ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul1812

NPAs and Profitability in Indian Private Sector Banks: Evidence from a Panel Study

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Publication Date: 2025/08/04

Abstract: The increasing percentage of non-performing advances and loans in India's banking sector has become an inevitable challenging problem for banks in the current environment, as it can negatively impact their money-making capacity and eventually lead to a decline in their profitability. Profitability can be significantly affected by non-performing advances, but there are some other factors as well that can affect profitability. Therefore, the aim of this study is to empirically investigate the relationship between non-performing assets (NPAs) and profitability by explicitly evaluating the potential determinants of bank profitability. Every pertinent data and fact utilized in this article was sourced from the "Capitaline-2000 Database" and the Reserve Bank of India's official website. It is entirely built on secondary sources. The analysis utilizes a dataset from all 21 Indian private sector commercial banks, spanning the period from April 1, 2014, to March 31, 2024. Static panel regression was used in the study to determine the factors influencing the profitability of Indian private sector commercial banks. The ratio of net NPA to net advances is used as an independent variable to represent non-performing assets (NPAs), while ROA is treated as a dependent variable to show bank profitability. Moreover, apart from non-performing assets (NPAs), several other bank-specific factors have also been used to assess their impact on bank profitability. These include total deposits, the ratio of net interest income to total income, net interest margin, the ratio of operating costs to total interest income, capital adequacy (Tier 1), and two macroeconomic variables: the annual inflation rate and the annual economic growth rate. Since non-performing assets (NPAs) have a detrimental effect on a bank's profitability, the study's conclusions indicate that banks ought to lower these assets in order to improve their profitability.

Keywords: *Indian Private Sector Banks, NPAs, Panel Regression, ROA, GDP Growth Rate, Inflation.*

How to Cite: Dr. Rajashree Upadhyay; Dr. Mahesh Kumar Kurmi (2025) NPAs and Profitability in Indian Private Sector Banks: Evidence from a Panel Study. *International Journal of Innovative Science and Research Technology*, 10(7), 2813-2819. https://doi.org/10.38124/ijisrt/25jul1812

I. INTRODUCTION

Over the past few decades, private banks' contribution to the growth of the Indian economy has been gradually expanding. The emergence and growth of private banks in the early 1990s, following the liberalization of the Indian economy, gave the Indian banking sector a new dimension. India's economy has benefited immensely from private banks' strategic efforts and range of cutting-edge financial services. Because they provide a wide range of financial services, encourage competition, and promote innovation in the banking industry, private sector banks in India are playing a vital role in the country's economy. Additionally, they are contributing significantly to financial inclusion by offering specialized financial solutions and expanding their clientele through technology.

However, stress in the retail and MSME sectors, excessive exposure to risky loan segments, and the impact of loan moratoriums have led to a rise in non-performing assets (NPAs) of many private banks in the post-COVID period. Non-performing assets (NPAs) are bank loans and advances that give the lender no earnings since the borrower has failed to repay principal and interest for at least 90 days. Banks mostly make money from interest on loans. Revenue is immediately impacted when a loan becomes non-performing since the bank no longer records interest income on it. Banks are required to set aside a percentage of their revenue as provisions for non-performing assets (NPAs). Consequently, an increase in NPAs raises the overall amount of provisions. As the amount of provisions increases, net worth and capital adequacy begin to decline, restricting the bank's ability to lend and further impacting income.

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul1812

Rising NPAs in private banks are leading to rising provisioning, which is directly reducing the profitability of private banks. The profitability of private banks is undoubtedly impacted by non-performing assets (NPAs). However, the question at hand is whether NPAs are the only factor influencing private bank profitability or if there are other factors as well. Theoretically, the answer is that, in addition to NPAs, there are other factors that may have an impact on a private bank's profitability. The net interest margin (NIM), operational costs, loan growth and credit demand, asset quality, provisioning requirements, capital adequacy, and regulatory compliance, and other macroeconomic factors all have an impact on the profitability of private banks.

