

Bank Specific and Macro Determinants Influencing Non Performing Assets in Indian Public Sector Banks

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Abstract

The objective of the paper was to study the theoretical framework of NPAs and also study the impact of NPAs on bank specific variables on NPAs. The sample consists of 10 banks from the public sector banks on the basis of size and sample has been decided by applying quartile deviation. The period of the study covers from 2001-02 to 2013-14. Data has been analysed with the help of panel data. Secondary data has been used and gathered from the various reports of RBI. The study found that Bank specific determinants and macro determinant influence the level of gross non-performing assets of public sector banks.

Keywords: NPAs, Return on Assets, Return on Equity, Credit Deposit Ratio, WALR, NDS

Introduction

NPAs are sticky assets which do not pay any profit to loaning institution and further creating provisions against such loans. Both ways, lending institution is getting disturbed. NPAs are not a problem which happened over night, it has been in the creating for a long time and it shows the foolishness of our system as well as our policy makers. Commercial Banks granting Loans from their bigger portion of the entire assets in banks so these assets earn interest income for banking Institutions which determines the financial performance of banking institutions. Though, some of these loans generally fall into non-performing assets position and badly disturb the performance of banks. As banking institutions plays a critical role in an economy so it is necessary to recognise the problems that disturb the performance of these banking institutions. This is the reason that non-performing assets can influence the capacity of banking institutions to play their important role in the growth of the economy. Bad loans are a functions of the economies, there is nothing special about NPAs but if banks do not take timely action right from applicants screening, then this current situation will be occur.

RBI introduced so many policies to manage the problem of Non-Performing Assets like Health code system was introduced during the year 1985, but the health code system suffered from various limitations like lack of transparency, fairness and consistency in measuring Non Performing Assets. For betterment of health code system, prudential norms related to asset classification of loans and provisioning norms was introduced by RBI in India during 1992-93 by following Narsimham Committee recommendations. The norms brought in

quantification and objectivity to assessment of NPAs. Based on the recommendations of the Narsimham Committees, Debt Recovery Tribunals were set up in different parts of the country and Asset Reconstruction Company was also set up to recover Non-Performing Assets. Apart from all this, various initiative were taken to decrease the level of NPAs including recovery through, Civil Courts, Lok Adalats, Debt Recovery Tribunals and compromise settlement, Recovery Camps, one time settlement. Gajanan A. Bhakare (2010), Mahua Biswas (2010)

Examining the determinants responsible for banks post lending risk is of a significant importance for governing authorities who are looking for monetary strength and effective banks' administration. In fact, the banks' post lending risk is expected to become Non-Performing Assets (NPAs). Non-Performing Assets can be alarming signal for commencement of banks financial crisis. There are bank specific variables which have a greater impact upon Non-Performing Assets. The present study examined the impact of determinants upon non-performing assets of public sector banks. Bank specific variables includes return on assets, return on equity, return on investment, return on advances, leverage, solvency, credit deposit ratio, cost of funds, capital adequacy ratio and ratio of interest margin to total assets.

Review of literature

Curak, Marijana Sandra, Pepur and Poposki Klime (2013) studied the factors of NPL in South Eastern European Banking Systems. The enquiry sampled 69 banks in 10 countries during the period from 2003 to 2010. Data was analysed with the help of dynamic panel models. The study included bank-specific variables and macroeconomic variables. The results found that lesser economic development leads to high rate of inflation and high rate of interest were which associated with high level of non-performing loans. Additionally, the credit risk was affected by bank-specific variables such as bank size, performance (ROA) and solvency.

Klein, Nir., (2013) investigated the non-performing loans in Central, Eastern and South- Eastern Europe during the period from 1998 to 2011. The analysis used panel data of banks' balance sheets and macroeconomic variables were taken from the Haver and World Economic Outlook datasets. The results of the study revealed that the level of NPLs can be due to both macroeconomic factors and banks' specific factors. While Non-Performing Loans were found due to macroeconomic variables, such as growth of GDP, rate of unemployment, and inflation rate, so many CESEE countries currently face adversely affect the pace of economic recovery.

