

Cross Sectional Comparison of Non Performing Assets : A study of Public, Private & Foreign Banks in India

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Abstract:

Non Performing Assets are considered to be curse for Indian Banking Sector. This Paper highlights the importance to curb the menace of Non Performing Assets which is directly affecting the Banks Profitability. This study is a detailed analysis to find out the significant difference between Non Performing Assets of all the three sectors of the banks i.e. Public, Private & Foreign Sector Banks. As there is general notion that Public Sector banks have lots of NPA's and Private and Foreign banks does not have, in this study we have done the cross comparison of Public, Private and Foreign Banks through ANOVA, Multiple Regression and Post hoc Analysis. There is evidence from various tests that there is a significant difference between NPA's of these banks.

Introduction

The stress arising from the credit growth along with the problems arising from the complex corporate & financial structure is also making banks vulnerable towards the changing external financing conditions. Indian economy though outperform in the various sections but banking sector was seen under the stress of Non Performing Assets (NPAs) for the year ended 2015-16. The concern was handled by Reserve bank of India in the form of Asset quality review (AQR) which was conducted to bring the discrepancies in the actual position and the result conveyed. Unfortunately AQR have resulted in the negative impact in the concern of profitability for the banks as they have to maintain the huge reserves to tackle the NPAs according to the recommendations of this review. Asset quality review accounts were identified by the banks and the stressed assets found were termed as Non performing assets .As a result the provision of for standard asset which was kept at 0.4 % was to increase to 15% after this event. Hence as a result profitability of the banks is affected in a direct way. This paper deals with finding the significant difference between Non Performing Assets of all the three sectors of the banks .The Non performing Assets are considered to be the curse of banking sector.]The present study focuses on finding the relationship in between the combined sector wise NPAs

along with the analysis of the NPAs of individual bank and the pattern of their change happening over the years.

Review of literature

Krueger, A. and Tornell, A. (1999) examined the financial crisis in Mexico and the credit crunch and increased level of NPA. The authors explained that the bailout policy adopted in 1995 could not resolve the problem of NPA in the banking sector. Based on the analysis, the authors explained that NPA is unlikely to disappear on their own even under a high growth scenario. The authors called for an alternate strategy under which all NPAs were recognized at once and the fiscal costs were all paid up-front as preferable to solve the issue of the NPA in the banking sector.

Herr and Miyazaki (1999) in their research article about the NPA problem in the Japanese banking industry, laid emphasis on the various problems faced by the banking sector in managing their NPA accounts. Aggressive levels of NPA during 1990s, a tax system that doesn't provide tax reductions for write offs, increased number of bankruptcies etc., were evident in the Japanese banking sector since 1990. The authors based on literature review rated securitization as an effective way to handle NPAs in the banking industry. The authors also proposed sale of NPA to a jointly established Special Purpose Companies (SPCs) to allow banks to remove NPA from their balance sheets.

Woo, D. (2000) examined two approaches to resolving NPAs during financial crisis with special focus on the Asian financial crisis that erupted in 1997. The study examined the creation of AMC and the development of out of court centralized corporate debt workout framework to manage NPA accounts. Based on literature review, the the author recommended setting up of AMC for financial restructuring and of the out-of-court centralized corporate debt workout framework for corporate restructuring. But the study also cautioned that there are some inherent weaknesses in both of these approaches due to their dependence on government involvement.

Dongili, P. and Zago, A. (2005) examined the relationship between bad loans and efficiency in Italian banks during the period 1998-2003. Using a directional output distance function, the study found a strong correlation between the NPA and economic efficiency of banks. The results of the study showed that once problem loans are taken into account, the economic efficiency of banks increases significantly, suggesting that a significant aspect of banking production, credit quality, needs to be considered when evaluating banks' performances.

Chang (2006) examined the role of the NPA and Capital Adequacy in banking structure and competition with special reference to Korean banking industry. The empirical analysis used unique data set of the entire commercial banking sector in Korea, which covers both pre and post banking crisis periods over 28 years between 1976 and 2003. The researcher through using empirical studies highlighted that the change from price cap regulation to rate of return regulation, impacted the banking structure.

Ingale and Abale (2013) investigated NPA issues with reference to bank in Nepal. It was argued the NPA send distressing signals about sustainability of banks. It was commented that high level of NPA adversely affects profitability and erosion in value of assets. It affects the whole economy of the country. The study analyzed NPA of Nabil Bank Limited for a period of six years from 2006 to 2011.

