

An Empirical Analysis of Non-Performing Assets in Indian Banking Sector Compared with Macroeconomic Variables

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Abstract

With the introduction of international norms for income recognition, asset classification and provisioning in the banking sector, managing NPAs has emerged as one of the major challenges facing Indian banks. Non-performing assets constitute a major portfolio of the Banks portfolio and hence are an inevitable burden on the banking industry. NPAs adversely affect the profitability, liquidity and solvency of the banks. This paper analyses the position and trend of NPAs in the Indian Banking scenario and the impact of macroeconomic variables on the Non Performing Assets over the years. The paper also analyses the various recovery channels that the bank has opted in the past. The data has been analysed using Pearson's Correlation Coefficient, t- test, F-test, Regression analysis and trend analysis. Microsoft Excel's Data Analysis Tool Pack has been used for the analysis. Through this study we infer that private banks and foreign banks have advantages in terms of their efficiencies in better credit management in containing the NPAs which indicates that bank privatization can lead to better management of default risk.

Key Words: Asset Classification, Credit Risk, Default Risk, Indian Banking Sector and Non Performing Assets.

INTRODUCTION

NPA is a disorder resulting in non-performance of a portion of loan portfolio leading to no recovery or less recovery / income to the lender. NPAs represent the quantified "Credit Risk". NPAs are an inevitable burden on the banking industry. Hence, the success of a bank depends upon the methods of managing NPAs and keeping them with intolerance level. The minimization of NPL is a necessary condition for improving economic growth. The concept of NPAs originated when Reserve Bank of India introduced 'prudential norms, on the recommendations of the Narashimam Committee in the year 1992-93. Banks have been advised by the RBI that they should identify the non-performing assets and ensure that interest on such assets is not recognized as income and taken to the profit and loss account. Banks are to recognize their income on accrual basis in respect of income on performing assets

and on cash basis in respect of income on non-performing assets. Any interest accrued and credited to income account must be cancelled by a reserve entry once the credit facility comes under the category of non-performing assets. Bank Assets are classified into two categories: **Performing assets** are those assets on which interest or instalments are correctly paid by a customer within stipulated time. **Non-performing assets** are those assets on which interest or instalments have been due for a period of more than 180 days. The level of NPA acts as an indicator showing the bankers' credit risks and efficiency of allocation of resources, because it is a loan which is due or outstanding from the customer beyond a stipulated time. The RBI has issued guidelines to banks for classification of assets into four categories. Out of these four, the following three are considered as NPAs:

- (a) Sub-standard Assets,
- (b) Doubtful Assets,
- (c) Loss Assets and (d) Standard Assets

LITERATURE REVIEW

Bloem & Gorters (2001) suggested that a more or less predictable level of non-performing loans, though it may vary slightly from year to year, is caused by and inevitably large number of wrong economic decisions by individuals and plain bad luck, inclement weather and sudden price changes for certain products. Under such circumstances, the holders of loan can make an allowance for a normal share of non-performance in the form of bad loan provision or they may spread the risk by taking out insurance. **Koeva (2003)** gave new empirical evidence on the impact of financial liberalization on the performance of Indian commercial Banks. The analysis focuses on examining the determinants of bank intermediation costs and profitability during the liberalization period. The empirical results suggest that ownership type has a significant effect on some performance indicators and that ownership type has a significant effect during financial liberalization. This has been associated with lower intermediation costs and profitability of the Indian banks. **Das and Ghosh (2003)** empirically examined non-performing loans of Indian public sector banks in terms of various indicators such as asset size, credit growth,

macroeconomic condition and operating efficiency. **Mohan (2004)** pointed out that although public sector banks have recorded improvement in profitability efficiency in terms of intermediation costs and asset quality in the year 1990 they continue to have higher interest rate spread but at the same time earn lower rates of return, reflecting higher operating costs. Consequently asset quality is weaker so that loan loss provisions continue to be higher. **Kumar (2004)** noted that Private sector banks play an important role in development of Indian economy. After liberalization, the banking industry underwent major changes in the public and the private sectors as per the recommendations of Narashimam Committee. The Indian banking industry was dominated by public sector banks earlier. But the situation has changed now: new generation banks which use technology and professional management have gained a reasonable position in the banking industry. **Varadi, Mavaluri & Nagarjuna (2006)** concluded that in the modern world, performance of banking is very important to stabilize the economy. In order to see the efficiency of Indian banks, they examined the force indicator profitability, productivity, assets quality and financial management for all banks in India for the period 1999-2003. **Vohra and Dhamu (2012)** pointed out that the NPAs have a direct impact on profitability, liquidity and equity of the banks. The authors observed that NPA of Indian banks are relatively very high by global standards.