Kwambai, Kipyego Daniel., & Wandera, Moses. (2013) find out the effects of non-performing loans in KCB, Kenya, also studied the trend of bad loans in economic sector. Data was

collected from primary sources and secondary data was collected from published financial statements of KCB between period ranges from 2007 to 2012. The researcher used stratified proportionate random sampling technique to select the sample and data was analysed by using both qualitative methods and quantitative methods. The study concluded that, the level of lending to economic sectors were increased, due to this reason, level of non-performing loans tends to increased.

Roland Beck, Petr Jakubik., & Anamaria, Piloiu. (2013). studied the macro-economic determinants of non-performing loans of 75 countries of the world during the past era and used a panel data set. According to dynamic panel estimates, the study found that those variables which were significantly disturb NPL ratios were growth of real GDP, prices of shares, rate of exchange, and lending rate of interest. In case of exchange rates, the direction of the effect depends upon the degree of foreign exchange lending to unhedged borrowers which was mostly high in these countries with managed exchange rates. In case of prices of share, the impact was found to be greater in countries which had a large stock market relative to GDP.

Objectives of the study

1. To study the theoretical framework of Non Performing Assets.
2. To study the impact of bank specific variables and macro variables on Non Performing Assets.

Research Methodology

The sample consists of 10 banks from the public sector banks on the basis of size and sample has been decided by applying quartile deviation and three banks taken from upper quartile, three from lower quartile and four from middle quartile from each sectors and Sampled Public Sector Banks are SBI, BOB, SBOP, SBOT, PNB, SB, AB, CBI, IOB, VB. The period of the study covers from 2001-02 to 2013-14. Data has been analysed with the help of panel data. Secondary data has been used and gathered from the various reports of RBI, Trend and Progress report of Banking in India, Statistical Tables relating to Banks in India, annual reports of selected banks, RBI bulletins, RBI Annual Reports, RBI Reports on Currency and Finance, RBI Reports on Hand book of Statistics on Indian Economy, RBI Report on Hand book of Indian economy, RBI Report on hand book of monitory statistics of India, RBI Reports on Bank statistical returns of Scheduled Commercial Banks in India. Dependent Variables are Gross NPAs as Percentage of Gross Advances of Public Sector Banks, Net NPAs as Percentage of Net Advances of Public Sector Banks and Independent Variables are Bank specific variables includes return on assets, return on equity, return on investment, return on advances, leverage, solvency, credit deposit ratio, cost of funds, capital adequacy ratio and ratio of interest

margin to total assets and macro variables includes GDP, REER, unemployment, inflation, growth of agriculture production, growth of industrial production, weighted average lending rate, bsebankex, growth rate of savings NEER and rate of interest.

Limitations and Scope of The Study

- The study is restricted to only Indian Commercial Banks, i.e. the Public and Private Sector Banks. As such, the Cooperative Banks and foreign banks are beyond the purview of the study.

- More bank specific and macro variables can be studied which are not covered under this study.

Analysis

Bank specific determinants influencing gross NPAs as percentage of gross advances of Public Sector Banks: Bank specific variables are taken as independent variable and has shown impact on non-performing of sampled banks of public sector banks.

TABLE 1.1
Impact of Bank Specific Variables on Gross NPAs as Percentage of Gross Advances of Public Sector Banks

Dependent Variables : Gross NPAs as Percentage of Gross Advances of Public Sector Banks			
Independent Variables	Coefficient	t	P>t
Leverage ratio	-2.038716	1.44	0.154
Solvency ratio	-.8737298	0.64	0.521
Interest margin to total asset	.2402686	0.53	0.594
Return on asset	-1.172094	1.39	0.168
Return on equity	.1026734	2.48	0.015*
Return on advances	.6438528	4.59	0.000*
Cost of fund	-.1243633	0.39	0.700
Credit deposit ratio	.1589687	8.69	0.000*
Return on investment	.5086527	2.31	0.022*
Capital adequacy ratio	-.3276334	3.34	0.001*
Constant	13.34175	5.59	0.000
R²		0.8145	
Adjusted R²		0.7972	
F		47.11	
Prob >t		0.0000	

Notes: * denotes values significant at 5 % level.

