

# Factors Contributing to Non-Performing Assets in India: An Empirical Study

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## Abstract

*Non-performing Asset is an important parameter in the analysis of financial performance of a bank as it results in decreasing margin and higher provisioning requirements for its doubtful assets. The paper identifies ten factors responsible for generation of NPAs through reviewing literature on Indian banking industry. Then, data collected from the publications of the Govt. of India for the period of 1997-2017, have been processed using Multiple liner regression technique to calculate the explanatory power of independent factors and their significance for generation of NPAs. The study finds that non priority sector lending has higher contribution in NPAs than priority sector lending. Also, gross domestic product, cash reserve ratio, repo rate, exchange rate, inflation, provision, taxation, fiscal deficit have significant contribution in generation of NPAs.*

**Keywords:** NPAs, non-priority sector lending, gross domestic product, provision, multiple regression.

## Introduction

In the Discussion Paper on Prompt Corrective Action. The Department of Banking Supervision, Central Office, Policy Planning Division RBI (2000) states in the introduction "The 1980s as well as early 1990s was a period of great stress and turmoil for banks and financial institutions all over the globe viz. Brazil, Chile, Indonesia, Mexico, Venezuela and USA, etc. In USA, more than 1600 commercial and savings banks insured by the Federal Deposit Insurance Corporation (FDIC) were either closed or given FDIC financial assistance during this period. More than 900 Savings and Loan associations were closed or merged with assistance from Federal Savings and Loan Insurance Corporation (FSLIC) during 1983 to 1990. Cumulative losses incurred by the failed institutions exceeded US \$ 100 billion. These losses resulted in the insolvency and closure of FSLIC." In Indian context, the present situation in the banking sector is similar to that of countries

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of other part of the globe in 90s. The emergence of Non-Performing Assets and its impact on liquidity, profitability and solvency are not to be ignored. The recent announcement of the Government to consolidate Bank of Baroda, Vijaya Bank and Dena Bank into a single bank is made with a view to improving liquidity, profitability and solvency. Wilful default, weak internal control system, delayed supervisory review process, impact of bank specific variables and macro-economic variables may be termed as the main causes of this default. The banking industry in India has undergone a sea change after the first phase of economic liberalization in 1991 and hence credit management came into picture (Navaneethakrishnasamy et al, 2017). The primary function of banks is to receive deposits and to create assets through credits advanced to various sectors such as agriculture, industry, personal and housing etc. Receiving deposit involves no risk, while banks need to pay interests on them with the promise of payments of the principal and interest amounts on demand. On the other hand, lending always involves risks of

defaults on repayment of interest and the principal amount. In recent times, banks have been carefully adopting risk management policies due to mounting non-performing assets in this sector as whole. An asset becomes non-performing when it ceases to generate income that is when principal loan amount and interests on loan are not repaid by borrowers within stipulated time.

Non-performing assets had been the single largest cause of irritation of the banking sector of India. "It reduces capital adequacy and the profits as banks need to arrange provisioning against bad loan"(Navaneethakrishnasamy, et al., 2017). Narasimha committee-I(1992) mentioned that in the period prior to the report, the main reason for the reduced profitability of the commercial banks in India was for priority sector lending and hence recommended this to be phased out (Rana, 2016) . Subsequently, the Narasimha committee-II(1998) also highlighted the need for zero non-performing assets for all Indian banks with international presence. Recently, huge amount of non-performing assets are noticed to have occurred due to non-priority sector lending. The policy of restructuring loans to reduce NPAs has completely failed. The corporate sector has been taking advantage of weak restructuring measures of the Government in a wrong way and wilfully defaulting on huge loans are accumulated through fresh loans advanced to them to restructure bad loans . Recent kingfisher scam and Punjab national bank fraud are examples of wilful defaulters among many others. Over and above, global volatility, economic slowdown severely curving the borrower's ability to repay loans. Thus, to a great extent, the Govt. policies are responsible for generating Non-Performing Asset.