Selvarajan and Vadivalagan (2013) examined NPA from viewpoint of priority sector lending. It was argued that major reason for NPA in priority sector is abuse of power by politicians and bureaucrats. The study included data of ten years for Indian bank and public sector banks as a group. It was found that priority sector lending of Indian bank was more than public sector banks put together. But it was found that Indian bank had managed its NPA better than public sector banks put together.

Sahoo, B., (2015) investigated the causes and remedies of NPA in Indian banks. It was argued that bankers should be proactive in credit management. It was recommended that 3 R measures should be adopted. The 3 R stands for rectification, restructuring and recovery. It was commented that poor management of NPA may restrict the infrastructure development of the country and restrict financial inclusion.

Hypothesis of the Study

H₀, There is no significant difference between the Non Performing Assets of Public, Private and Foreign banks taken under study

H₁, The significant difference exists between the Non Performing Assets ratio of Public, Private and Foreign banks taken under study.

Data Collection

Data for the present study is collected from secondary resources i.e. Statistical Tables relating to Banks, RBI Bulletin, Special lectures , Report on Currency and Finance, IBA journals , Published annual reports of selected banks and individual reports of banks under study.

List of Banks under study:

Public sector Banks	Private Sector Banks	Foreign Banks
1.Andhra Bank	1.City Union Bank	1.Bank of America
2.Bank of Baroda	2.Federal Bank	2.CITI Bank
3.Canara Bank	3.HDFC Bank	3. Deutsche Bank
4.Corporation Bank	4.ICICI Bank	4.HSBC Bank
5.Dena Bank	5.Jammu & Kashmir Bank	5.Standard Chartered Bank
6.Indian Overseas Bank		
7.Oriental Bank of Commerce		
8.Punjab & Sind Bank		
9.Punjab National Bank		
10.State Bank of India		

Statistical Tools

Data is analyzed with the help of suitable Parametric tests based on the nature of data collected. Apart from these financial analytical tools will also be applied to achieve the objectives of the present study. ANOVA, F-Test and T-test along with Post Hoc test has been used to check the variations between the various ratios taken for the study of Profitability Management , Management of funds, Priority sector lending and Non performing assets of 10 Public Sector banks along with the 05 private sector banks and 05 Foreign Banks operating in India.

ANALYSIS

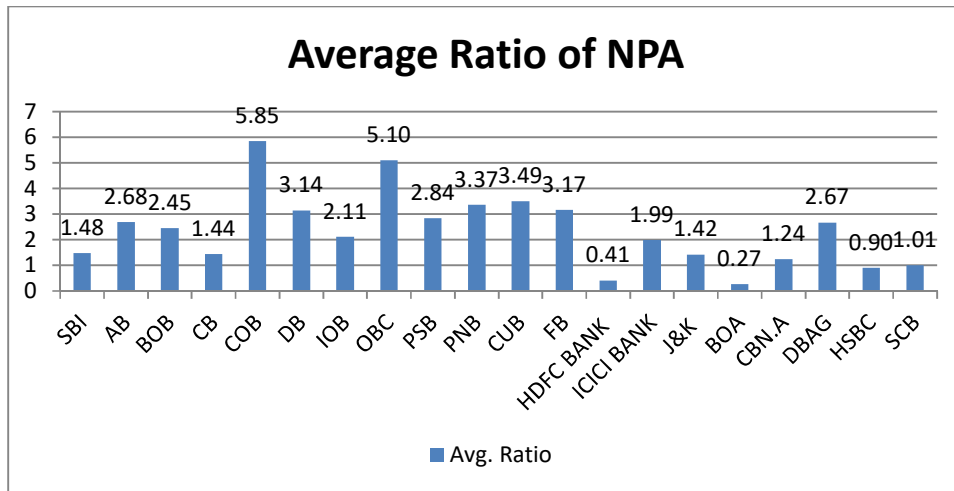
The Non -performing assets ratio as against the total advances is studied for the 10 public sector, 5 Private sector and 5 foreign banks taken under the present study for the year of 1999-2015 .The individual ratios along with the sector wise trend of Public ,Private and Foreign banks are studied to draw the various conclusions. The study is focusing on pointing out the relationship between the NPAs of Public ,Private and Foreign banks on the basis of their descriptive statistics available for the study period .The following Tables describes the pattern

of Non Performing assets in all the three sectors of banks ,bank wise as well as group wise . The NPA of Public sector banks, Private sector banks and Foreign banks are analyzed with average and individual figures to see the overall changing pattern of Non performing assets in the Indian Banking industry.

