

# Non-Performing Assets and its Impact on Banking Sector - An Empirical study in North India's Banks

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## **ABSTRACT**

*Banks plays a vital role in the economic development of a country because a strong banking sector is important for prosperous economy. Non-performing assets are one of the major issues for banks in India and the banking sector is uncovered different risk, such as credit risk, liquidity risk, interest risk, market risk and operational risk. Apart from these risks the very important risk is recovery of loan. The sound financial situation of a bank or financial institution depends upon the timely recovery of debts or its level of NPAs. The Indian banking businesses are still facing a constraint of non- performing assets. To get better the competence and profitability of banks the NPA need to be reduced and controlled. The study is based on secondary data. The paper highlights the trends, status and impact of NPA on PSBs profitability during the period of 12 years i.e. from 2006 to 2018. Several research journals including research papers and articles have been stated by the researchers. Moreover, RBI Reports on Trend and Progress of Banking in India for various years and websites have been referred during the study. Study purports to use the quantitative analysis, one - way ANOVA has been used to see if there is any significant difference between various NPA measuring variables amongst different categories of banks. The findings and analysis reveal that the NPA impact not positively on public sector bank's financial performance in the period under study.*

**Keywords-Banks, Non-Performing Assets, financial performance, Impact & GDP**

## **Introduction**

Non-performing Asset is a vital factor in the examination of financial performance of a bank. Non-Performing Asset is the key term for the banking corporations. Non-Performing Assets show the competence of the performance of the banks. Non-Performing Assets means which amount is not received by the bank in return of loans disbursed. Non-Performing Assets affect not only the finance institution but the total financial system. Thus a selective study has been

done on public sector banks in India to evaluate the effect of Non-Performing Assets on the profitability of banks. Banks today are not judged only on the basis of number of branches and volume of deposits but also on the basis of standard of assets. NPAs negatively effect on the profitability, liquidity and solvency of the banks. This paper analyses the circumstances of NPAs in selected banks namely State Bank of India (SBI), Bank of India, and United Bank of India, Bank of Baroda, Indian Overseas Bank, Punjab National Bank and Central Bank India. It also highlights the policies followed by the banks to tackle the NPAs and suggests a multi-pronged strategy for speedy recovery of NPAs in banking sector. Seven Public Sector Banks has been selected for the study the relation between Gross NPA and Net Profit of seven banks. In this paper is applying the panel regression.

### **Need and importance of the studies**

The current study aims at examining the impact of NPA on bank performance. For this purpose the current study purports to use the quantitative analysis. In the current study, both descriptive and inferential statistical analysis tools have been used. Hence, the study aims at both describing the statistics of variables on one hand and analyzing and drawing inferences on the other hand. While doing secondary data analysis, an attempt has been made to analyse data both across time and across variables separately

### **Objectives of the Study**

1. To see whether different types of banks have significantly different NPAs. This objective is obtained by using a one-way ANOVA analysis.
2. To explicate the trend in the movement of NPA over time and across different types of banks which are divided into four broad categories viz. Scheduled commercial banks, public sector banks, old private sector banks and new private sector banks. This objective is obtained by formulating a trend line for various types of banks for various NPA measures.
3. To examine the relationship between NPA of banks and macro-economic variables. For the purpose of current study, three macro-economic variables are taken i.e. inflation, GDP and industrial production. Multivariate regression analysis has been used to achieve this objective.

### **Research Methodology**

The study is based on the primary and secondary data and which comprises the analyzing data across variables, one - way ANOVA has been used to see if there is any significant difference between various NPA measuring variables amongst different categories of banks over a period of 12 years. Secondly, for analyzing data across time, a trend line analysis has been carried out to observe the trend of various categories of banks for each NPA measuring variable over a period of 12 years starting from 2006 to 2018. Finally, a multivariate regression analysis has been carried out to see the impact of macroeconomic variables i.e. inflation, industrial production and gross domestic production (GDP) on NPA of various categories of banks.

