

# MACRO AND MICRO INDICATORS OF NON PERFORMING ASSETS: AN EMPIRICAL ANALYSIS ON INDIAN BANKS

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**Abstract :** Indian banking system is dominated by public sector banks as they hold major portion of banking business of India. Problem of bad loans is bigger in public sector banks due to their big size and bigger area of operation. Several macroeconomic and bank specific variables influences NPA of public sector banks. An attempt has been made in the present paper to examine the impact of selected macro and micro indicators on Non Performing Assets of Indian public sector banks. It has been observed that Macroeconomic variables GDP and Exchange rate had significant impact over NPA of PSBs. Further, it has been examined that selected banks specific indicators viz. advance, bank's borrowing, total deposits, total assets, reserves & surplus and total number of employees also had great influence over NPA of public sector banks during the study period.

**Key words:** Macro indicators, micro indicators, NPA, public sector banks

## I. INTRODUCTION

Banking system mobilizes nations saving into profit generating assets through extension of credit in various priority and non priority sectors. Banks also deals in lending activities for fulfilment of socio economic objectives of the nation (Siraj K.K. 2014). Loans/advance are considered as high risk weighted assets because of credit risk associated with. Indian banking system is struggling with challenges related to NPA (Siraj.K.K. and Pillai, P.S.2012). Behind mounting NPAs there are Internal, External and other factors. Internal factors are diversion of funds, poor credit appraisal and lack of modern technology platform. External factors are recession, exchange rate fluctuations and frequent changes in government policies (Dr Mahesh U Daru 2016). A high level of NPAs shows high possibility of a huge number of credit defaults that impinge on the profitability and net-worth of banks and also obstructs the money of the banks consequently affects the liquidity in the economy. Several reasons behind mounting NPA viz. economic conditions, wilful defaults, diversion of funds and inefficiency of banks to manage credit risk (Pooja Rana 2016). There is a significant impact of macroeconomic indicators on the Gross and Net Non-Performing Assets (Dr P Krishna prasanna 2014, swamy 2012). Also financial performance of the banks is influenced by several micro economic factors (Lavinia Mihaela 2015). Bank specific factors such as liquidity, operational cost efficiency, asset quality and income diversification had a significant statistical impact on the profitability of banks (Olweny, T. and Shipho, T.M. 2011). Behavior of NPA can be explained by macroeconomic variables like GDP growth, unemployment, public debt, and bank specific variables viz. performance and operational efficiency and quality of management may also explain the movement of Non Performing Assets (Louzis, D.P., et al 2010)

## II. OBJECTIVES

1. To examine impact of selected macroeconomic factors on Non Performing Assets of Indian PSBs
2. To study impact of selected bank specific determinants on Non Performing Assets of Indian PSBs

## III. RESEARCH METHOD

Research is exploratory and empirical based on secondary data which has been drawn from different publications of RBI viz. report on trend and progress in banking, handbook of statistics on Indian economy, financial stability report and RBI bulletins etc. four macroeconomic (GDP, Interest rate, Inflation and Exchange rate) and six bank specific determinants (Advances, total deposits, bank borrowings, total assets, total no of employees and reserves & surplus) have been considered as independent variables. Gross and net NPA of Indian public sector considered as dependent variables. Impact of Independent variables have been analysed on dependent variables with the help of bivariate correlation and liner regression analysis. Relevant

data of NPA and above variables tabulated with MS excel and imported in software package SPSS 20.0 for further analysis. Time period of 2003-2016 (14 years) has been considered as study period. Database of independent and dependent variables belongs to study period has been taken into account for the purpose of analysis.

#### IV. ANALYSIS AND INTERPRETATION

Table: I (Macroeconomic variables and Gross NPA - Coefficient Values, Test of Significance and comparison)

Variables	Regression Coefficients	Test of Significance		Value of R-Square	Correlation Coefficient (r)
		P-Value	Significance		
GDP	0.036	0.000	Yes	0.693	0.832
Inflation	-0.718	0.002	Yes	0.579	- 0.761
Interest rate	-0.706	0.089	No	0.222	-0.471
Exchange Rate	159.924	0.000	Yes	0.796	0.892

Source: Author's compilation through by SPSS output

Table: II (Macroeconomic variables and Net NPA - Coefficient Values, Test of Significance and comparison)

Variables	Regression Coefficients	Test of Significance		Value of R-Square	Correlation Coefficient (r)
		P-Value	Significance		
GDP	0.022	0.000	Yes	0.680	0.824
Inflation	-0.323	0.026	Yes	0.351	-0.593
Interest rate	-0.443	0.061	No	0.263	-0.513
Exchange Rate	100.418	0.000	Yes	0.784	0.885

Correlation between GDP with Gross and Net NPA of PSBs during the study period is significant. It means when GDP increased, NPA of PSBs has also increased significantly. Value of R square indicates that GDP is able to measure 69 % variation in Gross NPA and 68 % variation in Net NPA. Correlation between Inflation with Gross NPA and Net NPA of PSBs during the study period is negative and significant. It means when Inflation increases, NPA of PSBs decreases significantly. Value of R square indicates that Inflation is able to measure 57 % variation in Gross NPA and 35 % variation in Net NPA.

