



## Profitability Position of Commercial Banks in India - A Comparative Study

Kavita S. Vadrale\* and Dr. (Mrs.) V.P. Katti\*\*

\*Assistant Director/Assistant Professor,

Yashwantrao Chavan School of Rural Development, Shivaji University, Kolhapur (MS), India

\*\*Assistant Professor, Department of Economics, Shivaji University, Kolhapur (MS), India

(Corresponding author: Kavita S. Vadrale)

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**ABSTRACT:** The present study attempts to analyze the profitability performance of selected public and private sector banks during 2001 to 2015. Based on the core business activity of banks, study has considered seven ratios such as Return on Funds, Return on Advances, Return on Investments, Cost of Funds, Cost of Deposits, Cost of Borrowings and SPREAD for profitability analysis. Spread is the real indicator of profitability which was better in case of private sector banks. Therefore in the light of seven indicators especially spread study concludes that profitability position of private sector banks was better than public sector banks.

**Key Words:** Public Sector Banks, Private Sector Banks, Profitability Indicators, Ratio Analysis

### I. INTRODUCTION

The credit is an essential input for economic development because it enhances the growth of various sectors and such an indispensable input is provided by banks in the economy. Therefore, the strong and efficient banking system is more important. Looking of the first phase of banking in India it was seen that the banks were working with commercial objective. Therefore, the basic objective of the nationalization of 14 commercial banks in 1969 was to initiate the commercial banks to transform class banking to mass banking and making the banks to work as agents of social and economic change in the economy. Branch expansion in less developed areas or unbanked areas, extend finance to priority sectors, concessional rate of finance etc. became a prime important factors for commercial banks. As a result of this, profit was given the backseat in the priority list of bankers. Indeed, economic performance or viability is essential for the survival of any business activity and the banking industry is not exception for that. To maintain sustained growth, sufficient profit is needed for banks. Good profit helps banks to meet current contingencies and strengthen their reserve position and to shoulder greater responsibilities.

In the era of economic and financial sector reforms, the approach towards commercial banks has again changed. The financial sector reforms have also emphasized the need for banks to bring back their commercial character without sacrificing the national objectives. In the article Pralhad Sabnani, (2004) stated that "Among the top 1000 banks in the world, 21 banks were from India. Out of which 17 are public sector, 2 new private sector banks, 1 old private sector banks and 1 from cooperative sector" [1]. The given statement clears that the place of Indian banks in the world in terms of profitability position was low compared to others.

A profitable bank can raise the internal generation funds, it manages the offsets losses and makes provision against bad debts, it can invest in technology and premises to earn better returns in future, helps to extend products with diversifying the business, it satisfies the shareholders expectations, and it pays better remuneration to its employees for enhancing employee morale. Profit is the principle enabling factor for growth and viability of banks [2]. To survive in the competition the Indian banks moved to their original motive i.e. commercialization without compromising the national priorities.

Profitability is the key indicator for evaluating the success of any business entity. Banking sector is also a service industry hence profitability is the major indication of measuring a business performance. Profit is one of the financial measures of the operation of a firm during a period. It is the difference between income earned and expenditure incurred. "Profitability is ascertained by the ratio of profits earned to the capital invested. Thus, while profit is an absolute figure, the profitability indicates a relative measures" [3].

The present research work is focused on how much banks are earning profit through their core banking activities (interest income and interest expended).

Return on funds and cost of funds are the two principal ratios of key banking activities like mobilizing the deposits and lending funds. Furthermore, the difference between return on funds and cost of funds shows the spread. At present, banks are also earning good amount of income through fee based income by adopting improved technology and providing better services i.e. known as non-interest income. The present study examines the profitability performance of banks based on core functioning of banks considering seven ratios. The parameters used in study to measure the profitability are given below;

- 1) Return on Funds (ROF) = (Return on Advances + Return on Investments) / (Investments + Advances)
- 2) Return on Advances (ROA) = Interest Earned on Advances / Advances
- 3) Return on Investments (ROI) = Interest Earned on Investment / Total Investment
- 4) Cost of Funds (COF) = (Interest paid on Deposits + Interest paid on Borrowings) / (Deposits + Borrowings)
- 5) Cost of Deposits (COD) = Interest paid on Deposits / Deposits
- 6) Cost of Borrowings (COB) = Interest paid on Borrowings / Borrowings
- 7) SPREAD = Return on Funds - Cost of Funds

The outcome is multiplied by 100 to get the value in percentage.

