

NON-PERFORMING ASSETS: A BRUNT ON FINANCIAL PERFORMANCE OF BANKS

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ABSTRACT

Non-Performing assets (NPAs) in the banking arena is adding to the troubles of Indian economy. It is apparent that banks in each and every economy are behind propelling of an economic growth. And in turn, the growing economy has positive impact on the survival of banks too in terms of augmenting demand for credit. The brisk rate of Indian economic growth can be considered as good example of the role played by banks in the country's success. Now days, banks are playing the role of credit creators and are offering number of services by widening their area of operations. But along with the expansion of banks, have emerged a biggest problem and that is NPAs. Though this problem is not new yet a lot of efforts are required to be put into this specific area. So to solve this problem, a lot of concentrated efforts with a focused approach are the need of hour and Government of India along with RBI has started to take steps to tackle this mounting edifice of NPAs. The current study has been carried out on nationalized banks in India in order to study the impact of NPAs on liquidity and profitability of banks using Correlation and Multiple regression analysis. The study bring forth that NPAs reduce the profitability of banks, weaken its financial health and erode its liquidity. The study also reveals that the NPA to total advances is a critical variable that not only affect the profitability of the banks but also affect the liquidity position of the banks.

Keywords: Non-performing assets, SARFAESI, Correlation Analysis and Multiple Regression Analysis.

INTRODUCTION

Banking sector reforms in India have sheltered facets like models for interest rates and its deregulation, decreasing the statutory ratio requirements, the concepts of asset classification etc. But the results were not as expected. This was because of the reason of lack of reforms related to the execution stages drawn in the banking activities. So the preamble of transformations without the changes in the execution of work can only add to the situation of mayhem and the conditions will only worsen rather than to improve. After India gained independence in the year 1947 and before the era of nationalization of banks, the banking sector was the puppet in the private hands. As the control power was with the private hands, so the big industrial house were successful in eating out a big chunk of the financial resources for their own benefit and as per their own priority. These kinds of activities add to the sufferings of various sectors of Indian economy. Banks directly or indirectly affect economic development (Schumpeter 1961, Goldsmith 1969, Anagdi 2003) and established all over the world to mobilize savings and invest into economy either directly or indirectly for production and generation of income and employment (Shrivastav 1981). The importance and necessity of banking system has been realised in post-independence period and were restructured into nationalised or public sector banks till eighties to achieve broader economic objectives (Chhipa, 1987 Deb, 1988). It was with the nationalization of

banks in the year 1969 that all the sections of the society accepted this move as a way to revolutionise the economic scenario of India. Government of India issued the directive to the banking sector to enlarge the base of their activities by entering the rural areas and to sanction loans on the basis of priority to sectors like agriculture, small-scale industries etc. To a certain extent the banking sector has achieved this mandate. Lead Bank Scheme enabled the banking system to expand its network in a planned way and make available banking services to the large number of population and touch every strata of society by extending credit to their productive endeavors. The importance of bank's stability in a developing economy is noteworthy as any distress affects the development plans (Rajaraman and Vasishtha, 2002) thereby the economic progress (Thiagarajan *et al.* 2011). During the decades of 1980 and 1990, banking industry throughout the world was in a state of crisis. India was no exception. The high-flying reason for the crisis was well built edifice of NPAs that was continuously mounting up. Numerous factors were there that lead to escalating up of NPAs like lack of objectivity in the credit assessment of the borrowers, loopholes in the legal system, increasing influence of politicians etc.

RBI has been taking strong measures from time to time and based on the recommendations of the Narsimahan Committee, the landscape of Indian banking changed altogether. All the banks were directed to follow the norms of capital adequacy, asset quality, provisioning for NPAs, prudential norms, disclosure requirements, acceleration of pace and reach of latest technology, streamlining the procedures and complying with accounting standards and making financial statements transparent. The banks were not only required to take the above steps but always evaluate their financial position from period to period. Because of this factor, the interest of the analysts and researchers got developed to analyze, evaluate, measure and finally manage the financial performance of the Indian banks. In this direction, the researchers like Chidambaram and Alemelu (1994), Sarkar and Das(1997), Ajit and Bangar (1998), Bhatia and Verma (1998), Kaur and Bhatia (1998), Padmanabhan (1998), Dasgupta (2000), Desai and Farmer (2001), Edirisuriya and Fang (2001), Mittal (2001), Passah (2001), Sikander and Mukherjee (2001), Khatik (2002), Sangmi (2002), Purohit *et al.* (2003), Kapil and Nagar (2003), Duncan *et al.* (2004), Reddy (2004) and Mohanty (2006) have attempted to make a contribution in the field.

