

# Asian Resonance

## An Empirical Study on the Performance of Public Sector Banks: A Post Reform Analysis in India

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#### Abstract

The study designed to examine the effect of bank specific variables on the performance and profitability considering 182 observations of 26 banks during 2009 to 2015. The investigation process considers all 26 public sector banks in India. To accomplish the research objective this study obtained data from RBI time series data base such as statistical table relating to banking sector and handbook on Indian economy. The study forms a balanced panel and employs Pooled-OLS and fixed effects models to analyse the relationship between bank profitability i.e. Return on Asset (ROA) and different bank specific variables such as market share, credit to deposit ratio, business per employee, non-interest income, interest to asset ratio, demand deposit to total deposit. The findings reflect that the market share, credit to deposit ratio, interest to asset ratio and demand deposit to total deposit are positive and highly significant. While business per employee is negatively related and highly significant and non-interest income is negative and significant.

**Keywords:** ROA, Profitability, PSBs.

#### Introduction

The Central Government entered the banking business with the nationalization of the Imperial Bank of India (now the State Bank of India) in 1955. In 1969, fourteen large banks were nationalized and again in 1980, six more banks were taken over by the Government. These nationalized banks are called public sector banks. The year of 1991 can be treated as the turning point in India's official position on economic policies, with the launch of wide ranging measures to de-regulate the economy and ending of 'quota-license' regime. Depleted official reserves, large deficits in balance of payments, and sharp decline in GDP growth which was reflected in similar declines in almost all sectors of the economy demanded urgent attention and bringing economic reforms was the main agenda.

Until the early 1990s, the banking sector suffered from lack of competition, low capital base, Low productivity and high intermediation cost. Commenting on the performance of the nationalized banks, the Reserve Bank of India observed, "After the nationalization of large banks in 1969 and 1980, the Government-owned banks have dominated the banking sector. The role of technology was minimal and the quality of service was not given adequate importance. Banks also did not follow proper risk management systems and the prudential standards were weak. All these resulted in poor asset quality and low profitability."

The key objective of reforms in the banking sector in India has been to enhance the stability and efficiency of banks. To achieve this objective, various reform measures were initiated that could be categorized broadly into three main groups: (a) enabling measures, (b) strengthening measures and (c) institutional measures.

*The Enabling measures* were designed to create an environment where banks could respond optimally to market signals on the basis of commercial considerations. Salient among these included reductions in statutory pre-emptions so as to release greater funds for commercial lending, interest rate deregulation to enable price discovery, granting of operational autonomy to banks and liberalization of the entry norms for financial intermediaries. *The strengthening* measures aimed at reducing the vulnerability of banks in the face of fluctuations in the economic environment. These included, inter alia, capital adequacy, income recognition, asset classification and provisioning norms, exposure norms,

improved levels of transparency, and disclosure standards. *Institutional framework* conducive to development of banks needs to be developed. Salient among these include reforms in the legal framework pertaining to banks and creation of new institutions.

The first phase of reforms implemented subsequent to the release of the Report of the Committee on Financial System (Chairman: M. Narasimham), 1992 (or Narasimham Committee) focused mainly on enabling and strengthening measures. According to the Committee, the poor financial shape and low efficiency of public sector banks was due to: (a) extensive degree of central direction of their operations, particularly in terms of investment, credit allocation and branch expansion and (b) excessive political interference, resulting into failure of commercial banks to operate on the basis of their commercial judgment and in the framework of internal economy.

Further, the second phase of reforms, implemented subsequent to the recommendations of the Committee on Banking Sector Reforms (Chairman: M. Narasimham), 1998 (or Narasimham Committee II) placed greater emphasis on structural measures and improvement in standards of disclosure and levels of transparency in order to align the Indian standards with international best practices.

Banking sector reforms since 1991 have included, among others, the following: 1. Granting operational autonomy to banks. 2. Liberalization of entry norms for banks. 3. Reduction in statutory pre-emptions so as to release greater funds for commercial lending. 4. Deregulation of interest rates. 5. Relaxation in investment norms for banks. 6. Easing of restrictions in respect of banks' foreign currency investments. 7. Withdrawal of reserve requirements on inter-bank borrowings. Thus, financial repression has eased substantially with the deregulation of interest rates and substantial removal of credit allocation.

