

# A Study on the Effect of Bank Size and Operational Efficiency on Performance of Banks

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## **Abstract**

*In this paper, Financial performance has been measured by using two indicators; Internal-based performance measured by Return on Assets, Market-based performance measured by Tobin's Q model or P/B ratio. The study employed the correlation and multiple regression analysis of annual time series data from 2009-2013 to capture the impact of bank size, operational efficiency and Non performing asset on financial performance measured by the two indicators and to create a good-fit regression model to predict the future financial performance of the bank.*

## **Key words:**

Financial Performance, Tobin's Q ratio, Operational Efficiency, Non performing asset

## Introduction

The banking sector is considered to be an important source of financing for most businesses. The common assumption, which underpins much of the financial performance research and discussion, is that increasing financial performance will lead to improved functions and activities of the organizations. The subject of financial performance and research into its measurement is well advanced within finance and management fields. It can be argued that there are some principal factors to improve financial performance for financial institutions: the bank's size, its assets management, leverage ratio, operational efficiency ratio, its portfolio composition, and its level of non-performing assets. The motivation of conducting this study stems from that few studies have examined this issue or tried to better explain the performance of Indian banks, those

studies tend to use traditional financial ratio analysis and benchmarking to measure banks' performance, therefore a comprehensive performance analysis framework that needs to be developed to go beyond the traditional ratio analysis.

## Financial Performance of Commercial banks in India

Commercial Banks Slower growth in profits with low credit off take impacting interest earnings in 2012-13, interest earnings were adversely affected with credit growth slowing down. This was also a period when interest rates, which had hardened during earlier years, started softening. Interest expended also grew at a slower pace during the year but its growth was higher than that of interest earned, thereby putting a downward pressure on the growth in both operating and net profits of banks. In continuation with the past trend, RoA

witnessed a further contraction in 2012-13. Return on assets (RoA), the most commonly used indicator of profitability, showed a further reduction by about 5 basis points in 2012-13<sup>1</sup>.

New private sector banks and foreign banks reported an increase in RoA in 2012-13 as against nationalized banks and SBI Group. The growth of profits of new private sector/foreign banks did not show a sharp fall in 2012-13, as was the case with nationalized banks and SBI Group. Although the interest income of new private/foreign banks posted a lower growth during the year, they could manage to maintain their profits growth through a reduction in the growth of their operating expenses, particularly wage bill.

The asset quality of banks is an important indicator of their financial health; it also reflects the efficacy of their credit risk

management and recovery environment. The asset quality of the banking system deteriorated significantly during the year 2012-2013 and there was an increase in the total stressed assets in the banking system (that is, NPAs plus restructured assets). Banks need to not only follow the various measures put in place by the Reserve Bank and the Government of India effectively for resolution and recovery of bad loans but also strengthen their due diligence, credit appraisal and post sanction loan monitoring systems to minimise and mitigate the problems of increasing NPAs. There is a need to improve the effectiveness of the recovery system. Recovery should be focused on efficiency and fairness - preserving the value of underlying assets and jobs where possible, even while redeploying unviable assets to new uses and compensating employees fairly. This should be done while ensuring that contractual priorities are met. In this regard, there is

urgent need for accelerating the working of Debt Recovery Tribunals and Asset Reconstruction Companies. It is also necessary to collect credit data and examine large common exposures across banks. This will enable the creation of a central repository on large credits, which can be shared with the banks. This in turn will enable banks to be aware of building leverage and common exposures. This also underscores the need for expediting the setting up of an enhanced resolution structure for financial firms. Going forward, these issues will engage priority attention of Reserve Bank.

### Objectives of the study

- 1.To study the effect of bank size, operational efficiency and level of NPA on performance of banks
2. To develop a regression model to predict the internal and market performance of the bank.

### Hypothesis Development :

In developing the hypothesis, the main goal is to find whether there exist significant impact between each independent variable and the dependent variable, and to assess the significance impact of the independent variables used together on the dependent variable(s), the null and alternative hypothesis are:

**1- H<sub>0</sub>:** There exist an insignificant impact of size, non performing asset and operational efficiency on financial performance of Indian commercial banks.

**2- H<sub>1</sub>:** There exist an insignificant impact of size, non performing asset and operational efficiency on financial performance of Indian commercial banks

### Methodology and Research Design

The research design is descriptive in nature based on secondary data. The study aims to explain the existing relationship between the performance measurement variables and the

operational efficiency and size of the banks.