In Table 1.1 the impact of independent variables have been measured on dependent variable. Panel data results shows the variations in dependent variable (Gross NPAs as Percentage of Gross Advances) due to bank specific factors is of 81 per cent as value of R² stands at 0.8145.

A bank with strong profitability is less likely to contribute in risky activities, such as sanctioning unsafe loans. As analysis depicts that return on equity and return on advances are significantly and positively associated with non-performing assets (Anastasiou Dimitrios, Louri Helen, Tsionas Mike, 2016), (Marijana curak (Croatia), Sandra Pepur (Croatia), Klime Poposki (Macedonia) 2013). It was also discovered that CDR is positively linked with NPAs which demonstrating that higher the CDR the lower will be the level of NPAs (Arpita Ghosh 2013). A higher return on investment means the investment gains comparatively satisfactorily to investment cost. If banks earning more

return on their investments than level of non-performing assets would be go down and results prove that there is a significant relation between return on investment and level of gross non performing assets. CAR was also measured as a factor in opinion of the judgment that the greater the capital of the banks the lower is the level of NPAs. Because of the fact that as capital base of the banks rises confidence of the bank also rises and gets revealed in their performance thus leading to effective reclamation of bank loans and level of NPAs will go down. As results of the study demonstrate that CAR has significant and negative impact on gross non performing assets of public sector banks (Salas & Saurina, 2002). So other variables have not shown significant impact on Gross NPAs as Percentage of Gross Advances of Public Sector Banks. (Lis, et.al., (2000).

The difference in the average found statistically significant as value of p is less than 0.05, in return on equity (p>0.015),

return on advances ($p>0.000$), credit deposit ratio ($p>0.000$), return on investment ($p>0.022$) and capital adequacy ratio ($p>0.001$) so as analysis shows that five factors among ten factors are highly influence the gross non performing assets of sampled banks. Model has been found fit as shown by F value which is 47.11.

Bank specific determinants influencing net NPAs as percentage of net advances of Public Sector Banks: Bank specific variables are taken as independent variable and has shown impact on net non-performing of sampled banks of public sector banks.

Table: 1.2
Impact of Bank Specific Variables on Net NPAs as Percentage of Net Advances of Public Sector Banks

Dependent Variable : Net NPAs as Percentage of Net Advances of Public Sector Banks			
Independent Variables	Coefficient	t	P>t
Leverage ratio	-1.759712	1.14	0.256
Solvency ratio	-.7548538	0.51	0.609
Interest margin to total asset	.186386	0.38	0.703
Return on asset	-.7597512	0.83	0.408
Return on equity	-.100282	2.23	0.027*
Return on advances	.4178243	2.75	0.007*
Cost of fund	-.1548568	0.44	0.659
Credit deposit ratio	-.1296165	6.53	0.000*
Return on investment	.3492053	1.46	0.146
Capital adequacy ratio	-.106727	1.00	0.318
Constant	11.01633	4.25	0.000
R²	0.6514		
Adjusted R²	0.6189		
F	20.05		
Prob > F	0.0000		

Notes: * denotes values significant at 5 % level.

In Table 1.2 the impact of independent variables have been measured on dependent variable. Panel data results shows the variations in dependent variable (net NPAs as Percentage of net Advances) due to bank specific factors is of 65 per cent as value of R² stands at 0.6514. A bank with strong profitability is less likely to contribute in risky activities, such as sanctioning unsafe loans. As analysis depicts that return on equity is having negative coefficient and significantly associated with non-performing assets (Anastasiou Dimitrios, Louri Helen, Tsionas Mike, 2016). (Marijana curak (Croatia), Sandra Pepur (Croatia), Klime Poposki (Macedonia) 2013). Although, return on advances has shown positive and significant impact on NPAs. It was also discovered that CDR is negatively linked with net NPAs which demonstrating that higher the CDR the lower will be the level of net NPAs (R² 0.82, Mahipal Singh Yadav, year n.d.). (Arpita Ghosh 2013). A higher return on investment means the investment gains comparatively satisfactorily to investment cost. If banks earning more return on their

investments than level of non-performing assets would be go down and results prove that there is a significant relation between return on investment and level of gross non performing assets. (R² = .858, ubhendu Dutta, Nitin Gupta, P.Hanumantha Rao, 2013).