## II. REVIEW OF LITERATURE

Singh S.P, (1974) examined the 14 nationalised banks in terms of changes in their profitability between pre-nationalisation and the post-nationalisation periods.

Vergheese, S. (1983) examined whether the profit and profitability of Indian commercial banks has been declining in seventies and indentified the main factors affecting on profit performance of banks. Garg, S. C. (1989) stressed on rising costs and declining profitability of the Indian Commercial banks since 1970. Study recommended that, RBI in collaboration with bank should organize regular and systematic sample survey to estimate cost and profitability; branch level performance, standardizing and simplifying the systems and procedures for bank operations which lead to reduction of the cost of banking service and improves the profit. Jain, (1991) analyzes the factors responsible for profitability and productivity of banks in his article. Verma, H. L., & Malhotra, A. K. (1993) highlighted on profitability of commercial banks after bank nationalization for the period of eight years from 1980 to 1987. Study observed the high degree of correlation between deposits & net profits and advances & net profits. Satyanarayana, (1996) analyzed the profitability of banks using various ratios such as interest income on average advances, interest income on average investment, interest cost on average deposits, book value of share and earnings per share etc. Greuning & Bratanovic, (2003) used the various ratios for assessing profitability of banks such as interest received/average loans and advances, interest paid/average deposits, return on assets return on equity etc. Doonger Singh, K. (2011) compared the profitability of commercial banks during the seven years of study period from 2003-04 to 2009-10. Study finds that spread is very high in foreign and new private sector banks and low in case of public sector banks. Ranganathan, & Balasubramaniam (2011) focused on correlation between profit and advances, investment, deposits and other income. Nandy, D. (2011) attempted to indentify factors which are influence on profit and also examined whether these factors have any significant influence on profitability of banks. Study observed that an interest expense is the good predictor for net profit of all different bank groups. Mistry, (2012) undertook the profitability analysis based on ROA and interest income as an independent variable and operational efficiency, asset utilization and asset size as dependent variables. Alrabei, A. M. (2013) evaluates the profitability of SBI from India and Cairo Amman Bank (CAB) from Jordan, for the period of 2006-07 to 2010-11. To evaluate the profitability of banks seven ratios like gross profit ratio, net profit ratio, operating profit ratio, operating ratio, return on equity share holders fund, return on capital employed ratio, return of total assets ratio have been used. Gupta, R., & Sikarwar, N. S. (2013) explored the profitability of PNB and HDFC bank during the period of 11 years from 2000 to 2011. Mainly three techniques were uses for financial analysis i.e. arithmetic technique, accounting technique and statistical techniques. Saini, N. (2014) pointed out on productivity and profitability of public and private sector banks during 2008-09 to 2012-13. The study observed that profitability and productivity of both banks has been continuously increasing during study period. Profitability was better in private sector banks and productivity was good in public sector banks.

## III. METHODOLOGY OF THE STUDY

### A. Selection of Sample Banks

The purposive sampling method has been used for the selection of the banks. Top ten banks from net profit point of view were selected for the study of which five i.e. 20 percent of all public sector banks and five i.e. 20 percent of all private sector banks. While selecting the banks, researcher has considered net profit of last five years from 2007 to 2011 for public and private sector banks. Researcher has assigned the ranks for each bank. After having mean value of ranks further researcher has reviewed C.V. of banks. On the basis of mean value and C.V., again ranks were assigned to the banks and top five banks from public sector and top five banks from private sector were selected.

The selected banks under public sector (PSBs) are State Bank of India, Punjab National Bank, Canara Bank, Bank of Baroda and Bank of India. From private sector banks (PrSBs); ICICI Bank, HDFC Bank, Axis Bank, Jammu and Kashmir Bank and Federal Bank have been selected.

#### B. Data Collection

The study is mainly based on secondary data which is obtained from the annual reports of various banks. Mainly, data was collected through annual reports of respective banks for the period of 2001 to 2015. The collected data has been processed by employing suitable statistical tools like arithmetic mean, coefficient of variation, compound growth rate, correlation, regression and ratio analysis by using Ms-Excel. For the testing of hypothesis 't-test: two sample assuming unequal variances' both one tailed and two tailed have been used to assess the performance of public and private sector banks. The merit ranking is used for rating the banks based on their performance.