Everyone is aware of the fact that the banking activities primarily, include borrowing and lending of funds. As far as lending is concerned, risk is involved. The best indicator for the health of the banking industry in a country is its level of Non-performing assets (NPAs). NPAs are one of the major concerns for banks in India. It reflects the performance of banks. When the lending of funds or the loan extended by the bank is not recovered or turns out to be unproductive, then that loan is termed as Non-Performing asset. Reduced NPAs generally gives the impression that banks have strengthened their credit appraisal processes over the years and growth in NPAs involves the necessity of provisions, which bring down the overall profitability of banks (Bhavani Prasad and Veena, 2011).

As per SARFAESI Act 2002, NPA is defined as an asset or borrower's account, which has been classified by bank as sub-standard asset, doubtful or loss asset, in accordance with the guidelines related to asset classification issued from time to time by RBI. Previously, the loan and advances that remained overdue for more than 180 days were termed as NPAs but now the time period has been reduced to 90 days with effect from 31st March 2004. The banking system is, therefore, sure to see a bulge NPA portfolio in the coming years. This poses a serious liquidity and credit risk on the banking system, which unless managed effectively would jeopardize the same. NPAs include: Standard Assets, Sub-standard assets, doubtful assets and loss assets. This classification is based on the time period when the assets remain

overdue but the time period may vary. But from 2005, the internationally accepted criterion of 12 months has been applicable. No doubt that banks are playing an important role in the development of an economy in terms of the various activities that they carry out for the benefit of all sections of an economy, but they also suffer from some hurdles which acts as impediment to the economy's growth. This obstacle is in terms of NPAs that are generated in ordinary course of banking activities that is, lending of funds but with inefficient process. So, ultimately this inefficiency retards the growth rate of an economy. The impact of NPAs on the activities of a bank can be: the profits of a bank suffer a setback, cost of capital will increase and return on investment falls. Due to mounting edifice of NPAs, RBI in co-operation with Government undertook various measures to resolve this problem that has the inclination of intensification if relaxations are there. So number of measures has already been in place to tackle this problem and up to some extent, this issue is under control.

REVIEW OF LITERATURE

Realising the importance of banking sector for an economy, NPAs as an area of research has attracted the attention of lot many researchers all over the world. Numerous researches have been carried out from time to time in the arena of NPAs. This section covers a snapshot of the previous studies on impact of NPAs on the financial performance of the banks.

A study by Sergio (1996) examined the non-performing loans in Italy and found that an increase in the riskiness of loan assets was rooted in a Bank's lending policy adducing to relatively unselective and inadequate assessment of sectoral prospects. Business cycle could be a primary reason for Bank non-performing loans. But the increase in bad debts as a consequence of recession alone was not empirically demonstrated. With many countries adopting the policy of liberalization, a research by Brooks (2003) put forth new empirical evidence on the impact of financial liberalization on the performance of Indian commercial banks. The analysis focused on examining the behaviour and 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 the observed increase in competition during financial liberalization has been associated with lower intermediation costs and profitability of the Indian banks. With the policy of privatization resulting in more number of foreign banks entering domestic markets, a study by Sathya (2005) examined the effect of privatization of banks on performance and efficiency. The data taken was for five years (1998-2002) and it was analyzed by using difference of means test. It was concluded that partially privatized banks have performed better as compared to fully public sector banks in respect of financial performance and efficiency.