## Literature Review

Maravarman (2003) studied Non-performing Assets in public sector banks for the period 1991-2001 and found market recession, globalization, legal system,

intention of borrowers, mismanagement were mainly responsible for poor recovery of bad loans. Karim et al. (2010) investigated the relationship between Non-Performing loans and bank efficiency in Malaysia and Singapore. Authors on the basis of Tobit simultaneous equation regression results, clearly specified that higher non-Performing loans reduced cost efficiency and poor management in banking institution resulting in bad quality loans. Dhal et al. (2011) empirically assessed crucial issues relating to the linkage of financial stability with economic growth and inflation in the Indian context using vector auto-regression (VAR) model comprised of banking sector stability index along with output, inflation, interest rates and their analysis revealed that financial stability on the one hand and macroeconomic indicators comprising output inflation and interest rates on the other hand had statistically significant relations. Shrivastava et al. (2012) measured impact of GDP and inflation on credit risk ratios of Axis bank for the period 2001-2011 and found total loan and inflation having significant relation with GDP. Also there was significant correlation between total loan and total deposit of banks in the study. Jain and Seikh (2012) observed that the lending policies of the various banks were faulty due to improper financing. Swamy (2012) observed as the banks grew in size, they tended to control the NPA better through efficient management. This finding supported consolidation of underperforming public sector banks to achieve potential efficiency in scale of operation. Larger banks exhibited better credit risk management with lower NPA levels. Tsige (2013) found that Non-Performing Assets resulted from macroeconomic and bank specific factors. Ramanadh and Rajesham (2013) analyzed bank credit, economic growth and Non-Performing Assets for the period 1996-97 to 2010-11 and found a positive and moderate correlation between expansion of credit and GDP growth and negative correlation between GDP

growth and Non-Performing Assets of banks. Private sector banks were at a less risk of Non-Performing Assets as compared to the public sector banks. Sontakke and Tiwari (2013) found that NPAs was a serious strain on the profitability as, on the one hand banks could not generate income on such asset and on the other hand they were required to provide the funding cost and arrange provision requirements from the Bank profits. Thus they concluded that a mounting level of NPA in the banking sector could severely affect the economy in many ways.

Narula and singla (2014) analysed Punjab National Bank and found that due to mismanagement in the bank there were a positive relation between Total Advances, Net Profits and NPA . Positive relation between NPA and profits implied that in the period of high profit , the bank mismanaged distribution of credits carelessly by choosing wrong clients. Ghosh Roy (2014) analysed trends of Non-Performing Assets for the period 1996-97 to 2012-13 in Indian banks and its determinants with several financial parameters applying panel regression and found GDP growth, change in exchange rate and global volatility had major effects on Non-Performing Assets level on Indian banking sector. Samantaraya (2016) studied on pro cyclical credit growth and bank Non-Performing Assets in India focusing on various issues for surging Non-Performing Assets for the period 2009-10 to 2013-14 and found economic slowdowns aggravated loan delinquencies in banks. Excessive credit growth at the time of economic boom might have resulted in Non-Performing Assets in future setting in recession in the economy. Kuchekar (2016) highlighted the dimensions of credit risk and its effect on asset quality that banks and regulatory authorities might utilize in their decision making. NPA is closely related to the level of advance and this relationship is mediated and moderated by many bank specific and economy specific indicators. Khosla and Kumar (2017) found

that Indian banks were confronting more than Rs. 90,000 crores NPAs issue and were running under loss of benefit. The common laws of the nation were excessively awkward, making it impossible to deal with recoup the awful credits. Sengupta and Bhardhan (2017) argued that regulatory forbearance did not facilitate resolution and could actually worsen the banking crisis by providing incentives to the banks to defer NPA recognition and delaying actions for loan recovery. Restructuring of a loan should be the commercial decision of a bank and should not automatically qualify for regulatory concessions in terms of deferment of recognition of NPAs. Das and Dey (2018) found that non-priority sector NPAs were higher compared to priority sector NPAs. NPAs had a strong positive correlation with restructuring of credits and a negative correlation with GDP.

## **Objective and Methodology**

The main objective of this paper is to analyse different bank specific and macroeconomic variables affecting NPAs thereby identify important factors responsible for generations of these assets. In the subsequent section, selected variables on the basis of literature review, are further discussed. Then multiple linear regression technique are applied to calculate explanatory power of independent factors for generation of NPAs and their significance. SPSS 20 is used to perform statistical operations. Data for the period 1997-2017 are from Reserve Bank of India, Ministry of Finance and International Monetary Fund etc.

### **Variables Used in Analysis**

Dependant Variable:

Non-Performing Asset (Y): In our regression model, we consider non-performing assets as dependent variable.

An asset becomes nonperforming as define in RBI

circular (No. DBOD.No.BP.BC.1/21.04.048/2013-14 dated July 1, 2013) when :

(a) Interest and /instalment of Principal remains overdue for a period of more than 90days in respect of a Term Loan.

(b) The account remains out of order in respect of overdraft/cash credit at paragraph 2.2 in respect of an Overdraft/Cash Credit (OD/CC),

(c) The bill remains overdue for a period of more than 90 days in the case of bills purchased and discounted

(d) Interest /instalment of Principal remains overdue for two crop seasons for short duration crops in case loan to Agricultural sector.

