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Synergetic Effect of Macroeconomic Determinants on Stressed Assets of Indian PSU Banks

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Abstract – Indian banking system is under threat of continuous deterioration in asset quality. The problem is more serious in PSU banks. The level of stressed assets popularly known as NPA has drastically increased in public sector banks in the recent past. There are various macroeconomic and microeconomic indicators which render impact on NPA of banks. The problem is serious and growing rapidly with a distressing rate. An attempt has been made in the present study to examine the multiparty impact of selected variables on NPA. Macroeconomic indicators viz. GDP, Interest rates, Inflation and Exchange rate together had greater impact on NPA of PSU banks. During the study period level of Gross and Net NPA has shown various movements which has been expressed through bar diagrams. Study focuses on determining combined impact of selected variables on NPA and various movements during study period in NPA of PSU banks in India.

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INTRODUCTION

Banks primarily deals in extension of credit through lending. Lending is to be done for the fulfilment of socioeconomic objectives, revenue generation through interest earning and to mobilize savings of stake holders in the economy. Lending always carries risk, popularly known as credit risk. If borrower is unable to fulfil its financial obligation, credit risk arises. Loan/advances are considered as assets of the banks which are weighed with credit risk. Under the threat of credit risk, the asset quality of banks is deteriorating with a noteworthy rate. Significant proportion of loan/advances weighted with credit risk has become stressed assets for the PSU banks in India.

Stressed assets which is also articulated as NPA has increased in PSU banks in the recent past with a rapid growth. Although the problem of NPA is associated with entire banking system of India but the magnitude of the problem is more significant with Indian PSU banks. PSU banks includes nationalized banks and SBI & its associates. Level of gross NPA in PSU banks during 2003-2016 has increased with average annual growth rate 20.68% and Net NPA during the same period showed average annual growth rate 24.13%. These rates indicate that the problem is increasing with deplorable level.

REVIEW OF LITERATURE

Bhati and Goyal (2017) in their empirical study analysed that macroeconomic and microeconomic variables has significant impact over Gross and Net Non-Performing Assets of Indian public sector banks. Further, they stated in their study that during 2009 to 2016 gross and net NPA of PSU banks has increased with an alarming rate. Study concluded that selected macroeconomic and microeconomic indicators viz. GDP at factor cost, exchange rate, Net advances total deposits, reserves & surplus had greater impact on NPA of PSU banks

Dr P Krishna prasanna (2014) examined in his research that there is a significant impact of macroeconomic indicators on the Gross and Net Non-performing assets. Study was conducted on Indian banks for the period 2000-2012. He found that higher growth rate in GDP and domestic savings reduces the level of NPA of Indian banks. Further, he concluded that higher interest rates and inflation contribute positively to increasing the NPA.

Swamy (2012) observed in his study titled “Impact of Macroeconomic and Endogenous Factors on Non-Performing Banks Assets” that NPA of banks is influenced by several macroeconomic factors. He found that there is a significant relationship between macroeconomic indicators and NPA of banks. Further, he stated that savings level in an economy gives explanation about the economic

surplus available. Domestic Savings is directly proportional to the repayment capacity of the borrowers of the banking sector. In other words, growth in domestic savings expected to show negative correlation with NPA.

Thiagarajan, S., et al (2011) examined in their study that both macroeconomic and bank specific factors plays a significant role in the determination of credit risk in commercial banks. Credit risk lead to Non Performing Assets, higher will be the credit risk; higher would be the level of NPA in Banks. Study was conducted on PSU banks and private banks for the period 2001-2010. Study revealed that there is a negative correlation between GDP of the nation and credit risk.

Kamal Das (2008) found in their research that last two decades there has been a crisis due to volume and growth of NPA that holds the prime resources resulting in severe strains on the normal resource allocation process essential for development. The author made a study on the factors associated with NPA. The study attributes to the macroeconomic factor such as increasing interest, economic slowdown, and currency devaluation. The observation of the study led to systematic framework with a clear objective, flexibility and adequate financial support was required to 43 resolve the distressed situation and for the strategy to succeed, adequate legal provisions.

Bhatia (2007) observed in his study that NPA is the most important factor to evaluate the financial health and performance of the banking system of India. Researcher studied the movement of NPA in Indian Public sector banks, private banks and foreign banks. Researcher found that the level of NPAs is one of the drivers of financial permanence and development of the banking industry. This objective of the study was to uncover the fundamental factors which are responsible for NPAs of banks. Two types of factors, macroeconomic and bank specific factors have been considered in the study to understand the problem of Non Performing Assets in banking sector of India.