It is apparent that banks in each and every economy are behind propelling of an economic growth. And in turn, the growing economy has positive impact on the survival of banks too in terms of augmenting demand for credit. Working on these lines, Dash and Kabra (2010) analysed the sensitivity of non-performing loans to macroeconomic and bank specific factors in India. In particular, it employed regression analysis and a panel dataset covering 10 years (1998-99 to 2008-09) to examine the relationship between non performing loans and several key macroeconomic and bank specific variables. The results revealed a significant positive relationship between non-performing loans and the real effective exchange rate.

The liberalisation policy adopted by India in 1990s resulted in emergence of new foreign banking players hitting Indian market resulting in increased competition in the banking sector. A study by Saluja and Lal (2010) compared the performance of public and private sector banks and in foreign banks in India with special reference to their NPAs. For this purpose four banks from public sector: State Bank of India, Allahabad Bank, Bank of Baroda and United Bank of India, from private sector: Axis Bank, HDFC Bank, ICICI Bank and Indusind Bank, from foreign banks: Citibank, Deutsche Bank, HSBC Bank and Standard Chartered Bank were selected and comparative analysis of all three categories was made on the basis of gross NPAs and Net NPAs. The study inferred that there was huge difference in NPAs of public, private and foreign banks and greater quantum of NPAs was observed in non-priority sector than in priority sector. The results also put forth the differential management of NPAs in different bank categories. Extending the findings of this research, another study by Ghosh and Ghosh(2011) emphasized on management of non-performing assets in the perspective of the public sector banks in India. This study traced the movement of the nonperforming assets present in public sector banks of India by analyzing the financial performance of the banks with respect to key performance indicators and management of the non-performing assets under the purview of new policy actions and regulatory compliance of the Reserve Bank of India. On the same lines, another research by Malyadri and Siricha (2011) examined the state of affair of the Non performing Assets (NPAs) of the public sector banks and private sector banks in India with special reference to weaker sections. The study was based on the secondary data retrieved from Report on Trend and Progress of Banking in India and was limited to the analysis of NPAs of the public sector banks and private sector banks for the period seven (7) years i.e. from 2004-2010. The data was analyzed by statistical tools such as percentages and Compounded Annual Growth Rate (CAGR). The study observed that the public sector banks have achieved a greater penetration compared to the private sector banks vis-à-vis the weaker sections.

Highlighting the importance of growth of banks in Indian economy, a study by Kaur and Saddy (2011) put forth that non-performing assets are one of the major concerns for banks in India. NPAs reflect the performance of banks. An attempt has been made in the paper to explore the factors contributing to NPAs, the magnitude of NPAs, reasons for high NPAs and their impact on Indian banking operations. Another effort in the same direction was made by Poongavanam (2011) who analysed the mounting nonperforming assets (NPAs) in the recent times. The paper discussed that an NPA account not only reduces profitability of banks by provisioning in the profit and loss account, but their carrying cost is also increased which results in excess & avoidable management attention. Similarly, Yadav (2011) found that one fourth credit of total advances was in the form of doubtful asset in the initial year of the nineties and had an adverse impact on profitability of public banks at aggregate or sectoral level indicating high degree of riskiness in credit portfolio. The profitability of all public sector banks was affected at very large extent when non-performing assets (NPAs) work with

other banking strategic variables and also affected productivity and efficiency. Carrying out the research in tandem with the earlier findings, Kavitha (2012) observed in the study that credit of total advances was in the form of doubtful asset in the past and had an adverse impact on profitability of public sector banks. The profitability of all public sector banks was affected at very large extent when non-performing assets (NPAs) worked with other banking and also affected the productivity and efficiency of the banking groups. Banks directly or indirectly affected trade and industry development.

In an attempt to explore the indicators of NPAs and its related impact, Rajput, Gupta, and Sharma (2012) used an empirical approach to analyse the profitability indicators as a focal point on non-performing assets (NPAs) of commercial banks in the Indian context. The empirical findings used observation method and statistical tools like DEA, correlation, regression and data representation techniques that identified a negative relationship between profitability measure and NPAs. Also in another study, an attempt was made by Siraj and Pillai (2012) where they explored movement of various NPA indicators; Gross NPA, Net NPA, Additions to NPA, Reductions to NPA and Provisions towards NPA and compared it with Total Advances and Total Deposits of banks up to the period ended 31st December 2011. The study utilized growth rate calculating using correlation and regression study to analyze the movement and significance of NPA indicators during the period. The study concluded that NPA still remains a major threat and the incremental component explained through additions to NPA poses a great question mark on efficiency of credit risk management of banks in India.

