

# Determinants of Return on Assets of Public Sector Banks in India : An Empirical study

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The time period after 2008 was very volatile for financial markets throughout the world. The global banking system was adversely affected by the weakening of global growth, escalation of the sovereign debt crisis and financial market crisis. However, the fundamentals of the banking sector in emerging economies were comparatively better, which was reflected in higher economic growth and sound capital base in those economies. As far as India is concerned, we observe that RoA and RoE of most of the banks in India have dipped during last one or two years. This makes the study on the determinants of ROA of public sector banks very significant particularly when the banking system in India is predominantly led by public sector banks. From the study, we find that the most significant factors influencing RoA of public sector banks are spread, operating expenses, provisions & contingencies and non interest income.

**Key words:** Return on Assets, Public Sector Banks.

## Introduction

A well regulated financial system is helpful for sustainable economic growth and development of a country. It not only ensures the most productive allocation of investible funds in the economy but also thwarts any external threats that we may face any time; particularly when the economy is open. 'Financial innovation and integration have increased the speed and extent to which shocks are transmitted across asset classes and countries, blurring boundaries between systemic and non-systemic institutions (RBI, 2008-09).' Recent global financial crisis is one of such threats which affected financial sectors across the globe. It also weakened Keynes' theory which revived U.S. in 1930s. Against this background the present paper makes an attempt to examine the ROA performance of public sector banks during in last two years.

The economic crisis has exposed the vulnerability of the financial systems across the globe. It has at the same time established the importance of the banking sector in fuelling sustainable growth of the country. Improved performance of the banking industry in India has helped the economy to bounce back to a positive growth level. According to the Reserve Bank of India, the banking sector in India is sound, adequately capitalized and well-regulated.

Indian financial and economic conditions are much better than in many other countries of the world. Credit, market and liquidity risk studies show that Indian banks are generally resilient and have withstood the global downturn well. Though the Indian banks have performed well on the parameters of asset quality and profitability, there are several notable limitations which hamper the growth of the sector thus; Indian banks are yet to get rid of financial bruises.

Confederation of Indian Industries's (CII) survey on "Health of Indian Banking sector in current regulatory environment" assessed the prevailing market conditions vis-à-vis asset quality, capitalization of banks and growth estimate of the banking sector while focusing upon the current regulatory environment and its impact on bank business and profitability taking feedback from 15 lenders including five state-owned, three private sector and seven foreign entities. In 2012-13, the report said that their profitability is likely to "decline sharply" because to two reasons (a) stricter regulatory requirements and (b) stress assets. "From an average growth of 23 per cent witnessed during the last year (FY 2011-12), the surveyed banks have projected an increase of 14 per cent in profit after tax (PAT) for FY 2012-13. However, it is interesting to note that this has been forecasted to rise to 21 per cent in FY 2013-14, reflecting increased optimism of banks for a change in scenario positively. Furthermore, the Basel III capital requirements are likely to have the highest impact on profitability of the Indian banking sector followed by the revised guidelines on Priority Sector Lending (PSL), the Gross NPAs level of the Indian banking sector which was already at its highest level in last six years (as at end March 2012) is expected to worsen with significant rise in restructured loan accounts. This is going to have major impact on bank's profitability.

The last five years have been very volatile for not only the Indian economy but also for the entire world economy. Lots of investors have lost their money as the stock prices have fallen flat all over the world during this period. Banking sector has always been one of the important sectors for investment. In the time of uncertainty, when some are arguing that the economies are in the process of recovery and while others are

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opining that the world is set for another recession soon. Slowing growth along with higher interest rates can have a number of multiple implications for the operations of the banks. First of all, low rate of business growth restricts the capacity of banks to levy higher interest rates from borrowers. Deposit growth in the system declines in comparison to the credit growth which has an adverse effect on banks' ability to lower interest offered to depositors. Both these factors have a significant effect on the net interest income (NII) and net interest margin (NIM) of the banks. In addition to this, the loan servicing capacities of business community comes under pressure, which strains the asset quality of the banking system. When non-performing assets (NPAs) increases, banks are required to make higher provisioning, which ultimately affects their profitability.

Profitability of the banks can be examined with the help of number of parameters. One of such parameter is ROA. Return on assets is an indicator of how profitable a company is relative to its total assets. It gives an idea of the efficiency of the management in using its assets to generate earnings. The growth in net profit of commercial banks has slowed down, mainly due to steep increase in interest expenditure. Also, Net Interest Margin (NIM) declined marginally during 2011-12 as compared with the previous year. As a result of this, during the same time period, two major indicators of profitability, RoA and RoE have declined marginally compared with the previous year, mainly reflecting the slowdown in net profit caused by increased interest expenditure. As public sector banks still accounts for two-thirds of total assets of all scheduled commercial banks, it becomes very relevant to examine the determinant of ROA of public sector banks in India.

