_{11}$  and  $H_{12}$ .

$$\text{Eq. (11) Gross NPA ratio} = \beta_0 + \beta_1 \text{ NPA recovery} + U_i$$

$$\text{Eq. (12) Net NPA ratio} = \beta_0 + \beta_1 \text{ NPA recovery} + U_i$$

In equations (Eq. (11) and Eq. (12)), the Gross NPA ratio and the Net NPA ratio are dependent variables.  $\beta_0$  represents the constant value of the dependent variables' Gross and Net NPA ratios, irrespective of NPA recovery, which is the independent variable.  $\beta_1$  is a slope coefficient that indicates the change in NPA recovery

(the independent variable) leading to alterations in the dependent variables: Gross and Net NPA ratios.  $U_i$  denotes the error term, which reflects the unexplained variation in the dependent variables.

The  $H_{11}$  and  $H_{12}$  for Eq. (11) and Eq. (12) are tested using OLS regression models, employing E-Views software, as shown in Table 9.

## Data Analysis and Results

### Examination of trend in NPAs and their recovery

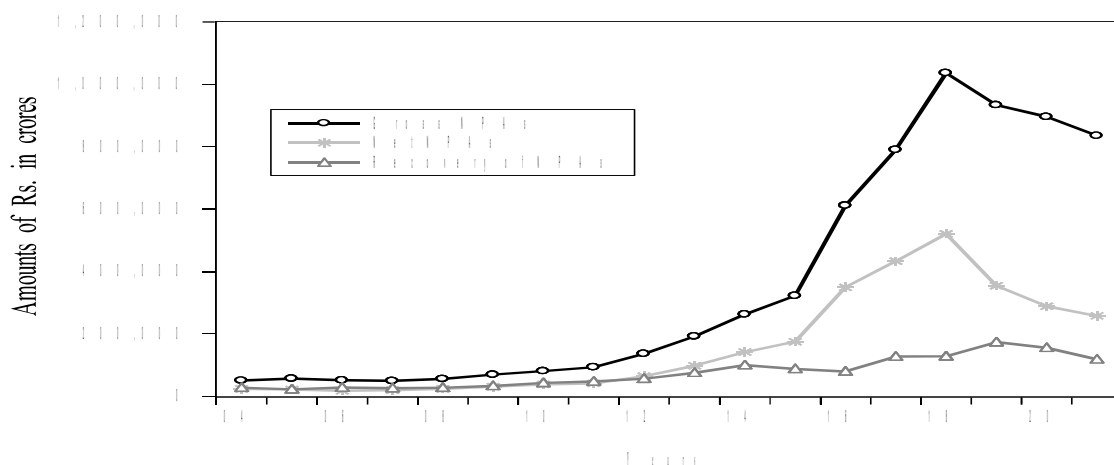
**Table No. 1: Summary statistics and Normality Test for NPA and their recovery**

Variables	Mean	Skewness	Kurtosis	Jarque-Bera Prob.
GNPA (Rs. in crores)	362887.30	0.72	1.80	0.2668
GNPA (%)	5.24	0.58	1.93	0.3908
NNPA (Rs. in crores)	161678.40	0.85	2.37	0.2892
NNPA (%)	2.39	1.07	3.07	0.1749
NPA Recovery (Rs. in crores)	75845.61	0.58	2.08	0.4392
NPA Recovery (%)	35.64	-0.28	1.44	0.3578

Source: Authors compilation

From 2003-04 to 2020-21, the average gross NPA, net NPA, and NPA recovery are Rs. 3,62,887.30 crores, Rs. 1,61,678.40 crores, and Rs. 75,845.61 crores, respectively, as per Table 1. The average gross NPA ratio is 5.24%, the net NPA ratio is 2.39%, and the NPA recovery rate is 35.64%. Positive skewness is observed for GNPA and NNPA (amount and percentage) and NPA recovery (amount), while the NPA recovery rate is negatively skewed. GNPA and NPA recovery (amount and percentage) and NNPA (amounts) have a kurtosis beta of less than 3 (platykurtic), while the NNPA ratio is mesokurtic with a beta of 3.07. Jarque-Bera probability values exceed 0.05, confirming normal distribution for all variables.