## Analysis of data

### 1.1. One- way ANOVA

In this section of the study, data is analyzed using one - way ANOVA to find out if there is any statistically significant difference between NPA of different categories of banks. For this purpose, NPA has been measured through 4 indicators viz. Gross NPA as percentage of gross advances, gross NPA as percentage of total assets, net NPA as percentage of net advances and net NPA as percentage of total assets. Banks are also sub-divided into four groups- scheduled commercial banks, public sector banks, new private sector banks and old private sector banks. The analysis is carried out for a period of 12 years starting from the year 2006 till 2018. The analysis is carried out for each NPA indicator separately. For the purpose of drawing inferences on the basis of ANOVA, following chronological steps have been followed:

1. Checking assumptions - The first step is to check whether data satisfies the underlying assumptions of ANOVA analysis. There are two assumptions :
  - i. Assumption of normality - For ANOVA analysis, it is presumed that the distribution is normal. Normality of data in the current study has been checked using K-S test.
  - ii. Assumption of homogeneity of variances - This assumption is checked using Levene's test.
2. Data analysis - Once the data satisfies both the assumptions, analysis is carried out using one - way ANOVA analysis. The p-value will reveal if there is any difference between the mean NPA indicators of the 4 categories of the banks.
3. If there is no significant difference, the analysis ends here as no significant inference can be drawn. But if there is a significant difference, then further analysis is done using -
  - i. Post-hoc analysis tell us that where is the difference. Which all categories of banks significantly differ from each other viz.- a -viz. NPA indicator.
  - ii. Mean plot - Mean plot graph will tell as to which category of bank is significantly higher or lower than other categories of banks with respect to each individual NPA indicator.
4. Drawing inference - Finally, inferences can be drawn for the population and suggestions may be made.

In the following tables, the results of ANOVA tests for each of the NPA indicators are presented.

### 1.2. ANOVA Analysis for Gross NPA as % of Gross Advances for 4 Groups of Banks

For the purpose of analyzing the differences, a hypothesis test is conducted to see whether there is a significant difference in an NPA indicator i.e. Gross NPA as % of gross advances across 4 groups of banks viz. scheduled commercial banks, public sector banks, new private sector banks and old private sector banks. One - way ANOVA is used for the purpose of analysis. Following statistical hypotheses have been constructed for this purpose:

**H<sub>0</sub>:** Bank type does not explain the difference in NPA indicator i.e. Gross NPA as % of gross advances. (There is no difference in the NPA indicator of different bank groups).

**H<sub>1</sub>:** Bank type explains the difference in NPA indicator (There is difference in the NPA of different bank groups).

**Checking of Assumptions**

For running ANOVA, data should satisfy two assumptions. Thus, first before doing ANOVA analysis, following assumptions are checked:

- i. **Assumption of normality** - Normality of the distribution is checked using K-S test in SPSS. The result is presented in the following table 1

**Table 1** One-Sample Kolmogorov-Smirnov Test

		Gross NPA as % of Gross Advances
N		48
Normal Parameters <sup>a,b</sup>	Mean	4.25
	Std. Deviation	2.870
Most Extreme Differences	Absolute	.273
	Positive	.273
	Negative	-.216
Kolmogorov-Smirnov Z		1.889
Asymp. Sig. (2-tailed)		.902

As observed from the above table 6.6, since null hypothesis is not rejected at 5% level of significance, therefore the above distribution is a normal distribution. Thus, first assumption is satisfied.

- ii. **Homogeneity of variances** - Second assumption for ANOVA analysis is to test for homogeneity of variances. This assumption is tested using Levene’s test for homogeneity of variances. Result is reported in the following table 6.7

**Table 2:** Levene’s Test for Homogeneity of Variances

Levene Statistic	df <sub>1</sub>	df <sub>2</sub>	Sig.
.746	3	44	.030

From the above table 6.7 it is observed that as p- value (0.030) is less than .05(5% level of significance), therefore homogeneity of variances assumption is also satisfied.

**Results of ANOVA Analysis**

To test the above hypotheses, one-way ANOVA analysis is conducted on SPSS 20.0 ( a statistical software) and the results are presented below.

**Table 3:** ANOVA Analysis for Gross NPA as % of Gross Advances Across Bank Groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.500	3	1.833	.211	.018
Within Groups	381.500	44	8.670		
Total	387.000	47			

From the above table 6.8, it can be observed that there is a statistically significant difference in gross NPA as % of gross advances across 4 groups of banks at 5% level of significance as p-value of the output is 0.018. Thus, null hypothesis is rejected.