### Literature Review

A review of literature on profitability and performance of Indian banks has thrown ample light on banks' status in the present economic scenario. A few selected studies were reviewed, some of which are mentioned as under.

Narang et al (2011), Chaudhry (2012), and Uppal et al (2012) and many others have examined Indian banking system in terms of their performance and profitability. Narang et al (2011) found that some banks achieved excellent performance with regard to index of interest earned to total assets ratio. Chaudhary (2012) made an analysis of the performance of selected public and private banks in India on the basis of parameters recommended in the CAMEL Model. Researchers have taken various parameters to evaluate banks' performance such as business per employee, profit per employee, total deposits, total advances, total investment, total assets, total income, total expenditure and net profits. Uppal (2010) and Ramaratnam et al (2011) examined certain key parameters to evaluate the performance of the Indian banks during the global financial turmoil. Chaudhary et al (2011) made a comparative study of public and private sector banks to evaluate their performance. They suggested that suitable and stringent

measures should be taken to get rid of NPA problem and an efficient management information system should be developed. Koundal (2012) measured the relative performance of Indian banks. Koeva (2003) provided empirical evidence on the impact of financial liberalization on the performance of Indian banks by examining the behaviour costs and profitability during the liberalization period. The study observed that ownership type has a significant effect on the some of performance indicators.

Reviews of work revealed that various reform measures introduced in India have indeed strengthened the Indian banking system in thwarting the new challenges ahead. It was observed that India is lagging in many aspects. It is still far away from the 100 per cent globalization. Less use of technology along with high NPAs in Indian banks and poor human resource management are other concerns. It was also found that reform measures taken in India have largely benefited foreign and private sector banks. Public sector banks are still lagging behind in terms of various financial parameters and needs much improvement.

### Objective of The Study

Performance of banking sector has a very significant influence on the economic growth. Last three years were very significant as most of the economies started recovering from the financial crisis. As public sector banks accounts for major proportion of banking business in India, their profitability studies have always assume great importance. The performance of the banks is said to be satisfactory if the ROA exceeds 1%. The average return on assets of the public sector banks is 0.88 for 2011-12 whereas as it was 0.96 in the year 2010-11. So, we can find a decline in the ROA of public sector banks. The main objective of the present study is to critically examine the determinants of ROA of banks in public sector. Further, it also aims to predict the ROA performance of public sector banks in India on the basis of some parameters.

### Research Methodology

The study focuses on all banks in India under public sector. It included 19 nationalized banks, SBI and its associates and also one new public sector bank (IDBI Ltd.).

**Key Variable:** Dependent variable for the purpose of study is Return on Assets of banks. Spread as a percentage of assets, Credit deposit ratio, investment deposit ratio, Capital adequacy ratio, operating expenses, provision for contingencies, net NPA as a percentage of net advances and non interest income of banks have been taken as independent variables.

1. Spread Ratio (SP) (Spread/Total Assets): Spread is the difference between interest earned and interest paid. The ratio is calculated as a percentage spread to total assets. The higher the ratio, the more will be the profitability.

2. Provisions and Contingencies (PC): (provision & contingencies/ total expenses) A portion of profits which is kept aside for contingent situations and expenditure is known as provision for contingencies, and it has a direct bearing on the profitability.
3. Non-Interest Income (NII): (Non interest income / total assets) Non interest income refers to the Income of a bank from its allied and non-banking activities. Banks should aim to increase their non interest income to enhance their return on assets.
4. Credit-Deposit (CD) Ratio (Total advances/Total deposits). Higher the CD ratio, higher is the utilization of depositor's money which helps banks to earn higher return on their assets.
5. Operating Expense (OE) Ratio (Operating Expenses/Total expenses): The ratio has a negative relationship with profitability, and a high OE ratio highlights operational inefficiency of a bank.
6. Investment-Deposit (ID) Ratio (Investments/Deposits): The ratio indicates the efficiency of a bank to invest its deposits and surplus cash so as to generate profits.
7. Capital Adequacy Ratio (CAR) (Capital/Risk-weighted assets): In the adoption of risk management strategies by a bank, the ratio determines the cushion available to a bank against the credit risk, operational risk and market risk.
8. Non-Performing Asset (NPA) ratio (NPA/Total assets): The ratio bears a negative relationship with profitability as it indicates the credit risk of a bank.