(e) Interest/instalment of Principal remains overdue for one crop season for long term crops.

(f) amount due to Bank under any facility is overdue for a period of more than 90 days.

(g) account where regular/adhoc credit facilities have not been renewed /reviewed within 180 days from the due date /date of sanction

### **Independent Variables:**

Priority Sector Lending ( $X_1$ ): Banks create assets by advancing loans to the production sector and to the general public which generate incomes for them as the borrowers repay interests and principal amounts at a prior fixed instalments within specified dates. This lending is of two types i.e. priority sector lending and non-priority sector lending. Priority sector refers to small scale industries, Industrial estates, Road and water transport operators, professional and self-employed person, Retail traders, Education. Available literatures exhibits that priority sector contributes a large portion of NPAs.

Non-Priority Sector Lending ( $X_2$ ): Any lending

other than priority sector lending is termed as non-priority sector lending. Now a days, non-performing asset generation out of the above sector is higher than the priority sector lending.

Restructuring of loan ( $X_3$ ): Restructuring refers to reviving Non-Performing Assets into performing assets by providing fresh loans to those who were unable repay previous loans due some economic distress. One of the objective of restructuring loans is to minimise NPAs, now a days, it has become a serious concern for policy makers as its fails to curb NPAs due to the fact that wilful defaulters are taking advantage of the weak policy.

Gross Domestic Product ( $X_4$ ): GDP of a country is the total market value of all final goods and services produced in a country in a given year. As GDP grows, loans and advances also grow and hence, NPAs have impacts on GDP. Moreover, when the economy is in the phase of recession, the corporate usually defaults in loan repayment which thereby lead to an increase in NPAs. In our model we consider GDP growth as a variable.

Cash Reserve Ratio ( $X_5$ ): Cash reserve Ratio (CRR) is the mandatory cash kept as reserve with RBI proportionate to total deposits of a bank. The ratio is fixed by RBI and time to time is changed through RBI's policy declaration. If RBI increases or decreases CRR, it directly impact on lending capacity of the bank and thus can impact NPAs.

Repo Rate ( $X_6$ ): Repo rate is the rate at which the central bank of a country lends money to commercial banks in the event of any shortfall of funds. Repo rate is generally related to the bank prime lending, reverse repo and MLR. It is an indicator of the prevailing interest rate in the country. Interest rate has an effect on the economy as it influence decision of the borrower to take credit.

Exchange Rate ( $X_7$ ): An exchange rate is the rate at which domestic currency of one country are

exchanged with that of foreign country. Global volatility generally measured through exchange rate fluctuation (Ghosh Roy 2014). In a globalized world the volatility of exchange rate has an impact on NPAs through distress created for the corporate sector through appreciation or depreciation of the value of domestic currency against foreign currency. we should consider it as a parameter in our model.

**Inflation ( $X_8$ ):** This index is a measure of weighted average prices of basket of goods and services which consumers buy from the. Among other inflation indices, the consumer Price index is taken as the variable to determine the impact of inflation on purchasing power of the public and influencing aggregate market demand. Inflation impacts business profitability and repaying capacity of loan taken by them. Thus inflation is a factor that influences generation of NPA.

**Provision ( $X_9$ ):** RBI in its master circular (No. DBOD.No.BP.BC.1/21.04.048/2013-14 dated July 1, 2013) in Prudential norms on Income Recognition, Asset Classification and Provisioning pertaining to Advances, all banks need to make provisioning for all kinds of bad assets including nonperforming assets at a prescribed rate or above and make disclosure in the Balance sheet . Hence NPAs increases, provisioning needs to increase mandatorily, Thus affecting a bank's profit and loss accounts. We want to see if there any significant impact of this variable in predicting NPAs.

**Taxation ( $X_{10}$ ):** Taxation refers to banks obligation towards the government in terms of money out of its profit element. Tis is incorporated as variable in the model.

**Fiscal Deficit ( $X_{11}$ ):** A fiscal deficit occurs when a government's total expenditures exceed the revenue that it generates, excluding money from borrowings. It is observed that an increase in the NPAs reduces the revenue and increase the fiscal

deficit. Therefore this macro-economic variable is taken into consideration.