### IV. ANALYSIS OF DATA

#### A. Mean, Growth and Variance Analysis

The aggregate value of mean, growth and variance of various profitability ratios of selected banks shows the average growth and stability of profitability of banks during fifteen years of the study period.

**Table 1: Mean, Growth and Variance Analysis of Public & Private Sector Banks.** (Figures in Percent)

| Mean Analysis      |              |              |              |              |               |              |              |                    |              |              |             |              |               |              |             |
|--------------------|--------------|--------------|--------------|--------------|---------------|--------------|--------------|--------------------|--------------|--------------|-------------|--------------|---------------|--------------|-------------|
| →Ratios<br>↓ Banks | ROA          | ROI          | ROF          | COD          | COB           | COF          | Spread       | →Ratios<br>↓ Banks | ROA          | ROI          | ROF         | COD          | COB           | COF          | Spread      |
| SBI                | 8.19         | 7.72         | 8.12         | 5.51         | 3.01          | 5.31         | 2.81         | ICICI              | 8.47         | 6.05         | 7.59        | 5.13         | 1.53          | 3.98         | 3.61        |
| PNB                | 8.90         | 7.92         | 8.67         | 5.18         | 2.36          | 4.99         | 3.67         | HDFC               | 9.39         | 6.99         | 8.50        | 4.51         | 8.28          | 4.72         | 3.78        |
| CAN                | 8.83         | 7.97         | 8.59         | 5.79         | 18.85         | 5.70         | 2.88         | AXIS               | 8.56         | 6.96         | 7.93        | 5.12         | 2.24          | 4.79         | 3.14        |
| BOB                | 7.75         | 7.74         | 7.79         | 4.72         | 4.74          | 4.66         | 3.12         | J & K              | 9.69         | 7.26         | 8.80        | 5.41         | 5.73          | 5.41         | 3.39        |
| BOI                | 7.89         | 7.48         | 7.78         | 4.86         | 6.50          | 4.92         | 2.86         | FED                | 10.28        | 7.51         | 9.32        | 6.09         | 2.16          | 5.91         | 3.41        |
| <b>PSBs</b>        | <b>8.31</b>  | <b>7.77</b>  | <b>8.19</b>  | <b>5.21</b>  | <b>7.09</b>   | <b>5.12</b>  | <b>3.07</b>  | <b>PrSBs</b>       | <b>9.28</b>  | <b>6.95</b>  | <b>8.43</b> | <b>5.25</b>  | <b>3.99</b>   | <b>4.96</b>  | <b>3.46</b> |
| Growth Analysis    |              |              |              |              |               |              |              |                    |              |              |             |              |               |              |             |
| SBI                | 0.41         | -1.82        | -0.39        | -1.32        | -2.01         | -1.77        | 2.60         | ICICI              | 3.98         | 1.25         | 2.90        | 2.43         | 4.48          | 3.03         | 3.68        |
| PNB                | 0.56         | -3.58        | -0.70        | 0.32         | -9.31         | -0.32        | -1.14        | HDFC               | 2.52         | -1.02        | 1.75        | 1.40         | 2.10          | 1.50         | 2.30        |
| CAN                | 0.70         | -2.23        | -0.19        | 1.49         | -5.58         | 1.27         | -3.01        | AXIS               | 0.09         | -1.35        | -0.13       | -0.93        | -8.13         | -1.73        | 2.92        |
| BOB                | -1.54        | -2.59        | -1.93        | -1.92        | -13.08        | -2.29        | -1.29        | J & K              | 1.89         | -3.38        | 0.08        | 0.10         | -3.08         | 0.02         | 0.22        |
| BOI                | -0.55        | -1.22        | -0.75        | 0.10         | -8.55         | -0.51        | -1.12        | FED                | 0.35         | -2.54        | -0.34       | 0.02         | -6.96         | -0.32        | -0.28       |
| <b>PSBs</b>        | <b>-0.04</b> | <b>-2.29</b> | <b>-0.77</b> | <b>-0.22</b> | <b>-10.46</b> | <b>-0.68</b> | <b>-0.88</b> | <b>PrSBs</b>       | <b>1.31</b>  | <b>-1.63</b> | <b>0.55</b> | <b>0.49</b>  | <b>-2.22</b>  | <b>0.20</b>  | <b>1.26</b> |
| Variance Analysis  |              |              |              |              |               |              |              |                    |              |              |             |              |               |              |             |
| SBI                | 11.18        | 14.84        | 8.93         | 15.22        | 43.18         | 15.93        | 16.01        | ICICI              | 25.63        | 18.40        | 22.44       | 20.91        | 113.67        | 28.22        | 34.84       |
| PNB                | 10.55        | 20.32        | 9.55         | 16.77        | 119.96        | 17.11        | 9.32         | HDFC               | 18.87        | 11.42        | 13.38       | 19.99        | 175.10        | 19.44        | 15.58       |
| CAN                | 12.29        | 14.61        | 10.72        | 16.78        | 281.81        | 15.83        | 19.70        | AXIS               | 14.37        | 14.73        | 13.31       | 23.50        | 159.52        | 23.33        | 15.37       |
| BOB                | 13.64        | 17.53        | 13.30        | 17.42        | 82.63         | 18.53        | 11.82        | J & K              | 12.46        | 23.80        | 11.15       | 14.61        | 61.41         | 14.71        | 7.35        |
| BOI                | 10.11        | 13.23        | 9.75         | 14.82        | 60.47         | 15.20        | 7.74         | FED                | 11.86        | 20.28        | 11.88       | 18.34        | 90.40         | 18.11        | 8.10        |
| <b>PSBs</b>        | <b>10.60</b> | <b>14.95</b> | <b>9.81</b>  | <b>14.56</b> | <b>149.77</b> | <b>14.87</b> | <b>8.27</b>  | <b>PrSBs</b>       | <b>11.34</b> | <b>13.83</b> | <b>9.84</b> | <b>16.33</b> | <b>118.01</b> | <b>15.57</b> | <b>9.04</b> |