Therefore, this study explicitly aims to empirically investigate the relationship between non-performing assets (NPAs) and profitability by evaluating the potential factors of a private bank's profitability. Nonetheless, the following is the structure of this paper: In Part 2, a literature review that is available in this pitch provides an overview of previous research; in Part 3, the study's goals are examined; in Part 4, the hypothesis is investigated; in Part 5, the methodology is described; in Part 6, the findings and their interpretation are highlighted; and in the final section, the research conclusion is discussed.

II. SURVEY OF EXISTING LITERATURE

Non-performing assets (NPAs) have been a persistent issue in the banking industry in India, particularly for private sector banks. Non-performing assets (NPAs) are deemed unhealthy for a bank because they are loans that are not being repaid by the borrower, meaning the bank is not receiving any income from the money. This has a major effect on the bank's profitability, limits its ability to lend, and may even cause financial instability if the volume of NPAs rises too high. Consequently, an evolutionary system incorporating income recognition, asset classification, and bad loan provisioning was proposed in the 1991 Narasimham Committee Report. Notwithstanding these steps, non-performing assets (NPAs) remain a significant issue that has an impact on the banking sector's profitability. Nonetheless, the majority of earlier research that looked at the connection between bank profitability and non-performing assets (NPAs) came to the conclusion that NPAs impair bank profitability. However, before initiating this empirical investigation, it would seem appropriate to do a brief but thorough review of the literature on this vital topic.

A comparative study of the nonperforming assets of a few Indian public and private sector banks, as well as their impact on profitability, was conducted by **Biplab Kumar Dey (2013).** They discovered that the ratios of sixteen banks' net and gross non-performing assets differed significantly. Lastly, the analysis comes to the conclusion that NPAs significantly affect the profitability of banks.

In a study, **Jayakkodi and Rengarajan (2016)** analyzed trends in the ratio of non-performing assets (NPAs) across selected public and private sector banks in India, and explored the association between profitability—measured by Return on Assets (ROA)—and gross NPAs (GNPA). The researchers sourced data from the annual reports of eight major Indian banks: State Bank of India, Punjab National Bank, Bank of Baroda, Bank of India (public sector), as well as ICICI Bank, HDFC Bank, Axis Bank, and Federal Bank (private sector). Covering five fiscal years from 2010-11 to 2014-15, their analysis employed correlation methods and evaluated multiple indicators: Gross NPA Ratio, Net NPA Ratio, Depositor Safety Ratio, Shareholders Risk Ratio, and ROA. They argued that asset quality is fundamental to financial stability—while Gross NPA provides an overview of the credit's health, Net NPA captures the bank's true exposure. Their findings revealed that private sector banks demonstrated greater efficiency than public sector counterparts in managing the impact of NPAs on profitability.

In another study, Kumari et al. (2017) investigated whether non-performing assets and the financial performance (ROA) of certain public and private banks were connected. They got their data from secondary sources like bank websites, annual reports, journals, magazines, and newspapers. They chose five banks from both public and private sectors using judgmental sampling. They used a panel data regression model to study how non-performing assets affected banks' financial performance from 2013 to 2017. The study found that GNPA has a strong and positive effect on the financial performance of the Indian banking sector. Both NNPA and GNPA also affect the sector's financial performance. The study concluded that non-performing assets have a negative and significant effect on banks' financial performance. This research builds on earlier studies on non-performing assets and suggests that both public and private banks should focus on GNPA and NNPA because they affect the financial performance of both banking sectors.

Bapat (2018) looked into what affects the profits of Indian banks, both public and private. The goal was to find out which factors like macroeconomic, industry, and bank-specific ones have an influence on profitability. The study included 42 commercial banks from 2006–07 to 2012–13. First, they checked bank-specific factors such as ROA, ROE, non-performing loans, other income to operating income ratio, cost to income ratio, and CD Ratio. Then they looked at macroeconomic factors like GDP growth, inflation, and financial crises, and banking sector factors like ownership structure and bank size. Using a dynamic panel model to analyze the relationship between the independent variables (bank-specific, sector-specific, and macro-economic) and the dependent variables (ROA and ROE), it was found that non-performing assets (NPAs) had a negative effect on bank profitability.

