

Profitability and productivity analysis of Indian SCBs

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Abstract

Objectives: This study analyses the profitability and productivity of Indian SCBs in India. Banking industry forms a mechanism for industrial and agricultural growth as well as entails in the subsistence and welfare of the nation.

Methods/Statistical analysis: Simple random sampling without replacement method has been used to represent the universe. Yamane's basic formula for determination of sample size has been considered and the profitability and productivity performance of 32 commercial banks are evaluated out of fifty commercial banks. This study is based on secondary data obtained from RBI database for the period from 2007-08 to 2016-17 and performances are analyzed adopting descriptive statistics and one sample t- test.

Findings: Descriptive statistics on the basis of five profitability indicators and four productivity indicators show that some Indian public and private banks are attaining high efficiency of productivity and profitability and t-test results supporting the findings, whereas some public and private Indian banks are having a very high inefficiency level during the sample period and t-test results supporting the findings.

Application/Improvements: In order to raise profitability and productivity, low-profit making banks should spell turnover strategies, income-oriented and cost-oriented strategies at regular periodical interval. Better management information system, credit monitoring and cash management can result increasing profitability and productivity.

Keywords: Profitability, Productivity, Commercial banks, India, Descriptive statistics, t-test.

1. Introduction

Banking industry performs as a catalyst for industrial growth and agricultural growth as well as involves in the existence and welfare of the nation. The Indian banking sector was enumerated by inimitable development and the resurgence of cluster banking in the pre-liberalization era. Bank management forever oversees the success, good performance; high productivity and efficiency. In a comparable approach performance of any economy relies on the utility and organization of its financial structure. Indian economy is primarily planted on the pursuance of the financial system and thereupon the financial system of a nation establishes its economic growth indicator [1].

Due to efficient management of the private sector banks, Indian Commercial banks did well even during the global financial and European crisis. Previous research demonstrated that private banks are more productive than public sectors, particularly in the first decade of the new century [2]. The Indian bank has earned a lot of reputation through reviewing of efficiency of the financial sector [3]. Triumph of the Indian banking system in 2011-12 was prejudiced by decelerate in the domestic economy. All banks including commercial banks act as merchants in money for the acceleration in the economy. Improved efficiency in banking sector can enhance profitability and more protection in terms of performance increases productivity with less risk [4].

There is bundle of literature on productivity and profitability of commercial banks in India. Many studies are emphasized on one avenue e.g. correlation amidst public and private or public or private. There are not many studies, which observed the Indian SCBs by way of productivity and efficiency analysis along with the determination of efficient bank using efficiency estimator. The present study emphasizes on the Indian SCBs. The essential rationale of the study is to recognise the productivity and profitability status of Indian commercial banks.

2. Literature survey

Banking sector is a foremost drifter in the economic growth of a country and research is so important to develop its working outcomes. The prime theme and principle of few pertinent studies are given below:

In [5] observed the stimulus of profitability of Malaysian banks during 1986-1995 and revealed a significant positive association between efficient expenses management and profitability; but high interest ratio was negatively linked with the banks' profitability. In [6] noticed the consequences of financial liberalization on the accomplishment of Commercial banks in India using secondary data collected from RBI database for the period from 1992-2001 with the application of mean and panel regressions. The study focused on examining the behaviour and determinants of bank intermediation costs and profitability during the liberalization period. The outcome of the study recommended that ownership type had an important effect on some indicators of achievement and that the noticed acceleration in competition during financial liberalizations had been associated with poorer negotiating costs and affecting profitability of the Indian banks. In [7] analyzed the banking sector and its current trends as well as evaluated the operational efficiency in all five banking groups to observe the banks' profitability and productivity and also to compare the credit efficiency of banks to evaluate the best banking group regarding financial performance using secondary data from IBA bulletins for the period from 2002 to 2003 applying ratios, trends, correlation, T-test, F-test, Z-test, regression, Anova. They concluded that capital adequacy ratio has comparatively higher than RBI guideline in all the associate banks of SBI groups and the other selected banks. In [8] observed the distinction of financial features amongst the public, private and Foreign Banks seeing the variables like profitability, liquidity, risk and efficiency. Their study revealed during 2000-2005 that the public banks were attaining outstanding ROE (return on equity) and foreign banks were proven to be high performer in generating business and having better management practices. In [9] conducted a study on technical, pure technical and scale efficiencies in Indian public banks during 1992 to 2005. Using Logistic Regression Analysis, Slacks and Target Setting Analysis and Input oriented efficiency scores, the results of this study provide that the factors like market share, profitability and asset quality do not have any significant impact on the overall efficiency of public sector banks. In [10] observed the profitability position of Philippines banks from 1990 to 2005. They suggested that expense, size and credit risk preference behaviour were inversely related to banks' profitability, while capitalisation and non-interest income had an affirmative effect. In [11] observed the financial conduct of 7 private and public sector banks for the years 2009-2010 using operating performance ratios, financial ratios and efficiency ratios. They have established that Axis Bank took the first position, followed by ICICI Bank, BOI, PNB, SBI, IDBI and HDFC in that order. In [12] investigated the profitability and bank specific variables in 35 banks of Europe during 2009- 2013. The outcome revealed that deposits and loans ratio has clear effect on the banks' profitability. In [13] instrumented the impact on the profitability of the CDR of Indian public banks. ROA, ROE and NIM were adjudged as the important variables of the profitability of Indian bank. They also found that there is an inverse relation on the profitability of the CDR of the Public banks. Thus, the review of earlier investigations emphasizes that there are many studies which precisely reviewed the productivity and profitability of Indian banks. However, a descriptive assessment on profitability and productivity position of Indian Commercial banks is somewhat missing in the studied literature.

