Economic Sciences
https://economic-sciences.com
ES (2026) 22, 1(S), 87-99 | ISSN:1505-4683

Impact of Banking Frauds on Asset Quality and Profitability: An Empirical Study of Indian Scheduled Banks

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Abstract *Banking sector plays a vital role in the growth of an economy and as it extends credit facilities, unfortunately, the probability of misappropriation of funds, diversion of funds is always associated. Credit fraud has been increasingly common in India in recent years and post- liberalization the periodicity, nature and the associated loss due to frauds has also been increased and consequently raises the concern of financial regulators. Apart from eroding customer confidence, frauds pose a number of challenges for the financial system, including reputational risk, operational risk, and business risk. The aim of this study is to review and analyze current trend of frauds in the Indian banking sector, as well as its impact on the continuous rise in the non-performing assets. Moreover, the study aims to bring insight on the impact of GNPAs on the profitability of the banking sector in India. Secondary data of 33 banks covering all public sector and private sector Indian scheduled banks is collected and examined for a period of 17 years i.e., from the year 2005 to 2021, by using linear regression analysis in conjunction with descriptive analysis using SPSS. The study shows that the number of frauds affecting the Indian banking sector have been significantly increasing in recent years, leading to an increase in non-performing assets (GNPAs) and Gross Non-Performing Assets depicts a negative impact on the banking sector's profitability. By keeping in view the recently unearthed scam of ABG Shipyard Limited, worth crore of rupees and to restore the Indian banks' credibility, concerned authorities to take tough action and find new ways to prevent and reduce frauds.*

Keywords: *Gross Non-Performing Assets, Fraud, Profitability, Indian scheduled banks*

1. INTRODUCTION

The financial sector is crucial for a nation's economic development. However, as lending is one of its primary functions, there is always a risk of fund misappropriation by the borrower. Banks face numerous financial and non-financial risks when conducting financial transactions, such as credit risk, interest rate risk, foreign exchange rate risk, liquidity risk, reputational risk, and operational risk. Fraud, an operational risk, creates credit risk for banks and reduces available funds for lending, ultimately affecting the economy. Financial fraud has been increasingly common in India in recent years, especially corporate frauds, and following the liberalization period, the frequency, nature, and related expenses of banking fraud have also risen, raising the concern of financial regulators. As per the Reserve Bank of India, fraud refers to "an action or failure to act that aims to provide unjust advantages to one individual while causing unjust harm to another, either through the withholding of information or by other means." Kautilya, in his famous book Artha Shastra, describes forty ways of misappropriation, some of which are: "what is acknowledged sooner is recorded later; what is acknowledged later is recorded sooner; what should be acknowledged remains unacknowledged; what is difficult to acknowledge is presented as acknowledged; what is gathered is depicted as not gathered; what hasn't been gathered is portrayed as gathered; what is partially gathered is recorded as fully gathered; what is fully gathered is recorded as partially gathered; what is gathered belongs to one category, while what is recorded belongs to another." [6][8]

As per the data collected from the Reserve Bank of India, in the last seventeen years (from 2005 to 2021), fraud related to banking advances was reported at nearly Rs. 4,88,534 crore for a total of 40,080 accounts, out of which Rs. 3,18,965 crore was reported alone in the last two years (2020 and 2021) for only 8,109 accounts, which shows that

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ES (2026) 22, 1(S), 87-99 | ISSN:1505-4683

these two recent years constitute approximately 65% of the reported fraud amount in advances against approximately 20% of the accounts in the last seventeen years, which is an alarming situation. However, during the financial year 2020–21, the reported number of cases of fraud declined as compared to the financial year 2019–20.

A growing trend of non-performing assets (GNPAs) in the banking sector has been observed, which is significantly affecting its profitability. Volatile non-performing assets (GNPAs) have been associated with various factors, including global and domestic economic conditions and recessions. However, there is also a connection between fraud and GNPAs. The recent cases of banking frauds like IL&FS Tamil Nadu Power Company (Rs.148 crore), ABG Shipyard Limited (₹22,848 crore), Syndicate Bank Scam (₹1,000 crore), ICICI Videocon scandal (₹1,875 crore), Rotomac Pens fraud (₹3,695 crore), PMC scandal (₹4,355 crore), Kingfisher fraud (₹10,000 crore), and Nirav Modi PNB fraud (₹14,000 crore) act as the primary impetus for me to conduct this study in the context of the Indian financial sector and analyze frauds from several perspectives. Though it's not feasible for banks to operate in a completely fraud-free setting, implementing prevention strategies like evaluating the risks associated with their operations and policies can assist them in reducing the likelihood of losses caused by fraud. As stated by Shri S. S. Mundra, Deputy Governor of RBI, "Foster a culture of constant vigilance, robust internal control, and adherence to compliance. Keep in mind that fraud is a criminal act."

1.1 Research Objectives

The main goals of this research are as follows:

- To investigate and evaluate the existing trends of fraud within India's banking industry.
- To examine the impact of fraud on the increasing levels of non-performing assets (GNPAs) within the Indian banks.
- To assess how the Gross Non-Performing Assets Ratio (GNPAR) influences the profitability of the banking sector in India.

1.2 Hypotheses of the Study

1) **The impact of fraud on the rise of non-performing assets in the Indian banking sector.**

1) H0: Fraud in Indian banks does not have a significant impact on GNPAs.

2) H1: Fraud in Indian banks has a significant impact on GNPAs.