Source: Computed from Data Collected from Annual Reports of respective Banks – 2001 to 2015

Table 1 shows the aggregate mean value of public and private sector banks. Spread is the real indicator for measuring the profitability of banks. Slightly high mean value of spread was observed in private sector banks than public sector banks i.e. 3.46 percent and 3.07 percent respectively. The high value of spread in private sector banks is a result of high value of ROF and least value of COF. Return on advances was better in private sector banks and return on investment was attractive in public sector banks. Cost of deposits was same in both banks and cost of borrowings was higher in public sector banks. Higher COB in public sector banks was due to high COB of Canara Bank.

Looking the compound growth rate of profitability indicators of banks, it shows the positive growth in major indicators of private sector banks. Conversely, negative growth in all indicators was found in public sector banks. Positive growth in spread is a good indication of rising profitability and negative sign reflect the tendency of declining profitability.

The least value of coefficient of variation shows the more stability in ratio over the period and vice versa. In case of private sector banks, high value of C.V. was realized in ROA, ROF, COD, COF and Spread. The value C.V. was high in ROI and COB in public sector banks.

*B. Ranking of Banks based on Mean Value and Coefficient of Variation*

Ranks are assigned to various profitability indicators of selected public and private sector banks based on their mean values and coefficient of variations. The merit rating scores are given in such a way that higher value of ratio implies good performance in case of ROA, ROI, ROF and Spread. Rank '1' is assigned for the highest ratio of mean value. Further, for descending values scores viz. 2, 3, 4 and so on allotted to the respective banks. Thus, the bank with the highest value of ratio would get the lowest score, which implies the superior performance.

Higher value of ratio implies poor performance in case of COD, COB, COF and the value of C.V. Rank '1' is allotted to the lowest mean value ratio. Further, higher and higher value represents poor performance, scores 2, 3, 4 and so on allotted to the respective banks. Thus, the bank with the lowest value of ratio would get the least score, which implies the better performance.