3. Objective

The key reason is to observe the conceiving association between productivity and profitability of Indian SCBs. More precisely, it explores to locate mostly upon the following issues:

1. To analyze the profitability position of the Indian Commercial banks;
2. To examine the productivity situation of the Indian Commercial banks.

4. Methodology

4.1. Data source and period of the study

The research is supported on secondary data accessed from the RBI database. Since the work is to inspect the productivity and profitability of Indian Commercial banks, however, it has also explored the financial ratios correlated with. The period of the research taken into account is for 10 years i.e., 2007-08 to 2016-17.

4.2. Sample design

Indian Commercial banks represented the population of the research. 50 SCBs are considered for the Simple Random Sampling without Replacement (SRSWOR) method. For sample selection, simple random sampling without replacement method has been used in this research study because this method provides equal opportunity for all banks in the study to be comprised in the sample and it reduces the survival of sampling biases. Because the population is finite (50), we have used [14] basic formula for determination of sample sizes, which is $n = N / 1 + N(e)^2$, Where, n = optimum sample size, N = population size and e = margin of error or sampling error. So, the acceptable sample size has come to 32. As the sample range is two-digit, therefore, we have considered two-digit random numbers for the SRSWOR procedure. In this way, the sampled banks are Allahabad Bank, BOB, BOI, Andhra Bank, Bank of Maharashtra, Canara Bank, CB of INDIA, Corporation Bank, Dena Bank, IDBI, Indian Bank, IOB, OBC, P&S Bank, PNB, CSB Ltd., CUB Ltd., Federal Bank, HDFC, ICICI Bank, IndusInd Bank Ltd., J&K Bank, Karnataka Bank, RBL Bank, SIB Ltd., TMB Ltd., The DBL, Yes Bank, SB of Bikaner and Jaipur, SBI, SB of Mysore and SB of Patiala.

4.3. Variables used

To observe the productivity and the profitability stand and the association of productivity with profitability of the selected Indian Commercial banks, this research preferred some relevant dependent and independent variables based on [15] as portrayed on the subsequent sub-sections. This study selects four productivity indicators as independent variables, such as BPE, PPE, SPE and DPE as these are most important variables for measuring the productivity position. We also select five variables for the study, such as NPMR, ROA, ROE, NPDR and NPS to assess the profitability situation.

4.4. Tools used

To examine the profitability stand and the conceiving association of productivity with the profitability of the Commercial banks, descriptive statistical methods (arithmetic mean, standard deviation, coefficient of variation) and one sample test are used.

4.5. Hypotheses taken

Based on the problem statement the dimensions of the study, the following hypotheses may be undertaken.

Hypothesis 1

Null: The profitability situation of the Commercial banks is not satisfying;

Alternative: The profitability situation of the Commercial banks is satisfying.

Hypothesis 2

Null: The productivity arena of the Commercial banks is not decent;

Alternative: The productivity arena of the Commercial banks is decent.

Hypothesis 3

Null: There is no association between profitability ratios among various Indian Commercial banks.

Alternative: There is an association between profitability ratios among various Indian Commercial banks.

Hypothesis 4

Null: There is no association between productivity ratios among various Indian Commercial banks.

Alternative: There is an association between productivity ratios among different commercial banks in India.

5. Profitability analysis

Profitability is the lifeline to any business as it is required to survive in the long run so is in the case of long-term sustainability of banks. It reflects effective participation of anyone over total yield. It reflects the competency of the bank employees in carrying out business and fetching profits. Profitability stand is evaluated using NPMR, ROA, ROE, NPDR and NPS. For examining the profitability position, grand industry average has been considered so that comparison can be made. Grand industry average is determined on the basis of all the Commercial banks under study. Five profitability ratios, i.e., NPMR, ROA, ROE, NPDR and NPS, have been considered and descriptive statistics of these five profitability indicators have been instrumented to evaluate the profitability stand of the selected Indian Commercial banks.

5.1. NPMR

NPMR is termed as the proportion of net profit to the revenue for a particular period.

$$\text{NPMR} = \frac{\text{Net Profit}}{\text{Revenue}} \times 100\%$$

Higher the value of this ratio better is the profitability and lower the value lower is the financial productivity of banks. The mean of NPMR is greater than the grand industry average (5.76) in the event of Allahabad Bank, BOB, Andhra Bank, Corporation Bank, Indian Bank, P&S Bank, PNB, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, J&K Bank, Karnataka Bank Ltd., RBL Bank Ltd., SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of Bikaner & Jaipur and SBI, which indicates that SCBs are demonstrating better performance in terms of financial productivity. One sample t-test is instrumented to observe that the null hypothesis of the banks is denied, which states that the profitability of these commercial banks is satisfactory. While, the mean of NPMR is lesser than the grand industry average (5.76) in the event of BOI, BOM, Canara Bank, CB of India, Dena Bank, IDBI, IOB, OBC, CSB Ltd., DBL, SB of Mysore and SB of Patiala, which states that these banks are demonstrating poor performance in terms of financial productivity. One sample t-test is instrumented to observe that the null hypothesis is established, which states that the profitability of these commercial banks is not satisfactory. CV is greater in the matter of NPMR than grand industry average (64.41) in the event of Allahabad Bank, BOB, BOI, BOM, Canara Bank, CB of INDIA, Corporation Bank, Dena Bank, IDBI, IOB, OBC, P&S Bank, PNB, CSB Ltd., J&K Bank, SB of Bikaner & Jaipur, SB of Mysore and SB of Patiala, which points out high variability and very less consistency. Whereas, CV is lower than grand industry average (64.41) in the matter of Andhra Bank, Indian Bank, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, Karnataka Bank Ltd., RBL Bank Ltd., SIB Ltd., TMB Ltd., DBL, Yes Bank Ltd. and SB of India, which states low variability and more consistency.