OBJECTIVES OF THE STUDY

1. To study the joint impact of selected macroeconomic determinants on NPA of PSU banks

2. To examine trends of Non Performing Assets of PSU banks during study period

METHODOLOGY AND DATABASE

Research is descriptive and analytical grounded on secondary data. Four macroeconomic indicators have been considered for the purpose of analysis viz. GDP, Interest rates, Inflation and exchange rate. Above variables have been considered as independent variables and Gross NPA and Net NPA of PSU banks have been considered as dependent variables in the study. Joint impact of above indicators have been analysed on Gross and Net NPA of PSU banks during the study period. Bivariate correlation and multiple regression analysis have been used to examine the impact of independent variables on dependent variables in order to achieve the first objective of the study.

Data of relevant dependent and independent variables have been gathered through various publications of RBI viz. handbook of statistics on Indian economy, report on trend and progress of banking in India, statistical tables relating to banks in India, RBI bulletins etc. In order to meet the second objective of study average annual growth rate (AAGR) and trend analysis have been performed. Appropriate trend lines have used to determine movement of Gross and Net NPA of PSU banks in India during the study period. Year 2003 to 2016 (14 years) have been taken into account as study period.

ANALYSIS AND INTERPRETATION

Analysis of collected data has been done in two parts namely analysis part-I and analysis part-II. To examine impact of independent variables (GDP, Interest rates, Inflation and Exchange rate) on dependent variables (Gross NPA and Net NPA) in analysis part-I two separate regression models have been developed. Further, analysis part II contains movement of NPA in PSU banks during study period explained through bar charts.

Analysis part-I

(a) Gross NPA has been considered as dependent variable while selected four variables GDP, Inflation, Interest rate, Exchange rate have been considered as independent variables. Relevant data has been analysed by 'Enter' method in SPSS and the following regression model has been developed.

$$\text{Gross NPA} = \alpha + \beta1X1 + \beta2X2+\beta3X3+ \beta4X4+e$$

Where; α is constant value and $\beta1$, $\beta2$, $\beta3$, $\beta4$ are regression coefficients for independent variables respectively and X1, X2, X3, X4 are independent variables namely GDP, Inflation, Interest rate and Exchange rate respectively and e is error term.

Table I Model summary multiple regression-I

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.946[a]	.895	.848	567.98241
a. Predictors: (Constant), Exchange Rate, Inflation, Interest Rate, GDP				

Source: SPSS Output

Table II ANOVA Output multiple regression-I

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	24740770.585	4	6185192.646	19.173	.000[b]
	Residual	2903436.125	9	322604.014		
	Total	27644206.710	13			
a. Dependent Variable: Gross NPA						
b. Predictors: (Constant), Exchange Rate, Inflation, Interest Rate, GDP						

Source: SPSS Output

Table III Coefficients Output multiple regression-I

Coefficients						
Model		Un standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2893.603	2278.010		-1.270	.236
	GDP	.036	.014	.826	2.479	.035
	Inflation	-235.371	87.331	-.449	-2.695	.025
	Interest Rate	126.036	126.544	.151	.996	.345
	Exchange Rate	44.694	51.006	.249	.876	.404
a. Dependent Variable: Gross NPA						

Source: SPSS Output

Analysis: Value of adjusted R square in the model summary table is 0.848. It means independent variables are able to explain the variations in the dependent variable up to 84.8 %. P-value (0.000) in ANOVA table indicates that model is significant and after putting the values of constant and regression coefficient from the coefficient table the final form of regression model is as following-

Gross NPA = -2893.603 + 0.036(GDP) - 235.371(Inflation) + 126.036(Interest rate) + 44.694(Exchange rate)

From the above regression model we can estimate the Gross NPA with the help of GDP, Inflation, Interest rate and Exchange rate of the respective year.

Analysis part-I

(b) Net NPA has been considered as dependent variable while selected four variables GDP, Inflation, Interest rate, Exchange rate have been considered as independent variables. Relevant data has been analysed by 'Enter' method in SPSS and the following regression model has been developed.

$$\text{Net NPA} = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Where; α is constant value and β1, β2, β3, β4 are regression coefficients for independent variables respectively and X1, X2, X3, X4 are independent variables namely GDP, Inflation, Interest rate and Exchange rate respectively and e is error term.