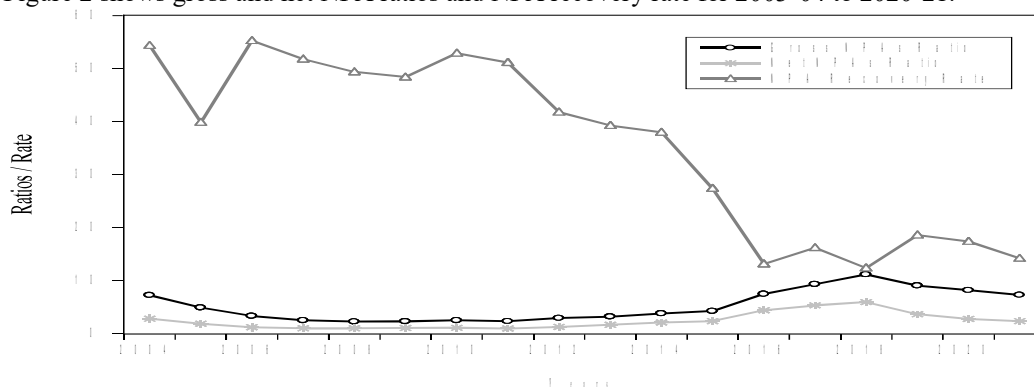
Figure 1 shows gross NPA, net NPA and NPA recovery in Rs. in crores from 2003-04 to 2020-21.



Source: Authors compilation

Figure 1 shows that gross NPA increases faster than net NPA while the recovery of NPA in amount grows slower. Gross and net NPAs have risen at a higher rate from 2014-15 to 2017-18 while NPA recovery was moderate; this can be due to various reasons such as an increase in wilful defaulters, aggressive lending practices by banks, poor recovery management practices, etc. From the financial year 2018-19 onwards, gross and net NPAs have started declining due to the combined efforts of RBI and the governments of India, which helped banks in India to write off the accumulated NPAs (Hazarika (2019)).

Figure 2 shows gross and net NPA ratios and NPA recovery rate for 2003-04 to 2020-21.



Source: Author compilation

As shown in Figure 2, the NPA recovery rate was initially higher than the gross NPA and net NPA ratios due to the introduction of a new NPA recovery mechanism, the SARFAESI Act 2002, which has helped the banks boost the NPA recovery. However, the NPA recovery rate declined while the gross and net NPA ratios increased. This can be attributed to the other NPA recovery channels' inefficiency in managing NPAs and banks' aggressive lending behaviour. This trend poses a significant concern for banks in India.

**Table No. 2: Trend in NPAs and their recovery**

Model	Hypothesis	Variables	Coefficient values	Adjusted R <sup>2</sup>	P-value	Inferences
1	H <sub>1</sub>	GNPA (Rs. in Crores)	62300.90	0.7921	<0.0001	Supported
2	H <sub>2</sub>	GNPA (%)	0.3442	0.3565	0.0053	Supported
3	H <sub>3</sub>	NNPA (Rs. in Crores)	25584.60	0.6716	<0.0001	Supported
4	H <sub>4</sub>	NNPA (%)	0.1705	0.3096	0.0097	Supported
5	H <sub>5</sub>	NPA Recovery (Rs. in Crores)	8434.97	0.8509	<0.0001	Supported
6	H <sub>6</sub>	NPA Recovery Rate (%)	-2.7291	0.7827	<0.0001	Supported

Source: Authors compilation

Table 2 shows the p-values for GNPA, NNPA, and NPA recovery (amount and percentage) are significant: H<sub>1</sub> <0.0001, H<sub>2</sub> 0.0053, H<sub>3</sub> <0.0001, H<sub>4</sub> 0.0097, H<sub>5</sub> <0.0001, H<sub>6</sub> <0.0001. All are below the 0.05 threshold, indicating a significant trend. Adjusted R<sup>2</sup> values show that time trends account for 79.21% and 35.65% of variation in GNPA in amount and percentage, 67.16% and 30.96% of variation in NNPA in amount and percentage and 85.09% and 78.27% of variations in NPA recovery in amount and rate, respectively. Positive coefficients for GNPA, NNPA, and NPA recovery in amount indicate increases of Rs. 62,300.90, Rs. 25,584.60, and Rs. 8,434.97 crores per annum, respectively. GNPA and NNPA ratios are rising by 0.3442% and 0.1705% per annum, whereas NPA recovery rates are declining by 2.7291% per annum, raising concerns for Indian scheduled commercial banks.