As the different variables used are heteroscedastic in nature, we use logarithmic transformation of variables for removal of heteroscedasticity and the logarithmic variable will be denoted as  $Z$  i.e.,  $\log X_1 = Z_1$ ,  $\log X_2 = Z_2$ ,  $\log X_3 = Z_3$  and so on. Thus the multiple regression equation based on the transformed variables is as follows:

$$\begin{aligned} \text{Log}Y &= \beta_1 + \beta_1 Z_1 + \beta_2 Z_2 + \beta_3 Z_3 + \beta_4 Z_4 \\ &+ \beta_5 Z_5 + \beta_6 Z_6 + \beta_7 Z_7 + \beta_8 Z_8 + \beta_9 Z_9 + \beta_{10} Z_{10} + \varepsilon \end{aligned}$$

$\beta_0 = \text{Intercept of the regression equation}$   
 $\beta_i = \text{Regression coefficient of } Z_i, i = 1, 2, \dots, 11$   
 $\varepsilon = \text{Random error}$

## Data Analysis and Findings

Priority sector lending of all the banks in 1997 is Rs 832.43 billion and in 2017 it is Rs 26119.19 billion i.e., 31.37 times increase in lending of this category. On the other hand lending in non-priority sector in 1997 is Rs 1615.88 billion and in 2017 is Rs 46351.85 billion i.e., 28.68 times increase and in case of total NPAs, in the year 1997 are 508.15 billion and Rs 5069.22 billion in 2017 i.e., 9.97 times increase. Clearly seen that non-priority sector NPAs increases almost 2 times than priority sector NPAs. It is very interesting to observe that the corporate debt restructuring in 2005 was Rs 103.98 billion and in 2015, 2016 and 2017 is Rs 1824, Rs 1103 and 794 billion respectively i.e., 20.06 times increase in 2016 than 2005. In 2017 the restructuring is slightly reduced than 2016. It may be said from above data as soon as the corporate debt restructuring increases the non-priority sector NPAs and the total NPAs increases. Insolvency due to poor performance in certain core sectors such as power, coal, steel, infrastructure etc. are the reason for this restructuring of loans. When the performance of core sectors deteriorates, banks provide loans

revive them . Statistical analysis exhibits a positive correlation NPAs and Corporate debt restructuring and CDR is strongly correlated with non-priority sector NPAs .It means that the objective of this restructuring procedure to reduce NPAs by banks has not been successful. . On the other hand NPAs is negatively correlated GDP which means surging NPAs has a negative impact on GDP. Provision and have significant impact on generation Of NPAs. Fiscal deficit also have significant impact on NPAs which establish the fact that when expenditure of the country increases the revenue, the status of Non-Performing Assets of the country also changed. As soon as the deficit increases, the NPAs also increased. It is also observed as volatility in exchange rate increases NPAs level of the country also increased.

The dependent and independent variable for the proposed model are explained bellow. In in our model ,dependent variable is total Non-performing assets of banking sector and denoted by LogY. The association of significant explanatory variables denoted by  $Z_1$  to  $Z_{11}$  are discussed with results bellow.

**Table 1: Correlation Matrix of Variables (in Appendix)**

**Analysis of Results:**

Non-Performing Assets is highly correlated with corporate debt restructuring ( $Z_3$ ) which indicates that restructuring procedure to reduce the prevailing NPAs level has not been successful. Volatility in exchange rate( $Z_7$ ) has been also aggravating NPAs problem as shown table 1. Most of the priority sector and non priority sector lending( $Z_2$ ) are become bad quality loan in future as this type of lending is highly correlated with NPAs. In all the parameters, the situation is vulnerable in the case of non-priority sector lending. Non-priority sector lending is highly correlated with restructuring implies that as

NPSL increases NPAs increases and restructuring also correlation between  $Z_2$  and  $Z_3$ ). As CRR is negatively correlated with NPAs and lending it may be used as a tool to curb NPAs ( $Z_5$ ). As exchange rate is correlated with restructuring increases (  $Z_3$  and  $Z_7$ ) the banker should not restructure bad debt arising out of an exposure to the volatile international market. Provisioning increases with a parallel increase in priority sector lending ( $Z_9$  &  $Z_2$ ). Fiscal deficit and NPAs is positively correlated which reflects that a deficit in economy may bring NPAs problem for the economy ( $Z_{11}$ ).

**Table 2: Durbin-Watson Statics considering important Variables( in Appendix)**

Results exhibit that the independent variables explain the dependent variable about 98.2% (adjusted R2= 0.982). ANOVA table express a highly significant F test value which further established that the model is statistically significant. The Durbin-Watson statistic also shows that the variables are not autocorrelated as the value (2.654) is in between 2-3. This shows that our model is not affected by serial correlation. However, due to high auto correlation found between NPAs and Priority sector lending, PSL ( $Z_1$ ) is automatically excluded while predicting NPAs through liner regression in SPSS. The coefficients of variable used in model are stated bellow.