Combined Analysis of NPAs

The focus of this section is to have an insight view of the banking industry’s average NPA in the 17 years of our study. The following Graph shows the combined average NPA of all the banks in the study:

Graph 1
Combined NPA of all the Banks



The Graph 1 shows the average ratio of Non Performing assets for the year 1999-2015) in the individual banks .The bars are high in case of Public sector banks signalling the heaps accumulated in this sector ,whereas the foreign bank’s mechanism of handling assets may result in lesser amount of Non Performing assets. The highest average NPA is observed in Corporation Bank(5.85) whereas the least NPA is in case of Bank of America(0.27)which is the highest profit making bank. The maximum NPA is in case of foreign banks is in the case of Deutsche bank(2.67) ,whereas in Private sector banks the amount is maximum in City union bank (3.49)and the least NPA bearing bank in private sector is HDFC Bank(0.41).The average NPA of the largest bank (State Bank of India)is surprisingly is very less (1.48)over the years .The minimum NPA in Public sector banks is of Canara Bank(1.44). The average combined NPA of all the banks is 2.398 ,which is more than that of Bank of America, CITI Bank, Deutsche bank, HSBC Bank ,Standard Chartered Bank in foreign banks ,followed by

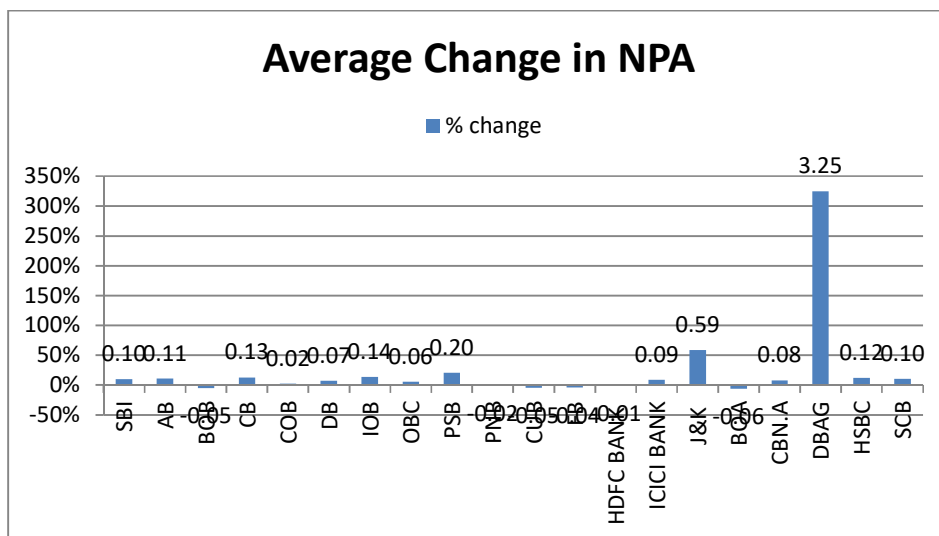
HDFC, J&K and ICICI Bank of private sector .In Public sector banks, the average NPA is less than the overall NPA in case of SBI, Bank of Baroda, Indian Overseas bank and Canara Bank.

Overall Change in NPAs

The next part discusses about the overall change happening in the Non Performing Assets in all the 20 banks taken for the study for the study period of 17 years (1999-2015).The average overall change in the banks is shown in the Graph below to depict the fluctuations happening.

Change in NPA over the years

Graph: 2
Average Change in NPA over the years



The Graph 2 is prepared to see the fluctuations over the years in NPA of all the banks under study. Though the NPA’s are least in case of foreign banks but the maximum change has been observed in a foreign bank, Deutsche bank almost 3.25 change is seen followed by the J&K bank (0.59) .The NPA ratio is found to be maximum in Public sector banks but over the year of study no major change has been observed in this sector. The maximum change is of (0.14) in Indian Overseas bank of Public sector . The overall decline has been maximum in case of Bank of America (-0.06) followed by CITI Union Bank (-0.05) and Bank of Baroda(-0.05) . The overall change is found to be positive at (0.24) except Deutsche and J&K bank in all the other banks average change is less than 24%.