Correlation between Interest rate with Gross NPA and Net NPA of PSBs during the study period is negative and not significant. Interest rates are not significantly correlated with Gross and Net NPA. Value of R square indicates that Interest rate is able to measure 22 % variation in Gross NPA and 26 % variation in Net NPA. Correlation between Exchange rate and gross NPA and net NPA during the study period is positive and significant. It indicates that when exchange rate increased, Gross NPA has also increased during the study period. Value of R square indicates that Exchange rate is able to measure 79.6 % variation in Gross NPA and 78.4 % variation in Net NPA

Table: III (Bank specific determinants and Gross NPA - Coefficient Values, Test of Significance and comparison)

Variables	Regression Coefficients	Test of Significance		Value of R-Square	Correlation Coefficient (r)
		P-Value	Significance		
Advance	0.063	0.001	Yes	0.637	0.798
Bank's borrowing	0.013	0.000	Yes	0.741	0.861
Total deposits	0.056	0.000	Yes	0.651	0.807
Reserves and surplus	0.739	0.000	Yes	0.675	0.822
Total assets	0.043	0.000	Yes	0.661	0.813
Total employees	0.013	0.007	Yes	0.464	0.681

Table: IV (Bank specific determinants and Net NPA - Coefficient Values, Test of Significance and comparison)

Variables	Regression Coefficients	Test of Significance		Value of R-Square	Correlation Coefficient (r)
		P-Value	Significance		
Advance	0.039	0.001	Yes	0.623	0.789
Bank's borrowing	0.008	0.000	Yes	0.725	0.851
Total deposits	0.035	0.001	Yes	0.637	0.798
Reserves and surplus	0.463	0.000	Yes	0.661	0.813
Total assets	0.027	0.001	Yes	0.647	0.804
Total employees	0.008	0.010	Yes	0.437	0.661

Correlation between Advance with Gross NPA and Net is positively significant. It indicates that when Advance increased, gross and net NPA has also increased during the study period. Value of R square shows that Advance is able to explain variations in Gross NPA up to 63.7% and net NPA up to 62.3%. Correlation between Banks's borrowing with Gross and net NPA is positively significant. It indicates that when Total borrowing increased, gross and net NPA has also increased during the study period. Value of R square indicates that Bank's borrowing is able to explain variations up to 74.1% and 72.51% in gross and net NPA respectively. Correlation between Total deposits with Gross NPA and net NPA is positively significant. It indicates that when Total deposits increased, Gross NPA has also increased during the study period. Total deposits are able to explain variations in Gross NPA up to 65.1% and net NPA up to 63.7%.

Correlation between Reserves & surplus with Gross and net NPA is positively significant. It indicates that when Reserves and surplus increased, NPA has also increased during the study period. Reserves and surplus are able to explain variations in Gross NPA up to 67.5% and net NPA up to 66.10%. Correlation between Total Assets and Gross and net NPA is positively significant. It indicates that when Total Assets increased NPA has also increased during the study period. Value of R square indicates that total Assets is able to explain variations in gross NPA up to 66.10% and net NPA up to 64.70% Correlation between Total number of employees and Gross and net NPA is positively significant It indicates that when Total number of employees increased, Gross NPA has also increased during the study period. Number of employees are able to explain variations in gross and net NPA up to 46.40 % and 43.70% respectively.

## V. FINDINGS

(1) Correlation between GDP and Gross NPA ( $r=0.832\%$ ) and GDP and Net NPA ( $r=0.824\%$ ) of Public Sector Banks is significant during the study period (2003-2016). It means when GDP increased, Gross and Net NPA of PSBs have also increased significantly. When GDP increases each and every sector of the economy performs well and because of the same demand for loan increases consequently banks' lending aggressively increases and banks disburses huge loans, as a result generation of fresh NPA increases. Regression analysis exhibited that GDP has a significant impact on the NPA of Public Sector Banks during the study period.

(2) Inflation is negatively correlated with Gross NPA ( $r=-0.761$ ) and Net NPA ( $r=-0.593$ ). The correlation is significant but negative, it implies that when Inflation increases, Banks restricts lending (Particularly in risky projects) to control money supply in the economy as a remedial measure according to the directives provided by RBI consequently fewer loans to be disbursed by banks and generation of fresh NPA reduces. Regression analysis highlighted that Inflation has significant impact on Gross and Net NPA of Public Sector Banks in India during 2003-2016.