## Review of Literature

The concerned literature with the research work is presented below to highlight the work done on the subject in India and abroad which proved useful to delineate the various issues and methodologies adopted

Varghese (1983) analysed the trend in the profit and profitability of Indian commercial banks in seventies. He included the employee productivity theory in his analysis and also used different set of variables like gross profit, net profit, operating margin, spread, average earning asset, average cost of fund, cost of incremental CRR and SLR (anticipated), interest tax, average effective yield etc. to find out the main factor that affects the profit performance of commercial banks in seventies. Author's findings imply that the changes in interest rate and pre-emption of funds through CRR & SLR and the monetary policy measure are responsible for the subsequent increase and decline in the bank profitability of the Indian commercial bank in seventies.

Agu (1992) analysed the hypothesis that economic performance of a banking system is a function of its market structure, policy and demand variables with particular reference to the Nigerian commercial banking system. He has taken different variables in his model like, net profit, total asset, total deposit, time and saving deposits, loan and advances, GDP current prices, number of bank offices etc. and calculated the concentration ratio, the Herfindahl Hirschman Index to analyse the profitability of banking sector. His finding shows that, market structure as measured by concentration ratio had no significant and statistical association with banks profitability performance. However, market structure as measured by the number of bank branches was found to be statistically significantly correlated with banks profitability performance. According to the authors argument a relatively simple description of structure such as the number of bank offices matters. Expansion of bank branches is desirable for increased bank performance. Furthermore, regulatory emphasis should be more on policy factors. To regulate the policy variables optimally, the monetary authorities should create an encouraging environment to enable the banks adopt policies that will enhance their performance.

Kaushik et al. (1996) has compared the performance and profitability of commercial banks, credit unions, and saving banks in the deregulatory environment of 1980s in U.S. They used variables like interest margin, non-interest margin, loss provision, securities gain, income before tax, net income dividends, equity capital, return on asset, net charge offs, delinquency rate to make comparative analysis of profitability between credit unions, commercial banks, and saving banks using income statement and balance sheet data. Their findings reveal successful achievement of credit unions in the deregulatory environment. The growth in the equity capital accounts of credit unions has been consistently more than double that of commercial bank since 1985.

Bhattacharya et al. (2001) examined the investment in government securities by bank in post-reform period and the variation in flow of credit to the various sectors. They incorporated theory of financial liberalisation in their study, used different variables like share & rate of growth of investments, govt. securities, advance prime lending rate, capital, reserves, deposits, borrowings, bills payable, profit etc. to know the significant variation between pre and post-reform situations. Their findings show that there has been an increase in the ratio of deposits to national income in the post-reform period, structural break in the movement of bank deposits, credit and investment. And the investment in government securities is much higher than prescribed Statutory Liquidity Ratio (SLR).

Hutchison (2002) examined whether EU country banking systems are particularly vulnerable to systemic risk. Our approach is to explore episodes of banking sector distress for a large sample of countries, highlighting the experience of the EU. He estimated multivariate probit models linking the

likelihood of banking problems to a set of macroeconomic variables and institutional characteristics such as aspects of bank supervision and regulation, restrictions on bank portfolios, and development of the banking system. Given these characteristics, the model predicts a low probability of banking sector distress in EMU countries. He has used cross-sectional regression method and his findings show that while there is a positive correlation between bank crises and bouts of severe exchange rate pressure, the latter does not appear to be a causal factor in bank crises. Both the macroeconomic and institutional variables therefore point to relatively low risk for banking sector distress/crisis in EMU.

Goddard (2004) investigated the interactions between firm growth and profitability, using a data set comprising 583 banks with various ownership characteristics, located in five major European Union (EU) countries. Growth and profit rates are observed annually over the period 1992 to 1998, together with a set of control variables that capture the impact of a variety of firm-level, industry-level, and macroeconomic variables. Dynamic panel and cross-sectional regressions are used to estimate growth and profit equations for a sample of commercial, savings, and co-operative banks from five major European Union countries during the mid-1990s. His methodology and finding shows The growth regressions reveal little or no evidence of mean-reversion in bank sizes. Profit is an important prerequisite for future growth. Banks that maintain a high capital-assets ratio tend to grow slowly, and growth is linked to macroeconomic conditions. Otherwise, there are few systematic influences on bank growth. The persistence of profit appears higher for savings and co-operative banks than for commercial banks. Banks that maintain high capital-assets or liquidity ratios tend to record relatively low profitability. There is some evidence of a positive association between concentration and profitability, but little evidence of a link between bank-level x-inefficiency and profitability.