### Effectiveness of NPA recovery channels

**Table No. 3: Summary statistics and normality test for recovery of NPAs through selected NPA recovery channels.**

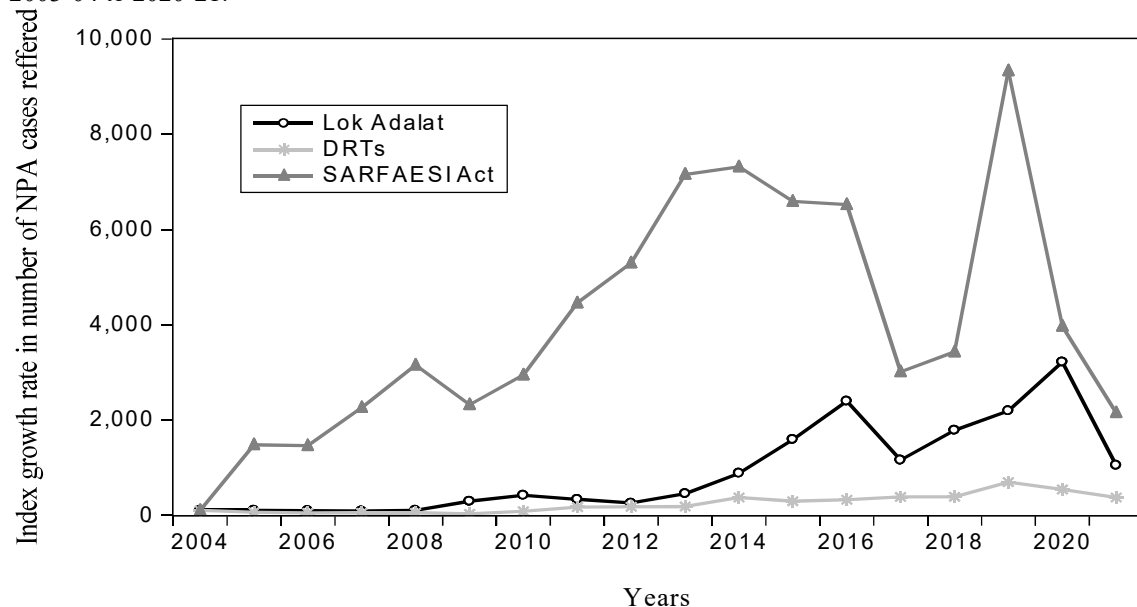
Variables	NPA Recovery Channels	Mean (Index Rate/Ratio)	Skewness	Kurtosis	Jarque-Bera Prob.
The index growth rate in the number of NPA cases referred	Lok Adalat	916.46	1.04	2.97	0.1988
	DRTs	239.68	0.75	2.73	0.4143
	SARFAESI Act	4053.51	0.51	2.35	0.5825
The index growth rate in amount Involved in NPA cases	Lok Adalat	2397.74	1.19	3.39	0.1123
	DRTs	583.98	1.48	3.81	0.0297
	SARFAESI Act	911.80	1.47	4.59	0.0154
The index growth rate in the amount of NPA Recovered	Lok Adalat	853.33	0.91	2.46	0.2599
	DRTs	270.67	1.62	5.20	0.0032
	SARFAESI Act	1364.49	1.09	3.33	0.1610
NPA Recovery rate	Lok Adalat	7.33	1.04	3.02	0.1954
	DRTs	24.53	1.35	3.75	0.0530
	SARFAESI Act	28.18	0.63	3.56	0.4886

Source: Authors compilation

The SARFAESI Act stands out, demonstrating the highest average index growth rate for NPA cases at 4053.51, as shown in Table 3. This is a significant finding, especially when compared to Lok Adalats at 916.46 and DRTs at 239.68. Regarding monetary recovery, Lok Adalats led with an index growth rate of 2397.74, while the SARFAESI Act followed at 911.80 and DRTs at 583.98. The SARFAESI Act also excels in index growth rate for NPA amount recovered at 1364.49, followed by Lok Adalats at 853.33, and DRTs at 270.67. Furthermore, the SARFAESI Act accounts for the highest NPA recovery rate at 28.18%, compared to DRTs at 24.53% and Lok Adalats at 7.33%.