A final point of distinction is that our study allows for the possibility of performance measures to respond asymmetrically to mounting NPAs, and examines the direction and impact of relationship in the nationalised banks in India.

NEED AND OBJECTIVES OF THE STUDY

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 requirement for doubtful debts. When the previous researches conducted on the Impact of NPA were reviewed, a wide research gap was identified as far as the researches in Indian context are concerned. Therefore the current research was conducted to investigate into the impact of NPA on liquidity and profitability of nationalized banks in India. The study has been carried out in light of the following objectives:

- To explore the relationship between NPAs and performance of banks.
- To measure the impact of NPA on liquidity and profitability of banks.

HYPOTHESES OF THE STUDY

The success of banking is assessed on the basis of its profit and quality of asset. A major threat to banking sector is prevalence of Non-Performing Assets (NPAs). Michael *et al.* (2006) emphasized that NPA in loan portfolio affect operational efficiency which in turn affects profitability, liquidity and solvency position of banks. Batra (2003) noted that in addition to the influence on profitability, liquidity and competitive functioning, NPA also affect the psychology of bankers in respect of their disposition of funds towards credit delivery and credit expansion. Chijoriga (2000) and Dash *et al.* (2010) showed the relationship between bank failures and higher NPAs worldwide. Brooks (2003), Ghosh and

Ghosh (2011), Poongavanam (2011), Kavitha (2012) and Rajput, Gupta and Sharma (2012) examined that the profitability of all banks was affected at very large extent when a high level of non-performing assets (NPAs) constituted the portfolio. In order to examine the same in case of nationalised banks in India, the following null hypotheses were framed and tested:

H_{01} : There is no significant impact of holding of Non- performing assets on the profitability of nationalized banks in India.

H_{02} : There is no significant impact of holding of Non- performing assets on the liquidity of nationalized banks in India.

DATA BASE AND METHODOLOGY

In order to carry out the study, secondary data has been extracted from annual reports of banks, Journal of Indian Banking Association and Report on Trend and Progress of Banking in India and statistical tables relating to banks in India as published by RBI. The final list of variables has been identified after a brief review of studies of Saluja and Lal (2010), Sangmi and Nazir (2010) and Siraj and Pillai (2012). The data has been collected regarding different parameters affecting the profitability and liquidity of the banks and has been segregated into dependent and independent variables as given in table 1. Here return and Liquidity have been taken as the dependent or the criterion variable and Gross NPA, Net NPA, provision coverage ratio and Capital adequacy ratio have been taken as the independent or the predictor variables.

TABLE 1 DESCRIPTION OF DEPENDENT AND INDEPENDENT VARIABLES

FACTOR	VARIABLE	DESCRIPTION OF VARIABLE
INDEPENDENT VARIABLES		
NON PERFORMING ASSETS (NPA)	Gross NPA Ratio	Gross NPA/Gross Advances
	Net NPA Ratio	Net NPA/Net Advances
		Net NPA = Gross NPA – (Balance in Interest Suspense account + DICGC/ECGC claims received and held pending adjustment + Part payment received and kept in suspense account + Total provisions held)
	Provision Coverage Ratio	Total Provision/Gross NPA
	Capital Adequacy Ratio	Qualifying capital/risk adjusted (or weighted) assets
DEPENDENT VARIABLES		
PROFITABILITY	Return on Net Worth	Net Profit/ Net Worth
LIQUIDITY	Current Ratio	Current Assets/Current Liabilities
	Quick Ratio	Quick Assets/Current Liabilities

Source: Authors' own.