OBJECTIVES OF THE STUDY

1. To analyse the trend and composition to NPAs of banks in India.
2. To study the impact of macroeconomic variables on the NPAs like exchange rate, fiscal deficit, interest rate and inflation rate.

DATA SOURCE, SAMPLE SIZE AND RESEARCH

METHODOLOGY: Data has been sourced from RBI’s annual publication- “Report on Banking” and RBI’s online repository at dbie.rbi.org.in. General statistics on the Indian economy have been sourced from various official government websites. A sample size of 10 years has been selected for analysis, Financial Year 2007-08 TO 2016 - 17. The data has been analysed using Pearson’s Correlation Coefficient, t- test, F-test, Regression analysis and trend analysis. Microsoft Excel’s Data Analysis Tool Pack has been used for the analysis.

ANALYSIS AND INTERPRETATION

ANALYSIS 1: TREND AND COMPOSITION OF

NPA: Data of Non Performing Assets of public sector banks and private sector banks has been collected from the official database of the Reserve Bank of India and the same has been collated in the tables presented in this

analysis. $Gross\ NPA\% = \frac{GROSS\ NPA}{TOTAL\ ADVANCES}$

TABLE 1: TREND OF NPA AND GROSS NPA%

Year	Rs. In billion		Gross NPA to Total Advances		
	Gross Advances	Gross NPAs	Com	Private sector	Public sector
2008	23,317	557	2.39%	2.33%	2.75%
2009	27,893	682	2.45%	2.10%	3.25%
2010	32,644	818	2.51%	2.28%	2.97%
2011	39,915	941	2.36%	2.32%	2.45%
2012	46,655	1,371	2.94%	3.17%	2.08%
2013	51,025	1,759	3.45%	1.91%	3.84%
2014	58,022	2,395	4.13%	1.88%	4.72%
2015	62,826	2,943	4.68%	2.20%	5.42%
2016	68,738	5,504	8.01%	2.70%	9.88%
2017	72,471	7,149	9.86%	3.51%	12.47%

INFERENCES

1. It was observed that over the years both gross advances and gross NPAs of the banks have increased.
2. The gross NPAs have increased at a higher rate than the gross advances as indicated by the rising gross advances to gross NPA ratio.
3. The gross NPA ratio of public sector banks has been higher than the private sector banks and the gap between the two is widening.
4. The analysis shows that over the years the banks have been ineffective in selecting the customers.
5. The assets of public sector banks are in greater stress than that of the public sector banks. This implies that ownership of bank i.e. public or private bank has an impact on the total NPA and ultimately on the profitability of the bank.
6. The banking sector has expanded over the years as indicated by the rising advances but the expansion has not been managed effectively as indicated by the rising Gross NPA ratio.

COMPOSITION OF NON PERFORMING ASSETS OVER

THE YEARS: The banks nationalization were carried out in 1969 by the government to bring banking services to the

Indian mass to ensure appropriate credit delivery for the development of the economy. Since then significant measures have been adopted for the purpose of appropriate credit delivery. In this connection, Priority sector lending is playing very significant role for the development. Priority sector, which was properly defined in 1972, are the sectors which require special attention in terms of availability of appropriate credit for development. These are the sectors which may not get timely and adequate credit without special dispensation. Basically the financial assistance under this lending are small value loans to farmers for agriculture and allied activities, micro and small enterprises, poor people for housing, students for education and other low income group and weaker sections, are the. As per the Reserve Bank of India (RBI), categories under priority sectors includes, Agriculture, Micro, Small and Medium enterprises, Export Credit, Education, Housing, Social Infrastructure, Renewable Energy and others. The targets and sub-targets for priority sector lending are set for the Scheduled Commercial Banks (SCBs) are operating in India are as follows:

- Total Priority Sector: 40 percent of Adjusted Net Bank Credit [ANBC defined in sub paragraph (iii)] or Credit Equivalent Amount of Off-Balance Sheet Exposure, whichever is higher.
- Agriculture: 18 percent of ANBC or Credit Equivalent Amount of Off-Balance Sheet Exposure, whichever is higher.
- Micro Enterprises: 7.5 percent of ANBC or Credit Equivalent Amount of Off-Balance Sheet Exposure, whichever is higher
- Advances to weaker Sections: 10 percent of ANBC or Credit Equivalent Amount of Off-Balance Sheet Exposure, whichever is higher.