The skewness beta for all the variables is positive, indicating that each variable is positively skewed. Our kurtosis analysis reveals that some variables exhibit leptokurtic distributions (with kurtosis beta values less than 3), while others show a platykurtic distribution (with kurtosis beta values greater than 3). The Jarque-Bera test further highlights normality, revealing probabilities below 0.05 for DRTs and the SARFAESI Act concerning the monetary amounts involved and recovered from NPAs, indicating non-normal distributions. This finding is crucial as it suggests employing non-parametric tests to compare NPA recovery among the selected channels. Consequently, the researcher utilised the Kruskal-Wallis (non-parametric) test to assess differences in NPA recovery across the three channels, as illustrated in Table 4. Graphical analysis of the recovery of NPAs by NPA recovery channels is shown in Figures 3 to 6.

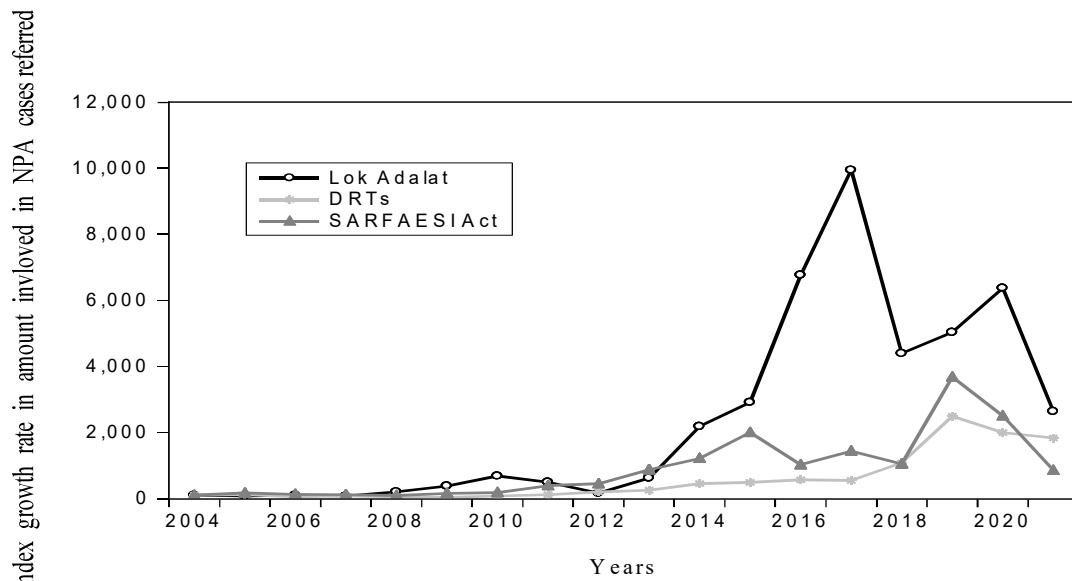
Figure 3 shows the indexed growth rate in a number of NPA cases referred by NPA recovery channels from 2003-04 to 2020-21.



Source: Authors compilation

The SARFAESI Act has the highest index growth rate in the number of NPA cases referred, followed by Lok Adalats, while DRTs show the lowest growth rate, as depicted in Figure 3. Since its introduction, the SARFAESI Act has attracted more NPA cases from banks than Lok Adalats and DRTs, as it has three different mechanisms to recover NPAs and allows secured creditors to recover debts without court intervention.

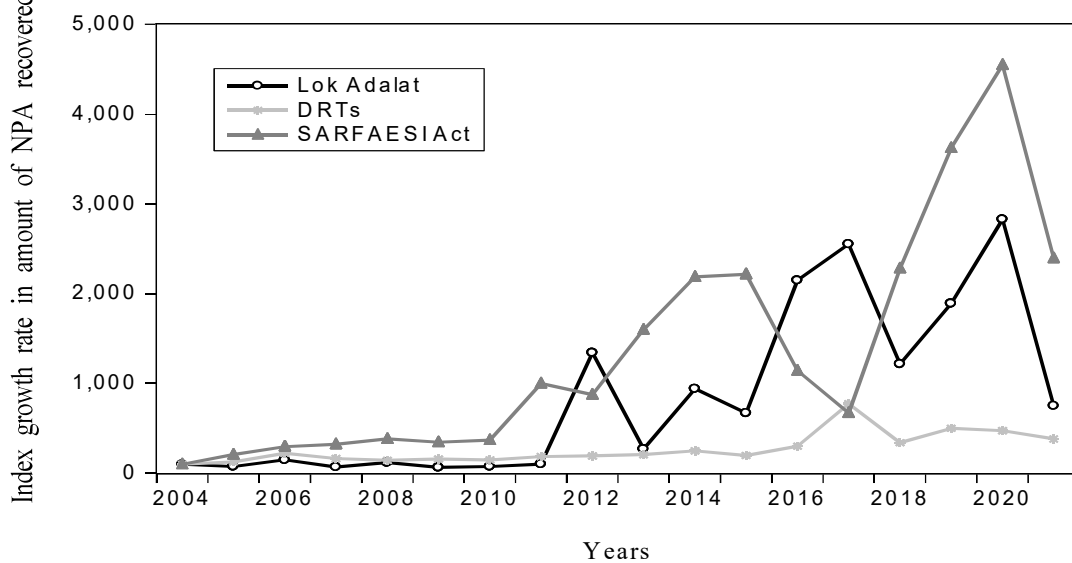
Figure 4: Shows the index growth rate in amount involved in NPA cases referred by NPA recovery channels for 2003-04 to 2020-21.