Athanasoglou et al. (2006) examined the effect of bank specific, industry related and macroeconomic determinant on profitability in South Eastern European region through structure conduct performance hypothesis. They used variables like ROA, ROE, Profitability and other bank, industry and macroeconomic determinants and interpreted it through a linear regression model using OLS method. Their findings reveal that the liquidity, credit risk, and economic activity has a positive effect on profitability. And capital, operating expenses, management has a negative effect on profitability.

Abbas et al (2008) analysed the market perception about the performance of Pakistani commercial banks in the wake of financial liberalisation and deregulation measures taken by the central bank over the last two decades. For this purpose, they used the Survey approach. Unlike the parametric and nonparametric approaches, their Paper employs a perception Survey approach which aims at capturing the feedback/responses of

executives/senior bankers with regard to the impact of banking sector reforms. The findings show that, during the pre-reform era, years of bank operations under state-owned structure and under regulation of banks were identified as the key factors behind inefficiency and vulnerability of Nationalised Commercial Banks. During the pre-reform period, the imposition of high reserve requirements for banks, large credit allocations for government sponsored schemes, restrictions on opening of private banks, and putting restraints on branch network of banks, left little room for Pakistani commercial banks to extend credit at their own choice. Banks' performance improved due to enhanced competition in the backdrop of financial liberalisation, deregulation, and institutional strengthening measures. Banking spread, which is supposed to be an important indicator of financial liberalisation and deregulation measures, is still larger.

Alexiou et al. (2009) has investigated the effect of bank specific and macroeconomic determinants of bank profitability using Structure Conduct Performance Hypothesis in Greek. They have taken quarterly panel data in their model. Their findings show that macroeconomic factors such as inflation and private consumption play a significant role in shaping the performance of banking institutes. Additionally, bank specific variables such as capital or measure of cost efficiency also play a critical role in determining bank profitability.

Tariq et al. (2014) observed the impact of commercial determinants to the deviation in profitability across banks in case of Pakistan. The study has used the bank level data from 2004-2010 and also used panel data regression, fixed effect model and random effect model to explore out the relationship between the key factors in 17 commercial banks of Pakistan and their effects on high profitability. Their findings show that the banks with high equity to capital are anticipated to have higher safety and this superiority leads to high profitability and performance enhancement, high loans to assets ratio higher level of earning, as due to less competitive market and increase in the return rate on investment, which increase the net spread of the bank that have positive impact on profitability, banks with large size are earning more as compare to small banks on their equity and assets, the bank free services also have inverse relation with banks profitability because service fees are major earning of the banks, Banks debt to equity or debt risk has negative impact on profitability because as more customers become defaulters the bank will become bankrupts.

Seenaih et al. (2015) examined whether the priority sector lending have any impact on bank profitability in India. They have taken independent variables like operating profits, cost of deposits, ratio of wage bill to total expenditure, proportion of priority sector lending, net interest margin and ROE, ROA as dependent variables. They have applied a panel data model. Their findings show, priority sector lending doesn't influence profitability, and other factor like

wage bill has a positive impact and net interest margin has a significant but negative impact on bank profitability in India.

Noman et al. (2015) investigated the effect of bank specific and macroeconomic determinants on profitability of 35 banks in Bangladesh from 2003 to 2013. They have taken Return on Average Equity (ROAE) and Net Interest Margin (NIM) as profitability indicators, and some bank specific and macroeconomic variables as independent variables. OLS has been applied to their fixed effect and two step GMM system model have been applied for the analysis. Their findings show the effect of credit risk and cost efficiency is negative and significant which calls for prudent cost management. Effect of capital adequacy and bank size on profitability is positive and significant but the effect of liquidity is insignificant. Development bank and private commercial bank are more profitable than state owned commercial banks in Bangladesh

Nisar (2015) has investigated how the bank specific, industry specific and macro-economic factors affect the profitability of banking sector in Pakistan over the period 2006-2013. They have taken a panel data model and bank specific variables like, funding cost, liquidity, credit risk, admin expenses, non-fund based service and capital adequacy, industry specific variable like banking sector development, macroeconomic indicator like economic growth and dependent variables as ROA. They have applied pooled ordinary least square regression. Their findings show that, profitability is negatively affected by funding cost, liquidity, non-performing-loan, administrative expenses and positively affected by non-fund based service, capital adequacy, Banking sector development and Economic growth.

Petria et al. (2015) investigated the main determinants of commercial banks profitability in European Union for eight years' period (2004 – 2011). They have taken internal factors that influence profitability like: bank size, financial structure, credit risk taken, liquidity risk, business mix, income-expenditure structure and capital adequacy. Industry specific factor is the market concentration, while macroeconomic factors are economic growth and inflation. They have used Hausman test to select the appropriate estimation method – fixed effects or random effects, their findings show the size of the bank does not influence the return on equity, namely the return of the shareholders' investment. On the other hand, the return on assets depends on the total assets of the bank, but the estimated coefficient has a weak statistical significance.