The difference in the average found statistically significant as value of p is less than 0.05, in return on equity ($p>0.027$), credit deposit ratio ($p>0.000$), return on advances ($p>0.007$) so as analysis shows that five factors among ten factors are highly influence the gross non performing assets of sampled banks. Model has been found fit as shown by F value which is 20.05.

Macro determinants influencing gross NPAs as percentage of gross advances of Public Sector Banks macro variables are taken as independent variable and has shown impact on non-performing of sampled banks of public sector banks in table 1.3

TABLE 1.3
Impact of Macro Variables on Gross NPAs as Percentage of Gross Advances of Public Sector Banks

Dependent Variable : Gross NPAs as Percentage of Gross Advances of Public Sector Banks								
Independent Variables	Coefficient	t	P>t	R²	Adjusted R²	F	Prob > F	Constant
GDP	-.6118493	4.74	0.000*	0.1495	0.1429	22.51	0.0000	8.897699
REER	-.3440283	4.90	0.000*	0.1581	0.1515	24.04	0.0000	39.18316
NEER	-.0866838	2.44	0.016*	0.0444	0.0369	5.95	0.0161	12.33998
Inflation	-.6930645	8.68	0.000*	0.3706	0.3656	75.36	0.0000	9.392837
Unemployment	-.7344899	4.75	0.000*	0.1500	0.1434	22.59	0.0000	9.289649
Interest	-.4062319	3.35	0.001*	0.0805	0.0733	11.21	0.0011	9.52689
WALR	2.669291	13.37	0.000*	0.5829	0.5796	178.86	0.0000	-28.61406
BSEBANKEX	-.0005077	10.28	0.000*	0.4521	0.4478	105.62	0.0000	8.294603
IND Prod	.0461723	4.32	0.000*	0.1272	0.1204	18.66	0.0000	-2.975162
NDS	-.7481653	14.41	0.000*	0.6187	0.6158	207.73	0.0000	22.70258
Agr Prod	.3761238	3.23	0.002*	0.0752	0.0680	10.41	0.0016	2.905148

Notes: * denotes values significant at 5 % level. GDP is gross domestic product, REER is real effective exchange rate, NEER is nominal effective exchange rate, inflation is rate of inflation as per consumer price index, unemployment is rate of unemployment, WALR is weighted average lending rate, BSEBANKEX is Bombay stock exchange-Bankex, IND Prod is index of industrial production, NDS is net domestic Saving and agr prod is index of agriculture production.

In Table 1.3 the impact of independent variables have been measured on dependent variable. Regression results shows the variations in dependent variable (Gross NPAs as Percentage of Gross Advances) due to macro determinants.

Above analysis depicts that all independent variables have shown significant impact on dependent variable. Non-Performing assets are highly influenced by NDS with 61 per cent variation as value of R² stands at 0.6187 as rate of savings are high than value of non-performing assets will go down. NDS has shown negative and significant impact on gross NPAs to gross advances. (R² 0.879, Vighneswara Swamy). Although, the deviations in WALR of banks may also cause changes in level of NPAs with 58 per cent variation due to WALR as value of R² stands at 0.5829, So Toughening of lending rates makes loans repayment problematic for borrowers, mostly for those who have taken loans earlier at fluctuating rates. WALR has shown positive and significant impact on NPAs. Highest weighted average lending rate transforms to lower non-performing assets and vice versa. (R² = .541 Anthony James Lusweti Munialo