**Table 2: Ranking of Public and Private Sector Banks based on Profitability Ratios.**

| Based on Mean |          |          |          |          |          |          |          |                      |                            |
|---------------|----------|----------|----------|----------|----------|----------|----------|----------------------|----------------------------|
| Ratios        | ROA      | ROI      | ROF      | COD      | COB      | COF      | Spread   | Total Score of Ranks | Ranks based on Total Score |
| SBI           | 3        | 4        | 3        | 4        | 2        | 4        | 5        | 25                   | 4                          |
| PNB           | 1        | 2        | 1        | 3        | 1        | 2        | 1        | 11                   | 1                          |
| CAN           | 2        | 1        | 2        | 5        | 5        | 5        | 3        | 23                   | 3                          |
| BOB           | 5        | 3        | 4        | 1        | 3        | 1        | 2        | 19                   | 2                          |
| BOI           | 4        | 5        | 5        | 2        | 4        | 3        | 4        | 27                   | 5                          |
| <b>PSBs</b>   | <b>2</b> | <b>1</b> | <b>2</b> | <b>1</b> | <b>1</b> | <b>2</b> | <b>2</b> | <b>11</b>            | <b>2</b>                   |
| ICICI         | 5        | 5        | 5        | 3        | 1        | 1        | 2        | 22                   | 4                          |
| HDFC          | 3        | 3        | 3        | 1        | 5        | 3        | 1        | 19                   | 2                          |
| AXIS          | 4        | 4        | 4        | 2        | 3        | 4        | 5        | 26                   | 5                          |
| J & K         | 2        | 2        | 2        | 4        | 4        | 2        | 4        | 20                   | 3                          |
| FED           | 1        | 1        | 1        | 5        | 2        | 5        | 3        | 18                   | 1                          |
| <b>PrSBs</b>  | <b>1</b> | <b>2</b> | <b>1</b> | <b>2</b> | <b>2</b> | <b>1</b> | <b>1</b> | <b>10</b>            | <b>1</b>                   |
| Based on C.V. |          |          |          |          |          |          |          |                      |                            |
| Ratios        | ROA      | ROI      | ROF      | COD      | COB      | COF      | Spread   | Total Score of Ranks | Ranks based on Total Score |
| SBI           | 3        | 3        | 1        | 2        | 1        | 3        | 4        | 17                   | 2                          |
| PNB           | 2        | 5        | 3        | 3        | 4        | 4        | 2        | 23                   | 3                          |
| CAN           | 4        | 2        | 4        | 4        | 5        | 2        | 5        | 26                   | 4                          |
| BOB           | 5        | 4        | 5        | 5        | 3        | 5        | 3        | 30                   | 5                          |
| BOI           | 1        | 1        | 2        | 1        | 2        | 1        | 1        | 9                    | 1                          |
| <b>PSBs</b>   | <b>1</b> | <b>2</b> | <b>1</b> | <b>1</b> | <b>2</b> | <b>1</b> | <b>1</b> | <b>9</b>             | <b>1</b>                   |
| ICICI         | 5        | 3        | 5        | 4        | 4        | 5        | 5        | 31                   | 5                          |
| HDFC          | 4        | 1        | 4        | 3        | 1        | 3        | 4        | 20                   | 3                          |
| AXIS          | 3        | 2        | 2        | 5        | 2        | 4        | 3        | 21                   | 4                          |
| J & K         | 2        | 5        | 1        | 1        | 3        | 1        | 1        | 14                   | 1                          |
| FED           | 1        | 4        | 3        | 2        | 5        | 2        | 2        | 19                   | 2                          |
| <b>PrSBs</b>  | <b>2</b> | <b>1</b> | <b>2</b> | <b>2</b> | <b>1</b> | <b>2</b> | <b>2</b> | <b>12</b>            | <b>2</b>                   |

Source: Calculation based on original table of respective ratios of public and private sector banks.

Table 2 evaluates the ranking of public and private sector banks based on profitability indicators. The lowest value of total score of ranks reflects highest performance. Therefore rank '1' is assigned to the lowest total score. Banks are assigned the ranks in this order.

**Based on Mean Value Ranking:** Private Sector Banks > Public Sector Banks

Public Sector Banks: 1<sup>st</sup> rank-PNB, 2<sup>nd</sup>-BOB, 3<sup>rd</sup>-Canara Bank, 4<sup>th</sup>-SBI and 5<sup>th</sup>-BOI.