5.2. ROA

ROA is the proportion of net income to total assets. It determines the profits per currency units of assets. It is a parameter of how the assets have been utilised in an organization. $\text{ROA} = \text{Net income} / \text{Total assets}$. Higher the value of this ratio better is the profitability of banks and lower the value lower is the profitability of banks. The mean of ROA is greater than the grand industry average (1.01) in the event of BOB, Indian Bank, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, RBL Bank Ltd., TMB Ltd. and Yes Bank Ltd, which indicates that SCBs are demonstrating better performance in terms of financial productivity. One sample t-test is instrumented to observe that the null hypothesis is denied, which states that the profitability of these commercial banks is satisfactory. But the mean of ROA is lesser than the grand industry average (1.01) in the event of all the selected commercial banks under study except the above-mentioned banks, which indicates that these banks are demonstrating poor performance in terms of financial productivity. One sample t-test is instrumented to observe that the null hypothesis is established, which states that the profitability of these commercial banks is not up to standard. CV in the matter of ROA is greater than grand industry average (32.67) in the event of Allahabad Bank, BOB, Andhra Bank, BOI, BOM, Canara Bank, CB of India, Corporation Bank, Dena Bank, IDBI, Indian Bank, IOB, OBC, P&S Bank, PNB, CSB Ltd., IndusInd Bank, RBL, SB of Bikaner & Jaipur, SB of Mysore and SB of Patiala, which shows high variability and very less consistency. Whereas, CV is lower than grand industry average (32.67) in the event of CUB, Federal Bank, HDFC, ICICI Bank, Karnataka Bank Ltd., SIB Ltd., TMB Ltd., DBL, Yes Bank Ltd. and SBI, which states low variability and more consistency.

5.3. ROE

This ratio measures profits per unit of equity capital as per audited records. It is a pointer from the shareholder's perceptions regarding the profitability of a bank. This indicator attracts fresh capital from the market in the name of various deposits. ROE is derived with the help of the following formula:

$\text{ROE} = \text{Net Profit} / \text{Capital} + \text{Reserves} + \text{surplus}$. Higher the value of this ratio better is the profitability and lower value states lower financial productivity of bank. The mean is greater in the matter of ROE than the grand industry average (8.56) in the event of Andhra Bank, BOB, BOI, Canara Bank, Corporation Bank, Dena Bank, Indian Bank, P&S Bank, PNB, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, J&K Bank, Karnataka Bank Ltd., SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of Bikaner & Jaipur and SBI, which indicates that SCBs are demonstrating better performance in terms of financial productivity.

One sample t-test is instrumented to observe that the null hypothesis is denied, which states that the profitability of these commercial banks is satisfactory. But the mean of ROE is lower than the grand industry average (8.56) in the event of Allahabad Bank, BOM, CB of INDIA, IDBI, IOB, OBC, CSB Ltd., RBL, DBL, SB of Mysore and SB of Patiala, which indicates that these banks are demonstrating poor performance in terms of financial productivity. One sample t-test is instrumented to observe that the null hypothesis is established, which states that the profitability of these commercial banks is not up to standard. CV in the matter of ROE is greater than grand industry average (46.96) in the event of Allahabad Bank, BOI, Andhra Bank, BOM, Canara Bank, CB of India, Corporation Bank, Dena Bank, IDBI, IOB, OBC, P&S Bank, PNB, CSB Ltd., J&K Bank, SB of Bikaner & Jaipur, SB of Mysore and SB of Patiala, which states high variability and very less consistency. Whereas, the CV is lower than grand industry average (46.96) in the event of BOB, Indian Bank, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, Karnataka Bank Ltd., RBL, SIB Ltd., TMB Ltd., DBL, Yes Bank Ltd. and SBI, which means low variability and more consistency.

5.4. NPD

This ratio is obtained as the proportion of net profit to the total deposits for a certain period.

$$\text{NPD} = \frac{\text{Net Profit}}{\text{Total Deposits}} \times 100\%$$

Higher the value better is the profitability and lower value shows lower productivity of banks. The mean of NPD is greater than the grand industry average (0.69) in the event of Andhra Bank, BOB, Corporation Bank, Indian Bank, P&S Bank, PNB, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, J&K Bank, Karnataka Bank Ltd., RBL, SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of Bikaner & Jaipur and SBI, which indicates that SCBs are demonstrating better performance in terms of financial productivity. One sample t-test is instrumented to observe that the null hypothesis is denied, which shows that the profitability of these commercial banks is satisfactory. But the mean of NPD is lesser than the grand industry average (0.69) in the event of Allahabad Bank, BOI, BOM, Canara Bank, CB of INDIA, Dena Bank, IDBI, CSB Ltd., DBL, SB of Mysore and SB of Patiala, which indicates that these banks are demonstrating poor performance in terms of profitability. One sample t-test is instrumented to observe that the null hypothesis is established, which states that the profitability of these commercial banks is not up to standard. CV in the matter of NPD is greater than grand industry average (68.12) in the event of Allahabad Bank, BOB, BOI, BOM, Canara Bank, CB of INDIA, Corporation Bank, Dena Bank, IDBI, IOB, OBC, PNB, CSB Ltd., J&K Bank, SB of Bikaner & Jaipur, SB of Mysore and SB of Patiala, which shows high variability and very less consistency. Whereas, CV is lower than grand industry average (68.12) in the matter of Andhra Bank, Indian Bank, P&S Bank, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, Karnataka Bank Ltd., RBL, SIB Ltd., TMB Ltd., DBL, Yes Bank Ltd. and SBI, which means low variability and more consistency.