Statistical Tools and Techniques of Analysis

Dash and Kabra (2010), Yadav (2011) and Rajput, Gupta and Sharma (2012) and Siraj and Pillai (2012) have made use of correlation and multiple regression methodologies to test the impact of NPAs on liquidity and profitability of banks. Following their methodologies, in

order to analyse the data in the present study, Correlation and Multiple Regression approach have been used. For this purpose, SPSS has been meticulously used.

Correlation Analysis

The Bivariate Correlations procedure computes the [pairwise associations](#) for a set of variables and displays the results in a matrix. It is useful for determining the strength and direction of the association between two [scale](#) or [ordinal](#) variables. Under this Pearson correlation coefficients have been computed which measure the degree of linear association between two variables. The correlation table shows correlation coefficients ranging in value from -1 (a perfect negative relationship) and $+1$ (a perfect positive relationship). A value of 0 indicates no linear relationship.

Multiple Regression Analysis

Multiple Regression Analysis is a statistical technique which analyses the linear relationship between a dependent variable and multiple independent variables by estimating coefficients for the equation for a straight line. The linear regression model assumes that there is a linear, or "straight line," relationship between the dependent variable and each predictor variable. On the lines of the study based on regression analysis carried out by Elder, Miao and Ramchander (2012), in order to examine the impact of NPA on the performance of the firms, univariate and stepwise regression analysis has been applied. Stepwise regression analysis is procedure in which the predictor variables enter or are removed from the regression equation one at a time. The purpose of this procedure is to select from a large number of predictor variables a subset of variables that account for most of the variation in the dependent or the criterion variable.

RESULTS AND DISCUSSIONS

The results have been presented in two sections. The first section briefs the results of correlation analysis and second section covers the results of multiple regression analysis. Table 2 shows the Pearson correlation coefficients of the dependent and the independent variables.

TABLE 2 CORRELATIONS ANALYSIS OF NPA WITH PROFITABILITY AND LIQUIDITY MEASURES

		Gross NPA Ratio	Net NPA Ratio	Provision Coverage Ratio	Capital Adequacy Ratio	Return On Net Worth	Current Ratio	Quick Ratio
Gross NPA Ratio	Pearson Correlation	1	.253	-.224	-.345*	-.728**	-.542*	-.415
	Sig. (2-tailed)		.296	.357	.043	.000	.017	.077
	N	19	19	19	19	19	19	19
Net NPA Ratio	Pearson Correlation	.253	1	-.305	-.211	-.272	-.035	-.347
	Sig. (2-tailed)	.296		.205	.385	.260	.887	.145
	N	19	19	19	19	19	19	19
Provision Coverage Ratio	Pearson Correlation	-.224	-.305	1	.313	.120	-.203	-.013
	Sig. (2-tailed)	.357	.205		.192	.624	.404	.958
	N	19	19	19	19	19	19	19
Capital Adequacy Ratio	Pearson Correlation	-.345*	-.211	.313	1	.268	-.359	.457*
	Sig. (2-tailed)	.043	.385	.192		.267	.132	.049
	N	19	19	19	19	19	19	19
Return On Net Worth	Pearson Correlation	-.728**	-.272	.120	.268	1	-.313	.300
	Sig. (2-tailed)	.000	.260	.624	.267		.192	.212
	N	19	19	19	19	19	19	19
Current Ratio	Pearson Correlation	-.542*	-.035	-.203	-.359	-.313	1	-.366
	Sig. (2-tailed)	.017	.887	.404	.132	.192		.124
	N	19	19	19	19	19	19	19
Quick Ratio	Pearson Correlation	-.415	-.347	-.013	.457*	.300	-.366	1
	Sig. (2-tailed)	.077	.145	.958	.049	.212	.124	
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Source: Authors' own.

Notes: **Correlation is significant at the 0.01 level (2-tailed).

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	N	19	19	19	19	19	19	19

*Correlation is significant at the 0.05 level (2-tailed).