**Time Period:** We have taken data for three years covering time period from 2009-10 to 2011-12.

**Source of data:** Secondary data have been collected from the annual reports and websites of respective banks, the website of Reserve Bank of India and Indian Banking Association and their bulletins.

### Hypotheses of The Study

The present study attempts to test a number of hypotheses which as below:

- H1: There is a positive relationship between spread as a % assets and ROA.
- H2: Provision for contingencies has a negative relationship with ROA.
- H2: There is a positive relationship between credit deposit ratio and ROA.
- H3: There is a positive relationship between Investment deposit ratio and ROA
- H4: CAR bears a positive relationship with ROA.

H5: Operating expenses has a negative relationship with ROA.

H7: Net NPA as a % of net advances has negative relationship with ROA.

H8: Non interest income has a positive relationship with ROA

**Statistical Tools:** Backward multiple regression analysis was used to analyze the impact of determinants on the ROA of public sector banks.

### Results and Discussions

We framed a regression equation to see the impact of various predictors on the RoA of the public sector banks as under.

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \varepsilon$$

Where,

Y = Return on Assets (RoA)

X<sub>1</sub> = Spread Ratio (SP)

X<sub>2</sub> = Credit-Deposit (CD)

X<sub>3</sub> = Investment-Deposit Ratio (ID)

X<sub>4</sub> = Capital Adequacy Ratio (CAR)

X<sub>5</sub> = Operating Expense (OE)

X<sub>6</sub> = Provisions and Contingencies (PC)

X<sub>7</sub> = Non-Performing Asset Ratio (NPA)

X<sub>8</sub> = Non-Interest Income (NII)

First multivariate regression is run by including all the independent variables mentioned above, the results of which are shown below. From our first model (1) for the year 2009-10, we find that 88.3% of variation in the dependent variable was explained by all the eight variables taken together. Similarly, the models explained 81.7% (model-2) and 87.5% (model-3) of variation in RoA in 2010-11 and 2011-12 respectively. All the three initial models were found to be significant at 1% level. However, we found many of the independent variables to be insignificant in the regression models for the time periods-2009-2012.

$$\text{ROA} = 0.455 + 0.573\text{SP}^* - 0.007\text{CD} + 0.03\text{ID} + 0.012\text{CAR} - 0.019\text{OE} - 3.442\text{PC}^{**} - 0.321\text{NPA}^* + 75.56\text{NII}^{**} \quad \dots(1)$$

$$(4.603) \quad (-1.209) \quad (0.437) \quad (0.421) \quad (-1.388) \quad (-2.721) \quad (-5.496) \quad (3.288)$$

$$R^2 = 0.883; \text{Adj. } R^2 = 0.832; \text{F-stat.} = 17.046$$

$$\text{ROA} = 1.246 + 0.368\text{SP}^{**} - 0.012\text{CD} - 0.005\text{ID} + 0.036\text{CAR} - 0.031\text{OE}^{**} - 0.170\text{PC} - 0.381\text{NPA}^{**} + 69.897\text{NII}^{**} \quad \dots(2)$$

$$(2.442) \quad (-1.456) \quad (-0.469) \quad (0.83) \quad (-2.295) \quad (-0.135) \quad (-3.893) \quad (2.456)$$

$$R^2 = 0.817; \text{Adj. } R^2 = 0.712; \text{F-stat.} = 7.8$$

$$\text{ROA} = -0.144 + 0.771\text{SP}^* + 0.003\text{CD} + 0.005\text{ID} - 0.019\text{CAR} - 0.070\text{OE}^* - 2.697\text{PC} - 0.103\text{NPA}^{***} + 110.141\text{NII}^{**} \quad \dots(3)$$

$$(4.988) \quad (0.342) \quad (0.402) \quad (-0.338) \quad (-5.237) \quad (-1.471) \quad (-1.823) \quad (3.308)$$

$$R^2 = 0.875; \text{Adj. } R^2 = 0.792; \text{F-stat.} = 10.529$$

Then backward multiple regression was run to remove insignificant variables and get a fit model for explaining the

variations in RoA. The results of the backward regression analysis for the three periods are shown in Table 1 below.