Sector wise NPA Ratio analysis

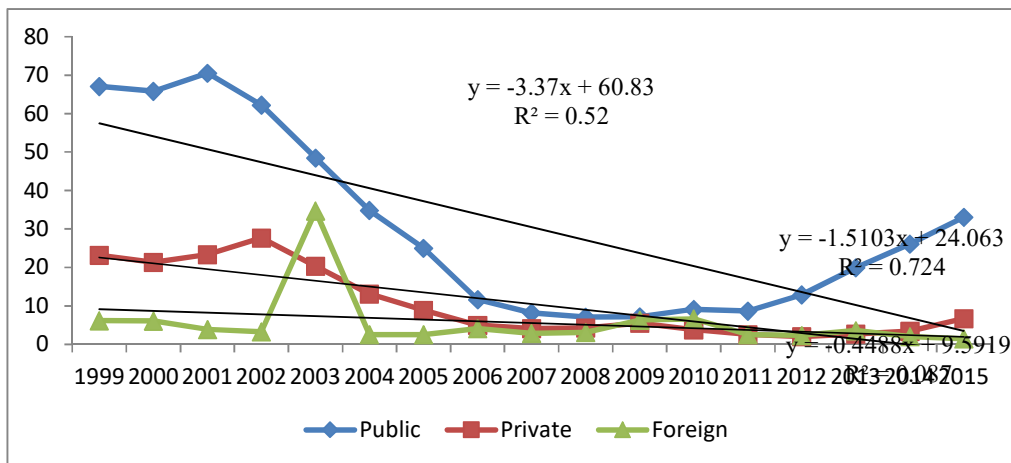
The individual NPAs bank wise and sector wise is analyzed here with the help of Table 1 .The NPAs in Public Sector Banks ,Private Banks and Foreign Banks is shown and the overall change happening in each bank’s NPA is observed. The Table.1 shows the individual Non performing asset ratio as against total advances for the 10 public sector banks for the year of 1999-2015.with the increasing advances in diverse sections of the society the amount of nonperforming assets also increases over the year .The ratio analysis gives the best view of judging the trend of change that is occurring.

NPA Ratio Trend Analysis

The trend analysis uses linear or Non linear regression to find the trend having Time as an explanatory variable .The trend analysis is used to check the pattern over the long period of time in a series. The sector wise NPA here is analyzed to predict the pattern over the years taking time as independent variable.

Graph: 3

NPA Trend Analysis of Public, Private and Foreign Banks



The trend analysis of Non Performing assets over the years of study shows that the beta value is negative in all the banks hence a sharp decline of NPA in all the banks is noted. The major decline was surprisingly noted in case of Public sector banks with beta value of -3.374, whereas the minimum decline was observed in the foreign banks over the year with beta value of -0.448 .The private banks also having the declining trend over the years with beta value of -1.5103 which is more than that of foreign banks and lesser than the Public sector banks taken for the study

NPAs of Public Sector Banks:

From the Table 1 below, we can notice the minimum NPA is noted in the year 2005 in case of Indian overseas bank where the figure is almost 0, shows that all the advances made are turned out to be performing. On the other hand the maximum NPA ratio in the study period is observed in case of Corporation bank in the year 2001 with 18.4 % of advances turning out to be bad, followed by next poor ratio in the year 2002 with 16.3 % in case of same bank. The average figures when compared shows that in 17 years of study the NPA ratio was observed to be maximum in case of corporation bank as compared to the other 9 banks in the public sector including the largest bank i.e SBI, The second bank having high NPA ratio is observed in the case of Oriental bank of commerce with average NPA is of 5.10 followed by 3.36 of Punjab national bank. On the other hand the optimum condition with minimum ratio was found in case of Canara bank with average NPA ratio of 1.44 % followed by the state bank of India with 1.48% and 2.45% of Bank of Baroda.

In the year 1999, the maximum NPA ratio was seen in case of oriental bank of commerce with 10.5% of NPA followed by Punjab and Sind Bank (8.96%). The minimum NPA ratio in the year 1999 was seen 1.98 % in case of Canara Bank as justified in the average figures also, was followed by SBI with Net NPA ratio of 4.26 % in the year 1999. Whereas, when the ratios were observed in the year 2015, the maximum ratio was found in the Indian overseas bank with NPA of 5.68%. followed by 4.06% of Punjab national bank. The minimum Net Non performing asset ratio in the year 2015 was observed in case of Bank of Baroda with 1.89% followed by State Bank of India with 2.12% and Canara bank with 2.65%.