Source: authors compilation

Figure 4 shows that Lok Adalats have exhibited the highest growth rate in the amount involved in NPA cases referred, followed by the SARFAESI Act, with DRTs showing the lowest.

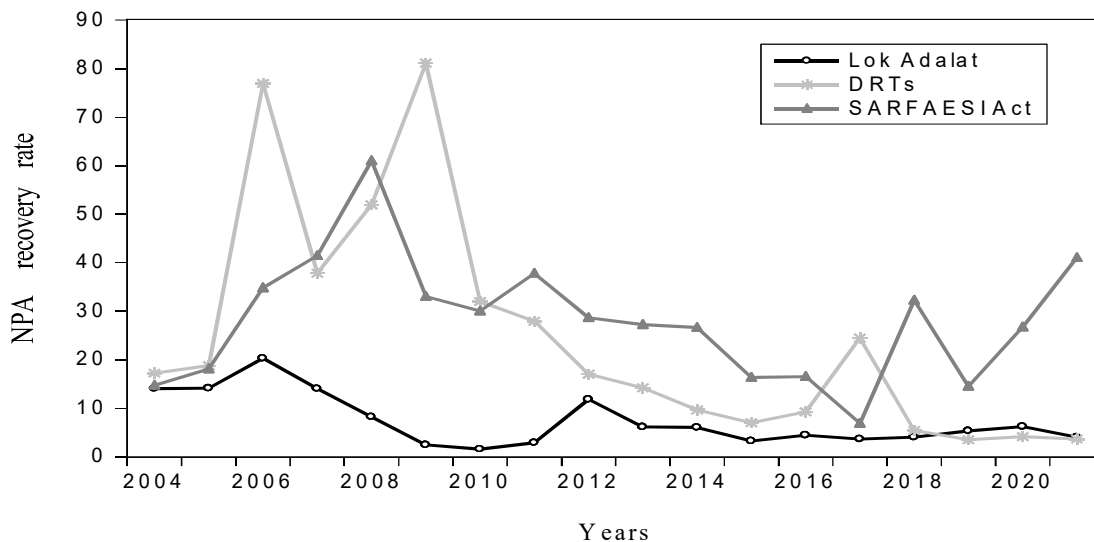
Figure 5 shows the index growth rate in the amount of NPA recovered through channels from 2003-04 to 2020-21.



Source: Authors compilation

Figure 5 confirms that the SARFAESI Act had the highest index growth rate in the amount of NPA recovered, followed by Lo a adalats and the lowest by DRTs.

Figure 6: Shows the NPA recovery rate by NPA recovery channels for 2003-04 to 2020-21.



Source: Authors compilation

Figure 6 depicts that the SARFAESI Act achieves the highest average growth rate in recovering NPA, followed by DRTs and the lowest for Lok adults.

**Table No. 4: Kruskal-Wallis Test showing comparison of NPA recovered by NPA recovery channels**

Hypothesis	NPA Recovery Parameters	NPA Recovery Channels	Mean Rank	Sig. Value	Inferences
<b>H<sub>7</sub></b>	The index growth rate in the number of NPA cases referred	Lok Adalat	24.78	<0.001	Supported
		DRTs	14.78		
		SARFAESI Act	42.94		
<b>H<sub>8</sub></b>	The index growth rate in amount involved in NPA cases	Lok Adalat	32.72	0.082	Not supported
		DRTs	21.17		
		SARFAESI Act	28.61		
<b>H<sub>9</sub></b>	The index growth rate in the amount of NPA recovered	Lok Adalat	25.44	0.006	Supported
		DRTs	20.39		
		SARFAESI Act	36.67		
<b>H<sub>10</sub></b>	NPA Recovery Rate	Lok Adalat	13.86	<0.001	Supported
		DRTs	30.08		
		SARFAESI Act	38.56		