### Statement of The Problem

The reform process started in 1991 poses challenges before bankers as never before. After liberalization, various new private sector banks and foreign banks have joined the banking industry in India. It is generally believed that there is a decline in profitability and productivity of the PSBs as a result of liberalization. It is believed that PSBs have not only lost their deposits to new generation private sector banks but also to old private sector banks and foreign

sector banks. Only four banks, viz. State Bank of India, Bank of Baroda, Punjab National Bank, Canara Bank had more than 5 per cent market share in March, 1999. PSBs witnessed substantial loss in their market share deposit and still are losing, will have really struggle for retaining their position in the next millennium.

How to deal with the weak public-sector banks is a major problem for the next stage of banking sector reforms. It is particularly difficult because the poor financial position of many of these banks is often blamed on the fact that the regulatory regime in earlier years did not place sufficient emphasis on sound banking, and the weak banks are, therefore, not responsible for their current predicament. This perception often leads to an expectation that all weak banks must be helped to restructure after which they would be able to survive in the new environment.

### Objectives of The Study

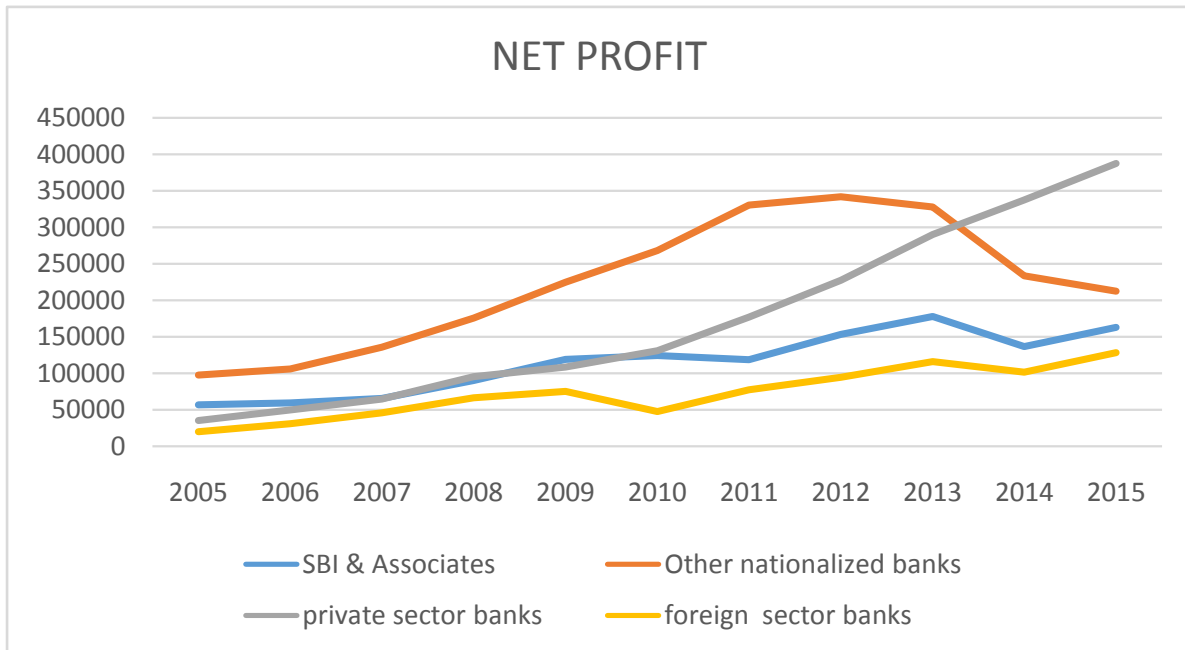
1. To analyse the trend and pattern of various performance indicator.
2. To evaluate financial performance of Public Sector Banks.
3. To identify the various factors affecting the profitability of PUBLIC SECTOR BANKS after *crisis period*.

### Data and Methodology

The study has been conducted on the basis of secondary data. The secondary data has been compiled from statistical tables relating to banks, RBI bulletins, reports on Currency and Finance (annual reports) published by RBI, Govt. of India. The time series data were collected from 2005 – 2015. However, for a cross section of 26 public sector banks, the study of data from 2009 – 2015 (7 years) has been considered to avoid the effect of Global Financial Crisis 2008.