Bank size is measured in terms of total asset.

Operational efficiency is measured by finding out the ratio of operating expenses to total interest income.

Non-performing asset is measured as a percentage to total funds of the bank

### Sample of the study

For the purpose of the study, the financial data of major public sector bank in India named State Bank of India was selected. Annual Time series data for independent-dependent variables were extracted from banks' annual audited financial statements from the period 2008-2012. It is given in Appendix 1.

### Tobin's Q model

**Tobin's Q** was introduced in 1968 by James Tobin and William Brainard. Tobin's Q is the ratio between the market value and replacement value of the same physical

asset. Tobin's q ratio is also known as Price to Book ratio (P/B ratio). **Tobin's Q ratio** is a measure of firms assets in relation to a firms market value. This ratio can be used to measure the market performance of a particular company or a firm.

The formula for Tobin's Q is:

$$\text{Tobin's Q} = \frac{\text{Total Market Value of Firm}}{\text{Total Asset Value of Firm}}$$

### How it works/Example:

For example, let's say Company XYZ has \$40 million of assets, 10 millions of shares outstanding and a current share price of \$3. Using the formula, calculate that Tobin's Q is:

$$\text{Tobin's Q} = (10,000,000 \times \$3) / \$40,000,000 = 0.75$$

When the Tobin's Q ratio is between 0 and 1, it costs more to replace a firm's assets than the firm is worth. A Tobin's Q above 1 means that the firm is worth more than the

cost of its assets. Because Tobin's premise is that firms should be worth what their assets are worth, anything above 1.0 theoretically indicates that a company is overvalued.

**Regression models**

To assess the financial performance of the Indian banks, the researcher developed two

models; each consists of one dependent variable and three identical independent variables. In designing the models, used the ROA as an internal financial performance indicator and the Tobin's Q model (Market Price / Book value) as a market financial performance indicator

**Variables used for the study**

Dependent Variable	Description	Independent variables	Description
RoA	Net income/Total asset	Bank Size	Total Asset
Tobin's Q	Market value of the bank/Book value of equity	Operational Efficiency	Total operating expense/Net interest income
		Non-performing asset	Non performing asset as a % to total funds.

Referring to the correlation matrix (see Appendix) table 2, it is found that

**Data Analysis and Results**

**Correlation and regression Results for model I**

- A negative correlation between the dependent variable RoA and the independent variable banks' size

measured by total assets of about (-0.485).

- A negative correlation was found between RoA and Non performing asset (-0.548).
- Operational efficiency found to be positively-weak correlated with RoA of about (0.432).

Here the value of the correlation between RoA and other three independent variables are more than 0.4. So directly go for regression analysis in order to understand the percentage of variation on dependent variable explained by each independent variable.

Referring to table 3, it is found that the adjusted R-square is .690, so we can conclude that 49% of the variation in the dependent variable (RoA) is explained by the independent variables. This implies somehow strong explanatory power for the whole regression. As long as the F-stat (

table 4 ) equals 5.776 and is insignificant ( less than 5%), and reject the null Hypothesis claiming that there exist an insignificant impact of Asset size, NPA and operational Efficiency on internal financial performance of commercial banks measured by RoA.

Thus, it can predict the average RoA with about 69% explanatory power by the following model:

$$\text{ROA} = - 0.654 + -0.84 \text{ SIZE} + 1.415 \text{ NPA} + - 0.008 \text{ OE}$$

### **Correlation and Regression Results for model II**

Analyzing the second model, and scanning Table 6, it is found that the following correlations of the Independent variables with the market performance of banks measured by

Tobin's Q (P/B ratio) as the following:

- A strong positive correlation between bank P/B ratio and bank size.(0.546)

- A positive correlation between operational efficiency and P/B ratio. (0.361).
- A positive correlation between Non performing asset and P/B ratio. (0.472)

Looking at regression analysis and Analysis of Variance in table 7 and table 8, respectively, it is found that the explanatory power of the whole second regression model is about 74%, where at the same time, the F-stat is 86.64 and is higher than 5%, which is insignificant . As a result, we accept the alternative hypothesis claiming that “ there is an insignificant impact of Asset size, NPA, and operational Efficiency on market financial performance of commercial banks measured by Tobin’s’ Q model

Thus, we can predict the average Tobin’s Q (market-based performance indicator) with

about 74% explanatory power by the following model:

$$\text{Tobin's Q} = 7.201 + 5.747 \text{ BSIZE} + - 8.592 \text{ NPA} + 0.013 \text{ OE}$$

### Conclusion

On the basis of the finding of the study, it is concluded that bank should try to increase its size in terms of assets and reduce the level of non performing assets. More over the bank also take care to increase its operational efficiency by reducing the operating expenses. The analysis of the study reveals that there exist a significant impact of Asset size, NPA and operational Efficiency on internal financial performance of commercial banks measured by RoA. On the contrary the findings of the study reveals that there is an insignificant impact of Asset size, NPA, and operational Efficiency on market financial performance of commercial banks measured by Tobin’s’ Q model.