2) **The impact of GNPAs on the profitability of the Indian banking industry.**

1) H0: The profitability of the Indian banks is unaffected by GNPA.

2) H1: The profitability of the Indian banks is affected by GNPA.

1.3 Contribution

In this paper, we fill the gap of missing empirical evidence through linear regression analysis to validate the significant, multi-step impact (Fraud→ GNPA→ Profitability) within the Indian scheduled banking system

2. LITERATURE REVIEW

Rani et al. (2019) found that as banks' functionality increases, the number of frauds increases exponentially. This study aims to examine the frequency of bank fraud and its effects on bank performance, specifically focusing on how scams affect Punjab National Bank. The research relied on secondary data from multiple reliable sources and examined them using various statistical techniques, including T-tests, ratios, and percentages, which revealed a trend of increasing fraud. According to the findings, the number of financial fraud incidents has been steadily increasing, primarily in public sector institutions [14]. Singh et al. (2016) examined the increase in nonperforming assets (GNPAs) in various scheduled commercial banks, especially in public-sector banks, over recent years. This study aims to address problems such as banking fraud and rising credit card debt through a comprehensive evaluation using secondary data (a literature review and case method), along with an interview-based approach that involves all parties involved in disclosing financial misconduct [20]. Bhasin (2015) conducted a questionnaire-based study of 345 bank workers in 2012–13 to understand their views on bank fraud and to evaluate the factors that affect their level of adherence. Research found that employees were overworked, that there was a lack of internal monitoring mechanisms, and that compliance levels among bank managers, officers, and clerks were low [3].

Pan (2020) conducted a study on banking fraud to understand and analyze the fundamental reasons for the rising incidence of fraud in the Indian banking sector, by examining the current financial challenges arising from scams and fraudulent activities. The document discusses the increase in non-performing assets (GNPAs) in Indian scheduled commercial banks during the period from 2017–18 to 2018–19 [13].

Taiwa and colleagues (2016) conducted an empirical investigation into the increase of bank fraud in Nigeria to assess the scale of the issue and its underlying causes, to find the main types of fraud currently afflicting the business of the Nigerian banking industry; furthermore, to identify the impact of fraud on deposit mobilization and to propose remedies to the problems that have been found. An econometric model was employed in the research, along with a multiple regression method and an augmented Dickey-Fuller unit root test, utilizing annual secondary time series data from 2002 to 2014. The research indicated that fraud-related losses impact the bank's equity capital, negatively affecting its financial health and restricting its ability to offer credit for profitable ventures. Sharma and Sharma (2018) conducted a study using secondary data to identify trends and increases in fraud within the banking sector. Additionally, the research explored the roles of employees and customers in banking fraud, specifically in the Indian banking industry. The findings indicated that fraud is not merely a rare event; it is a persistent issue [18].

Offiong et al. (2016) analyzed secondary data utilizing two models, where bank deposits mobilized served as the dependent variable, and a model based on the ordinary least squares (OLS) method, after conducting pre-tests with the Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, to investigate banking system fraud, its underlying causes, and potential strategies for mitigation in Nigeria, covering a period of 19 years from 1994 to 2013. The study was performed using regression analysis and the generated descriptive statistics. The study found that, to achieve long-term success in the fight against Nigerian financial sector fraud, robust interdisciplinary collaboration, public awareness, and cross-border coordination are required [12]. Thangam and Bhavin (2019) studied multiple instances of bank fraud that were reported to the CBI and resulted in adjudicated by the court between 2015 and 2017 by considering the different types of frauds in Indian banks and also disclosed the legal recourse by the investigation agency [23].

3. RESEARCH GAP

- ✓ No comprehensive and quantitative research is done on the relationship between fraud, GNPAs and profitability by using broad and consistent sample of Indian scheduled banks over a long-term period.
- ✓ The available literature primarily uses non-performing asset (GNPA) as dependent variable and no research is available by using other profitability indicators such as return on assets (ROA).

4. MAJOR RECENT BANKING FRAUDS

1) **ABG Shipyard Limited Scam** (the largest fraudulent case in the history of banking in India, a scam valued at Rs. 22,842 crore): The Gujarat-based ABG Shipyard Limited, which was formerly a major player in shipbuilding and ship repair, has been accused of defrauding 28 banks (consortium headed by SBI) amounting to Rs. 22,842 crore. SBI and ICICI Bank, both considered "too big to fail," have exposures of Rs. 2,925 crore and Rs. 7,089 crore, respectively, while IDBI, BOB, and PNB Bank were the other major lenders, with exposures of Rs. 3,639 crore, Rs.1,614 crore, and Rs.1,244 crore, respectively. Following an examination of ABG SL's annual reports and records for the fiscal year 2014–15, it seems that ABG SL has redirected some funds and paid accommodation deposits of Rs.83 crore to its potentially related entities, such as Aries Management Services and Gold Croft Properties, prior to the financial year under review (in 2007–08). In March 2014, an attempt was made to restructure the loan. The restructuring was unsuccessful, leading to the account being classified as GNPA in July 2016, with the categorization being retroactive to November 30, 2013.