Source: Authors compilation

The Kruskal-Wallis test findings highlighted significant differences in NPA cases referred, amounts recovered, and recovery rate by Lok Adalats, DRTs, and the SARFAESI Act. Key significance values for hypotheses **H<sub>7</sub>** (<0.0001), **H<sub>9</sub>** (0.006), and **H<sub>10</sub>** (<0.001) are well below the 0.05 threshold, indicating strong statistical significance. For the index growth rate of NPA cases referred, the SARFAESI Act has the highest mean rank (42.92), followed by Lok Adalats (24.78) and DRTs (14.78), indicating its superior effectiveness. Regarding the amount recovered, SARFAESI Act also leads with a mean rank of 36.67, compared to Lok Adalats (25.44) and DRTs (20.39). Similarly, for the NPA recovery rate, the SARFAESI Act ranks highest at 38.56, with DRTs at 30.08 and Lok Adalats at 13.86.

The Dunn-Bonferroni post hoc test further analysed significant outcomes from the Kruskal-Wallis test for **H<sub>7</sub>**, **H<sub>9</sub>**, and **H<sub>10</sub>**, with additional results in Tables 5 to 7 using sub-hypotheses, as shown below. Sub-hypotheses **H<sub>7a</sub>**, **H<sub>7b</sub>**, and **H<sub>7c</sub>** are used for the main hypothesis **H<sub>7</sub>**. Sub-hypotheses **H<sub>9a</sub>**, **H<sub>9b</sub>**, and **H<sub>9c</sub>** test the main hypothesis **H<sub>9</sub>** and sub-hypotheses **H<sub>10a</sub>**, **H<sub>10b</sub>**, and **H<sub>10c</sub>** further test the main hypothesis **H<sub>10</sub>**.

**H<sub>7a</sub>**: The index growth rate in the number of NPA cases referred by Lok Adalats and DRTs differ significantly.

**H<sub>7b</sub>**: The index growth rate in the number of NPA cases referred by the SARFAESI Act and Lok Adalats differ significantly.

**H<sub>7c</sub>**: The index growth rate in the number of NPA cases referred by the SARFAESI Act and DRTs differ significantly.

**H<sub>9a</sub>**: The index growth rate in the amount of NPA recovered by Lok Adalats and DRTs differ significantly.

**H<sub>9b</sub>**: The index growth rate in the amount of NPA recovered by the SARFAESI Act and Lok Adalats differ significantly.

**H<sub>9c</sub>**: The index growth rate in the amount of NPA recovered by the SARFAESI Act and DRTs differ significantly.

**H<sub>10a</sub>**: A significant difference exists in the NPA recovered rate of Lok Adalats and DRTs.

**H<sub>10b</sub>**: A significant difference exists in the NPA recovered rate of the SARFAESI Act and Lok Adalats.

**H<sub>10c</sub>**: A significant difference exists in the NPA recovered rate of the SARFAESI Act and DRTs.

Table 5 shows the output of the Dunn-Bonferroni post hoc test to compare the index growth rate in the number of NPA cases referred by NPA recovery channels.

Hypotheses	Channels compared	Mean Rank Diff.	Sig. Value	Inferences
<b>H<sub>7a</sub></b>	Lok Adalats with DRTs	10.00	0.170	Not supported
<b>H<sub>7b</sub></b>	SARFAESI Act with Lok Adalats	18.16	<0.001	Supported
<b>H<sub>7c</sub></b>	SARFAESI Act with DRTs	28.16	0.001	Supported

Source: Authors compilation

The significance values for **H<sub>7b</sub>** and **H<sub>7c</sub>** are <0.001 and 0.001, respectively, supporting these hypotheses, as indicated in Table 5. The average mean rank difference for the number of NPA cases referred by the SARFAESI Act with Lok Adalat is 18.16, and the SARFAESI Act with DRTs is 28.16, respectively. This data demonstrates a significant difference in the number of NPA cases referred by the SARFAESI Act compared to DRTs and Lok Adalats, suggesting that the SARFAESI Act has referred more NPA cases than the other two channels. In contrast, the significance value of 0.170 for **H<sub>7a</sub>** indicates a failure to support this hypothesis, signifying no significant difference in the number of NPA cases referred by DRTs and Lok Adalats.