Private Sector Banks: 1<sup>st</sup> rank-Federal Bank, 2<sup>nd</sup>-HDFC Bank, 3<sup>rd</sup>-J & K Bank, 4<sup>th</sup>-ICICI Bank and 5<sup>th</sup>-Axis Bank.

**Based on Coefficient of Variation Ranking:** Public Sector Banks > Private Sector Banks

Public Sector Banks: 1<sup>st</sup> Rank-BOI, 2<sup>nd</sup>-SBI, 3<sup>rd</sup>-PNB, 4<sup>th</sup>-Canara Bank and 5<sup>th</sup>-BOB.

Private Sector Banks: 1<sup>st</sup> Rank-J & K Bank, 2<sup>nd</sup>-Federal Bank, 3<sup>rd</sup>-HDFC Bank, 4<sup>th</sup>-Axis Bank and 5<sup>th</sup>-ICICI Bank.

*C. Regression and Correlation Analysis*

To identify the association between different variables of profitability indicators regression and correlation techniques have been used.

**Table 4: Regression Analysis of Public Sector Banks.**

| <i>Regression Statistics</i> |             |
|------------------------------|-------------|
| Multiple R                   | 0.929562083 |
| R Square                     | 0.864085667 |
| Adjusted R Square            | 0.809719933 |
| Standard Error               | 0.11068477  |
| Observations                 | 15          |

ANOVA

|            | <i>df</i> | <i>SS</i> | <i>MS</i>  | <i>F</i>    | <i>Significance F</i> |
|------------|-----------|-----------|------------|-------------|-----------------------|
| Regression | 4         | 0.7788741 | 0.19471853 | 15.89393933 | 0.00024676            |
| Residual   | 10        | 0.1225112 | 0.01225112 |             |                       |

| <i>Variable</i>      | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> |
|----------------------|---------------------|-----------------------|---------------|----------------|
| Intercept            | 0.9457              | 0.3762                | 2.5140        | 0.0307         |
| Return on Advances   | 0.5049              | 0.0966                | 5.2275        | 0.0004         |
| Return on Investment | 0.2332              | 0.0359                | 6.4906        | 0.0001         |
| Cost of Deposits     | -0.7449             | 0.1262                | -5.9015       | 0.0002         |
| Cost of Borrowings   | -0.0004             | 0.0034                | -0.1058       | 0.9178         |

Spread = 0.9457 + (0.5049 \* Return on Advances) + (0.2332 \* Return on Investment) - (0.7449 \* Cost of Deposits) - (0.0004 \* Cost of Borrowings)

**Table 5: Regression Analysis of Private Sector Banks.**

| <i>Regression Statistics</i> |          |
|------------------------------|----------|
| Multiple R                   | 0.930687 |
| R Square                     | 0.866178 |
| Adjusted R Square            | 0.81265  |
| Standard Error               | 0.140382 |
| Observations                 | 15       |

ANOVA

|            | <i>df</i> | <i>SS</i> | <i>MS</i> | <i>F</i>    | <i>Significance F</i> |
|------------|-----------|-----------|-----------|-------------|-----------------------|
| Regression | 4         | 1.275577  | 0.318894  | 16.18158769 | 0.000229              |
| Residual   | 10        | 0.197072  | 0.019707  |             |                       |
| Total      | 14        | 1.472649  |           |             |                       |

| <i>Variable</i>      | <i>Coefficients</i> | <i>Standard Error</i> | <i>t Stat</i> | <i>P-value</i> |
|----------------------|---------------------|-----------------------|---------------|----------------|
| Intercept            | 0.1813              | 0.5455                | 0.3323        | 0.7465         |
| Return on Advances   | 0.6113              | 0.0821                | 7.4429        | 0.0000         |
| Return on Investment | 0.2461              | 0.0650                | 3.7891        | 0.0035         |
| Cost of Deposits     | -0.7359             | 0.1284                | -5.7329       | 0.0002         |
| Cost of Borrowings   | -0.0594             | 0.0323                | -1.8399       | 0.0956         |

Spread = 0.1813 + (0.6113 \* Return on Advances) + (0.2461 \* Return on Investment) - (0.7359 \* Cost of Deposits) - (0.0594 \* Cost of Borrowings).