Brahmaiah (2018) tried to find out what factors influences the profitability of Indian commercial banks. For this, 89 commercial banks—public, private, and international—were selected based on their balanced panel data. Secondary data on macroeconomic factors and banks specific factors was collected from the RBI database for the

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul1812

period 2005 to 2015. The study measured the impact of independent variables such as ownership structure, bank size, NPA ratio, equity ratio, credit risk, operating cost to total assets ratio, priority sector lending to total assets ratio, ratio of total bank deposits to GDP, ratio of market cap to GDP, inflation, and GDP growth rate on dependent variables like return on equity and return on assets—profitability measures. This was done using descriptive statistics and linear regression. The results showed that both internal and external factors affect the profitability of Indian banks. Bank size and the ratio of priority loans to total loans did not have an impact on profitability. However, operational efficiency, strength of equity capital, and the ratio of banking sector deposits to GDP had a positive effect. On the other hand, credit risk; cost of funds, NPA ratio, and inflation in the consumer price index (CPI) had a negative effect.

Bank management became increasingly alarmed by the increase of non-performing assets. In light of this, **Bawa et al. (2019)** used 31 financial indicators to provide a thorough examination of the non-performing assets (NPAs) of 46 Indian banks from 2007 to 2014. Finding out how different factors impact non-performing assets was the study's goal. The net non-performing assets (NPA) ratio, operating efficiency ratios, profitability, liquidity ratios, solvency, capital sufficiency, and company growth potential were the six categories of financial indicators chosen for examination. The relationship between the independent and dependent variables was assessed using the panel regression fixed effect model. The ratio of net non-performing assets to net advances was regarded as a dependent variable, whereas all other factors were regarded as independent. Finally, the analysis found a negative relationship between the banks' ROA and interaction cost and non-performing assets.

Agarwala and Agarwala (2019) utilized secondary data from the Reserve Bank of India spanning 2010–2017, applying the geometric mean approach to estimate the average growth rate of gross non-performing assets (NPAs) . Their analysis encompassed three categories of Indian banks—State Bank of India (SBI) and its associates, nationalised banks, and private sector banks—to investigate NPA dynamics across sectors. To enhance accuracy, each bank's individual gross NPA growth rate was compared against the sector-wide average as a refinement step in their methodology. Their findings indicate that private sector banks experienced significantly lower NPA growth rates compared to both SBI (and its affiliates) and nationalised banks. Conversely, SBI and nationalised banks struggled with distressed asset management, resulting in exceptionally high NPA growth over the study period that inversely affects the profitability.

Wadhwa and Ramaswamy (2020) investigated the effect of key financial metrics—namely total assets, total advances, and total deposits—on non-performing assets (NPAs), and further analyzed how NPAs influenced bank profitability. For their study, they drew NPA data from the RBI for the years 2014–15 through 2018–19, and collected information on the financial indicators from bank annual reports. Their sample comprised the five public and private banks with the highest NPA levels, according to RBI data. Using correlation analysis, they established a generally negative association between NPAs and net profit for the selected banks, although HDFC Bank was an exception. Multiple regression was then employed to gauge the influence of the financial indicators on NPA levels, as well as to assess the impact of NPAs on net profits. The regression findings indicated that NPAs had a significant adverse effect on profitability for SBI and Axis Bank, but notably, HDFC Bank showed a positive relationship between Net NPA and Net Profit, implying that higher NPAs correlated with higher profits in that particular case, an unexpected result. Finally, while the combined effect of assets, advances, and deposits did not significantly predict NPA levels overall, separate regression results revealed these variables exerted a strong impact on NPA formation in SBI and HDFC Banks specifically.