NPAs of Private Sector Banks

The Ratio of Net Non performing assets of Private sector banks taken under study for the year 1999-2015. The ratios are compared for the 17 years to analyze in which bank it is found to be maximum and minimum. The Net NPA ratio in case of private banks throughout the study is found to be maximum in case of Federal bank (11.7%) for the year 2002 followed by 10.1 % for the year 2001 and 8.56% in the year 2000 for the same bank. On the other hand throughout minimum ratio was observed in case of HDFC Bank with 0.16% in the year 2004 followed by 0.18% in the year 2012 in the same bank. The average ratios throughout the 17 years when compared has shown that the minimum Net NPA ratio was found in case of HDFC bank with average ratio of 0.40 (which is very good as compared to the minimum of public sector banks 1.44 in case of canara bank). followed by Jammu and Kashmir bank with 1.41 % Net NPA ratio through out the period of study, whereas the maximum average ratio was noted in case of CITI union bank with 3.49% of

Net NPA followed by 3.16 % in case of federal bank and 1.99% average Net NPA of ICICI Bank. At the starting period of the study in the year 1999, the minimum ratio among all the 5 banks of private sector banks is noted in HDFC Bank (1.08%) followed by ICICI bank with 2.88% of Net NPA on the other hand the highest Net NPA in the year 1999 was observed in case of CITI union bank with ratio of 7.96% followed by 7.53% of federal bank. On the other hand in the year 2015 the maximum Net NPA ratio was observed in the J&K Bank with 2.77% followed by 1.61% of ICICI Bank and the minimum ratio was seen in the HDFC Bank with 0.25% which was followed by federal bank (0.73%).

NPAs of Foreign Banks

The Ratio of Net Non performing assets-Total advances of 5 foreign sector banks taken under study for the year 1999-2015. The ratios are compared for the 17 years to analyze the pattern of NPA over the year in case of foreign banks. The minimum ratio throughout the years is observed in case of Bank of America with maximum times NIL NPA over the period of the study on the other hand the maximum amount of NPA ratio was seen in case of Deutsche bank with 32.1 % in the year 2003 followed by 2.63% in the year 2009 in case of CITI Bank. The average ratios in case of foreign banks are quite less as against the private and public sector banks. The average Net NPA ratio in case of foreign banks was observed minimum in case of Bank of America with 0.26% including the almost NIL figures for the maximum time periods, followed by 0.90 % of HSBC Bank and 1.00% of standard Chartered bank. The maximum average Net NPA was noted in case of Deutsche bank with 2.66% followed by 1.24% of CITI bank. In the year 1999, the minimum ratio of NPS was seen in case of Bank of America with 0 as against the 3.18 of standard Chartered bank, followed by CITI bank with 2.08% NPA. In the year 2015 the maximum Net NPA was observed in case of HSBC Bank with ratio of 0.51% followed by 0.40% of CITI Bank on the other hand the minimum Net NPA ratio was in case of 0.11% of Bank of America followed by 0.13% of Deutsche bank.