**Post hoc Analysis**

The results of ANOVA analysis only tell whether there is difference in the mean NPA indicators of various groups or not. If there is a difference, then it is essential to find the actual bank groups which differ in terms of underlying variable which here is Gross NPA as % of gross advances. This information is gathered through post-hoc analysis.

Results of post-hoc analysis are presented in the following table 6.9

**Table 4:** Results of Post-hoc Analysis (Gross NPA as % of Gross Advances)

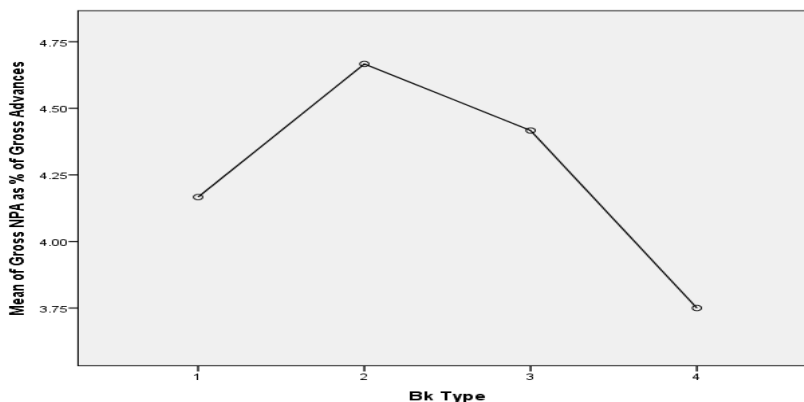
Multiple Comparisons						
Dependent Variable: Gross NPA as % of Gross Advances						
Tukey HSD						
(I) Bk Type		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Scheduled commercial banks	Public sector banks	-.500*	1.202	.045	-3.71	2.71
	New private sector banks	-.250*	1.202	.010	-3.46	2.96
	Old private sector banks	.417	1.202	.986	-2.79	3.63
Public sector	Scheduled commercial banks	.500*	1.202	.003	-2.71	3.71

banks	New private sector banks	.250*	1.202	.017	-2.96	3.46
	Old private sector banks	.917	1.202	.871	-2.29	4.13
New private sector banks	Scheduled commercial banks	.250*	1.202	.017	-2.96	3.46
	Public sector banks	-.250*	1.202	.007	-3.46	2.96
	Old private sector banks	.667*	1.202	.045	-2.54	3.88
Old private sector banks	Scheduled commercial banks	-.417	1.202	.986	-3.63	2.79
	Public sector banks	-.917	1.202	.871	-4.13	2.29
	New private sector banks	-.667*	1.202	.045	-3.88	2.54

Post hoc analysis suggests that Gross NPA as % of gross advances, being an NPA indicator for the scheduled commercial bank, is significantly different from that of public sector banks and new private sector banks. Similarly, Gross NPA as % of gross advances, being an NPA indicator for the public sector banks, is different from the new private sector banks. Finally, Gross NPA as % of gross advances being an NPA indicator for the old private sector banks is significantly different from new private sector banks.

### Mean Plot

The differences in Gross NPA as % of gross advances across various bank groups can also be observed through mean plot graph as presented below:



**Figure 1:** Gross NPA as % of Gross Advances Across (through Mean Plot)

From the above mean plot graph, it can be observed that the mean NPA indicator of 2nd bank type i.e. public sector banks is highest than other groups of banks. This indicates that the public sector banks need to take more stringent measures to control NPA.

### 1.3. ANOVA Analysis for Gross NPA as % of Total Assets for 4 Groups of Banks

To analyze the differences in the means of underlying variable i.e. Gross NPA as % of total assets, a hypothesis test is conducted to see whether there is a significant difference in this NPA indicator i.e. Gross NPA as % of total across 4 groups of banks viz. scheduled commercial banks, public sector banks, new private sector banks and old private sector banks. One - way ANOVA is used for the purpose of analysis. Following statistical hypotheses have been constructed for this purpose:

**H<sub>0</sub>:** Bank type does not explain the difference in NPA indicator i.e. Gross NPA as % of total assets (There is no difference in the NPA indicator of different bank groups).