Table 6 shows the results of the Dunn-Bonferroni post hoc test to compare the index growth rate in the amount of NPA recovered by NPA recovery channels.

Hypotheses	Channels compared	Mean Rank Diff.	Sig. Value	Inferences
<b>H<sub>9a</sub></b>	Lok Adalats with DRTs	5.05	0.335	Not Supported
<b>H<sub>9b</sub></b>	SARFAESI Act with Lok Adalats	11.23	0.002	Supported
<b>H<sub>9c</sub></b>	SARFAESI Act with DRTs	16.28	0.032	Supported

Source: Authors compilation

Table 6 highlights a significant difference in the amount of NPA recovered between the SARFAESI Act and Lok adalats (**H<sub>9b</sub>**) and the SARFAESI Act and DRTs (**H<sub>9c</sub>**), as the significance values for them are 0.002 and 0.032, respectively. The SARFAESI Act has recovered more NPA than Lok adalats and DRTs, confirmed by the positive mean rank difference of 11.23 for **H<sub>9b</sub>** and 16.28 for **H<sub>9c</sub>**, as shown in Table 6. In contrast, there is no significant difference in the amount of NPA recovered by Lok adalats and DRTs, as the study failed to support hypothesis **H<sub>9a</sub>** because its significance value of 0.335 is above the acceptance limit.

Table No. 7 shows the results of the Dunn-Bonferroni post hoc test to compare the NPA recovery rate of NPA recovery channels.

Hypotheses	Channels compared	Mean Rank Diff.	Sig. Value	Inferences
<b>H<sub>10a</sub></b>	Lok Adalats with DRTs	-16.22	0.002	Supported
<b>H<sub>10b</sub></b>	SARFAESI Act with Lok Adalats	24.7	0.0001	Supported
<b>H<sub>10c</sub></b>	SARFAESI Act with DRTs	8.48	0.1060	Not supported

Source: Authors compilation

There is a significant difference in the NPA recovery rate of Lok adalats compared with DRTs and the SARFAESI Act compared with Lok Adalats, confirmed by the significance values of 0.002 for **H<sub>10a</sub>** and 0.001 for **H<sub>10b</sub>** shown in Table 7. The NPA recovery rate of Lok adalats is lower than that of the DRTs, as it has a negative mean rank value of -16.22 for **H<sub>10a</sub>**. The SARFAESI Act has a higher NPA recovery rate than Lok adalats, as shown by the positive mean rank difference of 24.7 for **H<sub>10b</sub>**. A mean rank difference of 8.48 between the SARFAESI Act and DRTs shows that the SARFAESI Act has a higher NPA recovery rate than DRTs. However, this difference is not statistically significant as **H<sub>10c</sub>** has a significance value of 0.1060, above the acceptable limit.

#### Impact of NPA recovery on gross and net NPA.

Researchers have tested the output of simple regression models 7 and 8 (see Table 9) for robustness using the Breusch-Godfrey Serial Correlation LM Test to check the presence of serial correlation among error terms and the ARCH Heteroskedasticity Test to check the presence of heteroskedasticity among error terms, as shown in Table 8.

**Table No. 8 shows the results of the Breusch-Godfrey Serial Correlation LM Test and ARCH Heteroskedasticity Test.**

Variables	Breusch-Godfrey Serial Correlation LM Test (Prob. Chi-square Values)	ARCH Heteroskedasticity Test (Prob. Chi-square Values)
Gross NPA ratio	0.2963	0.4528
Net NPA ratio	0.1870	0.5247

Source: Authors compilation

As per Table 8, the probability Chi-square values for the Breusch-Godfrey Serial Correlation LM test for gross NPA and net NPA are 0.2963 and 0.1870, respectively, indicating that the error term for both the variables is free from the problem of serial positive or negative correlation. The probability chi-square values for the ARCH Heteroskedasticity test for gross NPA are 0.4528, and net NPA is 0.5247, respectively, indicating that both the variables have equal variance in error term over the period. The error term is homoscedastic; hence, there is no problem with heteroskedasticity. After determining the robustness of the regression models 7 and 8 (see Table 8), researchers used the regression output to estimate the impact, as shown in Table 9 below.