The performance analyses for this study were based on 26 banks. The study covers only Public-Sector Banks which include six state banks and its subsidiaries, and other twenty nationalized public sector commercial banks in India since 2009. Other sectoral banks like private and foreign sector are not considered in this study because of unavailability of data on some bank and time period. The sample consists 26 banks and 7 years' data comprising with 182 observations. Thus, this study forms a balanced data comprising 182 banks-year observations. This study uses econometric software package STATA 12 for processing and analysing the data.

The performance of a bank can be measured by number of indicators. Profitability is the most important indicator because it gives an insight into the broad indication of the capability of a bank to increase its earnings. For measuring the profits and profitability of commercial banks, the present study employs ROA (return on asset) as dependent variable and variables such as market share, business per employee, ratio of demand deposit to total deposit, non-interest income, credit to deposit, interest to asset ratio in a panel data model.



**Table 1: Construction of Variables**

Variables	Notation	Variable Measurement	Expected Sign
Market share	mktshr	Individual deposit/total deposit of all banks	+
Credit to deposit ratio	creddepo	Gross advances / total deposit	+/-
Business per employee	BPEmp	(Total deposit + advances) / employs	+
Non-interest income	Nonintinc	Income other than interest income	+/-
Interest to asset ratio	intoasset	Net interest income / total asset	+
Ratio of demand deposit to total deposit	DDTD	Demand deposit/total deposit	+

**Model Specification and Tools**

We begin with the pooled OLS model for the empirical analysis.

We use pooled OLS model for the empirical analysis. Having data for public sector banks for the period 2009 to 2015 we estimate the empirical model with pooled cross section-time series data. It is known that, panel data estimation methods refer to cases where  $n > 1$ ,  $T > 1$  and  $N = nT$ . It should be noted that while it is possible to use ordinary multiple regression techniques on panel data, they may not be optimal. This is because in OLS it is assumed that for a given individual, observations are serially uncorrelated; and across individual and time the errors are homoscedastic, which not always true. When errors are not homoscedastic, OLS estimates are consistent but inefficient leading to incorrect standard errors. To control for heteroscedasticity, we used the White corrected standard error. One of the

important assumptions of the classical normal linear regression model is that regressors should not be (perfectly) correlated as then the variance of the error term becomes infinite and causes the model to fail. Precisely, in such a case the explanatory variables are said to exhibit multicollinearity. In order to take care of probable multicollinearity problem, we use the correlation matrix with the cut-off value of 0.5 as the correlation coefficient among the right-hand side variables.

Thus, we first estimate the following basic regression model.

Return on asset = f (market share, credit to deposit ratio, business per employee, non-interest income, interest to asset ratio, ratio of demand deposit to total deposit).

The empirical specification of the testable model being

$$ROA_{it} = \beta_0 + \beta_1 mktshr_{it} + \beta_2 creddepo_{it} + \beta_3 BPemp_{it} + \beta_4 non\ int\ inc_{it} + \beta_5 int\ toasset_{it} + \beta_6 dtd_{it} + u_{it} \dots \dots \dots (1)$$

The subscript i and t refers to  $i^{th}$  firm operating in  $t^{th}$  year,  $\beta_0$  refers to the intercept term, the  $\beta_1, \beta_2, \dots, \beta_6$  refers to the vector of regression coefficients and  $u_{it}$  refers to the

disturbance term and follows the classical assumptions,  $E(u_{it}) \sim N(0, \sigma^2)$ . The null hypothesis for example mktshr doesn't affect ROA would be  $\beta_1=0$  against the alternative hypothesis, market share has

significant impact on ROA would be  $\beta_1$  is not equal to zero.

We begin with pooled OLS model for the empirical analysis. However, by using the OLS model one essentially ignores the panel structure of the data. While it is possible to use ordinary multiple regression techniques on panel data, they may not be optimal. This is because in OLS it is assumed that for a given individual, observations are serially uncorrelated; and across individual and time the errors are homoskedastic, which not always true. When errors are not homoskedastic, OLS estimates are consistent but inefficient leading to incorrect standard errors. Furthermore, the estimates of coefficients derived from regression may be subject to omitted variable bias. With panel data, it is possible to control for some types of omitted variables even without observing them, by observing changes in the dependent variable over time. It controls for the omitted variables that differ between cases but are constant over time. It is also possible to use panel data to control for omitted variables that vary over time but are constant between cases. In the panel data model, the collinearity among the variables are low (Baltagi, 2005). Panel data model can be estimated using both random and fixed effect estimation methods.