**H<sub>1</sub>:** Bank type explains the difference in NPA indicator (There is difference in the NPA of different bank groups).

#### *Checking of Assumptions*

For running ANOVA, data should satisfy two assumptions. Thus, first before doing ANOVA analyses, following assumptions are checked:

- i. **Assumption of Normality** - Normality of the distribution is checked using K-S test in SPSS. The result is presented in the following table 6.10

**Table 4:** One-Sample Kolmogorov-Smirnov Test

		Gross NPA as % of Total Assets
N		48
Normal Parameters	Mean	2.13
	Std. Deviation	1.282
Most Extreme Differences	Absolute	.268
	Positive	.268
	Negative	-.190
Kolmogorov-Smirnov Z		1.857
Asymp. Sig. (2-tailed)		.802

As observed from the above table 6.10, since null hypothesis is not rejected at 5% level of significance, therefore the above distribution is a normal distribution. Thus, first assumption is satisfied.

- ii. **Homogeneity of variances** - Second assumption for ANOVA analysis is to test for homogeneity of variances. This assumption is tested using Levene's test for homogeneity of variances. Result is reported in the following table:

**Table 5:** Levene’s Test for Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
.680	3	44	.009

From the above table 6.11, it is observed that as p- value (0.009) is less than .05(5% level of significance). Therefore, homogeneity of variances assumption is also satisfied.

**Results of ANOVA Analysis**

To test the above hypotheses, one-way ANOVA analysis is conducted on SPSS 20.0 ( a statistical software) and the results are presented below.

**Table 6:** ANOVA Analysis for Gross NPA as % of Total Assets Across Bank Groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.583	3	.528	.307	.020
Within Groups	75.667	44	1.720		
Total	77.250	47			

From the above table 6.12, it can be observed that there is a statistically significant difference in gross NPA as % of total assets across 4 groups of banks at 5% level of significance as p-value of the output is 0.020. Thus null hypothesis is rejected.

**Post-hoc Analysis**

The results of ANOVA analysis only tell whether there is difference in the mean NPA indicators of various groups or not. If there is a difference, then it is essential to find the actual bank groups which differ in terms of underlying variable which here is Gross NPA as % of total assets. This information is gathered through post-hoc analysis.

Results of post-hoc analysis are presented in the following table 6.13.

**Table 7:** Result of Post-hoc Analysis (Gross NPA as % of Total Assets)

Multiple Comparisons						
Dependent Variable: Gross NPA as % of Total Assets						
Tukey HSD						
(I) 1=		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Scheduled	Public sector banks	-.167*	.535	.009	-1.60	1.26

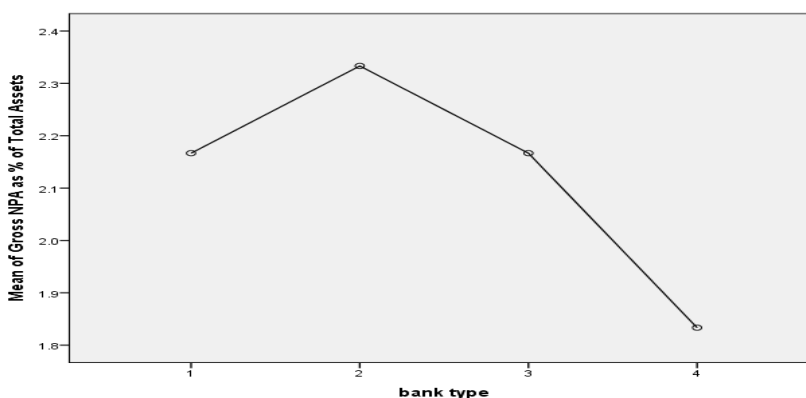


commercial banks	New private sector banks	0.000	.535	1.000	-1.43	1.43
	Old private sector banks	.333	.535	.924	-1.10	1.76
Public sector banks	Scheduled commercial banks	.167*	.535	.009	-1.26	1.60
	New private sector banks	.167	.535	.989	-1.26	1.60
	Old private sector banks	.500*	.535	.017	-.93	1.93
New private sector banks	Scheduled commercial banks	0.000	.535	1.000	-1.43	1.43
	Public sector banks	-.167	.535	.989	-1.60	1.26
	Old private sector banks	.333*	.535	.024	-1.10	1.76
Old private sector banks	Scheduled commercial banks	-.333	.535	.924	-1.76	1.10
	Public sector banks	-.500*	.535	.017	-1.93	.93
	New private sector banks	-.333*	.535	.024	-1.76	1.10