Note: The targets are for Domestic Scheduled Commercial Banks and Foreign banks with 20 branches and above

On the basis of above insights, it is evident that priority sector lending is major contributor to increase in NPAs in public sector banks; it has a bearing on banks performance. Furthermore, the various sectors of priority have been facilitated adequate financial assistance through banks. The public sector banks by providing loans and advances to these sectors, contributed significantly to the socio economic development of the country. Therefore banks should make their efforts to manage and reduce NPAs but not the advances in these sectors.

*Share of Priority Sector NPA for a year= (Priority Sector NPA/ Total Gross NPA)*100*

*Share of Non-Priority Sector NPA for a year= (Non-Priority Sector NPA/ Total Gross NPA)*100*

TABLE 2: SHARE OF PRIORITY SECTOR AND NON-PRIORITY SECTOR NPAs

Year	Priority Sector		Non-Priority Sector		Total (Rs. In Billion)
	Amount (Rs. In billions)	Ratio (%)	Amount (Rs. In billions)	Ratio (%)	
2008	357	64	200	36	557
2009	377	55	305	45	682
2010	443	54	375	46	818
2011	548	58	393	42	941
2012	691	50	680	50	1,371
2013	721	41	1,038	59	1,759
2014	852	36	1,542	64	2,395
2015	1,009	34	1,934	66	2,943
2016	1,383	25	4,122	75	5,504
2017	1,676	23	5,473	77	7,149

INFERENCEs

1. The absolute amount of NPAs in both priority and non priority has increased over the years.
2. The share of priority sector NPAs have declined from 64% in 2008-09 to 23% in 2017-18. Consequently share of non priority sector has increased from 36% in 2008-09 to 77% in 2017-18.
3. Contrary to public perception it is the non priority sector which is contributing to rise in Non Performing Assets. The rise in NPA of the priority sector is alarming and needs to be addressed.
4. Non priority sector advances became the majority contributor to the non performing assets after the 2012. It is to be noted that there was growth recession in 2012 in India which impacted the manufacturing and service industries. This could be one of the reasons for this steep rise in non priority sector NPAs.

ANALYSIS 2: IMPACT OF MACRECONOMIC VARIABLES

In this part of the analysis four macroeconomic variables have been considered to analyse their impact on Non Performing Assets:-

- Exchange Rate: Weakening of rupee vis-à-vis dollar is a sign of weakness in economy. Rise in Rs/\$ exchange rate shows that the demand of dollar has increased over time, implying that the country has been importing goods rather than becoming self sufficient. A rising demand for imports implies the goods produced domestically

are either of inferior quality or are expensive due to inefficiencies in production. This will lead to slowdown in economy and slowdown in repayment of loans.

- **Fiscal Deficit:** A sustained rise fiscal deficit is an indicator of weakness in the overall economy. A rising fiscal deficit directly implies that the government has been borrowing to meet its expenditure. An increase in government borrowings has a domino effect and leads to increased borrowings in the economy as well. As time passes this becomes a debt trap leading to bad loans
- **Interest Cost:** Interest Rates in the economy directly impact the amount of money borrowed. A rising interest rate would imply a rise in cost of borrowing leading to difficulty in repayment of the borrowed funds.
- **Inflation Rate:** The impact of inflation on Non Performing loan is difficult to identify. On one hand it will help to pay off the debts by lowering the real cost of debt. On the other hand it might have an adverse impact on the business especially in an agriculture dominant economy like India

To find out if there is any significant relationship between the macroeconomic variables selected and the NPA amounts over the years, correlation analysis is performed.

Correlation Coefficient =

$$r = r_{xy} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2}}$$

The value of coefficient of determination (r^2) has also been calculated. This value also gives us an idea about the strength of the correlation. Further the correlation obtained has been tested at 95% confidence using t-test and F-test. The critical values of the test have been obtained using Excel's Data Analysis Tool pack.

- **NULL HYPOTHESIS (H_0):** There is no significant correlation i.e. $r=0$.
- **ALTERNATE HYPOTHESIS (H_1):** There is significant correlation i.e. $r \neq 0$.

TABLE 3: Summary of the date used to perform the analysis

Year	NPA (in billion Rs.)	Exchange rate (Rs/\$)	Fiscal deficit (in billion Rs.)	Interest rate*	Inflation rate
2008	556.99	39.98	1464.35	7.00%	8%
2009	682.13	50.61	1425.73	4.50%	11%
2010	818.05	44.305	1269.12	4.50%	12%
2011	941.17	44.525	3369.92	6.75%	9%

2012	1370.96	50.955	4184.82	8.00%	9%
2013	1759	54.285	3735.92	7.50%	11%
2014	2394.83	59.965	5159.9	8.00%	7%
2015	2943.21	62.43	4901.9	7.50%	5%
2016	5504.48	66.255	5028.58	6.75%	5%
2017	7148.98	64.86	5311.77	6.25%	4%

*RBI repo rate has been used as a proxy for interest rate.