Table IV Model summary multiple regression-II

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.939[a]	.881	.828	382.17463
a. Predictors: (Constant), Exchange Rate, Inflation, Interest Rate, GDP				

Source: SPSS Output

Table V ANOVA Output multiple regression-II

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	9755951.235	4	2438987.809	16.699	.000[b]
	Residual	1314517.049	9	146057.450		
	Total	11070468.283	13			
a. Dependent Variable: Net NPA						
b. Predictors: (Constant), Exchange Rate, Inflation, Interest Rate, GDP						

Source: SPSS Output

Table VI Coefficients Output multiple regression-II

Coefficients						
Model		Un standardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2092.091	1532.790		-1.365	.205
	GDP	.023	.010	.829	2.341	.044
	Inflation	-150.356	58.762	-.453	-2.559	.031
	Interest Rate	92.265	85.147	.175	1.084	.307
	Exchange Rate	28.513	34.320	.251	.831	.428
a. Dependent Variable: Net NPA						

Source: SPSS Output

Analysis: Value of adjusted R square in the model summary table is 0.828. It means independent variables are able to explain the variations in the dependent variable up to 82.8 %. P-value (0.000) in ANOVA table indicates that model is significant and after putting the values of constant and regression coefficient from the coefficient table the final form of regression model is as following-

Net NPA = -2092.091+ 0.023 (GDP) -150.356 (Inflation) + 92.265 (Interest rate) + 28.513 (Exchange rate)

From the above regression model we can estimate the Net NPA with the help of GDP, Inflation, Interest rate and Exchange rate of the respective year.

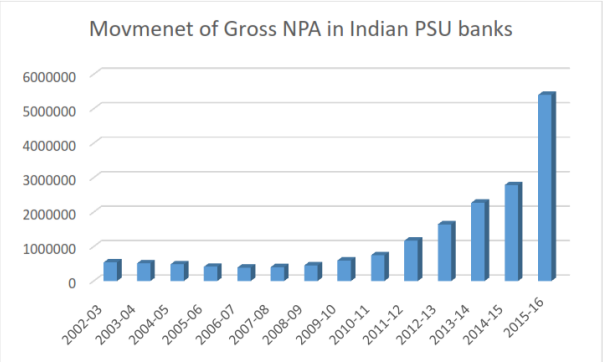
Analysis part-II

(a) Movement of GNPA of Public Sector Banks: Movement of GNPA of Public Sector Banks during the study period has shown in the below table:

Table VII Movement of GNPA of Public Sector Banks during 2003-2016

Movement of GNPA of Public Sector Banks As on 31 March (Millions)					
Year	**Gross NPA**	**AGR**	**Year**	**Gross NPA**	**AGR**
2002-03	540860	-4	2009-10	599273	34
2003-04	515380	-5	2010-11	746157	25
2004-05	483994	-6	2011-12	1172620	57
2005-06	413585	-15	2012-13	1644614	40
2006-07	389684	-6	2013-14	2272643	38
2007-08	404523	4	2014-15	2784679	23
2008-09	449570	11	2015-16	5399564	94
Average Annual Growth Rate(2003-09)		**-2.89**	**Average Annual Growth Rate(2010-16)**		**44.36**
AAGR (2003-2016) = 20.68 % per annum					

Source: Statistical tables relating to banks in India



Source: Author's compilation based on secondary data

Interpretation: Negative growth (AAGR -2.89%) in gross NPA has been observed during 2002-03 to 2008-09. On the other hand during 2009-10 to 2015-16 the average annual growth rate has remained 44.36%. A sharp increase in growth rate of Gross NPA has been observed in later. Average annual growth rate of total 14 years (2003-16) has remained 20.68% which is alarming.

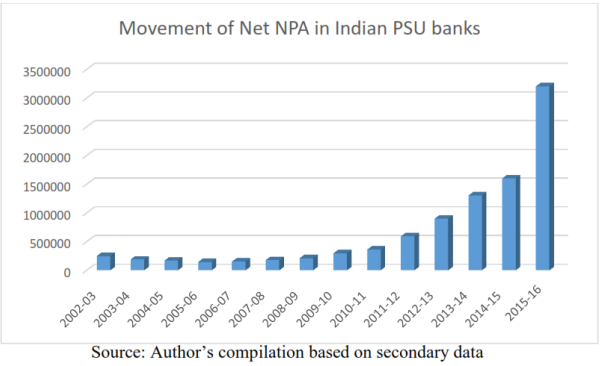
Analysis part-II

(b) Movement of Net NPA of Public Sector Banks: Movement of Net NPA of Public Sector Banks during the study period has shown in the below table:

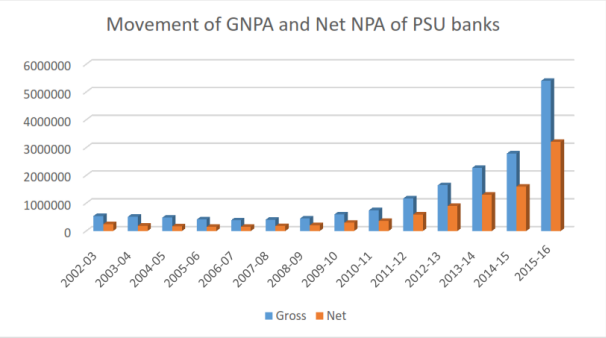
Table-VIII Movement of Net NPA of Public Sector Banks during 2003-2016

Movement of Net NPA of PSBs As on 31 March (amount Millions)					
Year	***Net NPA***	***AGR***	***Year***	***Net NPA***	***AGR***
2002-03	*249630*	*-11*	*2009-10*	*296434*	*40*
2003-04	*188600*	*-24*	*2010-11*	*360546*	*22*
2004-05	*169035*	*-10*	*2011-12*	*592052*	*64*
2005-06	*145655*	*-14*	*2012-13*	*899516*	*52*
2006-07	*153250*	*5*	*2013-14*	*1303615*	*45*
2007-08	*178365*	*16*	*2014-15*	*1599511*	*23*
2008-09	*211554*	*19*	*2015-16*	*3203758*	*112*
Average Annual Growth Rate(2003-09)		*-2.78*	*Average Annual Growth Rate(2010-16)*		*51.06*
AAGR (2003-2016) = 24.13 % per annum					

Source: Statistical tables relating to banks in India



Source: Author's compilation based on secondary data



Source: Author's compilation based on secondary data

Interpretation: Initial years of the study period (2003-2009) have witnessed negative growth (-2.78%) in Net NPA of PSU banks. While Net NPA has significantly increased during 2010 to 2016. Average annual growth rate has remained 51.06% during the second half of the study period (2010-2016). There are various reasons of this steep rise in level of NPA. 24.13% AAGR has been observed during entire study period.

FINDINGS

Stressed assets of the banks badly affects the profitability because it requires huge provisioning from the banks. Particularly PSU banks are suffering seriously with deterioration in asset quality. NPA has shown steep rise in the recent past in PSU banks of India. Table-I and Table-IV states that all selected macroeconomic variables jointly can explain variation in Gross NPA up to 84.8% and Net NPA 82.8%. GDP influences banks' lending capacity, during high growth rate PSU banks shown aggression in lending particularly in non priority sectors which resulted into NPA later. Increasing inflation reduces the repayment capacity of the borrower, Interest rates alone does not significantly affect NPA of the banks but it contributes jointly with other selected variables in steep rise of NPA. Further, an increase in exchange rate increases the cash outflow of the borrower in domestic currency. Synergetic effect of above variables may quantify the level of Gross and Net NPA for a particular year using regression model.

NPA of PSU banks have shown a sheer augmentation during study period. Particularly later half (2010-2016) has witnessed rapid growth in the level of gross and net NPA. Average annual growth rate of gross and net NPA during 2003-2009 shows that PSU banks were in comfortable position to manage NPA but the same could not continue during second half (2010-2016) of the study. Gross and net NPA has significantly increased with an alarming rate. It indicates that PSU banks could not cope with the problem of NPA during this period. There are various reasons behind this sharp increase in NPA. Economic slowdown in 2008-09 and very slow economic growth after subprime crisis, wilful defaults, ineffective credit risk management practices, lack of timely and effective legal solution, aggression in lending for the fulfilment of socio economic objectives of nation etc.

CONCLUSION

Banks play a crucial role in the overall economic development. A strong and robust banking system is always required to attain sustainable growth of the nation. Banks must review their asset quality time on time so that preventive measures can be initiate against deterioration in asset quality Stressed assets is a serious cause of concern for entire banking system of India. PSU banks are badly affected with this rapid growing problem. Indian banking system is dominated by PSU banks which includes nationalized banks and SBI & its associates. PSU banks has shown steep rise in NPA during study period particular during 2010 to 2016. It is a severe problem requiring serious attention of policy makers. Banks and policy makers must take prudent decisions to cope up with the problem.

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