Post hoc analysis suggests that Gross NPA as % of total assets (being an NPA indicator for the scheduled commercial bank) is significantly different from that of public sector banks. Similarly, Gross NPA as % of total assets, being an NPA indicator for the public sector banks, is different from old private sector banks and finally Gross NPA as % of total assets, being an NPA indicator for the old private sector banks, is significantly different from public sector banks and new private sector banks.

**Mean Plot**

The differences in Gross NPA as % of total assets across various bank groups can also be observed through mean plot graph as presented below:



**Figure 2:** Gross NPA as % of Total Assets (through Mean Plot)

From the above mean plot graph, it can be observed that the mean NPA indicator of 2<sup>nd</sup> bank type i.e. public sector banks is highest than other groups of banks. This indicates that the public sector banks need to take more stringent measures to control NPA.

#### 1.4. ANOVA Analysis for Net NPA as % of Net Advances for 4 Groups of Banks

For the purpose of analyzing the differences, a hypothesis test is conducted to see whether there is a significant difference in an NPA indicator i.e. Net NPA as % of net advances across 4 groups of banks viz. scheduled commercial banks, public sector banks, new private sector banks and old private sector banks. One-way ANOVA is used for the purpose of analysis. Following statistical hypotheses have been constructed for this purpose:

**H<sub>0</sub>:** Bank type does not explain the difference in NPA indicator i.e. net NPA as % of net advances (There is no difference in the NPA indicator of different bank groups).

**H<sub>1</sub>:** Bank type explains the difference in NPA indicator (There is difference in the NPA of different bank groups) .

#### *Checking of Assumptions*

For running ANOVA, data should satisfy two assumptions. Thus, first before doing ANOVA analyses, following assumptions are checked:

- i. **Assumption of normality** - Normality of the distribution is checked using K-S test in SPSS. The result is presented in the following table 6.14.

**Table 8:** One-Sample Kolmogorov-Smirnov Test

		Net NPA as % of Net Advances
N		48
Normal Parameters <sup>a,b</sup>	Mean	1.94
	Std. Deviation	1.643
Most Extreme Differences	Absolute	.299
	Positive	.299
	Negative	-.222
Kolmogorov-Smirnov Z		2.073
Asymp. Sig. (2-tailed)		.800

a. Test distribution is Normal.

b. Calculated from data.

As observed from the above table, since null hypothesis is not rejected at 5% level of significance, therefore, the above distribution is a normal distribution. Thus, first assumption is satisfied.

- ii. **Homogeneity of variances** - Second assumption for ANOVA analysis is to test for homogeneity of variances. This assumption is tested using Levene's test for homogeneity of variances. Result is reported in the following table 6.15.

**Table 9:** Levene’s Test for Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
1.182	3	44	.027

From the table 6.15 it is observed that as p- value (0.027) is less than .05(5% level of significance), therefore homogeneity of variances assumption is also satisfied.

**Results of ANOVA Analysis**

To test the above hypotheses, one-way ANOVA analysis is conducted on SPSS 20.0 ( a statistical software) and the results are presented below.

**Table 10:** ANOVA Analysis for Net NPA as % of Net Advances Across Bank Groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4.729	3	1.576	.568	.039
Within Groups	122.083	44	2.775		
Total	126.813	47			

From the above table 6.16, it can be observed that there is a statistically significant difference in net NPA as % of net advances across 4 groups of banks at 5% level of significance as p-value of the output is 0.039. Thus, null hypothesis is rejected.

**Post-hoc Analysis**

The results of ANOVA analysis only tell whether there is difference in the mean NPA indicators of various groups or not. If there is a difference then it is essential to find the actual bank groups which differ in terms of underlying variable which here is Gross NPA as % of gross advances. This information is gathered through post-hoc analysis.