2014). BSEBANKEX has also shown negative and significant impact of 45 per cent as value of R² is .4521 with respect to independent factor of NPAs (R² 0.910496, Shashidhar M. Lokare 2014) whereas it is just 12 per cent as value of R² is .1272 and 7 per cent as value of R² is 0.752 for industrial production (Vighneswara Swamy) and agriculture production respectively. An increase in interest rate declines repayment ability of the borrower thus non-performing assets are associated with the interest rates as value of R² is 0.0805 and shown negative and significant impact on NPAs (Christos K. Staikouras, Geoffrey E. Wood year, n.d.), (Seema Bhattarai 2014) on the other hand, increase in the unemployment in the nation negatively upsets the incomes of the individuals which rises their liability as value of R² is 0.1500, Ahlem Selma Messai, Fathi Jouini 2013). Higher rate of inflation can also influence the loan repayment capacity of borrower as wages and salary become sticky results proved that in NPAs 37 per cent found due to inflation as value of R² is 0.3706. (R-squared = 0.870, Seema Bhattarai 2014). Study found that REER has shown negative and significant impact on NPAs whenever there is appreciation in local currency, the NPAs of banking sector are expected to be high as value of R² is 0.1581 (Anamika Singh, Anil Kumar Sharma, 2016) and an increase of NEER signifies an appreciation of the domestic currency so it weakens debt-servicing abilities of export oriented firms and thus rise in NPAs as value of R² is 0.0444 and shown negative and significant impact on NPAs (Roland Beck, Petr Jakubik and Anamaria Piloitu 2013) although low GDP transforms in to higher level of Non-Performing Assets as

value of R² is 0.1495. GDP has shown negative and significant impact on NPAs. (R-squared = 0.870, Seema Bhattarai 2014)

The difference in the average found statistically significant as value of p is less than 0.05, in GDP (p>0.000), REER (p>0.000), NEER (p>0.016), inflation (p>0.000), unemployment (p>0.000), interest (p>0.001), WALR (p>0.000), BSEBANKEX (p>0.000), ind production

(p>0.000), NDS (p>0.000) and agri production (p>0.002) so as analysis shows that all factors are highly influence the gross non performing assets of sampled bank.

Macro determinants influencing net NPAs as percentage of net advances of Public Sector Banks: macro variables are taken as independent variable and has shown impact on non-performing of sampled banks of public sector banks in table 1.4.

TABLE 1.4
Impact of Macro Variables on Net NPAs as Percentage of Net Advances of Public Sector Banks

Dependent Variable : Net NPAs as Percentage of Net Advances of Public Sector Banks								
Independent Variables	Coefficient	t	P>t	R ²	Adjusted R ²	F	Prob > F	Constant
GDP	-.458737	4.46	0.000*	0.1343	0.1275	19.85	0.0000	5.905957
REER	-.2501352	4.44	0.000*	0.1335	0.1267	19.72	0.0000	27.82529
NEER	-.0643921	2.28	0.024*	0.0391	0.0316	5.21	0.0241	8.432355
Inflation	-.4861452	7.25	0.000*	0.2912	0.2857	52.59	0.0000	6.039097
Unemployment	-.5116174	4.10	0.000*	0.1163	0.1094	16.84	0.0001	5.943163
Interest	-.283188	2.92	0.004*	0.0625	0.0552	8.53	0.0041	6.111189
WALR	1.888165	10.57	0.000*	0.4659	0.4617	111.63	0.0000	-20.81649
BSEBANKEX	-.000364	8.69	0.000*	0.3711	0.3662	75.54	0.0000	5.327925
IND Prod	.0321868	3.75	0.000*	0.0988	0.0917	14.03	0.0003	-2.604048
NDS	-.5419534	11.74	0.000*	0.5186	0.5148	137.88	0.0000	15.79336
Agr Production	.2854316	3.08	0.003*	0.0692	0.0619	9.51	0.0025	1.398788

Notes: * denotes values significant at 5 % level. GDP is gross domestic product, REER is real effective exchange rate, NEER is nominal effective exchange rate, inflation is rate of inflation as per consumer price index, unemployment is rate of unemployment, WALR is weighted average lending rate, BSEBANKEX is Bombay stock exchange-Bankex, IND Prod is index of industrial production, NDS is net domestic Saving and agr prod is index of agriculture production.

In Table 1.4 the impact of independent variables have been measured on dependent variable. Regression results shows the variations in dependent variable (Gross NPAs as Percentage of Gross Advances) due to macro determinants.