5.5. NPS

Thespread is the difference between interest earned on loans, securities, other interest-earning assets and the interest paid on deposits, other interest-bearing liabilities.

Net Profit to Spread Ratio is determined as the proportion of net profit to the net interest rate spread for a particular period.

$$\text{NPS} = \frac{\text{Net Profit}}{\text{Net Spread}} \times 100\%$$

Higher the value better is the profitability of banks and lower the value lower is the profitability of banks. The mean of NPS is greater than the grand industry average (15.18) in the matter of Allahabad Bank, BOB, Andhra Bank, BOI, Corporation Bank, Dena Bank, IDBI, Indian Bank, OBC, P&S Bank, PNB, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, J&K Bank, Karnataka Bank Ltd., RBL, SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of Bikaner & Jaipur and SBI, which indicates that SCBs are demonstrating better performance in terms of financial productivity.

One sample t-test is instrumented to observe that the null hypothesis is denied, which states that the profitability of these commercial banks is satisfactory. But the mean of NPS is lower than the grand industry average (15.18) in the event of BOM, Canara Bank, CB of INDIA, IOB, CSB Ltd., DBL, SB of Mysore and SB of Patiala, which indicates that these banks are demonstrating poor performance in terms of financial productivity. One sample t-test is instrumented to observe that the null hypothesis is established, which shows that the profitability of these commercial banks is not up to standard.

Coefficient of variation in the matter of NPS is greater than grand industry average (45.26) in the event of Allahabad Bank, BOB, Andhra Bank, BOI, BOM, Canara Bank, CB of India, Corporation Bank, Dena Bank, IDBI, IOB, OBC, P&S Bank, PNB, CSB Ltd., J&K Bank, SB of Bikaner & Jaipur, SB of Mysore and SB of Patiala, which shows high variability and very less consistency. Whereas, CV is lower than grand industry average (45.26) in the matter of Indian Bank, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, Karnataka Bank Ltd., RBL, SIB Ltd., TMB Ltd., DBL, Yes Bank Ltd and SBI, which states low variability and more consistency.

6. Productivity Analysis

Employee productivity is the marker of long-term expediency of commercial banks. It denotes contribution of an individual over total output. This parameter entitles how active the bank employees are in making business and profits. Per employee productivity entails the ability to work of the bank employees. This ratio emphasizes in judging the over or under staffing of a bank group. Efficiency is a pointer of performance and frontier analysis techniques are acknowledged as an important method for performance evaluator in the banking industry. For examining the productivity position, grand industry average has been considered so that comparison can be made. Grand industry average has been calculated on the basis of all the selected Indian SCBs under study. Four productivity ratios, i.e., BPE, PPE, SPE, and DPE have been computed in the study.

6.1. BPE

The BPE is considered as an improved variable of productivity because total business constitutes deposits, advances and investment. $\text{Business per employee} = \text{volume of business} / \text{No. of employees}$. Higher the value of the above better is the productivity and lower the value lower is productivity. The mean is greater in the matter of BPE than the grand industry average (94.68) in the event of Allahabad Bank, BOB, Andhra Bank, BOI, BOM, Canara Bank, Corporation Bank, Dena Bank, IDBI, Indian Bank, IOB, OBC, P&S Bank, PNB, Federal Bank Ltd, SIB Ltd, TMB Ltd, Yes Bank Ltd, SBI and SB of Patiala, which indicates that SCBs are demonstrating better performance in terms of employee productivity. One sample t-test is instrumented to observe that the null hypothesis is denied, which states that the productivity of these commercial banks is satisfactory.

But the mean is lesser in the matter of BPE than the grand industry average (94.68) in the event of CB of INDIA, CSB Ltd, CUB, HDFC, ICICI Bank Ltd, IndusInd Bank Ltd, J&K Bank, Karnataka Bank Ltd, RBL, DBL, SB of Bikaner & Jaipur, SB of Bikaner & Jaipur and SB of Mysore, which indicates that these banks are demonstrating poor performance in terms of employee productivity. One sample t-test is instrumented to observe that the null hypothesis is established, which states that the productivity of these commercial banks is not up to standard. CV in the matter of BPE is greater than grand industry average (38.78) in the event of Allahabad Bank, BOM, RBL and SBI, which states high variability and very less consistency in relation to deposits, advances and investment. Whereas, CV is lower than grand industry average (38.78) in the matter of all the selected commercial banks under study except Allahabad Bank, BOM, RBL and SBI, which depicts low variability and more consistency.

6.2. PPE

Profit is the balance of profit according to profit and loss account. This ratio means net profit earned per employee. $\text{PPE} = \text{net profit} / \text{No. of employees}$. Higher the value of the ratio better is the productivity and lower the value of this ratio lower is the productivity per employee of a bank. The mean is greater in the matter of the PPE than the grand industry average (0.35) in the event of Andhra Bank, BOB, Canara Bank, Corporation Bank, Indian Bank, OBC, P&S Bank, PNB, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, J&K Bank, Karnataka Bank Ltd., RBL, SIB Ltd., TMB Ltd. and SBI, which indicates that SCBs are indicating better performance in terms of employee productivity. One sample t-test is instrumented to observe that the null hypothesis is denied, which states that the productivity of these commercial banks is satisfactory.