Das and Uppal (2021) scanned the profitability factors in order to investigate the relationship between NPAs and bank profitability. The researcher selected 39 scheduled commercial banks between 2005 and 2019 to perform the study; 20 of these were domestic private banks, and 19 were public sector banks (PSBs). Panel data techniques are used to get the desired outcome, and important information is taken from secondary sources like RBI publications and bulletins. According to the analytical conclusion, operating costs and profitability are negatively correlated, and the rate of profit is negatively impacted by the increase in non-performing advances. The FE and RE models' estimates show that the GDP growth rate, interest income, non-interest revenue, and capital sufficiency have all had a positive effect on the profit rate of Indian banks. According to this study, banks should reduce their non-performing assets (NPAs) and operating costs in order to increase their profitability.

Movalia and Shilu (2021) had put an effort to examine the profitability of Indian public and private sector banks, as well as the non-performing assets and their effect on the latter. They have gathered all relevant information from secondary data sources, including the RBI database, bank reports, and journals, for the fiscal years 2004–05 through 2018–19. They have examined the gross non-performing assets to advances ratio, the net non-performing assets to advances ratio, and the credit to deposit ratio in order to calculate the amount of non-performing assets (NPAs) in the bank. Regression analysis revealed that nonperforming assets would have an impact on banks' profitability, and they also examined the bank's profitability by looking at the net profit ratio, return on equity ratio (ROE), return on assets ratio (ROA), and net interest margin (NIM). The group of banks in the public and private sectors had significantly different NPA ratios.

It is evident from the review of the existing literature that there is a dearth of solid literature in India regarding the evaluation of the effects of non-performing assets (NPAs) and other probable factors on the profitability of private banks. The majority of research has been done either in the context of public sector banks exclusively or in the context

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul1812

of both public and private sector banks. The influence of non-performing assets (NPAs) and other probable factors on the profitability of private banks alone has barely been the subject of any research. Thus, in order to address this gap in the literature, a modest effort has been undertaken to examine how non-performing assets (NPAs) and other probable factors affect private banks' profitability.

➢ *Objective of the Study*

This article especially aims to investigate the relationship between non-performing assets and profitability by assessing the other potential factors that affect a private bank's profitability.

➢ *Hypothesis of the Study*

To accomplish the stated goal of the study, the following null hypothesis is proposed:

Profitability and the variables that are most likely to affect a private bank's profitability do not significantly correlate.

A statistically significant correlation between profitability and the variables that are likely to affect a private bank's profitability is indicated by the rejection of the null hypothesis.

III. DATABASE AND METHODOLOGY OF THE STUDY

The construction of this study was aided by secondary data, and all necessary information was taken from the "CAPITALINE – 2000" database. Data from all 21 private sector commercial banks in India (Axis Bank, Bandhan Bank, City Union Bank, CSB Bank, DCB Bank, Dhanlaxmi Bank, Federal Bank, HDFC Bank, ICICI Bank, IDBI Bank, IDFC First Bank, Indusind Bank, Jammu & Kashmir Bank, Karnataka Bank, Karur Vysya Bank, Kotak Mahindra Bank, Nainital Bank, RBL Bank, South Indian Bank, Tamilnad Merchantile Bank and Yes Bank) spanning from 1 April 2014 to 31 March 2024, are used as a sample for this study.

To determine the factors influencing Indian Private Sector Bank profitability, the study used static panel regression. Panel data has been utilized since it allows for the evaluation of numerous firm-specific attributes.

To achieve the defined objectives of the study and to test the research hypotheses, the following regression model is formulated here:

$$ROA_{it} = \alpha_0 + \beta_1 NNPA\_NA_{it} + \beta_2 LnTD_{it} + \beta_3 NII\_TI_{it} + \beta_4 NIM_{it} + \beta_5 OC\_TII_{it} + \beta_6 CA\_T1_{it} + \beta_7 AEGR_{it} + \beta_8 AROIF_{it} + e_{it}$$

The return on assets (ROA), which is the dependent variable in this study, is commonly used as a stand-in for profitability in research because it is a suitable indicator of profitability, as it shows a bank's earnings relative to its total assets. Along with bank-specific explanatory factors for bank profitability, such as the ratio of net non-performing assets to net advances (NNPA_NA), total deposits (LnTD), net interest income to total income (NII_TI), net interest margin (NIM), operating cost to total interest income (OC_TII), and capital adequacy-tier 1 capital (CA_T1), two macroeconomic factors have also been used as independent variables: the annual rate of inflation (AROIF) and the annual economic growth rate (AEGR). Table 1 reflects the description of variables and their expected relationship with banks' profitability.