2) **ICICI Videocon Scam (scam worth Rs.1,875 crore):** The ICICI Bank has approved a total of Rs.1,225 crore in "high-value" loans to various Videocon Group companies, named Millennium Appliances India Ltd., Videocon International Electronics Ltd., and Videocon

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ES (2026) 22, 1(S), 87-99 | ISSN:1505-4683

Industries. Out of these loans, Videocon Industries allocated Rs.64 crore to Nupower Renewables, an enterprise overseen by Deepak Kochhar. Another three high-value loans, worth Rs.650 crore, were sanctioned to three companies—Sky Appliances Ltd., Techno Electronics Ltd., and Applicomp India Ltd. — to reimburse unsecured loans they had availed from Videocon Industries. Most of these loans were found to directly violate banking regulations and ICICI Bank standards. Venugopal Dhoot, the MD of the Videocon group, and Chanda Kochhar, the head of ICICI Bank, along with her spouse, Deepak Kochhar, faced allegations of misappropriation of funds and of breaching the loan-sanctioning process in 2012**.**

3) **Nirav Modi PNB Scam (over Rs.14,000 crore**): Brady House, Mumbai branch of Punjab National Bank, issued approximately 1,213 fake letters of undertaking without any cash margin as a guarantee. A letter of undertaking was provided for the import of pearls for a duration of one year, which can be granted for a maximum of 90 days from the date of shipment, in accordance with the regulations set by the Reserve Bank of India. These transactions were not entered into the bank's core banking system, as they were performed via the SWIFT network by the accused bank employees.

4) **Kingfisher Scam (Exceeding Rs.10,000 crore):** Vijaya Mallya faces allegations of failing to repay loans taken from over a dozen Indian banks totalling Rs.10,000 crore after his airline, Kingfisher Airlines Ltd., collapsed in 2013.

5) **Rotomac Pens Scam (Worth Rs.3,695 crore**): The bank loan worth Rs.2,919 crore, approved for a specific export order, was redirected to another offshore business, and the money was eventually sent back to the Kanpur-based company without the export order being executed. Rotomac Global Private Limited, along with its promoter, Vikram Kothari, defrauded a group of banks for Rs.3,695 crore, comprising interest, by diverting the loan funds intended for the purchase of wheat and other goods for export.

5. RESEARCH METHODOLOGY

a. Dataset Creation

We consider secondary data collected from different government sources. The research uses information collected from the RBI website (https://www.rbi.org.in/), dbie-RBI website (https://dbie.rbi.org.in/), and various publications of the Reserve Bank of India, financial stability reports of RBI, and trend and progress of banking reports issued by RBI, for a period of 17 years (2005-2021). Secondary data of 33 banks covering all public sector and private sector Indian scheduled banks is collected and examined. The primary reason for selecting these 33 banks and the 17-year period was the availability of reliable and consistent data from the Reserve Bank of India (RBI). Besides it, the year 2005 is marked as the year of adoption of enhanced core banking solutions (CBS) and regulatory frameworks to improve management information system (MIS), payments, clearing and settlement mechanisms in Indian banks and RBI maintains data since this year in its repository. After elimination of the incomplete samples with missing values, our dataset has 561 sample data items for 33 banks for the period of 17 years. Each data items have 4 financial parameters. In this paper, we use X1-X4 to label the financial parameters. The description of these financial parameters is given in table 1.

Table 1: Financial parameters considered under our study

Label	Financial Parameters	Notation	Indicated as	Description
X1	Return on Assets	ROA	Dependent variable	Net Income to Total Assets Ratio (%)
X2	Gross Non-Performing Assets	GNPA		Total Non- performing loans and advances
X3	Gross Non-Performing Assets Ratio	GNPAR	Independent variable	Total GNPA to Total Advances Ratio (%)
X4	Fraud Amount	FA		Frauds related to advances (₹1 lakh and above)

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ES (2026) 22, 1(S), 87-99 | ISSN:1505-4683

Our research explores the fundamental indicators of banking performance and risk management, mentioned in table 1, specifically focusing on the relationship between profitability and asset quality. We assess Return on Assets (ROA) as an important metric for evaluating the increase or decrease in a bank's profits relative to balance sheet growth [4], alongside the impact of Gross Non-Performing Assets (GNPA), which defined as loans or advances that: (i) remains unpaid for over 90 days, in case of a term loan, and (ii) classified as out of order, in case of an overdraft or cash credit [15], [17]. To extend our assessment range, we also include the Gross Non-Performing Assets Ratio (GNPAR) ratio as a measure of overall credit quality of the company, and the amount declared by individual banks as fraud to RBI. These financial parameters are contextualized within the broader framework of institutional risk by incorporating the Reserve Bank of India's definition of fraud, which identifies deceptive actions or omissions intended to create unjust advantages.

b. Statistical Tools

- To test the hypotheses and to establish a statistically significant relationship between the variables linear regression analysis is performed.
- To summarize and characterize the basic features of the data set for the 17-year period (2005–2021) descriptive statistics using Statistical Package for the Social Sciences (SPSS) software is used.

iii. Assumptions of Linear Regression

For the validity of its statistical results, the paper relies on the standard assumptions inherent to Ordinary Least Squares (OLS) Linear Regression. Data in the dataset is assumed to fulfill the properties of linearity, independence, homoscedasticity, normality and implicit (no multicollinearity). It is assumed that there is a linear relationship exists between the independent and dependent variables (linearity), and the observations related to data

The reliability and validity of this study are established through a rigorous data selection process and robust statistical outcomes.

Reliability is ensured by the consistency and authority of the dataset, which spans a 17-year period (2005–2021). This extensive time-series approach minimizes short-term fluctuations, while the use of data from the Reserve Bank of India

c. Research Design and Model

In this paper, we used a quantitative research model and statistically analyzed the secondary data of 33 Indian scheduled banks to establish a significant relationship between key variables such as GNPA, fraud and profitability in the Indian banking sector. Under this study, our research design is analytical and explanatory in nature, focusing on two primary relationships using linear regression analysis. In the present research two main models are being tested and can further be expressed as simple linear regression equations.

i. Impact of Fraud on GNPAs (Model 1)

This model tests the hypothesis that amount of fraud significantly impacts Gross Non-Performing Assets (GNPAs).