(3) Correlation between Interest rates and Gross NPA is found negative and not significant ( $r=-0.471$ ). Interest rate is also negatively correlated with Net NPA ( $r=-0.513$ ). During the study period it has been observed that Interest rate is not significantly correlated with NPA of banks. The major cause behind mounting NPA is wilful default and it does not depend on the interest rate but it depends on unwillingness to make repayment of loans. Regression study exhibited that there is no significant impact of Interest rates on Gross and Net NPA of Public Sector Banks during 2003-2016.

(4) Exchange rate has a significant and positive correlation with Gross NPA ( $r=0.892$ ) and Net NPA ( $r=0.885$ ). When Exchange rate increases, value of domestic currency (INR) decreases and due to inflation, cash outflows (in order to purchase foreign exchange to make payments in overseas market) of the borrowers (particularly importers) also increases consequently the repayment potential of the borrower in domestic market decreases and leads to NPA. Further, Regression study indicated that there is a significant impact of the exchange rate on NPA of Public Sector Banks in India during the study period.

(5) Advance is significantly correlated with Gross NPA ( $r=0.798$ ) and Net NPA ( $r=0.789$ ). When Advance increases, NPA also increases. Aggressive lending practices in order to meet socio economic objectives and to meet the loan disbursement targets without proper pre-sanction appraisal and post sanction follow-ups along with ineffective credit risk management leads to Non Performing Assets. Regression study highlighted that Advance has significant impact on Gross and Net NPA of PSBs during the study period. .

(6) Bank borrowings have a significant positive correlation with Gross NPA ( $r=0.861$ ) and Net NPA ( $r=0.851$ ). Although borrowings increase the liability of banks but simultaneously this variable influences the credit potential of the banks and consequently extension of credit increases. Hence when borrowings increase NPA also increases. Regression study exhibited that there is significant impact of Bank borrowings on NPA of PSU banks during the study period.

(7) Total deposits of PSBs is significantly correlated with Gross NPA ( $r=0.807$ ) and Net NPA ( $r=0.798$ ) during the study period (2003-2016). Total deposits increase the liability of banks but simultaneously it also influences potential of PSBs for disbursement of credit, hence when deposit increases, bank's advance also increases consequently NPA increases. Regression study indicates that there is significant impact of Total deposits on NPA of Public Sector Banks.

(8) Correlation between Reserves and surplus of Public Sector Banks with Gross NPA ( $r=0.822$ ) and Net NPA ( $r=0.813$ ) is significantly positive during 2003-2016. Reserves and surplus influence the advance of Banks consequently advance/loan increases and leads to generation of fresh NPA of the Banks. Regression analysis showed the significant impact of Reserves and surplus on NPA of Public Sector Banks during the study period.

(9) There is positive and significant correlation between total number of employees in PSBs and Gross NPA ( $r=0.822$ ) and total number of employees and Net NPA ( $r=0.813$ ). Conceptually when number of employees increases, NPA should be managed effectively and the level of NPA should decrease with increase in the number of employees. But here NPA is increasing because the average annual growth rate in number of employees is slower (1.16%) than average annual growth rate of GNPA (23.17%) and Net NPA (27.25%) in PSBs during 2003-2016. Both are increasing simultaneously but with different growth rates therefore here is a positive correlation. Further, when the number of employees increases it not necessarily increases in the credit department of the banks. Hence employees are increasing and NPA is also increasing during the study period. Regression study highlighted significant impact of number of employees on NPA of PSBs during the study period.

(10) Total assets (Bank size) is also significantly correlated with Gross NPA ( $r=0.813$ ) and Net NPA ( $r=0.804$ ) of Public Sector Banks during the study period. It implies that when bank's total asset increases bank's lending power also increases. It influences the advance of banks and leads to NPA. Regression analysis indicates that there is a significant impact of Total assets of PSBs on NPA during the study period.

## VI. CONCLUSION

Macroeconomic indicators (GDP and Exchange rate) and selected bank specific variables had significant impact on NPA of public sector banks in India during the study period. There are various other reasons too behind mounting NPA. Wilful default, lack of timely legal solutions, improper selection of borrower, ineffectiveness of government machinery, and poor credit appraisal system etc. problem of NPA is more serious with public sector banks in India. Private sector banks have remained in comfortable position as they follow strict practices for credit appraisal and recovery of bad loans.

Public sector banks has bigger market share in the total banking business in India they extend huge credit in priority and non priority sectors in order to fulfil socio economic objective of the nation consequently problem of bad loan is bigger in public sector banks. Policy makers must pay attention and should follow some preventive and strict measures to cope up with the problem.

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