The mean of the PPE is lesser than the grand industry average (0.35) in the event of Allahabad Bank, BOI, BOM, CB of India, Dena Bank, IDBI, IOB, CSB Ltd., DBL, Yes Bank Ltd., SB of Bikaner & Jaipur, SB of Mysore, SB of Patiala, which indicates that these banks are demonstrating poor performance in terms of employee productivity. One sample t-test is instrumented to observe that the null hypothesis is established, which states that the productivity of these commercial banks is not up to standard. CV in the matter of PPE is higher than grand industry average (22.86) in the event of Andhra Bank, BOB, BOI, BOM, Canara Bank, CB of INDIA, Corporation Bank, Dena Bank, IDBI, Indian Bank, IOB, PNB, CUB, Federal Bank, IndusInd Bank, J&K Bank, RBL, SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of Bikaner & Jaipur, SB of Mysore, SB of Patiala, which shows high variability and very less consistency. Whereas, CV is lower than grand industry average (22.86) in the matter of Allahabad Bank, OBC, P&S Bank, CSB Ltd., HDFC, ICICI Bank, Karnataka Bank Ltd., DBL and SBI, which states more consistency and low variability in relation to deposits, advances and investment.

6.3. SPE

Spread is the gap between interest income and interest expenditure of a bank.

$SPE = \text{spread} / \text{No. of employee.}$

More the value of this better is the productivity and lower the value lower is the productivity. The mean is greater in the matter of the SPE than the grand industry average (160.24) in the event of Allahabad Bank, BOB, Andhra Bank, BOI, BOM, Canara Bank, Corporation Bank, Dena Bank, IDBI, Indian Bank, OBC, P&S Bank, PNB, Federal Bank, ICICI Bank, IndusInd Bank, J&K Bank, SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of Bikaner & Jaipur and SBI, which indicates that SCBs are indicating better performance in terms of employee productivity. One sample t-test is instrumented to observe that the null hypothesis is denied, which states that the productivity of these commercial banks is satisfactory. The mean of the SPE is lesser than the grand industry average (160.24) in the event of CB of India, IOB, CSB Ltd., CUB, HDFC, Karnataka Bank Ltd., RBL, DBL, SB of Mysore and SB of Patiala, which indicates that these banks are demonstrating poor performance in terms of employee productivity. One sample t-test is instrumented to observe that the null hypothesis is established, which shows that the productivity of these commercial banks is not up to standard. CV in the matter of SPE is greater than grand industry average (39.86) in the event of BOM, which shows high variability and very less consistency. Whereas, CV is lesser than grand industry average (39.86) in the matter of all the SCBs under study except BOM, which states more consistency and low variability in relation to deposits, advances and investment.

6.4. DPE

DPE is the deposits raise per employee in a bank. This ratio indicates the deposit-collection capacity of an employee. $DPE = \text{Total deposits} / \text{No. of employees.}$ Greater the value of this ratio higher is the productivity and lower the value lower is the productivity per employee. The mean of the DPE is greater than the grand industry average (54.33) in the event of Allahabad Bank, BOB, Andhra Bank, BOI, BOM, Canara Bank, CB of INDIA, Corporation Bank, Dena Bank, IDBI, Indian Bank, IOB, OBC, P&S Bank, PNB, Federal Bank, ICICI Bank, J&K Bank, SIB Ltd., TMB Ltd., Yes Bank Ltd., SBI and SB of Patiala, which indicates that SCBs are indicating better performance in terms of employee productivity.

Table 1. Analysis of profitability and productivity

Allahabad Bank									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	6.70	0.65	7.19	0.67	24.88	97.96	-2.86	188.79	66.56
S.D.	5.92	0.56	18.68	0.58	22.30	54.68	10.48	61.20	18.04
C.V. (%)	88.32	85.53	259.64	86.64	89.60	55.82	-366.6	32.42	27.10
ANDHRA BANK									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	8.08	0.82	14.00	0.84	27.91	123.76	0.52	201.56	67.18
S.D.	5.05	0.50	8.60	0.50	16.27	37.86	0.31	60.49	18.27
C.V. (%)	62.53	61.36	61.41	59.48	58.29	30.59	59.31	30.01	27.19
BOB									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	9.18	13.88	15.04	0.76	29.95	141.72	0.84	214.74	90.25
S.D.	8.24	41.07	6.80	0.69	28.20	42.91	0.88	58.48	29.75