The perusal of results in table 2 reveals that the Pearson's correlation coefficient of Gross NPA ratio and return on net worth is -0.728 at 0.01 level of significance indicating presence of negative and highly significant correlation. It clearly shows that a higher ratio of non-performing assets to advances for nationalized banks results in a corresponding fall in return on net worth for banks. It is so because, gross NPA reflects the quality of the loans made by banks. It consists of all the non standard assets like sub-standard, doubtful and loss assets. Because of the money getting blocked the prodigality of bank decreases not only by the amount of NPA but NPA leads to opportunity cost also so that much of profit invested in some return earning project/asset. The NPAs do not generate interest income for banks but at the same time banks are required to provide provisions for NPAs from their current profits. So NPA not only affect current profits but also future stream of profit, which may lead to loss of some long-term beneficial opportunity.

Further the correlation coefficient of gross NPA and current ratio is -0.542 at 0.05 level of significance depicting existence of negative correlation. It can be inferred that a rise in the gross NPA ratio of the banks results in deterioration of liquidity (current ratio) for banks. Since money is getting blocked and profits are declining due to increased Gross NPA ratio, it leads to lack of enough cash at hand which fosters borrowing money for shortest period of time leading to additional cost to the company, difficulty in operating the functions of bank and delays in making routine payments.

Also the correlation coefficient of capital adequacy ratio and quick ratio is 0.457 at 0.05 level of significance, showing that banks in India have been able to manage high level of CRAR to provide adequate cushion for any unexpected losses which ultimately improving their liquidity position and also resulting in less quantum of gross NPAs by banks (evident from the coefficient of capital adequacy ratio and gross NPA i.e., -0.345* at 0.05 level of significance).

The Pearson correlation coefficients of the other variables are found to be insignificant. Since some NPA variables have been found to have significant correlation with the dependent variables of return and liquidity, therefore to further analyse the impact of NPA on returns and liquidity of the nationalized banks in India, the data has been regressed.

Multiple Regression Analysis

Having established the nature of association of NPAs and performance measures in case of nationalised banks in India, we now investigate the degree of impact of increased NPAs in banks portfolios on its performance. In the first step we fit a univariate regression model of the following form:

$$Y1 = a + b1X1 + b2 X2 + b3 X3 + b4 X4 + u \text{-----} (1)$$

Where Y= Return on Net Worth,

X1= Gross non- performing asset Ratio; a= intercept, b=regression parameter; u= standard error.

X2= Net non- performing asset Ratio

X3= Provision coverage Ratio

X4= Capital adequacy Ratio

$$Y2 = a + b1X1 + u \text{-----} (2)$$

Where Y2= Current Ratio,

$$Y3 = a + b1X1 + u \text{-----} (3)$$

Where Y3= Quick Ratio,

The table 3 reports the estimated univariate regression models for the impact of NPAs on the profitability (return on net worth) and liquidity (current ratio and quick ratio) of nationalised banks.

TABLE 3 IMPACT OF NPAS ON PROFITABILITY AND LIQUIDITY OF BANKS: RESULTS FROM UNIVARIATE REGRESSIONS.

	Return on Net worth				Current Ratio				Quick Ratio			
	Optimal regressors	β	T-stat	Collinearity Statistics Tolerance VIF	β	T-stat	Collinearity Statistics Tolerance VIF	β	T-stat	Collinearity Statistics Tolerance VIF		
Non-Performing Assets	Gross NPA	-.709	-3.599	.841 1.189	-.510	-2.218	.841 1.189	-.272	-1.198	.841 1.189		
	Net NPA	-.112	-.576	.867 1.154	-.237	-1.044	.867 1.154	-.282	-1.260	.867 1.154		
	Provision	-.081	-.408	.837 1.195	-.098	-.424	.837 1.195	-.282	-1.241	.837 1.195		
	Capital	.025	.128	.818 1.222	-.202	-.867	.818 1.222	.392	1.702	.818 1.222		
	R^2	.543			.377			.393				
	F- Ratio	4.163			2.118			2.270				
	p-value	.020 ^a			.133			.113				

Source: Authors' own.

Notes: a Indicate significance at the 5% level.