**Table 6: Correlation Matrix of Profitability Parameters.**

| <b>Public Sector Banks</b>  |            |            |            |            |               |
|-----------------------------|------------|------------|------------|------------|---------------|
| <i>Ratios</i>               | <i>ROA</i> | <i>ROI</i> | <i>COD</i> | <i>COB</i> | <i>SPREAD</i> |
| <i>ROA</i>                  | 1          | -          | -          | -          | -             |
| <i>ROI</i>                  | 0.36       | 1          | -          | -          | -             |
| <i>COD</i>                  | 0.93       | 0.51       | 1          | -          | -             |
| <i>COB</i>                  | -0.39      | 0.24       | -0.35      | 1          | -             |
| <i>SPREAD</i>               | 0.07       | 0.58       | -0.04      | 0.37       | 1             |
| <b>Private Sector Banks</b> |            |            |            |            |               |
| <i>Ratios</i>               | <i>ROA</i> | <i>ROI</i> | <i>COD</i> | <i>COB</i> | <i>SPREAD</i> |
| <i>ROA</i>                  | 1          | -          | -          | -          | -             |
| <i>ROI</i>                  | 0.21       | 1          | -          | -          | -             |
| <i>COD</i>                  | 0.82       | 0.62       | 1          | -          | -             |
| <i>COB</i>                  | 0.33       | 0.38       | 0.48       | 1          | -             |
| <i>SPREAD</i>               | 0.47       | -0.16      | 0.02       | -0.25      | 1             |

(Figures in the parenthesis denotes the values of Karl- Pearson's Correlation Coefficient ( $r_{XY} = \frac{Cov(X,Y)}{\sigma_X \sigma_Y}$ ))

From Table 4 and Table 5, we see that the p-value of COB is 0.9178 and 0.0956 respectively, which implies the cost of borrowings is not significant factor to determine the spread. Table 6 represents the positive association between ROI and spread in public sector banks. In case of private sector banks positive association between ROA and spread and negative association between ROI, COB to spread are found. It indicates ROI is significant factor of spread in public sector banks and ROA is a determinant factor of spread in private sector banks.

*D. Testing of Hypothesis*

**1. Null Hypothesis (H<sub>0</sub>):** There is no significant difference between profitability of selected public and private sector banks.

**Sub-Hypothesis:** There is no significant difference in ROF, ROA, ROI, COF, COD, COB and spread between selected public and private sector banks.

**2. Alternative Hypothesis (H<sub>1</sub>):** There is significant difference between profitability of selected public and private sector banks.

**Sub-Hypothesis:** There is significant difference in ROF, ROA, ROI, COF, COD, COB and spread between selected public and private sector banks.

That is, we have to test,

H<sub>0</sub>:  $\mu_1 = \mu_2$  against the following three alternatives

- a) H<sub>1</sub>:  $\mu_1 \neq \mu_2$  (two sided alternative). That is there is a significant difference between profitability of selected public and private sector banks.
- b) H<sub>1</sub>:  $\mu_1 > \mu_2$  (one sided alternative). That is profitability of selected public sector banks is better than private banks.
- c) H<sub>1</sub>:  $\mu_1 < \mu_2$  (one sided alternative). That is profitability of selected private sector banks is better than public banks.

Under H<sub>0</sub>, test statistic is given by

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{S_1^2}{n} + \frac{S_2^2}{n}}}$$

which follows t-distribution with (n-1) degrees of freedom.

We have used 5 %, level of significance ( $\alpha$ ).

Note that, for a test with one sided alternative, we take the decision based on the sign of calculated value of test statistic 't'. That is if it is positive, we conclude that profitability of selected public sector banks is better than private banks (we are using alternative hypothesis given in (b)). If it is negative, we conclude that profitability of selected private sector banks is better than public banks (we are using alternative hypothesis given in (c)).