C.V. (%)	89.85	295.74	45.25	91.35	94.15	30.28	105.21	27.23	32.96
BOI									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	5.74	0.71	9.51	0.54	20.20	144.90	0.30	198.38	82.92
S.D.	8.52	0.48	13.35	0.79	31.25	50.21	0.61	52.92	28.79
C.V. (%)	148.38	68.01	140.42	144.86	154.65	34.65	201.64	26.67	34.72
BOM									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	3.96	0.37	8.13	0.39	13.37	115.99	0.15	186.04	66.36
S.D.	5.57	0.49	10.49	0.53	22.18	48.50	0.44	77.85	26.63
C.V. (%)	140.48	130.06	129.00	137.12	165.84	41.81	289.28	41.84	40.13
CANARA BANK									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	7.49	0.71	11.87	0.73	31.05	121.27	0.38	158.02	71.06
S.D.	6.12	0.56	9.559	0.58	24.58	31.28	0.51	38.48	20.62
C.V. (%)	81.62	79.04	80.53	79.00	79.16	25.79	135.42	24.35	29.02
CB OF INDIA									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	1.67	0.15	3.44	0.13	7.65	88.82	0.03	136.28	55.95
S.D.	5.86	0.53	10.08	0.55	25.11	26.83	0.34	50.73	14.83
C.V. (%)	349.27	355.14	292.88	404.71	328.21	30.20	1165.8	37.22	26.51
CORPORATION BANK									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	7.85	0.75	12.88	0.75	33.28	160.48	0.61	199.04	92.55
S.D.	5.95	0.55	9.25	0.55	23.95	41.16	0.45	46.14	25.93
C.V. (%)	75.89	74.07	71.82	73.88	71.96	25.65	74.13	23.18	28.02
DENA BANK									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	5.53	0.44	10.73	0.50	19.42	116.18	0.32	161.92	68.99
S.D.	7.69	0.78	13.51	0.72	31.36	34.43	0.44	45.43	19.96
C.V. (%)	138.97	177.47	125.90	143.92	161.47	29.64	138.05	28.05	28.93
IDBI									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	2.12	0.23	3.70	0.25	22.51	235	0.25	272.03	135.11
S.D.	8.71	0.79	11.54	1.036	58.12	24.97	1.45	103.51	20.84
C.V. (%)	409.66	337.82	311.44	398.98	258.17	10.63	565.34	38.05	15.43
INDIAN BANK									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	11.33	1.10	14.20	1.17	35.53	111.26	0.67	199.16	64.96
S.D.	4.98	0.51	6.51	0.52	11.93	39.00	0.18	50.70	22.27
C.V. (%)	43.95	46.35	45.83	44.32	33.59	35.06	27.07	25.45	34.28
IOB									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	2.23	0.34	4.53	0.21	5.75	106.13	0.03	155.88	60.16
S.D.	9.23	0.66	15.98	1.00	38.49	29.43	0.58	33.16	16.28
C.V. (%)	412.37	193.68	352.24	463.23	669.38	27.73	2153.4	21.27	27.06
OBC									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	5.19	0.56	7.63	0.52	20.86	148.29	0.45	215.51	85.70
S.D.	4.91	0.48	7.07	0.47	19.78	28.48	0.41	52.3	16.22
C.V. (%)	94.74	85.56	92.73	90.71	94.82	19.20	91.10	24.26	18.93
P&S BANK									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	7.01	0.67	11.65	0.69	26.92	122.28	0.41	174.50	73.99
S.D.	4.74	0.46	7.70	0.46	14.80	40.51	0.37	46.18	24.34
C.V. (%)	67.55	68.91	66.09	66.62	54.97	33.13	0.36	26.46	32.89
PNB									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	8.66	0.76	13.41	0.90	25.63	106.60	0.47	201.96	61.98
S.D.	7.06	0.65	10.85	0.71	21.72	31.40	0.43	57.12	19.79
C.V. (%)	81.45	86.18	80.93	79.13	84.76	29.46	91.35	28.28	31.93

CSB LTD.									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	0.78	0.07	1.74	0.07	1.54	62.53	-0.01	97.23	38.56
S.D.	4.54	0.44	8.56	0.48	19.94	19.68	0.20	30.77	12.65
C.V. (%)	582.11	567.14	489.85	653.53	1293.32	31.48	-4078.4	31.64	32.80
CUB LIMITED									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	13.73	1.55	19.93	1.60	49.69	83.74	0.78	159.81	48.23
S.D.	1.04	0.08	3.34	0.07	4.36	21.37	20	52.58	11.23
C.V. (%)	7.63	5.58	16.77	4.72	8.78	25.51	26.35	32.90	23.28
FEDERAL BANK LIMITED									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	11.18	1.2	11.82	1.29	35.52	99.91	0.71	201.50	56.40
S.D.	2.39	0.28	2.54	0.31	7.62	23.19	0.17	36.63	13.56
C.V. (%)	21.45	23.69	21.53	24.50	21.45	23.21	23.56	18.18	24.05
HDFC									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	15.66	1.71	18.38	2.02	39.56	11.69	7.47	148.62	3.84
S.D.	2.16	0.27	1.57	0.29	6.00	1.39	0.39	11.72	0.10
C.V. (%)	13.78	15.85	8.58	14.76	15.17	11.89	5.21	7.89	2.63
ICICI BANK									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	14.48	1.42	11.16	2.34	53.80	86.16	1.21	245.15	57.05
S.D.	3.02	0.29	2.31	0.50	6.617125	15.23	0.22	47.51	11.42
C.V. (%)	20.89	20.77	20.72	21.41	12.29	17.68	18.86	19.38	20.02
INDUSIND BANK LTD.									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	11.73	1.42	15.286	1.73	43.24	83.26	0.78	174.96	47.72
S.D.	4.12	0.56	4.03	0.73	8.744	10.16	0.28	40.97	8.14
C.V. (%)	35.11	39.52	26.4	42.06	20.22	12.20	35.82	23.42	17.07
J&K BANK LTD.									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	9.4	0.9	12.6	0.9	27.5	92.90	0.50	210.90	59.70
S.D.	11.9	1.1	15.0	1.2	34.3	25.60	0.80	66.40	13.10
C.V. (%)	127.20	124.26	118.67	126.71	125.02	27.54	156.17	31.49	21.95
KARNATAKA BANK LTD.									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	8.6	0.9	12.5	0.9	40.4	87.90	0.50	127.90	53.30
S.D.	2.23	0.24	3.36	0.24	11.45	18.98	0.09	40.15	11.01
C.V. (%)	26.02	27.80	26.89	26.66	28.38	21.59	20.18	31.39	20.64
RBL									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	10.77	1.10	7.43	1.26	33.21	66.86	0.48	142.39	39.31
S.D.	4.23	0.39	3.18	0.46	8.94	30.96	0.24	52.12	17.88
C.V. (%)	39.28	35.62	42.91	36.49	26.92	46.30	50.84	36.63	45.48
SIB LTD.									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	9.02	0.91	14.83	0.91	33.84	103.06	0.53	166.96	61.63
S.D.	2.41	0.25	4.30	0.22	7.86	28.76	0.15	47.65	16.94
C.V. (%)	26.74	27.48	29.01	24.74	23.24	27.91	29.24	28.54	27.55
TMB LTD.									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	13.11	1.47	16.8	1.57	43.12	98.66	0.89	209.94	57.27
S.D.	2.57	0.32	3.92	0.32	7.56	22.80	0.24	53.64	12.96
C.V. (%)	19.60	22.17	23.26	20.91	17.54	23.11	27.51	25.55	22.63
DBL									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	-3.27	-0.32	-6.63	-0.42	-17.91	66.71	-0.26	99.97	40.61
S.D.	11.01	1.09	20.78	1.19	49.17	18.82	0.56	37.73	12.20
C.V. (%)	-336.51	-333.90	-313.47	-281.55	-274.54	28.21	-220.17	37.74	30.04
YES BANK LTD.									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE

Mean	14.38	1.65	21.38	1.96	58.83	156.10	1.79	271.03	80.84
S.D.	1.50	0.10	2.24	0.284	1.64	43.00	0.51	69.86	20.42
C.V. (%)	10.49	6.38	10.49	14.45	2.79	27.54	28.24	25.78	25.26
SB OF BIKANER & JAIPUR									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	6.75	0.69	13.69	0.75	22.71	87.51	0.34	170.86	52.30
S.D.	6.96	0.67	12.52	0.72	25.04	29.25	0.52	58.78	15.76
C.V. (%)	103.16	97.12	91.39	96.70	110.25	33.43	152.61	34.40	30.14
SBI									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	8.75	0.76	12.66	0.95	28.64	94.27	0.49	190.17	56.55
S.D.	2.52	0.21	3.91	0.27	9.42	38.59	0.08	72.57	22.02
C.V. (%)	28.87	28.50	30.89	28.57	32.89	40.94	17.42	38.16	38.93
SB OF MYSORE									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	4.32	0.45	7.46	0.49	13.82	90.36	0.14	154.52	51.20
S.D.	10.88	0.99	19.21	1.10	43.57	26.04	0.75	44.58	15.65
C.V. (%)	251.34	221.32	257.2226	222.74	315.27	28.82	548.55	28.85	30.56
SB OF PATIALA									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	1.63	0.20	5.45	0.17	5.47	105.22	0.02	149.96	58.07
S.D.	12.90	1.17	19.68	1.42	62.32	16.77	0.96	36.30	7.81
C.V. (%)	787.12	568.70	361.05	818.89	1139.13	15.94	5986.76	24.21	13.45
INDUSTRY AVERAGE									
Parameter	NPMR	ROA	ROE	NPD	NPS	BPE	PPE	SPE	DPE
Mean	5.76	1.01	8.56	0.69	15.18	94.68	0.35	160.24	54.33
S.D.	3.71	0.33	4.02	0.47	6.87	36.72	0.08	63.87	22.69
C.V. (%)	64.41	32.67	46.96	68.12	45.26	38.78	22.86	39.86	41.76

One sample t-test is instrumented to observe that the null hypothesis is denied, which shows that the productivity of these commercial banks is satisfactory. The mean of the DPE is lesser than the grand industry average (54.33) in the matter of CSB Ltd., CUB, HDFC, IndusInd Bank Ltd., Karnataka Bank Ltd., RBL, DBL, SB of Bikaner & Jaipur and SB of Mysore, which indicates that these banks are demonstrating poor performance in terms of employee productivity. One sample t-test is instrumented to observe that the null hypothesis is established, which shows that the productivity of these commercial banks is not up to standard. CV in the matter of DPE is greater than grand industry average (41.76) in the event of RBL Bank Ltd., which shows high variability and very less consistency. Whereas, CV is lower than grand industry average (41.76) in the matter of all the selected commercial banks under study except RBL Bank Ltd., which states more consistency and low variability in relation to deposits, advances and investment as shown in the following Table 1.

7. Conclusions

The study findings are portrayed hereunder:

Profitability:

1. NPMR shows that Allahabad Bank, BOI, Andhra Bank, Corporation Bank, Indian Bank, P&S Bank, PNB, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, J&K Bank, Karnataka Bank Ltd., RBL, SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of Bikaner & Jaipur and SBI are showing better results and the rest are showing poor results in terms of profitability.
2. ROA demonstrates that BOB, Indian Bank, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, RBL, TMB Ltd. and Yes Bank Ltd are better results and the rest are showing poor performances in terms of profitability.
3. ROE indicates that Andhra Bank, BOB, BOI, Canara Bank, Corporation Bank, Dena Bank, Indian Bank, P&S Bank, PNB, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, J&K Bank, Karnataka Bank Ltd., SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of Bikaner & Jaipur and SBI are showing better performances and the rest are showing poor results in terms of profitability.
4. NPD indicates that Andhra Bank, BOB, Corporation Bank, Indian Bank, P&S Bank, PNB, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, J&K Bank, Karnataka Bank Ltd., RBL, SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of

Bikaner & Jaipur and SBI are showing better performances and the rest are showing poor results in terms of profitability.