The general form of fixed effect model can be specified as follows.

$$Y_{it} = bX_{it} + u_{it}$$

Where,

$i = 1, 2, 3, \dots, n$  (number of banks)

$t = 1, 2, 3, \dots, Tk$  (number of years)

$$u_{it} = \mu_i + v_{it}$$

$Y$  is the dependent variable and  $X$  is the vector of explanatory variables,  $b$  is the vector of regression coefficients and  $u$  is the disturbance term. The term  $\mu_i$  is the time invariant and accounts for any unobservable bank specific effect not included in the regression. The term  $v_{it}$  represents remaining disturbance and varies over bank and times. It is assumed that the  $\mu_i \sim IIN(0, \sigma^2)$  and independent of  $\sim IIN(0, \sigma^2)$  for all  $i$  and  $t$ .

On the other hand, the random effects model is the combination of between and within effects estimators. Both fixed and random effect model accommodate unobservable heterogeneity. In the fixed effect model  $\mu_i$  are the fixed parameters to be estimated, while in random effect model  $\mu_i$  are assumed to be random, independent and identically distributed. From this point of view perhaps the fixed effect model is less efficient than the random effect model because of the lost degree of freedom.

The random effect can be specified as

$$y_{it} = bX_{it} + u_{it}$$

**Table 3: Correlation Matrix of The Explanatory Variables**

	ROA	mktshr	creddpo	BPEMP	Nonintinc	inttoasset	DDTD
ROA	1						
mktshr	.118	1					
creddpo	-.08	.012	1				
BPemp	-.344	.002	.326	1			

Where

$$u_{it} = \mu_i + v_{it}$$

The error term consists of bank-specific effects and a combined bank and time varying error. One can prefer the random effect estimation over the fixed effect estimation if the time in-variant bank specific effects  $\mu_i$  are uncorrelated with  $X_{it}$ . When the true model is random effect model, OLS will yield consistent estimates of  $b$ , but the standard error will be underestimated. Also, when the random effect model is valid, the fixed effect estimators will still produce consistent estimates of the identifiable parameters. Whether the random effect estimator is appropriate over the fixed effect estimator is provided by the Hausman specification test. The hausman test statistic is distributed asymptotically as chi – square with  $k$  degree of freedom under the null hypothesis that the random effects estimator is appropriate. A large value of Hausman statistics favours the fixed effects estimators over the random effect estimators.

### Result and Discussion

The descriptive statistics are presented in the table 3. This table depicts the mean, standard deviation, maximum and minimum value of the performance measures of the banks in India. Table 3 shows and compares the mean and standard deviations of the variables with its minimum and maximum value in the study. The mean and standard deviation of ROA or the profitability are .006 and .003 respectively, which implies the average profit per bank is very low and the dispersion or deviation between the data on ROA of all the banks are very small. The minimum profit ratio or ROA is a negative value whereas the maximum ROA is 0.15.

**Table 2: Descriptive Statistics**

Variables	Mean	Std. Dev	Min.	Max
ROA	.006	.003	-.009	.015
mktshr	.038	.040	.009	.238
creddepo	.741	.069	.533	.924
BPemp	120	43.3	59.7	287
Nonintinc	21204	31288.83	3504	225759
inttoasset	.022	.004	.007	.033
DDTD	.076	.025	.031	.178

Where ROA stands for return on asset, mktshr stands for market share, creddepo stands for credit to deposit, Bpemp stands for business per employee, Nonintinc stands for non-interest income, inttoasset stands for interest to asset ratio, DDTD stands for ratio of demand deposit to total deposit.

Before going for the analysis of the performance we run Pearson's correlation test in order to check multicollinearity among the explanatory variables. Table 3 reports the Pearson's correlation coefficient matrix.

Nonintinc	.080	.024	.202	.030	1		
intoasset	.435	.09	.197	-.390	.196	1	
DDTD	.156	.274	.022	.048	-.105	-.093	1

Table 3 gives the correlation matrix of the variables of the study. This table has been drawn up to observe the inter-correlation between the independent variables. There appears to be no serious problems of multicollinearity since the values of the correlation coefficient are low (less than 0.5). Reports that the variables are free from the multi-

collinearity problem, hence expecting the unbiased estimation from the data analysis.

Table 4 exhibits empirical results based on OLS fixed effect and pooled OLS (robust) i.e corrected for heteroscedasticity for the panel of 26 public sector banks in India. The second, third and fourth columns presents the results of OLS, fixed effects and random effects respectively.