**Table 1: Final Models for explaining RoA during 2009-10, 2010-11 and 2011-12**

Independent Variables	2009-10	2010-11	2011-12
Spread as % of Assets (SP)	0.413* (5.899)	0.419* (3.886)	0.730* (6.705)
CD Ratio (CD)	X	X	X
ID Ratio (ID)	X	X	X
CAR Basel I(CAR)	X	X	X
Operating Expenses as a % to total expenses (OE)	X	-0.029* (-2.940)	-0.071* (-6.193)
Provision for Contingencies as a % of total expenditure (PC)	-2.475** (-2.468)	X	-2.322*** (-1.919)
Net NPA as % to Net Advances (NPA)	-0.349* (-7.102)	-0.400* (-5.0888)	-0.103*** (-2.070)
Non Interest Income as a % of total assets (NII)	54.719* (3.287)	45.962** (2.371)	111.598* (4.839)
R <sup>2</sup>	0.858	0.776	0.873
Adj. R <sup>2</sup>	0.832	0.726	0.831
F-stat.	33.262*	15.555*	20.605*
Darwin-Watson stat.	2.156	2.808	1.846

\* Significance at 1% level; \*\* Significance at 5% level; \*\*\* Significance at 10% level

Since neither of the predictor variables has a variance inflation factor greater than ten during all three periods in the final models (4 to 6) as shown in Table 3 (appendix), there are no apparent multicollinearity problems; in other words, there is no variable in the model that is measuring the same relationship as is measured by another variable or group of variables.

Table 1 above shows that 83 per cent of variation in ROA is explained by the factors viz., SP, PC, NPA, and NII during 2009-10 and 85 per cent of variation by all independent variables. The coefficients of SP, PC, NPA and NII were found to be statistically significant and theoretically sound. F-statistic in the model (33.262) is significant at 1 % level indicating that our model is fit. Though during 2010-11, adjusted R2 explains 72 per cent of the variation in ROA by SP and NPA and 77 per

cent by independent variables, but model is significant for explaining banks' profitability. During 2011-12, 83 per cent of variation in ROA is explained by SP, OE and NII. Coefficients such as SP and OE during this period were found to be statistically highly significant. We found that NII has the most positive impact on ROA of public sector banks. It is statistically significant at 1% level. Spread as a percentage of assets is another variable with positive impact on ROA and found to be statistically significant at 1% of significant for all the three years. PC and NPA had the negative impact on the ROA. Both PC and NPA were found to be statistically significant at 10% level in 2011-12. Durbin-Watson test is done to find if there is the problem of autocorrelation in the model/s. During all three years, the Durbin-Watson statistic shows absence of autocorrelation.

Table 2: Test of Hypotheses

Variable and Hypothesis	Expected relationship with ROA	Results of the study			Significance Level			Reasons for Differences
		2010	2011	2012	2010	2011	2012	
S	Positive	+	+	+	1%	1%	1%	NA
CD	Positive	E	E	E	X	X	X	NA
IC	positive	E	E	E	X	X	X	NA
CAR	Positive	E	E	E	X	X	X	NA
OE	Negative	E	-	-	X	1%	1%	NA
PC	Negative	-	E	-	5%	X	10%	NA
NPA	Negative	-	-	-	1%	1%	10%	NA
NII	Positive	+	+	+	1%	5%	1%	NA

E stands for the variables eliminated in the final regression model. All the results of variables in the final model is as per our hypothesis.

### Conclusion

On the basis of the results of the present study, we can conclude that the variables, viz., SP, OE, PC, NPA, NII were found to be the significant determinants of ROA of public sector banks. Of them, spread and NII had positive influence and all other had negative impact. So, in order to improve their ROA, public sector banks should focus on reducing their Operating expenses, Provision and Contingencies and NPAs. Positive spread and NII give us the impression that public sector banks have done very well on maintaining their spread margins as well as non interest incomes.

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### Appendix: Tables

**Table 3: Coefficients<sup>a</sup>**

Model (4)	Unstandardized Coefficients		Standardized	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
2009-10							
(Constant)	.222	.187		1.186	.248		
SPREAD	.413	.070	.569	5.899	.000	.694	1.441
PC	-2.475	1.003	-.276	-2.468	.022	.515	1.942
NPA	-.349	.049	-.612	-7.102	.000	.868	1.152
NII	54.719	16.649	.325	3.287	.003	.660	1.515
Model (5) 2010-11							
(Constant)	.632	.258		2.448	.025		
SPREAD	.419	.108	.557	3.886	.001	.608	1.646
OE	-.029	.010	-.418	-2.940	.009	.617	1.621
NPA	-.400	.079	-.581	-5.088	.000	.957	1.045
NII	45.962	19.382	.283	2.371	.029	.876	1.141
Model (6) 2011-12							
(Constant)	.071	.202		.354	.729		
SPREAD	.730	.109	1.281	6.705	.000	.232	4.312
OE	-.071	.011	-1.036	-6.193	.000	.303	3.302
PC	-2.322	1.210	-.331	-1.919	.074	.285	3.505
NPA	-.103	.050	-.205	-2.070	.056	.865	1.156
NII	111.598	23.063	.594	4.839	.000	.563	1.776

a. Dependent Variable: ROA