**Table 3: t-Test: Two-Sample Assuming Unequal Variances.**

| Two Tailed |                                 |          |          |                       |                      |
|------------|---------------------------------|----------|----------|-----------------------|----------------------|
| Ratios     | 5 percent level of significance |          |          | Decision              | Performance of Banks |
|            | t-cal                           | t-tab    | p-value  |                       |                      |
| ROA        | -2.63256                        | 2.05183  | 0.013845 | Reject H <sub>0</sub> | PSBs ≠ PrSBs         |
| ROI        | 2.01406                         | 2.05183  | 0.054066 | Accept H <sub>0</sub> | PSBs = PrSBs         |
| ROF        | -0.77856                        | 2.048407 | 0.44277  | Accept H <sub>0</sub> | PSBs = PrSBs         |
| COD        | -0.12627                        | 2.048407 | 0.900421 | Accept H <sub>0</sub> | PSBs = PrSBs         |
| COB        | 1.08531                         | 2.141787 | 0.296116 | Accept H <sub>0</sub> | PSBs = PrSBs         |
| COF        | 0.53456                         | 2.048407 | 0.59717  | Accept H <sub>0</sub> | PSBs = PrSBs         |
| Spread     | -3.71630                        | 2.055529 | 0.000975 | Reject H <sub>0</sub> | PSBs ≠ PrSBs         |
| One Tailed |                                 |          |          |                       |                      |
| Ratios     | 5 percent level of significance |          |          | Decision              | PSBs & PrSBs         |
|            | t-cal                           | t-tab    | p-value  |                       |                      |
| ROA        | -2.63256                        | 1.703288 | 0.006922 | Reject H <sub>0</sub> | PrSBs > PSBs         |
| ROI        | 2.01406                         | 1.703288 | 0.027033 | Reject H <sub>0</sub> | PSBs > PrSBs         |
| ROF        | -0.77856                        | 1.701131 | 0.221385 | Accept H <sub>0</sub> | PSBs = PrSBs         |
| COD        | -0.12627                        | 1.701131 | 0.450211 | Accept H <sub>0</sub> | PSBs = PrSBs         |
| COB        | 1.08531                         | 1.176131 | 0.148058 | Accept H <sub>0</sub> | PSBs = PrSBs         |
| COF        | 0.53456                         | 1.701131 | 0.298585 | Accept H <sub>0</sub> | PSBs = PrSBs         |
| Spread     | -3.71630                        | 1.705618 | 0.000488 | Reject H <sub>0</sub> | PrSBs > PSBs         |

**Note :** 1) t-Test has been used assuming unequal variances of both banks with 5 percent level of significance.

2) If (≠) The performance of public and private sector is not same and if (=) The performance of public and private sector is same.

Table 3 represents the t-test result of the profitability indicators of public and private sector banks. The two tailed results of seven parameters of profitability analysis shows that with respect to five parameters the null hypothesis were accepted i.e. there is no significant difference between public and private sector banks. Moreover, the two sub null hypothesis based on ROA and Spread were rejected. In this case there is a difference between public and private sector banks.

When we look into the results of one tailed analysis; out of seven parameters of profitability analysis, four parameters are showing no significant difference between public and private sector banks i.e. ROF, COD, COB and COF. On the other hand, there is significant difference between public and private sector banks in case of ROA, ROI and Spread. To know whether the difference is high or low in public and private sector banks, one tailed test is used. Out of these three parameters, high ROA and Spread found in private sector banks and high ROI is in public sector banks.

It clearly indicates that there is no significant difference between public and private sector banks in most of the profitability indicators. It has been shown by the calculated value which is less than tabulated value. Therefore, it is failed to reject null hypothesis and hence we accept it at both the level of significance.

Even though the majority of hypothesis were accepted but we cannot say here the profitability of both public and private sector banks is same. As the profitability performance of banks ultimately depends upon spread. In case of spread the null hypothesis is rejected and hence we reject it at both level of significance. Moreover, the negative value of t-cal of spread indicated the private sector banks performance is better than public sector banks.

## V. CONCLUSION

The study leads to conclude that the profitability position of private sector banks was better than public sector banks. Even though the cost of funds was same for both banks, private sector banks have more spread because return on advances was satisfactory. It has resulted the slightly high return on funds in private sector banks. Public sector banks need to increase the spread by widening the gap between return on funds and cost of funds. Bank should augment return on funds through extending appropriate advance schemes, simplifying the advance procedure etc. At the same time they should also focus on reducing the cost of funds with controlling cost of deposits and cost of borrowings. Considering the ranking of banks, public sector banks are more stable and private sector banks are more profitable under study period. Thus, the overall performance of private sector banks is more satisfactory than public sector banks.

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