**Table No. 9 shows the regression output measuring the effect of NPA recovery on the gross and net NPA ratios.**

Model	Hypothesis	Dependent Variables	Coefficient Values	Adjusted R2	P-values	Inferences
7	H <sub>11</sub>	Gross NPA ratio	-0.1464	0.6467	0.0001	Supported
8	H <sub>12</sub>	Net NPA ratio	-0.0760	0.6290	0.0001	Supported

Source: Authors compilation

As shown in Table 9, the P-values for gross and net NPA are 0.0001 (H<sub>11</sub>) and 0.0001 (H<sub>12</sub>), respectively, indicating that NPA recovery significantly impacts both. The gross and net NPA coefficient values of -0.1464 and -0.0760 signify that NPA recovery significantly helps reduce the gross and net NPA ratio. If the NPA recovery rate for the Indian banks increases by 1%, then the generation of gross and net NPAs will decrease by 0.1464% and 0.0760%, respectively.

### Conclusion and Discussions

The present study elucidates a significant trend in NPAs, demonstrating both positive gross and net NPAs in both absolute and percentage terms. This finding aligns with previous studies by Malepati (2013), Fatima and Ashraf (2020), Kankipati and Murty (2019), Sharma et al. (2019), and Pandey and Trivedi (2020), who have emphasised the increasing trend in NPAs.

While there is an observable increase in absolute terms regarding NPA recovery, it is imperative to acknowledge the declining rate, which raises substantial concerns for the banking sector in India. This finding is consistent with earlier studies by Alamelumangai and Sudha (2019), Sahoo and Majhi (2020), and Kumar and Muralidhar (2020), all of which emphasised the declining NPA rate.

Within the framework of NPA recovery mechanisms, the SARFAESI Act emerges as the most efficacious channel, evidenced by superior performance in terms of the volume of cases referred, total amounts recovered, and the highest NPA recovery rates relative to Lok Adalats and DRTs. Supporting evidence for this assertion is found in the works of Fatima and Ashraf (2020), Kumar (2017), Shaardha and Jain (2016), Chaki et al. (2019), Kumar et al. (2017), and Kumar et al. (2017a) but contradicting with the work of Dey (2018) who found that NPA recovery through DRTs is better than the SARFAESI Act and Lok Adalats.

Notably, while Lok Adalats surpassed DRTs regarding the number of cases referred and the total recovery amounts, they demonstrated lower NPA recovery rates. This finding is consistent with the research of Sahoo and Majhi (2020), who indicated that Lok Adalats outperform DRTs while contradicting the conclusions of Sharma and Vagrecha (2022), which suggest that DRTs are ineffective in recovering NPAs. Additionally, notable researchers such as Kumar et al. (2017), Dan et al. (2024), Pramahender (2022), Rajput et al. (2011), Pandey (2019), Kumar et al. (2017b) and Thakkar et al. (2020) have expressed apprehensions regarding the efficacy of current NPA recovery channels. They advocate for enhancements in the efficiency of existing mechanisms and the exploration of new avenues.

Furthermore, the study highlighted the negative impact of the NPA recovery rate on both gross and net NPA ratios. This suggests that an increase in the NPA recovery rate will likely reduce the gross and net NPA ratios, indicating that the recovery rate adversely influences these ratios. This emphasises the critical importance of efficient NPA recovery channels in mitigating NPAs within the Indian banking landscape.

**Managerial Implications**

The rise in gross and net NPAs poses a significant concern for banks in India. This has led policymakers and bank management to consider more assertive strategies for managing NPAs within the Indian banking sector. The increasing trend in the amount of NPAs recovered, alongside the declining trend in the NPA recovery rate, draws policymakers' attention to the need to enhance the efficiency of the NPA recovery mechanism in India.

The SARFAESI Act is more efficient in recovering NPAs than other NPA recovery mechanisms in India. In light of these, policymakers urgently need to enhance the effectiveness of existing NPA recovery channels, particularly in conjunction with the SARFAESI Act. Such improvements are essential for assisting banks and financial institutions in reducing current NPAs and preventing the future accumulation of additional NPAs. Policymakers in India and worldwide should prioritise legislation like the SARFAESI Act to strengthen NPA recovery efforts and create a more stable and prosperous banking sector.

An increase in NPA recovery has been shown to reduce the level of NPAs in the Indian banking sector. This encourages policymakers and bank management to enhance NPA recovery rates, thereby improving the asset quality of Indian banks.

**Future Scope**

Future research could further assess the effectiveness of NPA recovery strategies across different banks and banking groups, emphasising the importance of continuous improvement and innovation in this field. Additionally, future studies may explore the use of machine learning and AI in managing NPA recovery for Indian banks.

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