$GNPA = \beta_0 + \beta_1 (FA) + \varepsilon$

- Here, Gross NPA (Non-Performing Assets) is dependent variable.
- FA (Fraud Amount) is independent variable.

ii. Impact of GNPA on Profitability (Model 2)

This model tests the hypothesis that GNPA significantly impact the profitability of bank.

$ROA = \gamma_0 + \gamma_1 (GNPAR) + \mu$

- Here, ROA (Return on Assets) is dependent variable.
- GNPAR (Total GNPA to Total Advances Ratio (%)) is independent variable.

points for each year and for individual banks are independent of each other (independence). It is also assumed that the error terms (ε and μ) are normally distributed (normality), and the variance of the error terms is constant across all levels of the independent variables (homoscedasticity). We assume that the independent variables are highly uncorrelated or not correlated and employed simple linear regression in both the models.

d. Reliability and Validity

(RBI)—the nation's official regulatory body—guarantees institutional credibility and data integrity.

Furthermore, the paper maintains high validity through its methodological choices. Statistical conclusion validity is evidenced by the highly significant results of the linear regression analyses, where Model 1 (FA → GNPA) and Model 2 (GNPAR → ROA) yielded p-values of less than

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0.005 and 0.001, respectively. Lesser p-value indicates higher significance. Complementing this, constructive validity is achieved by utilizing standardized financial indicators: Return on Assets (ROA) is employed as a definitive measure of profitability, while the GNPAR (Total GNPA to Total Advances Ratio) serves as a critical parameter for evaluating asset quality and portfolio risk, which is mentioned in established banking literature. The paper validates its main hypotheses on the basis of its significant statistical evidences resulted from the regression models.

e. Input Dataset Analysis

Table 2 and Figure 1 show the counts of fraud and their amounts over 17 years, from 2005 to 2021. It is evident that the total amount of money lost to scams has significantly increased, even as the number of fraud cases has decreased.

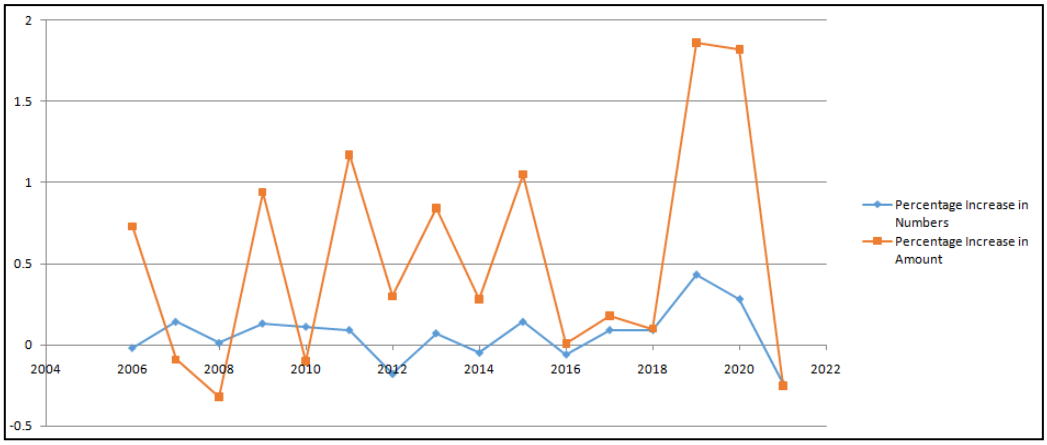

Figure 1: Percentage increase in the number of fraud accounts and fraud amount.

Source: Compilation of the author, based on data collected from the RBI.

The largest number and amount of fraud were observed in 2020. Since 2005, the amount involved in fraud related to advances has approximately increased 203 times in the year ending 2021.

Table 2: Frauds related to advances in Indian scheduled commercial banks (₹1 lakh and above)

Year (ending 31st march)	No. of Fraud accounts	Percentage increase in number	Amount (in crore)	Percentage increase in amount
2005	1564	--	672	--
2006	1525	-0.02	1162	0.73
2007	1734	0.14	1055	-0.09
2008	1750	0.01	721	-0.32
2009	1977	0.13	1402	0.94
2010	2190	0.11	1263	-0.10
2011	2382	0.09	2740	1.17
2012	1953	-0.18	3552	0.30
2013	2087	0.07	6530	0.84
2014	1985	-0.05	8334	0.28
2015	2256	0.14	17123	1.05
2016	2120	-0.06	17367	0.01
2017	2320	0.09	20556	0.18
2018	2525	0.09	22558	0.10
2019	3603	0.43	64534	1.86
2020	4608	0.28	181942	1.82
2021	3501	-0.24	137023	-0.25

Source: RBI report on trend and progress of banking in India, 2020-2021

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ES (2026) 22, 1(S), 87-99 | ISSN:1505-4683

A comparison of GNPA and gross advances is shown in Table 3. Gross NPAs have consistently increased over time, reaching a peak in 2018, accompanied by a comparable increase in advances, and then declining. The ratio of Gross Non-Performing Assets to Total Advances has been rising over time, with the highest percentage in 2018, followed by a decrease since then.