Table 1 Sector wise NPAs of PSBs, PVTBs, FRGNBs

Public Sector Banks																		
Ratio of Non Performing Assets-Total Advances																		
Bank/Yr.	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Avg.
SBI	4.26	3.47	2.95	2.45	1.79	0.93	0.28	0.24	0.17	0.15	0.18	0.17	0.38	0.91	2.10	2.57	2.12	1.48
AB	7.7	5.94	6.77	5.06	3.72	2.99	1.45	0.87	0.60	0.47	0.31	0.34	0.35	0.54	2.45	3.11	2.93	2.68
BOB	7.09	5.2	4.84	3.89	3.59	2.89	1.88	1.12	0.94	0.84	1.09	1.06	1.11	1.46	1.28	1.52	1.89	2.45
CB	1.98	1.92	1.98	2.31	1.65	1.8	2.68	0.64	0.47	0.32	0.29	0.31	0.46	0.87	2.18	1.98	2.65	1.44
COB	7.67	13.5	18.4	16.3	11.8	9.4	5.23	3.04	1.99	0.94	1.09	1.21	1.22	1.01	1.19	2.32	3.08	5.85
DB	7.3	7.65	7.01	6.32	5.23	2.85	1.27	0.65	0.55	0.60	1.33	2.52	1.19	1.35	1.39	2.35	3.82	3.14
IOB	4.5	3.8	3.6	3.2	1.4	0	1.29	0.49	0.49	0.99	0.65	0.87	0.98	2.21	2.50	3.20	5.68	2.11
OBC	10.5	9.39	12.3	11.7	10.9	9.62	8.11	2.43	0.66	0.37	0.32	0.36	0.56	1.19	2.27	2.82	3.34	5.1
PSB	8.96	8.52	6.69	5.32	3.86	0.98	0.2	0.29	0.76	0.64	0.17	0.53	0.85	1.52	2.16	3.35	3.55	2.84
PNB	7.18	6.41	6.03	5.63	4.5	3.48	2.65	1.87	1.56	1.78	1.76	1.72	1.63	1.82	2.35	2.85	4.06	3.37
Private Sector Banks																		
Ratio of Non Performing Assets-Total Advances																		
Bank/Yr.	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Avg.
CUB	7.96	7.26	8.2	8.22	8.21	6.37	3.37	1.95	1.09	0.98	1.08	0.58	0.52	0.44	0.63	1.23	1.3	3.49
FB	7.53	8.56	10.1	11.7	4.95	2.89	2.21	0.95	0.44	0.23	0.3	0.48	0.6	0.53	0.98	0.74	0.73	3.17
HDFC	1.08	0.77	0.45	0.5	0.37	0.16	0.24	0.44	0.43	0.47	0.63	0.31	0.19	0.18	0.2	0.27	0.25	0.41
ICICI	2.88	1.53	2.19	5.48	5.21	2.21	1.65	0.72	1.02	1.55	2.09	2.12	1.11	0.73	0.77	0.97	1.61	1.99
J&K	3.79	3.22	2.45	1.88	1.58	1.48	1.41	0.92	1.13	1.07	1.38	0.28	0.2	0.15	0.14	0.22	2.77	1.42
Foreign Sector Banks																		
Ratio of Non Performing Assets-Total Advances																		
Bank/Yr.	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Avg.
BOA	—	1.92	0.68	0.18	0.05	0	0	0	0	0	0	-	-	-	-	-	0.11	0.27
CBN.A	2.08	1.05	0.7	0.4	1.17	1.4	1	1.95	1.02	1.23	2.63	2.14	1.21	0.9	1.47	1.24	0.4	1.24
DBAG	—	—	-	-	32.1	0	0	0	0.01	0.22	0.88	0.79	0.23	0.09	0.13	0.09	0.13	2.67
HSBC	0.91	1.04	0.99	2.27	1.03	0.7	0.5	0.58	0.43	0.58	1.42	2.31	0.91	0.62	0.33	0.24	0.51	0.9
SCB	3.18	2.04	1.53	0.4	0.31	0.52	1.12	1.57	1.43	1.04	1.37	1.4	0.27	0.7	1.63	0.45	0.34	1.01

Coefficient of Variations of NPA:

The Table 2 shows the mean figures of NPA ratios in Public, Private and Foreign banks along with standard deviation and coefficient of variation. The ratio is compared with year wise and combined sector wise figures is as follows:

Table: 2
Coefficient of Variation of NPA Ratio

Year	PBS	PVTBs	FRGNBS	Total	Mean	S.D	C.V
1999	67.1	23.2	6.2	96.5	32.2	31.4	97.7
2000	65.8	21.3	6.1	93.2	31.1	31.0	99.9
2001	70.5	23.4	3.9	97.8	32.6	34.2	105.1
2002	62.2	27.7	3.3	93.2	31.1	29.6	95.3
2003	48.5	20.3	34.7	103.4	34.5	14.1	40.8
2004	34.9	13.1	2.6	50.7	16.9	16.5	97.6
2005	25.0	8.9	2.6	36.5	12.2	11.6	95.0
2006	11.6	5.0	4.1	20.7	6.9	4.1	59.7
2007	8.2	4.1	2.9	15.2	5.1	2.8	54.8
2008	7.1	4.3	3.1	14.5	4.8	2.1	42.8
2009	7.2	5.5	6.3	19.0	6.3	0.9	13.5
2010	9.1	3.8	6.6	19.5	6.5	2.7	41.0
2011	8.7	2.6	2.6	14.0	4.7	3.5	75.8
2012	12.9	2.0	2.3	17.2	5.7	6.2	107.8
2013	19.9	2.7	3.6	26.2	8.7	9.7	110.9
2014	26.1	3.4	2.0	31.5	10.5	13.5	128.5
2015	33.1	6.7	1.5	41.3	13.8	17.0	123.3
Total	517.9	178.1	94.3	790.3	263.4	224.3	85.2
Mean	30.5	10.5	5.5	46.5			
SD	23.6	9.0	7.7	35.0			
CV	77.4	85.6	138.4	75.3			

The Table 2 is the descriptive of sector and year wise NET NPA Ratio for the Public, Private and Foreign Banks for the study period of 17 years from the 1999-2015 .The Table shows the sector wise Mean, Standard deviation and C.V .The sector wise mean is maximum in case of Public sector banks(30.5) with standard deviation of 23.6 followed by the Private sector banks(10.5) and standard deviation of 9.0 and the least mean was in case of Foreign banks with mean value of 5.5 and standard deviation of 7.7 .The coefficient of variance(CV)is found to be maximum in case of foreign banks (138.4) followed by private sector banks(85.6) and Public sector banks (77.4).