**Table 4: Regression Output of Ols and Fixed Effect Model**

Variables	OLS (robust)	OLS fixed effects (overall estimates)	OLS random effects (overall estimates)
Constant	.003(1.13)	-.007(-2.04)	.003(1.30)
mktshr	.002(0.61)	.204(3.91)***	.002(0.32)
creddepo	-.005(-1.25)	.006(1.72)*	-.001(-0.54)
BPEmp	-.00001(-2.58)***	-.00006(-8.24)***	-.00003(-5.32)***
Nonintinc	5.49(1.68)*	-9.97(-0.44)	1.70(0.17)
intoasset	.305(5.27)***	.348(6.36)***	.260(4.73)***
DDTD	.025(3.15)***	.021(2.11)**	.035(3.90)***
R <sup>2</sup>	0.277	R <sup>2</sup> (within) = 0.5735	R <sup>2</sup> (within) = 0.5146
F-statistic	(16.86)***	R <sup>2</sup> (between) = 0.0671	R <sup>2</sup> (between) = 0.0706
		R <sup>2</sup> (overall) = 0.0806	R <sup>2</sup> (overall) = 0.2534
<b>X<sup>^</sup> for Hausman Test</b>			X <sup>2</sup> (4) = (82.32)*** Fixed effect chosen over random effect

**Note**

The table presents OLS fixed effect and two step system GMM model output which is based on equation (1). The analysis uses a balance panel data of 26 banks over 07 years which satisfies the condition of small time period and large number of banks in order to use Fixed effect model. Moreover, \*, \*\* and \*\*\* indicate significant of the coefficient value at 10%,5% and 1% respectively. The study consider ROA for return on asset, mktshr for market share, creddepo for credit to deposit, Bpemp for business per employee, Nonintinc for non-interest income, intoasset for interest to asset ratio, DDTD for ratio of demand deposit to total deposit.

To begin with, equation (1) is estimated using OLS method. The potential heteroscedasticity is corrected using Whites method. This result indicates that three of the six independent variables are statistically significant in influencing the profitability. The R squared value is 0.27 implies that twenty-seven percent of the dependent variable is explained by the independent variables. The F statistics is highly significant indicating that the overall model fits well. Among the independent variables demand deposit to total deposit, interest to assets and non-interest earnings are positively and significantly influencing the return on asset, whereas, the business per employee is negative and statistically significant. Other variable such as market share and credit to deposit ratio are insignificant.

However as indicated earlier while using the OLS, with the assumption of each observation been independent and identically distributed, we ignored the panel structure of the data set. Therefore, we moved to fixed effects and random effects model. The fixed effect model has been chosen based on the chi square value for the Hausman test (82.32) and is

highly significant. Thus, we reject the null hypothesis that the random effect estimator is more appropriate and accordingly our interpretation would be based on results of the fixed effect estimators. The coefficient and t-values of the explanatory variables are reported in the table for the respective estimated methods.

It can be seen in Table 3 that the variables mktshr, creddepo, BPEmp, intoasset, and DDTD are significant in the determinant of profitability for the entire sample. Market share is positive and highly significant at 1% level. This result holds true with expectation. A one-unit increase in the market share results in .204 units increase in the bank profit. Credit to deposit ratio shows a positive and significant at 10% level. A very high and very low credit deposit ratio may be disastrous for the bank. So, it is necessary to maintain a normal positive and significant relationship as shown in the result. Business per employee is negative and significant at 1% level. Generally, it is expected to have a positive relation with profitability as this ratio shows the productivity of the bank. But result implies there is a negative relation with profitability. So, banks should put more effort and concern to the employees by raising the business per employee ratio in order to bring effectiveness in performance. Non- interest income is negative and insignificant to the profitability according to the result. Where a positive non-interest income is expected which could help in reducing risk and enhancing the stability of a bank. The negative relation shows the public-sector banks are indulging in many free and low-cost service for which non-interest income is declining. Interest to asset ratio implies it is positive and significant at 1% level relationship. It shows the significant earning or making of profit of a bank from the interest earned from assets. The banks should attract more deposits in order to advance loan

and hold asset to generate interest on it. Demand deposit to total deposit ratio shows it is a positive and significant at 5% level which implies there is no negative impact of demand deposit on profitability.

#### Conclusion

The study examines the effect of bank specific variables on bank performance in Indian public sector banks over a period of 7 years from 2009 to 2015. The bank specific determinants of the study include market share, credit to deposit, business per employee, non-interest income, interest to asset ratio, and demand deposit to total deposit. Moreover, study considers ROA as profitability indicator. The novelty of the study includes the analysis of banks performance on profitability, use of both pooled OLS as well as fixed effect models.