**Table 3: Multiple Regression Based on Important Explanatory Variables (in Appendix)**

The final model for predicting NPAs is as stated below with R Square as 0.991

**Interpretation of regression results and Concluding Remark**

As per above analysis, it is confirmed that variable non priority sector lending, restructuring, gross domestic product, cash reserve ratio, repo rate, inflation, exchange rate, provision, taxation fiscal

deficit is highly significant in our model. Non Priority Sector lending is highly correlated with NPAs. The model result exhibits that generation of Non-Performing Assets is more from non priority sector lending than priority sector lending. Restructuring is highly correlated with NPAs. Multiple regression result exhibits that the objective of restructuring to reduce NPAs is failed rather it increases faster than NPAs grows in the economy. It is evident from the analysis that banking industry is moving towards a crisis. Additional capital, more buffer provision with quality exposure and monitoring is needed to cope with the situation.

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## Appendix

**Table 1: Correlation Matrix of Variables**

	logY	Z <sub>1</sub>	Z <sub>2</sub>	Z <sub>3</sub>	Z <sub>4</sub>	Z <sub>5</sub>	Z <sub>6</sub>	Z <sub>7</sub>	Z <sub>8</sub>	Z <sub>9</sub>	Z <sub>10</sub>	Z <sub>11</sub>
logY	1.0	.89**	.89**	.94**	.07	-.53*	-.29	.914*	-.25	.69**	.85**	.45*
Z <sub>1</sub>	.89**	1.0	.99**	.88**	.18	-.62**	-.44*	.89**	-.05	.80**	.88**	.60**
Z <sub>2</sub>	.89**	.99**	1.0	.90**	.16	-.63**	-.40	.89**	-.007	.84**	.83**	.62**
Z <sub>3</sub>	.94**	.88**	.90**	1.0	.10	-.58**	-.26	.93**	-.14	.76**	.75**	.51*
Z <sub>4</sub>	.07	.18	.16	.10	1.0	-.39	-.53*	.07	-.05	.14	.07	-.08
Z <sub>5</sub>	-.53*	-.62**	-.63**	-.58**	.39	1.0	.74**	-.70**	.21	-.508*	-.49*	-.24
Z <sub>6</sub>	.29	-.44*	-.40	-.26	-.53*	.74**	1.0	-.41	.09	-.26	-.40	-.16
Z <sub>7</sub>	.91**	.89	.89**	.93**	.70	-.70**	.41	1.0	.24	.66**	.85**	.46**
Z <sub>8</sub>	-.25	-.05	-.007	-.14	-.05	.21	.09	-.244	1.0	.29	-.3	.31
Z <sub>9</sub>	.69**	.80**	.84**	.76*	.14	-.50*	-.26	.66**	.29	1.0	.44*	.49**
Z <sub>10</sub>	.85**	.88**	.83**	.75**	.07	-.49*	.40	.85**	-.3	.44**	1.0	.42
Z <sub>11</sub>	.45*	.601**	.62**	.51*	-.08	-.24	-.18	.48*	.31	.69**	.42	1.0

Sig. (2 tailed) \*\* 1% level of significance, \* 5% level of significance

Data Source: <https://dbie.rbi.org.in>

**Table 2: Durbin-Watson Statics considering important Variables**

Model	R	R Square	Adjusted R Square	Std Error of the Estimate	Durbin-Watson
	0.997	0.991	0.988	0.00163	2.654

Data Source: <https://dbie.rbi.org.in>

**Table 3: Multiple Regression Based on Important Explanatory Variables**

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std Error	Beta		
(Constant)	.244	.084		2.916	.210
Z <sub>2</sub>	-1.864	.016	-2.304	-114.321	.006
Z <sub>3</sub>	.054	.007	.085	7.192	.088
Z <sub>4</sub>	-.208	.016	-.071	12.914	.049
Z <sub>5</sub>	.323	.027	.118	11.949	.053
Z <sub>6</sub>	.337	.019	.079	17.463	.036
Z <sub>7</sub>	2.067	.039	.463	52.843	.012
Z <sub>8</sub>	.125	.007	.073	17.329	.037
Z <sub>9</sub>	1.638	.014	1.170	114.868	.006
Z <sub>10</sub>	1.357	.013	1.944	107.954	.006
Z <sub>11</sub>	-.566	.010	-.146	-56.916	.011

Data Source: <https://dbie.rbi.org.in>