On the other hand when year wise NPAs are compared in the year 2011 the combines mean of all the three sectors were minimum with average value of 4.7 with standard deviation of 3.5 and CV of 75.8 .on the other hand maximum combined mean was observed in the year 2003 with value of 34.5 , standard deviation of 14.1 and CV of 40.8.

Regression model for ratio of Net NPA to Net Advances:

Dependent variable (Y) = Ratio of net NPA To net advances

Independent variable(X1) =Year

Model

$$Y = a + b_1 X_1$$

Regression model of Net NPA to Net Advances of Public Sector ,Private sector and Foreign Banks

The regression model results of NPA trend analysis in Public sector banks, Private sector banks and Foreign banks taking NPA as dependent variable and Time as independent variable regression model is developed as follows:

Regression Model summary of Public Sector banks, Beta Coefficient and t value

Table 3
Summarized Regression model of NPA of Public Sector Banks

R	R Square	Adjusted R Square	Std. Error of the Estimate	F value	p value
0.72	0.52	0.49	16.8	16.4	0.00**

Table 4
Beta coefficient and t values of independent variable of public bank

	Beta coefficient	Std. Error	t value	p value
(Constant)	60.8	8.53	7.13	0.00
Time(Year)	-3.37	0.83	-4.05	0.00**

Dependent variable: Net NPA

** Significant at 0.01level (t=2.58),0.05*level(t=1.96)

The model summary of the public sector banks with R Square 52% with F-value of 16.4 with adjusted R Square 49% is found to be significant at 0.01% level of significance. The significant variations caused in NPA over the period are evidenced. The beta factor (-3.37)with t value(-4.05)states the negative trend over the years of the study states that there is a decline in the NPA over the years in the Public sector banks found to be significant.

Regression Model summary of Private Sector banks, Beta Coefficient and t value

Table 5
Summarized Regression model of Private Banks

R	R Square	Adjusted R Square	Std. Error of the Estimate	F value	p value
0.85	0.72	0.71	4.86	39.35	0.00**

Table 6
Beta coefficient and t values of independent variable of private bank

	Beta coefficient	Std. Error	t value	p value
(Constant)	24.10	2.45	9.75	0.00
Priority ratio	-1.51	0.24	-6.27	0.00**

Dependent variable: Net NPA

** Significant at 0.01level (t=2.58),0.05*level(t=1.96)

The model summary of Private sector Bank's NPA with R square of 72% and adjusted R square 71% with F value of 39.35 with P value<0.01 is found to be significant. The beta Coefficient

(-1.51) with standard error of 0.24 and t value -6.27 is found to be significant at 0.01% level of significance. The banks regression on the basis of Time from the year 1999-2015 signifies the negative trend occurring over the period in the private sector banks.

Regression Model summary of Foreign banks , Beta Coefficient and t value

Table 7

Summarized regression model of NPA for foreign banks

R	R Square	Adjusted R Square	Std. Error of the Estimate	F value	p value
0.30	0.09	0.03	7.58	1.43	0.25

Table 8

Beta coefficient and t values of independent variable of foreign banks

	Beta coefficient	Std. Error	t value	p value
(Constant)	9.59	3.84	2.49	0.03
Priority ratio	-0.45	0.38	-1.20	0.25

Dependent variable: Net NPA

The regression results in the summarized Foreign bank's NPA with R Square 9% and adjusted R Square 3% ,with F Value 1.43 is found to be insignificant with p value >0.05 . .The beta coefficient (-0.45)and t value (-1.20) shows the decline in the NPA trend over the years of study in Foreign banks .

One way ANOVA Analysis of NPA Ratio

The one way ANOVA is applied to check whether any significant difference lies in between the Non performing Assets of Public, Private and foreign Bank's NPA over the study period. The results are checked at 0.01% and 0.05% level of significance. The between and within comparisons followed with post hoc multiple comparison is pursuit to check the variations among the sectors.