5. NPS indicates that Allahabad Bank, BOB, Andhra Bank, BOI, Corporation Bank, Dena Bank, IDBI, Indian Bank, OBC, P&S Bank, PNB, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, J&K Bank, Karnataka Bank Ltd., RBL, SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of Bikaner & Jaipur and SBI are showing better results and the rest are showing poor performances in terms of profitability.

Productivity:

1. BPE indicates that Allahabad Bank, BOB, Andhra Bank, BOI, BOM, Canara Bank, Corporation Bank, Dena Bank, IDBI, Indian Bank, IOB, OBC, P&S Bank, PNB, Federal Bank Ltd, SIB Ltd, TMB Ltd, Yes Bank Ltd, SBI and SB of Patiala are demonstrating better performance in the area of productivity and the remaining banks are demonstrating poor performance.

2. PPE indicates that Andhra Bank, BOB, Canara Bank, Corporation Bank, Indian Bank, OBC, P&S Bank, PNB, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, J&K Bank, Karnataka Bank Ltd., RBL, SIB Ltd., TMB Ltd. and SBI are indicating better performance in the field of productivity and the remaining banks are demonstrating poor performance.

3. SPE shows that Allahabad Bank, BOB, Andhra Bank, BOI, BOM, Canara Bank, Corporation Bank, Dena Bank, IDBI, Indian Bank, OBC, P&S Bank, PNB, Federal Bank, ICICI Bank, IndusInd Bank, J&K Bank, SIB Ltd., TMB Ltd., Yes Bank Ltd., SB of Bikaner & Jaipur and SBI are indicating better performance in the area of employee productivity and the remaining banks are demonstrating poor performance.

4. DPE shows that Allahabad Bank, BOB, Andhra Bank, BOI, BOM, Canara Bank, CB of INDIA, Corporation Bank, Dena Bank, IDBI, Indian Bank, IOB, OBC, P&S Bank, PNB, Federal Bank, ICICI Bank, J&K Bank, SIB Ltd., TMB Ltd., Yes Bank Ltd., SBI and SB of Patiala are indicating better performance in the field of employee productivity and the remaining banks are demonstrating poor performance.

Test of Hypotheses:

1. Null hypothesis 1 has been proven denied in case of the selected banks in the event of Indian Bank, CUB, Federal Bank, HDFC, ICICI Bank, IndusInd Bank, RBL, TMB Ltd. and Yes Bank Ltd. This affirms the profitability position is satisfactory. Null hypotheses 1 has been established in case of the selected banks in the event of the remaining banks in India. This approves that profitability position is not satisfactory.

2. Null hypothesis 2 has been proven denied in case of the selected banks in the event of Allahabad Bank, BOI, BOM, CB of INDIA, Dena Bank, IDBI, IOB, CSB Ltd., DBL, Yes Bank Ltd., SB of Bikaner & Jaipur, SB of Mysore, SB of Patiala. This approves that profitability position is satisfactory. Null hypothesis 2 has been established in case of the selected banks in the event of the remaining banks in India. It affirms the profitability position is not satisfactory.

3. Results of One way ANOVA test demonstrate that null hypothesis is proven rejected and clinched that there is an association between profitability ratios among various Indian Commercial banks.

4. One way ANOVA test results demonstrate that null hypothesis is proven rejected and clinched that there is an association between productivity and efficiency ratios among various Indian Commercial banks.

Specific Suggestions:

1. In order to raise profitability and productivity, low-profit making banks should spell turnover strategies, income-oriented and cost-oriented strategies at regular periodical interval. Better management information system, credit monitoring and cash management can result increasing profitability and productivity.

2. In order to raise profitability, low-profit making banks must improve their credit lending policies in an attempt to improve profitability and asset quality.

3. Commercial bank demonstrates low productivity; the reason may be high staffing. Staffs need to be managed according to the business and forecasting of human resource planning can be done accordingly.

Limitations of the Study

The work carries few limitations:

1. The work is planted on the financial ratio data of RBI database; for that reason it is depending on the whole constraints, which are natural in the full in published database.

2. This research work encircles a period of ten years from 2007-08 to 2016-17. This is a vital limitation of the research work.

4. This study considers Indian SCBs only. But we do not consider the foreign banks operating in India. The study could have been brightening if we contrast it.

5. The work deals with the sampled Indian Commercial banks as a whole. But we do not examine the efficiency and productivity of public and private sector banks in this study. This study could have been perked up if we contrast it.

6. This study considers nine productivity and efficiency indicators and five profitability indicators. Nevertheless, we do not judge all the relevant indicators in this study. This study could have been perked up if we consider all the productivity and profitability variables.

7. No growth and trend analysis is measured in this study; this is an essential limitation of this research work.

Concluding Remarks:

Some commercial banks are doing well in context to profitability and productivity, whereas, some banks are having a very high inefficiency levels during the sample period for the different indicators. So, it is reasonably obvious that efficient banks have wider scope to produce more and more output. In fact, efficient banks are having more high opportunity to fulfil corporate social responsibilities towards all stakeholders. In order to perk up the efficiency, inefficient banks should maintain their financial standards appropriately.

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