Table 3: Total Advances and Gross NPA of Indian Scheduled Commercial Banks

Year (ending 31st March)	Gross Advances (in crore)	Gross NPA (in crore)	Ratio of Gross NPA to Total Advances (%)
2005	1075518	57181.54	5.32
2006	1419249	49169.25	3.46
2007	1854898	48223.70	2.60
2008	2315803	53449.73	2.31
2009	2834539	61883.69	2.18
2010	3333460	77567.23	2.33
2011	4101977	92904.47	2.26
2012	4843710	136606.73	2.82
2013	5616093	186076.22	3.31
2014	6444071	252816.12	3.92
2015	7060561	312574.15	4.43
2016	7532916	596142.04	7.91
2017	7776707	777941.50	10.00
2018	8360103	1024936.50	12.26
2019	9219995	923144.66	10.01
2020	9783266	887885.13	9.08
2021	10288050	816756.53	7.94

Source: RBI

Figure 2 shows that the amount of non-performing assets of public sector banks (PSBs) exceeds that of private sector banks (PVBs) [20]. PSBs can reduce their GNPAs by implementing the RBI's credit risk management guidance. Moreover, several eligible credit accounts are being restructured by lenders in line with the COVID-19 relief measures, as announced by the Reserve Bank of India in the "Resolution Framework – 1.0 and 2.0". The impact of these temporary measures on banks' financial stability is not immediately evident and can only be fully understood after a period of time has elapsed.

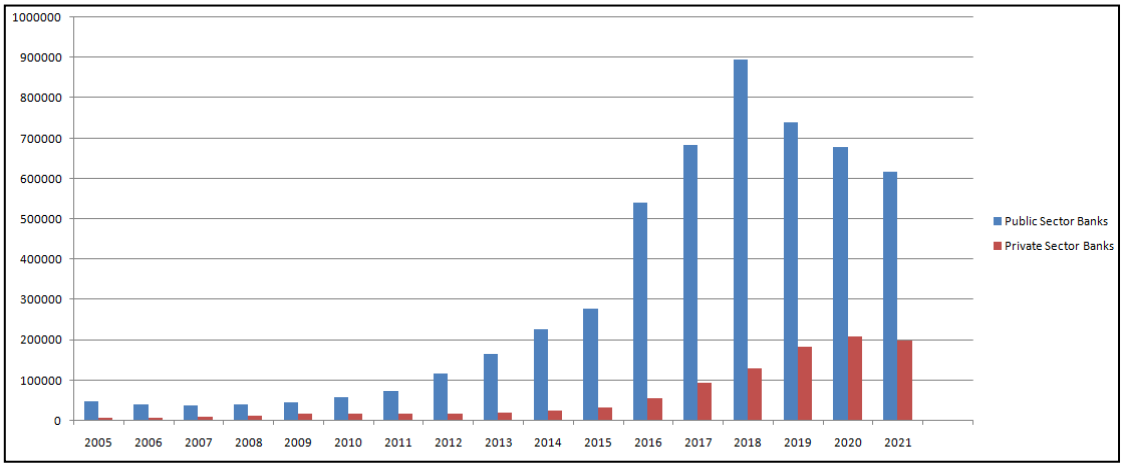

Figure 2: GNPA of Indian PSBs and PVBs

Source: Author's compilation

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f. Fraud-to-GNPA Data Analysis

Figure 3 demonstrates the rising trend of fraud in advances and its sharply increasing share in the non-performing assets of Indian banks.

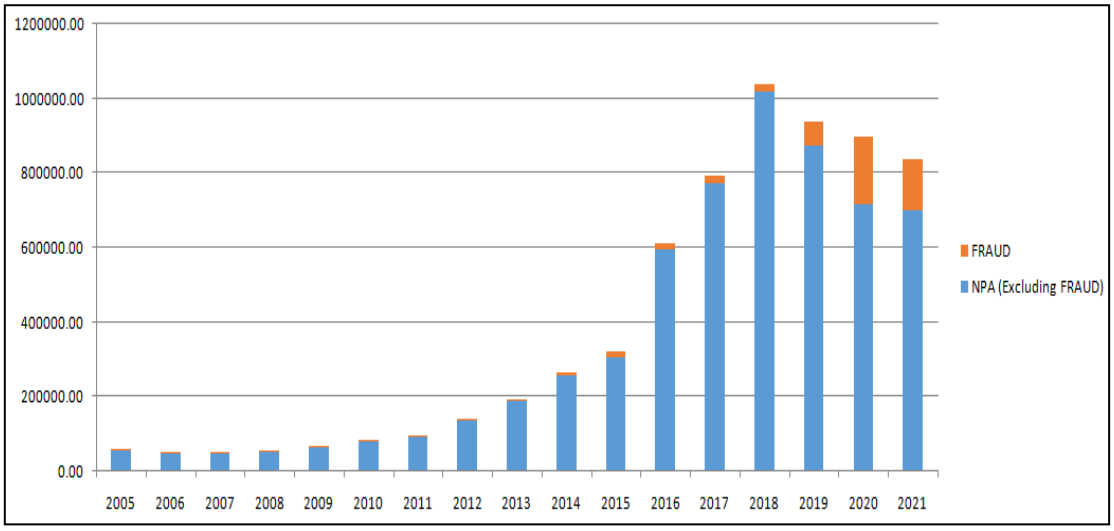

Figure 3: Rising trend of fraud in advances and subsequently in GNPA
Source: Author's compilation

The net profit of banks under study shows positive growth since the year 2005 to 2013, as evident from table 4 and figure 4, but after the year 2015 it started decreasing and attained even negative growth for three consecutive years, i.e., in 2018, 2019 and 2020, followed by a remarkable growth in the year 2021, but the amount involved in fraud kept on increasing and reached its pinnacle in the year 2020. It is evident from Figure 5 that public sector commercial banks (PSBs) are incurring a decline in net profit over the three consecutive years mentioned above, while private sector commercial banks (PVBs) are showing positive growth.