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Appendix 1:

Abbreviations

ROA	Return on asset
NPA	Non performing asset
OE	Operational efficiency
P/B ratio	Price to book value

Appendix 2:

Table No.1 Key financial data of SBI used for analysis

Year	RoA	P/B ratio	NPA(%)	Bank size(Total Asset in crores)	Operational Efficiency(%)
2008-09	01.04	1.14	1.79	9,64,432	46.62
2009-10	0.88	1.17	1.72	10,53,414	52.59
2010-11	0.71	2	1.63	12,23,736	47.60
2011-12	0.88	2.7	1.82	13,35,519	45.23
2012-13	0.91	1.67	2.10	15,66,261	48.51

Table No. 2 Correlation Matrix- Model 1

		ROI	Bank size	NPA	Operational efficiency
ROI	Pearson Correlation	1	-.485	-.548	.432
	Sig. (2-tailed)		.407	.939	.960
	N	5	5	5	5
Total Assets	Pearson Correlation	-.485	1	.885	-.386
	Sig. (2-tailed)	.407		.046	.522
	N	5	5	5	5
NPA	Pearson Correlation	-.548	.885	1	-.527
	Sig. (2-tailed)	.939	.046		.361
	N	5	5	5	5
Operational efficiency	Pearson Correlation	.432	-.386	-.527	1
	Sig. (2-tailed)	.960	.522	.361	
	N	5	5	5	5

**Table No. 3 Model Summary-model 1**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.749 <sup>a</sup>	.561	.690	.96985
a. Predictors: (Constant), CR, operating, AM, asset				

**Table No. 4 ANOVA –Model 1**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	30.014	4	7.504	7.977	.000 <sup>a</sup>
	Residual	23.515	25	.941		
	Total	53.530	29			
a. Predictors: (Constant), NPA, operating efficiency						
b. Dependent Variable: ROA						

**Table No.5 Coefficients-Model 1**

<b>Coefficients<sup>a</sup></b>						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-19.599	4.555		-4.302	.000
	asset	2.278	.512	.662	4.453	.000
	operating	-.001	.002	-.116	-.854	.401
	AM	.375	.141	.387	2.658	.014
	CR	-.018	.013	-.199	-1.370	.183
a. Dependent Variable: ROA						

Table No.6 Correlation-Model2

		Total Assets	NPA	Operational efficiency	PB ratio
Total Assets	Pearson Correlation	1	.885	-.386	.546
	Sig. (2-tailed)		.046	.522	.341
	N	5	5	5	5
NPA	Pearson Correlation	.885	1	-.527	.472
	Sig. (2-tailed)	.046		.361	.881
	N	5	5	5	5
Operational efficiency	Pearson Correlation	-.386	-.527	1	.361
	Sig. (2-tailed)	.522	.361		.795
	N	5	5	5	5
PB ratio	Pearson Correlation	.546	0.472	.361	1
	Sig. (2-tailed)	.341	.881	.795	
	N	5	5	5	5

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

Table No.7 Model Summary-Model11

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.898 <sup>a</sup>	.826	.745	.08021

a. Predictors: (Constant), operational efficiency, Total Assets, NPA

Table No. 8 Analysis of Variance –Model 11

ANOVA <sup>b</sup>						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.672	3	.557	86.644	.079 <sup>a</sup>
	Residual	.006	1	.006		
	Total	1.679	4			

a. Predictors: (Constant), operational efficiency, Total Assets, NPA

b. Dependent Variable: PB ratio

**Table No.9 Coefficients- Model 11**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-200.548	163.551		-1.226	.436
	Total Assets	-3.860E-5	.000	-.400	-.878	.541
	NPA	236.793	86.414	1.357	2.740	.223
	Operational efficiency	.654	2.039	.080	.321	.802

a. Dependent Variable: EPS