TABLE 4: Summary of the results of the tests performed

Factors	Actual Correlation(R)	R squared	p-value	Significance at 95% confidence interval
Exchange rate(Rs/\$)	0.846	0.716	0.0020	Significant
Fiscal deficit	0.736	0.541	0.0153	Significant
Interest rate	-0.126	0.016	0.7286	Not significant
Inflation rate	-0.826	0.682	0.0032	Significant
All combined	4 N.A.	0.759*	0.0208	Significant

INFERENCES

1. There is a positive correlation between exchange rate and Non Performing asset. The value of correlation is 0.846.

The p-value is 0.0020 which is <0.05 . Hence the Null Hypothesis is rejected at 95% confidence interval i.e. there is significant positive correlation between exchange rates and Non Performing Assets.

The value of R squared is 0.716 implying that exchange rate has been able to explain 71.6% variability in the Non Performing assets.

2. There is a positive correlation between Fiscal Deficit and Non Performing asset. The value of correlation is 0.736.

The p-value is 0.0153 which is <0.05 . Hence the Null Hypothesis is rejected at 95% confidence interval i.e. there is significant positive correlation between exchange rates and Non Performing Assets.

The value of R squared is 0.541 implying that exchange rate has been able to explain 54.1% variability in the Non Performing assets.

3. There is a negative correlation between interest rate and Non Performing asset. The value of correlation is -0.126.

The p-value is 0.7286 which is >0.05 . Hence the Null Hypothesis cannot be rejected at 95% confidence interval i.e. significant correlation between exchange rates and Non Performing Assets may not exist

The value of R squared is 0.016 implying that exchange rate has been able to explain 1.6% variability in the Non Performing assets.

4. There is a negative correlation between Inflation Rate and Non Performing asset. The value of correlation is -0.826.

The p-value is 0.0032 which is <0.05 . Hence the Null Hypothesis is rejected at 95% confidence interval i.e. there is significant negative correlation between exchange rates and Non Performing Assets.

The value of R squared is 0.682 implying that exchange rate has been able to explain 68.2% variability in the Non Performing assets.

5. Taking all the 4 variables together the regression equation obtained is:

$$\text{NPA} = 6274.50 + 37.12 * \text{Exchange Rate (Rs/\$)} + 0.75 * \text{Fiscal Deficit (billion Rs.)} - 83625 * \text{Interest Rate (\%)} - 36875 * \text{Inflation Rate (\%)}$$

Null Hypothesis: All the intercepts are 0 i.e. significant statistical relationship does not exist.

Alternate Hypothesis: At least one of the intercept is not 0 i.e. significant statistical relationship exists.

The p-value obtained after F-test is 0.0208 i.e. <0.05 . Hence Null Hypothesis is rejected i.e. **the regression equation obtained is statistically significant**. The adjusted R squared is 0.759 i.e. 75.9% variability in NPA is explained by the regression equation obtained.

LIMITATIONS OF THE STUDY:

This study is limited to the Indian Banks. The economic environment of a country is dynamic. The sample period is limited to only 10 years.

CONCLUSION:

Several policy implications can be gleaned from the analysis. Firstly favourable macroeconomic conditions facilitate in NPA management. This therefore calls for the need to have supportive macroeconomic environment within which bank operate if non – performing loans are to be effectively monitored and lowered overtime. Secondly Priority Sector lending by banks is found to be not much significant in contributing for NPAs in contrast to the perception of some urban bankers that Priority Sector Lending cause NPAs. This supports the contention that branch expansion in rural and semi urban areas for extending priority sector credit is a viable proposition and there need not be aversion on this by the policy makers as well as the industry heads. Thirdly, Ownership of banks is an interesting issue that has been quite often debated. This study has established that private banks and foreign banks have advantages in terms of their efficiencies in better credit management in containing the NPAs which indicates that bank privatization can lead to better management of default risk. Finally the recovery of NPAs through various channels has been improving in absolute terms but banks have been taking severe haircuts. The government has legislated the Insolvency and Bankruptcy code, 2016 to facilitate speedy and robust recovery of Non Performing Loans. Whether this new legislation will be a success or not, only time will tell. The above findings infer that better

credit risk management practices need to be taken up for bank lending. Adequate attention should be paid to those banks with low operating efficiency and low capitalisation as also to macroeconomic cycles that appear to be playing a role in NPA management. The state owned banks need to be toned up with adequate measures to sharpen their NPA management practices. These findings assume crucial importance in view of the current economic scenario of the country.

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