Table 4: Year-wise Net profit and fraud amount in advances of Indian Scheduled commercial Banks

Year (ending 31st March)	Net Profit (in crore)	Fraud Amount (in crore)
2005	18975.81	672
2006	21513.18	1162
2007	26617.44	1055
2008	36113.64	721
2009	45240.2	1402
2010	52368.32	1263
2011	62612.38	2740
2012	72231.84	3552
2013	79578.16	6530
2014	70772.96	8334
2015	76274.63	17123
2016	23320.69	17367
2017	30815.32	20556
2018	-43587.2	22558
2019	-38987	64534
2020	-6903.63	181942
2021	101294.6	137023

Source: RBI

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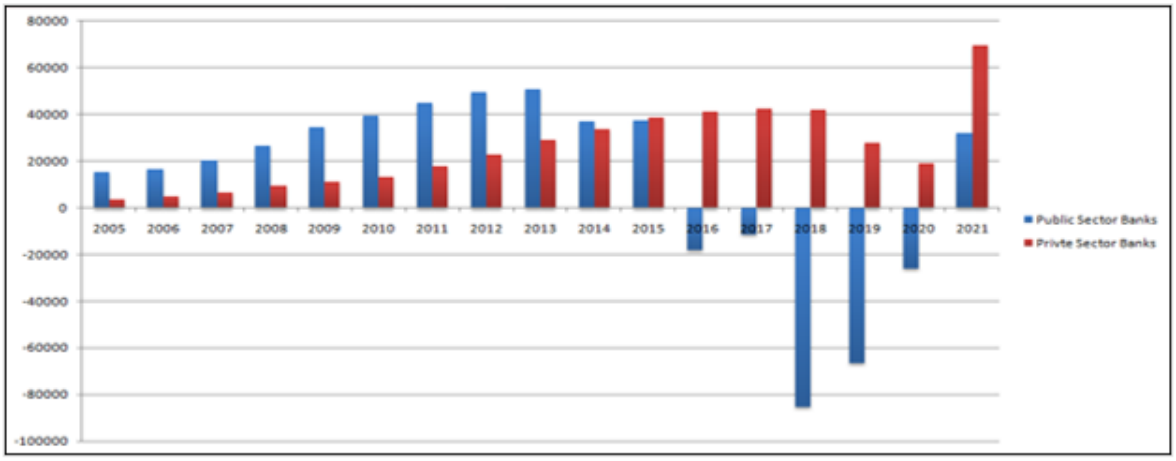

Figure 5: Net profit of Indian PSBs and PVBs

Source: Author's compilation

1) Linear Regression Analysis

The influence of fraud on the rise of GNPAs in the Indian scheduled commercial banks is illustrated in Table 5.

Table 5: Summary of findings in Linear Regression

Hypothesis	Regression Coefficient's Weight	Beta Factor	R Square	F	P value	Hypothesis Validated
H1	FA → GNPA	4.863	.460	12.80	.003	Yes

Note: *p<0.005, FA: Fraud Amount, GNPA: Gross Non-Performing Assets

Linear regression analysis is performed with the amount involved in fraud as the explanatory variable and GNPAs as the outcome variable (Table 5). The hypothesis tests whether the amount of fraud (FA) in advances has a significant impact on GNPA. To evaluate hypothesis H1, the outcome variable GNPA was analyzed with the predictor variable FA. Fraud amount significantly predicted GNPA, f(1, 15) = 12.80, p < 0.005, indicating that the fraud amount significantly increases GNPA (b = 4.863, p < 0.005). The positive beta factor suggests that an increase in fraud will lead to higher GNPAs. Moreover, R-square = 0.460 demonstrates that 46% of the change in GNPA is accounted for by the fraud amount in advances. Therefore, the null hypothesis is rejected, and the analysis found that the level of fraud in advances has a notable impact on non-performing assets in Indian commercial scheduled banks.

2) Descriptive Analysis

The descriptive analysis in Table 6 shows that, on average, fraud and GNPA amount to Rs.28,737.29 crore and Rs.3,73,838.77 crore, respectively, in banks in a year.

Table 6: Summary of findings of Descriptive Analysis

	N Statistic	Minimum Statistic	Maximum Statistic	Mean		Std. Deviation Statistic
				Statistic	Std. Error	
GROSS NPA	17	48223.70	1024936.50	373838.7759	89670.7563	369721.9999
FRAUD AMOUNT	17	672.00	181942.00	28737.2941	12670.7636	52242.8968
Valid N (list wise)	17					

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g. GNPAR-to-ROA Analysis

Figure 6 shows that the provision for GNPA as a percentage of total provision is very high, indicating that the banks under study have a large amount of non-performing assets, and that appropriating a provision for them reduces the banks' profits proportionately.