Table 1 Description of Variables used in the Study and their Expected Relation with Banks' Profitability

Variables	Description	Expected relation
ROA	Net Income as a percentage of total assets	-
NNPA_NA	Net NPA as a percentage of Net Advances	Negative
LnTD	Natural Logarithm of Total Deposit	Positive
NII_TI	Net Interest Income as a percentage of Total Income	Positive
NIM	Net Interest Income as a percentage of Average interest-earning assets	Positive
OC_TII	Operating Cost as a percentage of Total Interest Income	Negative
CA_T1	Percentage of Tier 1 capital as per Basel norms	Positive
AEGR	Rate of Economic Growth Per Year	Positive
AROIF	Inflation rate per year	Positive

IV. EMPIRICAL FINDINGS OF THE STUDY

➢ *Descriptive Results*

Table 2 Descriptive Statistics of Independent and Dependent Variables

Variables	N	Minimum	Maximum	Mean	Std. Deviation
ROA	210	-4.68	5.39	1.00476	1.08774
NNPA_NA	210	0.08	16.69	1.96995	1.99840
LnTD	210	8.58	14.68	11.32328	1.35188
NII_TI	210	0.09	0.98	0.79605	0.17577
NIM	210	1.14	10.44	3.63109	1.48493

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul1812

OC_TII	210	0.02	0.56	0.18114	0.13410
CA_T1	210	6.12	30.3	14.70462	4.15294
AEGR	210	-5.78	9.69	6.00600	4.19554
AROIF	210	3.41	6.65	4.97300	0.96671

Table 2 highlights the descriptive statistics of all the variables used to estimate the private sector banks' profitability determinants. Descriptive data are presented in terms of mean value, standard deviation, minimum, and maximum for the years 2014–15 through 2023–24 for all variables included in the research model, both dependent and explanatory variables. According to the findings, the ROA average is 1.00476 and ranges from -4.68 to 5.39. The results also show that, with a range of 0.08 to 16.69, the average NNPA to NA ratio is 1.96995. The mean and standard deviation, as well as the maximum and lowest values of each of the remaining explanatory variables, including LnTD, NII_TI, NIM, OC_TII, CA_T1, AEGR, and AROIF, are also shown in Table No. 2.

➢ *Model Diagnosis*

- *Correlation Matrix and Multicollinearity Test*

Table 3 Correlation Matrix of the Variables

	ROA	**NNPA_NA**	**LnTD**	**NII_TI**	**NIM**	**OC_TII**	**CA_T1**	**AEGR**	**AROIF**
ROA	1								
NNPA_NA	-0.403**	1							
LnTD	0.237**	-0.098	1						
NII_TI	-0.266**	0.083	-0.210**	1					
NIM	0.478**	-0.356**	-0.019	-0.315**	1				
OC_TII	-0.002	-0.110	0.096	-0.231**	0.105	1			
CA_T1	0.486**	-0.410**	0.014	-0.270**	0.638**	0.197*	1		
AEGR	0.011	-0.078	-0.006	0.028	0.0212	0.016	0.067	1	
AROIF	-0.031	-0.104	0.114	-0.005	0.055	0.083	0.188*	-0.314**	1

** Significant at 0.01 level, * Significant at 0.05 level

For the variables included in this study, Table 3 displays the correlation matrix and significance level. It is easier to determine the degree of correlation between the variables when this matrix is used. The results show that ROA has a positively significant relationship with CA_T1 (0.486) and NIM (0.478) and a negatively significant connection with NNPA_NA (-0.403). According to the correlation matrix, ROA is significantly inversely correlated with NII_TI and moderately positively correlated with LnTD. There is no substantial correlation between ROA and the other explanatory factors.