Above analysis depicts that all independent variables have shown significant impact on dependent variable. Non-Performing assets are highly influenced by NDS with 51 per cent variation as value of R² stands at 0.5186 as rate of savings are high then level of non-performing assets will show decreasing trend and NDS has shown significant and negative impact on NPAs (R² 0.879, Vighneswara Swamy) Although, the deviations in WALR of banks may also cause changes in level of NPAs with 46 per cent variation due to WALR as value of R² stands at 0.4659, So Toughening of lending rates makes loans repayment problematic for borrowers, mostly for those who have taken loans earlier at fluctuating rates. Highest weighted average lending rate transforms to lower non-performing assets and vice versa. (R² was .541 Anthony James Lusweti Munialo 2014).

BSEBANKEX has also shown significant and negative impact of 37 per cent as value of R² is .3711 with respect to independent factor of NPAs (R² 0.910496, Shashidhar M. Lokare 2014) whereas it is just 9 per cent as value of R² is 0.0988 and 6 per cent as value of R² is 0.0692 for industrial production (R² 0.879, Vighneswara Swamy) and agriculture production respectively. Industrial production and agriculture production has shown positive and significant association with NPAs. An increase in interest rate declines repayment ability of the borrower thus non-performing assets are associated with the interest rates as value of R² is 0.0625 (Christos K. Staikouras, Geoffrey E. Wood year, n.d.), (Seema Bhattarai 2014) on the other hand, increase in the unemployment in the nation negatively upsets the incomes of the individuals which rises their liability as value of R² is 0.1163. Higher rate of inflation can also influence the loan repayment capacity of borrower as wages and salary become sticky results proved that in NPAs 29 per cent found due to inflation as value of R² is 0.2912, (Seema Bhattarai 2014). Study found that REER has impact on NPAs whenever there is appreciation in local currency, the NPAs of banking sector are expected to be high as value of R² is 0.1335 (Anamika Singh, Anil Kumar Sharma, 2016) and an increase of NEER signifies an appreciation of the domestic currency so it weaken debt-servicing abilities of export oriented firms and thus rise in NPAs (Roland Beck, Petr Jakubik and Anamaria Piloiu 2013). As value of R² is 0.0391 although low GDP transforms in to higher level of Non-Performing Assets as value of R² is 0.1343(Seema

Bhattacharai 2014). GDP, Unemployment, REER, NEER, Rate of Interest and Inflation has shown negative and significant impact on NPAs.

The difference in the average found statistically significant as value of p is less than 0.05, in GDP ($p > 0.000$), REER ($p > 0.000$), NEER ($p > 0.024$), inflation ($p > 0.000$), unemployment ($p > 0.000$), interest ($p > 0.004$), WALR ($p > 0.000$), BSEBANKEX ($p > 0.000$), ind production ($p > 0.000$), NDS ($p > 0.000$) and agri production ($p > 0.003$) so as analysis shows that all factors are highly influence the gross non performing assets of sampled bank.

Conclusion :

Bank specific determinants influence the level of gross non-performing assets of public sector banks. In public sector banks, independent variables like return on equity, return on advances, credit deposit ratio, return on investment and capital adequacy ratio has been shown significant and negative influence on dependent variable i.e. gross non performing assets. If banks have strong capital base sound profitability will lead to lower the level of non-performing assets. In public sector banks, independent variables like return on equity, return on advances, credit deposit ratio has been shown significant influence on dependent variable i.e. net non-performing assets. If banks have strong capital base sound profitability will lead to lower the level of non-performing assets. Macro- economic determinants has been shown significant impact on banks gross NPAs to total advances. They found that REER has a positive influence on loans. The result specifies that whenever there is an increase of the local currency, the NPA portfolios of banking institutes are projected to be high. Non-Performing assets of Public Sector Banks are highly influenced by NDS with 61 per cent variation as value of R2 stands at 0.6187 as rate of savings are high than value of non-performing assets will go down. Higher inflation can boost the repayment capability of debtor by decreasing the value of debt, on the other hand, the relationship between NEER and non-performing Assets is uncertain. Increase in the unemployment in the nation negatively upsets the incomes of the individuals which rises their liability. So Toughening of lending rates makes loans repayment problematic for borrowers, mostly for those who have taken loans earlier at fluctuating rates. Highest weighted average lending rate transforms to lower non-performing assets and vice versa. BSEBANKEX, IIP and agriculture production respectively shown impact on NPAs of Public Sector Banks.

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