Table 3 reports estimated coefficients with corresponding standardized β values, t-statistics, collinearity stats, adjusted R-squares, F-ratio and p-values obtained from univariate regression models. The standardized beta coefficients show how strongly the independent variable is associated with the dependent variable, when adjusted for standard error to provide more comparable results. The t and Sig (p) values give a rough indication of the impact of each predictor variable – a big absolute t value and small p value suggests that a predictor variable is having a large impact on the criterion variable. The F- test value helps to determine whether the model is a good fit for the data. The variance inflation factor (VIF) was used to assess the multi-collinearity and the VIF scores ranged between 1.154 and 1.222. Threshold values of tolerance above .10 (Hair *et al.* 1998) and VIF scores of less than 10 suggest minimal multi-collinearity and stability of the parameter estimates (Neter *et al.* 1985; Dielman, 1991).

The results are discussed for the NPAs and performance of the banks. We notice that when all the predictor variables were taken together in univariate regression analysis, all three performance indicators were found to be sensitive to NPAs, but in different ways. In particular, a significant relation was identified between NPAs and return on net worth causing a variance of 54.3%, with an F-value of 4.163. The results were significant at less than 5% level of significance. In addition to the above results, the other two liquidity measures, current ratio and quick ratio, were affected by NPAs to the tune of 37.7% and 39.3% respectively, but these results were found to be insignificant.

In addition to estimating the full model, we also estimate a stepwise regression model that identifies a restricted set of regressors in the joint model with the most influential factors. Stepwise regressions allow some or all of the independent variables in a standard linear regression to be chosen automatically from a set of variables. We also check for consistency of the stepwise coefficients with the univariate model containing all variables in the system. We also allow for manual additions of selected factors from categories that are not represented in the stepwise approach. The stepwise regression results, which are reported in Table 4, are largely consistent with the univariate regression results discussed earlier.

The table 4 reports the estimated coefficients with corresponding t-statistics, p-values and adjusted R-squares obtained from stepwise regression models for the impact of NPAs on the profitability (return on net worth) and liquidity (current ratio and quick ratio) of nationalised banks.

TABLE 4 STEPWISE MODELS OF IMPACT OF NPAS ON PROFITABILITY AND LIQUIDITY OF BANKS

	Return on Net worth			Current Ratio			Quick Ratio		
	Optimal	β	T-stat	Optimal	β	T-stat	Optimal	β	T-stat
Non-Performing Assets	Intercept	24.361	14.039	Intercept	.012	2.325	Intercept	-	.9888
	Gross NPA	-.728	-4.375 ^a	Gross NPA	.542	2.658 ^b	Capital	.457	2.116 ^b
	Adjusted R ²			Adjusted R ²			Adjusted R ²		
	.502			.252			.162		
	F- Statistics	19.138 ^a		F- Statistics	7.063 ^a		F- Statistics	4.479 ^b	

Source: Authors' own.

Notes: a Indicate significance at the 1% level.

b Indicate significance at the 5% level.

The regression equation for non-performing assets on profitability and liquidity at aggregate level is:

$$Y1 = a + b1X1 + b2 X2 + b3 X3 + b4 X4 + u \text{-----} (4)$$

Where Y= Return on Net Worth,

X1= Gross non- performing asset Ratio; a= intercept, b=regression parameter; u= standard error.

X2= Net non- performing asset Ratio

X3= Provision coverage Ratio

X4= Capital adequacy Ratio

$$Y2 = a + b1X1 + u \text{-----} (5)$$

Where Y2= Current Ratio,

$$Y3 = a + b1X1 + u \text{-----} (6)$$

Where Y3= Quick Ratio,

We notice that several Gross NPAs and Capital adequacy, as a measure of NPAs have a significant impact on performance indicators viz. return on net worth, current ratio and quick ratio. All three performance indicators are sensitive to NPAs, but in different ways. The stepwise regression picks up only the Gross NPAs which have an impact on the Profitability and liquidity at the 5% significance level. In particular, Gross NPA has a negative influence on banks performance (return on net worth and current ratio), and a negative association has been established between capital adequacy and quick ratio. Here the t-value for Gross NPA ratio is significant at less than 1% level of significance showing that it has a huge impact on Return on Net Worth.