Table 4 Multicollinearity Test

Variables	**NNPA_NA**	**LnTD**	**NII_TI**	**NIM**	**OC_TII**	**CA_T1**	**AEGR**	**AROIF**
VIF	1.26	1.09	1.24	1.83	1.09	1.95	1.15	1.21
Tolerance	0.796	0.918	0.805	0.548	0.916	0.513	0.872	0.829

To check for multicollinearity among the explanatory variables, the variance inflation factor (VIF) was employed. Selecting the appropriate regression model may not be hampered by low, insignificant, or even moderate multicollinearity. According to Gujarati (2003), there must typically be significant multicollinearity if the VIF number is greater than 10, which could pose issues for the building of an efficient regression model. However, as Table 4 illustrates, the estimated VIF for the regression model's variables is not greater than 1.95 that suggest that the risk of multicollinearity is negligible. This supports accurate coefficient estimation and gives confidence in the regression findings.

- *Panel Unit Root Test*

Utilizing the Levin, Lin, and Chu (LLC) Test (2002), Unit Root Testing has confirmed the stationarity of every variable considered in the study. The test results in Table 5 clearly demonstrate that the series has no unit root and is stationary, rejecting the null hypothesis of the common unit root in the panel (p-value < 0.05) at different lag lengths. According to the LLC test, every variable is stationary at a constant level, meaning that its statistical characteristics remain constant across time.

Table 5 Panel Unit Root Test

Variables	**t-statistic (p-value)**	**Results**
ROA	-6.1147** (0.0000)	Stationary
NNPA_NA	-4.7585** (0.0000)	Stationary
LnTD	-4.280** (0.0000)	Stationary

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul1812

NII_TI	-4.4612** (0.0000)	Stationary
NIM	-6.1384** (0.0000)	Stationary
OC_TII	-6.5192** (0.0000)	Stationary
CA_T1	-3.6064** (0.0002)	Stationary
AEGR	-4.9922**(0.0000)	Stationary
AROIF	-4.3354** (0.0000)	Stationary

**Significance at 0.01 level

➢ *Regression Results*

To examine all the variables influencing profitability in Indian private sector commercial banks, estimates of both the fixed effect model and the random effect model have been made. The estimation results for the FE and RE models are shown in Tables 6 and 7, respectively.

Table 6 Determinants of Private Sector Banks' Profitability: Fixed Effect Estimates

Dependent Variable ROA	**Coef.**	**Std. Err.**	**t**	**P>|t|**	**` [95% Conf. Interval]**	
Explanatory Variables						
NNPA_NA	-0.106202**	0.041048	-2.59	0.010	-0.187196	-0.025208
LnTD	-0.208482	0.148534	-1.40	0.162	-.5015616	.0845982
NII_TI	-2.490882*	0.988206	-2.52	0.013	-4.440768	-0.540997
NIM	0.281269*	0.124363	2.26	0.025	.0358816	.5266572
OC_TII	-1.649660	1.549579	-1.06	0.288	-4.707222	1.407902
CA_T1	0.077915**	0.024388	3.19	0.002	.0297941	.1260356
AEGR	-0.013058	0.014984	-0.87	0.385	-.0426236	.0165083
AROIF	-0.111778	0.072110	-1.55	0.123	-.2540615	.0305056
C	4.323629*	1.762329	2.45	0.015	.8462777	7.800981
Number of Observations	210					
Number of Banks	21					
R-Square	0.2487					
Prob [F Statistics]	0.0000					

**Significance at 0.01 level , *Significance at 0.05 level

Table 7 Determinants of Private Sector Banks' Profitability: Random Effect Estimates