Results of post-hoc analysis are presented in the following table:

**Table 11:** Results of post-hoc analysis (Net NPA as % of Net Advances)

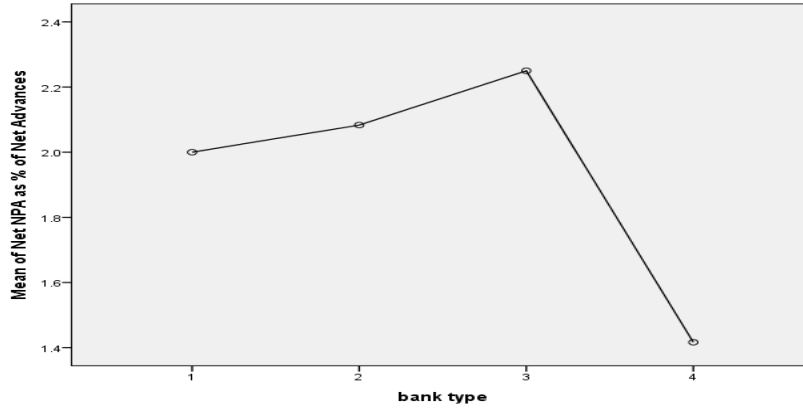
Multiple comparisons				
Dependent Variable: Net NPA as % of Net Advances				
Tukey HSD				
(I) Bank Type	Mean	Std.	Sig.	95% Confidence

		Difference (I-J)	Error		Interval	
					Lower Bound	Upper Bound
Scheduled commercial banks	Public sector banks	-.083	.680	.999	-1.90	1.73
	New private sector banks	-.250*	.680	.003	-2.07	1.57
	Old private sector banks	.583*	.680	.026	-1.23	2.40
Public sector banks	Scheduled commercial banks	.083	.680	.999	-1.73	1.90
	New private sector banks	-.167*	.680	.015	-1.98	1.65
	Old private sector banks	.667	.680	.761	-1.15	2.48
New private sector banks	Scheduled commercial banks	.250*	.680	.003	-1.57	2.07
	Public sector banks	.167*	.680	.015	-1.65	1.98
	Old private sector banks	.833*	.680	.014	-.98	2.65
Old private sector banks	Scheduled commercial banks	-.583*	.680	.026	-2.40	1.23
	Public sector banks	-.667	.680	.761	-2.48	1.15
	New private sector banks	-.833*	.680	.014	-2.65	.98

Post hoc analysis suggests that net NPA as % of net advances, being an NPA indicator for the scheduled commercial bank, is significantly different from that of new private sector banks and old private sector banks. Similarly, net NPA as % of net advances, being an NPA indicator for the public sector banks, is significantly different from the new private sector banks. Finally, net NPA as % of net advances, being an NPA indicator for the old private sector banks, is significantly different from scheduled commercial banks and new private sector banks.

**Mean Plot**

The differences in net NPA as % of net advances across various bank groups can also be observed through mean plot graph as presented below:



**Figure 3:** Net NPA as % of Net Advances (through Mean Plot)

From the above mean plot graph, it can be observed that the mean NPA indicator of 3<sup>rd</sup> bank type i.e. new private sector banks is higher than other groups of banks. This indicates that new private sector banks need to take more stringent measures to control NPA.

**1.4. ANOVA Analysis for Net NPA as % of Total Assets for 4 Groups of Banks**

For the purpose of analyzing the differences, a hypothesis test is conducted to see whether there is a significant difference in an NPA indicator i.e. Net NPA as % of total assets across 4 groups of banks viz. scheduled commercial banks, public sector banks, new private sector banks and old private sector banks. One - way ANOVA is used for the purpose of analysis. Following statistical hypotheses have been constructed for this purpose:

- H<sub>0</sub>:** Bank type does not explain the difference in NPA indicator i.e. net NPA as % of total assets (There is no difference in the NPA indicator of different bank groups).
- H<sub>1</sub>:** Bank type explains the difference in NPA indicator (There is difference in the NPA of different bank groups).