Descriptive statistics of Net Non Performing Assets:

The descriptive of NPA in Public sector banks, Private sector Banks and Foreign Banks is as follows:

Table 9
Descriptive statistics of NPA of Public, Private and Foreign Banks

Bank	Mean	Standard Deviation	Minimum	Maximum	Range
PSBs	3.05	3.22	0	18.37	18.37
PVTBs	2.1	2.62	0.14	11.66	11.52
FRGNBs	1.26	3.68	0	32.1	32.1
Total	2.39	3.27	0	32.1	32.1

The Table 6.9 shows the Minimum and maximum range of NET NPA ratios in all the three sectors of the banks taken for the study The combined mean in all the sectors is 2.39 with standard deviation of 3.27 with minimum range of 0 to the maximum range of 32.1. The mean of the ratio among all the sectors is found to be minimum in case of foreign banks with mean value of 1.26 followed by private banks with mean value of 2.1 and the maximum mean was observed in case of Public sector banks 3.05 with standard deviation of 3.22 .The SD in case of Private banks was noted as 2.62 and in case of foreign banks 3.68.

One way ANOVA Significance of Non Performing Assets-Total advances: The one way ANOVA results of NPA ratio is shown in the Table 10 as follows:

Table 10
One way ANOVA

Ratio	Comparison	Sum of Squares	Df	Mean Square	F-Value	P-Value
Ratio of Net NPA-Total advances	Between Group	176.94	2	88.47	8.68	0.00**
	Within Group	3334.32	327	10.2		
	Total	3511.26	329			

**Significant at 0.01 level of significance (t=2.58) ,0.05 level of significance (t=1.96)

The ratio of NET NPA to Total advances is compared between and within group at 0.01% level of significance. The results between group at $df(2)$ and with sum of squares 176.94, mean square of 88.47 and within group sum of squares 3334.32 with mean square of 10.2 at $df(327)$ with F-Value 8.68 is found to be significant at 0.01% level of significance. Which justifies the significant relationship existence between the sectors and within the different sectors.

Post hoc Multiple Comparisons of NPA Ratios:

The results of one way ANOVA between and within groups is found to be significant at 0.01% level of significance with p value <0.01 . The post hoc multiple comparison is done to find the significant difference among the two group of sectors. The following Table of multiple comparisons is shown to check the significant difference among the banks.

Table 11
Post Hoc Multiple Comparison test of NPAs

Ratio	Bank	Sources of Variation	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Ratio of Net NPA – Total Advances	PSBs	PRVTBs	0.95	0.42	0.08	-0.09	1.99
		FRGNBs	1.79*	0.44	0	0.7	2.88
	PRVTBs	PSBs	-0.95	0.42	0.08	-1.99	0.09
		FRGNBs	0.84	0.51	0.25	-0.41	2.08
	FRGNBs	PSBs	-1.79	0.44	0	-2.88	-0.7
		PRVTBs	-0.84	0.51	0.25	-2.08	0.41

**Significant at 0.01 level of significance ($t=2.58$), 0.05 level of significance ($t=1.96$)

In the Table 10, The one way ANOVA test justifies the significant difference between and within group with $df 2$ and $df 327$ at the significant level 0.01%. The Post hoc multiple comparison is made in table 11 to zoom the picture and to identify the exact difference falls in two means of the different sectors of banks taken for the study. For this purpose multiple layers

of comparison has been plotted where Public sector banks are compared with Private sector banks than with foreign banks ,the comparison between Private and foreign banks is to be done and vice versa to draw the exact place of lying the difference between the means of the three sectors of the banks. The multi comparison among the means ;the public sector banks when compared with the private sector banks with mean difference of 0.95 ,standard error 0.42 with P-Value of 0.08 is found to be insignificant at 0.05 % level of significance with lower bound of-0.09 and upper bound of 1.99 at 95% confidence level on the other hand when the public banks are compared with private banks having mean difference of 1.79 ,standard deviation of 0.44, with lower bound of 0.7 and upper bound of 2.88 at 95% confidence level is found to be significant at 0.01% level of significance .In the third case when Private and foreign bank's means were compared with mean difference of 0.84 and standard deviation of 0.51 with upper bound of 2.08 and lower bound of -0.41 at 95% confidence level is found to be insignificant at 0.01% level and 0.05% level of significance with P value of 0.25 .Hence the main difference lies in case of Public and Foreign bank's means ,whereas no significant difference is seen in the calculated means of public-private and Private –foreign banks.

Results

The NPAs of Public Sector Banks, Private Sector and Foreign Banks Between and within the group with p value<0.01 is found to be significant .The post hoc multiple comparison table shows that the major difference lies between the Public –Foreign banks. Hence ,we are able to accept the alternative hypothesis and reject the null hypothesis as significant difference is observed in between the NPAs of different sectors.

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