Dependent Variable ROA	**Coef.**	**Std. Err.**	**z**	**P>|z|**	**[95% Conf. Interval]**	
Explanatory Variables						
NNPA_NA	-0.115230**	0.033483	-3.44	0.001	-0.1808571	-0.0496035
LnTD	0.179646**	0.047667	3.77	0.000	0.0862212	0.2730723
NII_TI	-0.542001	0.389787	-1.39	0.164	-1.305971	0.2219682
NIM	0.158186**	0.055153	2.87	0.004	0.0500869	0.2662855
OC_TII	-1.092582*	0.479722	-2.28	0.023	-2.03282	-0.1523436
CA_T1	0.077664**	0.020013	3.88	0.000	0.0384393	0.1168893
AEGR	-0.019062	0.014936	-1.28	0.202	-0.0483374	0.0102131
AROIF	-0.177615**	0.066625	-2.67	0.008	-0.308199	-0.0470324
C	-0.891701	0.823766	-1.08	0.279	-2.506254	0.7228507
Number of Observations	210					
Number of Banks	21					
R-Square	0.4133					
Prob [chi-sq. Statistics]	0.0000					

**Significance at 0.01 level , *Significance at 0.05 level

Nevertheless, the null hypothesis of the Breusch-Pagan and Redundant Fixed Effect tests is rejected when the proper model is chosen. Thus, we performed the Hausman Test. The Hausman test establishes if the model has a fixed or random effect. Given that the "p" value is higher than 0.05, as seen in Table 8, this test suggests that the Random Effect Model should be used in our investigation.

Table 8 Hausman Test

chi-sq. Statistics	**chi-sq. df**	**Prob>chi-sq.**
13.16	8	0.1065

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/25jul1812

The empirical results (referenced in Table 7) reveal a statistically significant negative relationship between profitability (ROA) and non-performing assets (NNPA_NA) at the 1% level, indicating that higher levels of bad loans erode bank profitability. Additionally, net interest margin (NIM) shows a statistically significant positive association with ROA at the 1% level, suggesting that banks earn more profit when they have wider interest spreads. Operating cost as a proportion of total interest income (OC_TII) exhibits a negative connection with ROA at the 5% level, implying that higher operating expenses reduce profitability.

Moreover, both the logarithm of total deposits (LnTD) and the Tier 1 capital adequacy ratio (CA_T1) are positively correlated with ROA at the 1% significance level, demonstrating that larger deposit bases and stronger capital buffers support higher profitability. Although net interest income relative to total interest income (NII_TI) has a negative coefficient with ROA, this relationship is not statistically significant. Of the two macroeconomic variables examined, Annual Economic Growth Rate (AEGR) also has a negative but insignificant relationship with ROA, while the Annual Rate of Inflation (AROIF) shows a significant negative association with ROA at the 1% level.

V. CONCLUSION

The study employed panel data analysis of 21 Indian private sector banks to evaluate how specific bank-level and macroeconomic variables influence profitability (ROA). It focused on key factors including net non-performing assets (NNPA_NA), total deposits (LnTD), net interest margin (NIM), operating cost relative to total interest income (OC_TII), Tier 1 capital adequacy (CA_T1), and inflation rate (AROIF).

Higher non-performing assets (NNPA_NA) dramatically lower profitability, making them the most crucial negative factor of ROA. This finding is consistent with a larger body of literature. Operating cost to total interest income (OC_TII) and inflation (AROIF) are both significantly negatively associated with ROA, indicating that rising operational inefficiencies and inflation pressure degrade bank earnings. The net interest margin (NIM), total deposits (LnTD), and Tier 1 capital ratio (CA_T1) each show significant positive correlations with ROA, meaning that wider interest spreads, a larger deposit base, and stronger capital buffers support profitability.

The results suggest that NPAs are the predominant drag on the profitability of private sector banks; they also lead to lower future deposit growth and elevated operating costs due to recovery efforts. The study therefore advises that banks boost profitability by actively reducing non-performing assets (NPAs) and streamlining operating costs, while simultaneously managing interest rate risk and adjusting pricing models to counteract inflationary pressures.

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