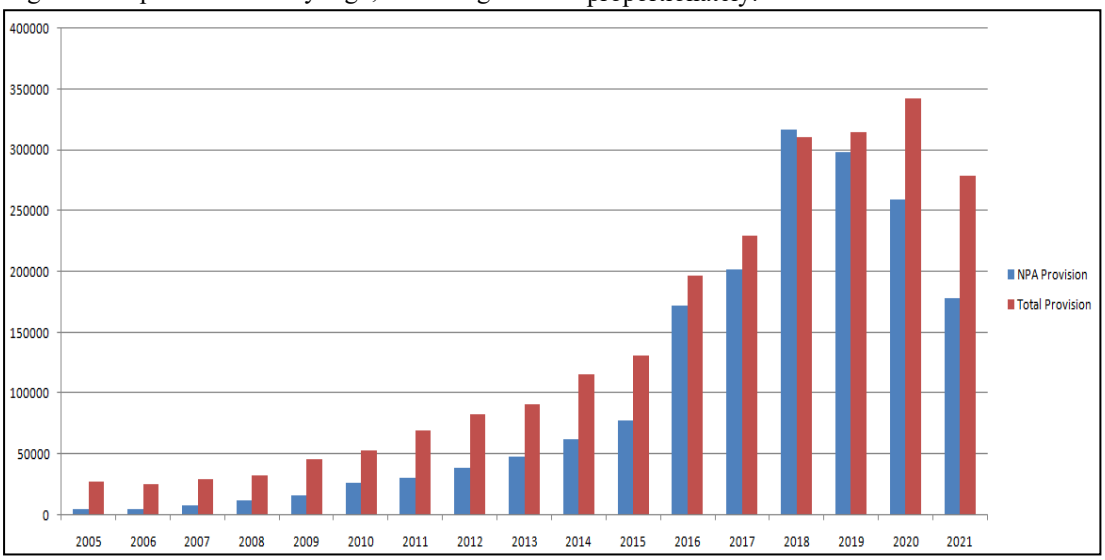

Figure 6: Provision of Indian public Scheduled Banks and private Scheduled Commercial Banks.

Source: Author's compilation

According to stress tests conducted by the Reserve Bank of India, shown in figure 7, the Gross Non-Performing Asset (GNPA) ratio for all Scheduled Commercial Banks (SCBs) could rise to 8.1 percent by September 2022 in a baseline scenario, and to 9.5 percent in the event of severe stress. Among the bank categories, the gross non-performing asset (GNPA) ratio for public sector banks was 8.8 percent in September 2021 and could worsen to 10.5 percent by September 2022 under a baseline scenario. For private sector banks, the percentage of bad loans may increase from 4.6 percent to 5 percent.

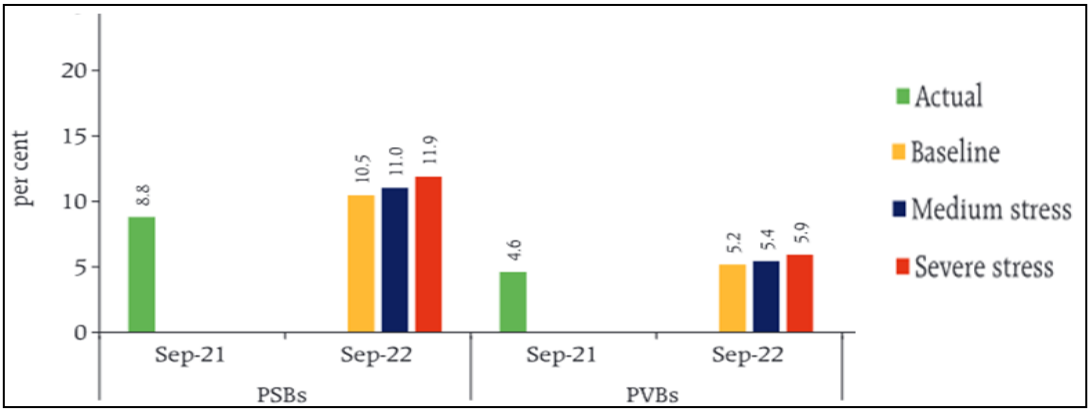

Figure 7: Projection of SCBs' GNPA Ratios

Source: Financial Stability Report 2021, RBI

1) Linear Regression Analysis

A linear regression analysis is conducted with the ratio of Gross Non-Performing Assets Ratio (GNPA) to total advances as the independent variable and return on assets (ROA) as the dependent variable, as shown in Table 7.

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ES (2026) 22, 1(S), 87-99 | ISSN:1505-4683

Table 7: Summary of findings in linear regression

Hypothesis	Regression Coefficient's Weight	Beta Factor	R Square	F	P value	Hypothesis Validated
H2	GNPAR → ROA	-.313	.346	331.262	<.001	Yes

Note: *p<0.001, ROA: Return on Assets, GNPAR: Total GNPA Total advances ratio

The hypothesis tests whether the GNPA-to-total advance ratio has a significant impact on ROA. To evaluate hypothesis H2, the dependent variable ROA was analyzed with respect to the predictor variable GNPAR. The ratio of total GNPA to total advances significantly predicted ROA, f (1, 625) = 331.26, p < 0.001, indicating that total GNPA plays a significant role in decreasing ROA (b = -0.313, p < 0.001). The negative coefficient indicates that an increase in total GNPA will decrease ROA. Moreover, R square = 0.346 suggests that the 34% change in ROA is accounted for by total GNPA alone. Therefore, the null hypothesis is rejected, and the analysis concludes that the total GNPA-to-total advances ratio has a significant impact on ROA.

2) Descriptive Analysis

The descriptive analysis in Table 8 shows that banks are earning an average return on assets of 0.52%. The proportion of Gross Non-Performing Assets Ratio (GNPA) to total advances reveals that, on average, the banks have 2.38% of their total advances classified as GNPA.