**Checking of Assumptions**

For running ANOVA, data should satisfy two assumptions. Thus, first before doing ANOVA analyses, following assumptions are checked:

- i. **Assumption of normality** - Normality of the distribution is checked using K-S test in SPSS. The result is presented in the following table:

**Table 12:** One-Sample Kolmogorov-Smirnov Test

		Net NPA as % of Total Assets
N		48
Normal Parameters <sup>a,b</sup>	Mean	.96

	Std. Deviation	.683
Most Extreme Differences	Absolute	.309
	Positive	.309
	Negative	-.295
Kolmogorov-Smirnov Z		2.141
Asymp. Sig. (2-tailed)		.900

- a. Test distribution is Normal.
- b. Calculated from data.

As observed from the above table, since null hypothesis is not rejected at 5% level of significance, therefore the above distribution is a normal distribution. Thus, first assumption is satisfied.

ii. **Homogeneity of variances** - Second assumption for ANOVA analysis is to test for homogeneity of variances. This assumption is tested using Levene’s test for homogeneity of variances. Result is reported in the following table 6.19

**Table 13:** Levene’s Test for Homogeneity of Variances

Levene Statistic	df1	df2	Sig.
6.464	3	44	.001

From the above table 6.19 it is observed that as p- value (0.001) is less than .05(5% level of significance), therefore homogeneity of variances assumption is also satisfied.

**Results of ANOVA Analysis**

To test the above hypotheses, one-way ANOVA analysis is conducted on SPSS 20.0 ( a statistical software) and the results are presented below.

**Table 14:** ANOVA Analysis for Net NPA as % of Total Assets Across Bank Groups

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.250	3	.750	1.678	.0186
Within Groups	19.667	44	.447		
Total	21.917	47			

From the above table, it can be observed that there is a statistically significant difference in net NPA as % of total assets across 4 groups of banks at 5% level of significance as p-value of the output is 0.0186. Thus null hypothesis is rejected.

**Post-hoc Analysis**

The results of ANOVA analysis only tell whether there is difference in the mean NPA indicators of various groups or not. If there is a difference, then, it is essential to find the actual bank groups which differ in terms of underlying variable which here is Gross NPA as % of gross advances. This information is gathered through post-hoc analysis.

Results of post-hoc analysis are presented in the following table 6.21.

**Table 15:** Post-hoc Analysis (Net NPA as % of Total Assets)

Multiple comparisons						
Dependent Variable: Net NPA as % of Total Assets						
Tukey HSD						
(I) Bk Type		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Scheduled commercial banks	Public sector banks	0.000	.273	1.000	-.73	.73
	New private sector banks	.333*	.273	.017	-.40	1.06
	Old private sector banks	.500	.273	.272	-.23	1.23
Public sector banks	Scheduled commercial banks	0.000	.273	1.000	-.73	.73
	New private sector banks	.333*	.273	.037	-.40	1.06
	Old private sector banks	.5008*	.273	.027	-.23	1.23
New private sector banks	Scheduled commercial banks	-.333*	.273	.017	-1.06	.40
	Public sector banks	-.333*	.273	.037	-1.06	.40
	Old private sector banks	.167	.273	.928	-.56	.90
Old private sector banks	Scheduled commercial banks	-.500	.273	.272	-1.23	.23
	Public sector banks	-.500*	.273	.027	-1.23	.23
	New private sector banks	-.167	.273	.928	-.90	.56

Post hoc analysis suggests that net NPA as % of total assets, being an NPA indicator for the scheduled commercial bank, is significantly different from that of new private sector banks. Similarly, net NPA as % of total assets, being an NPA indicator for the public sector banks, is significantly different from the new private sector banks as well as old private sector banks. Finally net NPA as % of total assets, being an NPA indicator for the old private sector banks, is significantly different from public sector banks.

**Conclusion**

To examine the impact of macroeconomic variables on NPA of different groups of banks, secondary data analysis is conducted by both differential and inferential statistical tools and tests.

The results reported, interpreted and summarized in the above sections reveal that first, out of four groups of banks; public sector banks have the highest NPAs. Secondly, out of four NPA indicators, Gross NPA as % of gross advances is highest for all categories of banks and finally macroeconomic variables have a statistically significant impact on all the four NPA indicators of all the four groups of banks.

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