The results are summarised as follow. Both the Pooled OLS and fixed effects results show more or less similar results. It has been found that:

The market share, credit to deposit ratio, interest to asset ratio and demand deposit to total deposit are positive and highly significant. While business per employee is negatively related and highly significant and non-interest income is negative and significant.

#### Limitation and Scope for The Future Research

All the economic / scientific studies are faced with various limitations and the study is no exception to the phenomenon. The limitations of the study are: The present study has been considered the sample period immediately after the global financial crisis and with the available data. Because of some data overlapping problem, merging of banks, and financial crisis effect, data from 2005 to 2008 are not considered and structure conduct performance study for market concentration analysis could not be operationalized. Extracting data for a longer period can improve the results. Secondly this study is limited to six bank specific factors the results are therefore limited to these factors. However, including some more independent variables, the industry factors and some macroeconomic factors can also improve the results. The future study can therefore capture the impact of these variables on bank profitability.

#### References

1. Abas Kalbe and Malik Manjoor Hussain (2008), "Impact of Financial Liberalisation and Deregulation on Banking Sector in Pakistan" *The Pakistan Development Review*, Vol. 47, No. 3 (Autumn 2008), pp. 287-313.
2. Agu Cletus C. (1992) "Analysis of The Determinants Of The Nigerian Banking System's Profits Andprofitability Performance" *Savings and Development*, Vol. 16, No. 4 (1992), pp. 353-370.
3. Ahoja Aditi (2008), "A Study Of Indian Banking Sectorperformance Analysis Since Liberalization" *Ph.d Thesis*.
4. Altunbas, Yener S., Edward P.M. Gardener, Philip Molyneux, and Barry Moore (2001). "Efficiency in European Banking." *European Economic Review* 45, 1931-1955.
5. Alexiou Constantinos (2009), "Determinants of Bank Profitability: Evidence From The Greek Banking Sector" *Economic Annals*, Volume LIV No. 182 / July – September 2009 UDC: 3.33 ISSN: 0013-3264.
6. Bhattacharya Pabir and Sivasubramanian M.N. (2001) "Aspects of Banking Sector Reforms in India" *Economic and Political Weekly*, Vol. 36, No. 43 (Oct. 27 - Nov. 2, 2001), pp. 4151-4156.
7. Francis, M. E. (2013) "Determinants of commercial bank profitability in Sub-Saharan Africa." *International Journal of Economics and Finance*, 5(9), 134.
8. Gadda Koteswara Rao (2014), "Business Intelligence for Public Sector Banks in India: A Case study- Design, Development and Deployment" *Journal of Finance, Accounting and Management*, 5(2), 37-58, July 2014 37.
9. Goddad John (2004) "Dynamics of Growth and Profitability in Banking" *Journal of Money, Credit and Banking*, Vol. 36, No. 6 (Dec., 2004), pp. 1069-1090.
10. Kaushik Surendra K. and Lopez Raymond H. (1996) "Profitability of Credit Unions, Commercial Banks and Savings Banks: A Comparative Analysis" *The American Economist*, Vol. 40, No. 1 (Spring, 1996), pp. 66-78.
11. Kolapo T. F., Ayeni R. K., & Oke M. O. (2012) "Credit risk and commercial banks' performance in Nigeria: A panel model approach". *Australian Journal of Business and Management Research*, 2(2), 31-38.
12. Naik, P. (2014). *R&D Intensity and Market Valuation of Firm: A Study of R&D Incurring Manufacturing Firms in India*. *Journal of Studies in Dynamics and Change (JSDC)*, 1(7), Pages 295-308.
13. Noman Abu (2015) "The Effect of Bank Specific and Macroeconomic Determinants of Banking Profitability: A Study on Bangladesh. *International Journal of Business and Management*; Vol. 10, No. 6; 2015.
14. Rizvi, S. F. (2001) "Post-liberalisation Efficiency and Productivity of the Banking Sector in Pakistan". *The Pakistan Development Review* 40:4, 605-632.
15. Salley, D.C (1972) "Concentration in banking markets: regulatory numerology or useful merger guideline", *Monthly Review*, Federal Reserve Bank of Atlanta, (Nov. 1972) pp. 71-75.
16. Wasiuzzaman S, & Tarmizi H. (2010). "Profitability of Islamic banks in Malaysia: an empirical analysis". *Journal of Islamic Economics, Banking and Finance*, 6(4), 53-68.