Table 8: Summary of findings in Descriptive Analysis

	N Statistic	Minimum Statistic	Maximum Statistic	Mean		Std. Deviation Statistic
				Statistic	Std. Error	
ROA	627	-20.35	4.46	.5248	.05419	1.35685
GROSS NPA TO GROSS ADVANCES RATIO	627	.00	16.89	2.3807	.10187	2.55081
Valid N (list wise)	627					

6. RESULT AND ANALYSIS

In the Indian banking sector, fraud is substantially leading to an increase in non-performing assets (NPAs), which plays a crucial role in affecting profitability, significantly contributing to its decline. A major portion of fraud is constituted by advances alone, which a cause of concern for banks because one of their primary businesses is lending, so they need to strengthen their credit risk management policies.

The proportion of gross non-performing assets to total loans shows a clear upward trend between 2005 and 2008. There was an increasing trend from 2009 to 2010 and again from 2012 to 2018, with its peak percentage increase of 12.26% in 2018. Since 2018, the percentage of gross non-performing assets to total advances has been declining. Still, in the year ending March 2021, the percentage rise is approximately double that of the year ending March 2014, indicating that NPA is increasing at a higher rate than advances. The profitability of banks has shown rising growth from 2005 to 2013. Still, the years 2018 and 2019 have shown negative growth, followed by very little growth in 2020, with approximately half the profit compared to 2005, despite having nine times the total advances. However, in 2021, the profit showed a respectable figure.

7. CONCLUSION

Frauds not only impose significant financial strains on banks but also lead to a notable decrease in funds available for additional lending, which impacts the economy as a whole. It might not be feasible for banks to operate in an environment completely devoid of fraud. To prevent credit fraud effectively, they need to improve their tools and focus on proactive strategies by carefully following loan policy guidelines, creating efficient policies and practices, establishing strict compliance protocols, upholding strong ethical principles, enhancing their surveillance features, and taking prompt and severe legal actions against offenders within a set timeframe to reduce the financial losses resulting from fraud. Over the past few years, in the wake of liberalization, there has been a rise in the

occurrence, nature, and associated costs of banking fraud in India, raising concerns not only for banks but also for financial regulators. The advances have grown significantly in the years under study, but have also been accompanied by a corresponding rise in fraud and GNPAs, which have drastically affected the profitability of the Indian banking sector. Financial institutions and relevant authorities need to implement strict measures and explore innovative strategies to prevent and mitigate fraud and non-performing assets (NPAs).

During the COVID-19 pandemic, actions like suspending loan repayments, pausing asset classification, restructuring loans, and restricting dividend payouts helped alleviate stress while enabling banks to keep lending to profitable sectors. Nevertheless, the effects of these temporary measures on banks' financial well-being are not immediately clear and will only be fully understood after a period has elapsed.

8. Policy Implications of the Study

The paper has significant implications for policy makers and executors. RBI is policy maker and regulator of banking sector. Our research provides empirical evidence to justify stricter supervisory and punitive policies by RBI. The research findings compel the policy makers to prioritize the monitoring of asset quality and mitigation of credit fraud, as it is shown to have a strong statistical influence on the overall health of the banking system.

Our paper has established that preventing fraud, by bank management, is essential for its profitability. These findings provide justification to bank management for investing in anti-fraud technology, personnel training, and strengthening internal audit and vigilance departments. It highlights the critical need for robust credit risk management strategy to prevent fraud from crystallizing into NPAs.

9. Limitations of the Study and Future Research Scope

The research was conducted using a sample of banks, both public and private, covering the period from 2005 to 2021. While foreign banks and payment banks are classified as scheduled commercial banks, reliable data for foreign banks was not accessible, and the needed information for payment banks has been available only since 2018. As a result, these banks were excluded from the study. The influence of fraud on gross non-performing assets (GNPAs) and the subsequent effect of GNPAs on profitability could be analyzed in the future if data from all scheduled banks in India become available over an extended time frame.

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Appendix: Banks considered for study.

Sr. No.	Name of bank	Sector	Sr. No.	Name of bank	Category
1	Bank of Baroda	Public	18	Federal Bank Limited	Private
2	Bank of India	Public	19	HDFC Bank Limited	Private
3	Bank of Maharashtra	Public	20	ICICI Bank Limited	Private
4	Canara Bank	Public	21	IDBI Bank Limited	Private
5	Central Bank of India	Public	22	IDFC First Bank Limited	Private
6	Indian Bank	Public	23	Indusind Bank Limited	Private
7	Indian Overseas Bank	Public	24	Jammu & Kashmir Bank Limited	Private
8	Punjab and Sind Bank	Public	25	Karnataka Bank Limited	Private
9	Punjab National Bank	Public	26	Karur Vysya Bank Limited	Private
10	State Bank of India	Public	27	Kotak Mahindra Bank Limited	Private
11	United Commercial Bank Lmited	Public	28	Nainital Bank Limited	Private
12	Union Bank of India	Public	29	Ratnakar Bank Limited	Private
13	Axis Bank Limited	Private	30	South Indian Bank Limited	Private
14	Bandhan Bank Limited	Private	31	Tamilnad Mercantile Bank Limited	Private
15	City Union Bank Limited	Private	32	The Dhanalakshmi Bank Limited	Private
16	Catholic Syrian Bank Limited	Private	33	Yes Bank Limited	Private
17	Development Co- operative Bank Limited	Private			