In interpreting the adjusted R-square values, it is worth pointing out that Gross NPA indicator has the highest degree of explanatory power in the regressions for return on net worth (53%) and current ratio (29%). The results also indicate that alone Capital adequacy ratio causes a variance of 20% in quick ratio. It shows that as the capital adequacy ratio increases, it enhances the liquidity (quick ratio) of banks. The F- test value determines whether the model is a good fit for the data. For the Return on net worth, F-ratio is 19.138, highly significant at less than 1% level of significance, for current ratio the F-value is 7.063, and for quick ratio, the F-value is 4.479, significant at less than 5% level of significance in both the cases.

The results in Table 4 provide meaningful insights into the nature of the relationship between NPAs and performance of the banks. If the results of correlation and regression analysis are summated, it is clear that a high level of NPAs suggests high probability of a large number of credit defaults that affect return on net-worth of banks. The loan portfolio of banks with NPAs also reduces the liquidity position of the credit institution. Since money is getting blocked and profits are declining due to

increased Gross NPA ratio, it leads to lack of enough cash at hand which fosters borrowing money for shortest period of time leading to additional cost to the company, difficulty in operating the functions of bank and delays in making routine payments. A bank's capital ratio is the ratio of qualifying capital to risk adjusted (or weighted) assets. The RBI has set the minimum capital adequacy ratio at 9% for all banks. A ratio below the minimum indicates that the bank is not adequately capitalized to expand its operations. The ratio ensures that the bank do not expand their business without having adequate capital. This signifies that Indian banks successfully managed to meet the increased capital requirement under the changed framework and it has enhanced its liquidity position. Again, the increase in CRAR, however, has reduced the quantity but cannot undermine the fact that quality of advances has deteriorated for nationalised banks in India in recent years. The results of the study have lead to the rejection of null hypotheses H_{01} and H_{02} indicating a significant negative impact of holding of Non- performing assets on the profitability and liquidity of nationalized banks in India.

The results of the present study has been documented in earlier studies of Michael *et al.* (2006), Batra (2003), Chijoriga (2000), Dash *et al.* (2010), Brooks (2003), Ghosh and Ghosh (2011), Poongavanam (2011), Kavitha (2012) and Rajput, Gupta and Sharma (2012).

CONCLUSIONS

Non-performing assets are assets which cease to generate any income for the bank. These have become the major concern of banks in India. It is just not a problem for the banks; they are bad for the economy too. The money locked up in NPAs is not available for productive use and adverse effect on banks' profitability is there. Nationalised banks are under severe pressures of NPAs as compared to its counterparts that private and foreign banks. The paper deals with understanding the concept of NPAs and investigating into the impact of NPA on liquidity and profitability of nationalized banks in India. Here profitability and Liquidity have been taken as the dependent or the criterion variable and Gross NPA, Net NPA, provision coverage ratio and Capital adequacy ratio have been taken as the independent or the predictor variables. The data has been analyzed by employing Correlation and Multiple Regression approach with the help of SPSS. The results revealed that a higher level of NPA in the portfolio of the banks has an adverse impact on profitability of public banks. An NPA account not only reduces profitability of banks by provisioning in the profit and loss account, but their carrying cost is also increased which results in excess & avoidable management attention. Apart from this, a high level of NPA also puts strain on a banks net worth because banks are under pressure to maintain a desired level of Capital Adequacy and in the absence of comfortable profit level, banks eventually look towards their internal financial strength to fulfil the

norms thereby slowly eroding the net worth. The enormous provisioning of NPA together with the holding cost of such non-productive assets over the years has acted as a severe drain on the profitability of the banks. NPA is not merely non-remunerative. It is also cost absorbing and profit eroding. The study reveals that the level of Non Performing Assets (Credit Risk) has a significant negative influence on the profitability and liquidity of banks. The NPAs do not generate interest income for banks but at the same time banks are required to provide provisions for NPAs from their current profits. The negative influence of the NPA to total advances is a critical variable that not only affect the profitability of the banks but also can undermine the very existence of the banking sector. To improve the efficiency and profitability of banks the NPA need to be reduced and controlled.

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