Research Paper
Impact Factor: 3.996
Peer Reviewed & Indexed Journal

IJMSRR
E- ISSN - 2349-6746
ISSN -2349-6738

OPERATING EFFICIENCY OF SELECTED PUBLIC SECTOR BANKS IN INDIA: USING DATA ENVELOPMENT ANALYSIS

T. Sasikumar* **Dr. K. Krishnamurthy****
**Assistant Professor, Department of Commerce, SRM University & Part –time Ph.D Scholar.*
***Assistant Professor & Research Guide, PG Department of Commerce, R.V. Government Arts College, Chengalpattu.*

Abstract
This paper investigates the efficiency level of Indian public sector banks during the period 2014-2015 by using Data Envelopment Analysis. Data Envelopment Analysis (DEA) is a very powerful service management and benchmarking technique originally developed by Chames, Cooper and Rhodes (1978). A total of 12 banks were evaluated by using DEA - Constant Return to scale (CRS) and Variable Return to Scale (VRS) models to analyze the relative efficiency of each bank based on its operating and intermediation levels. The findings reveal that most of banks are close to efficient but inefficient in their operating level, but 50% banks are efficient i.e. six banks are efficient on their operating level under VRS Model and 25% of sample banks were efficient under CRS model.

Key Words: DEA, Efficiency.

1. Introduction

The banking sector plays an important role in the country's economic development. Finance is at the life blood of all activities of society. Banking system occupies a vital place in a nation's economy and is indispensable in a modern society. The over whelming role of finance in the economic development of a country is well recognized and forms the core of the money market in economy. Over a decade's the commercial banks have played a vital role in giving direction to economic development process by catering the financial requirement of trade and industry in the country.

Banking industry faces the problem of disparate results in terms of efficiency. This problem is a cause the operation of banks. In particular, the last decade has witnessed continuous changes in regulation, technology and competition in the global financial services industry, and Indian banks are no exception. Rising cost-income ratios and declining profitability reflect increased competitive pressure. To assess the stability of the banking system, it is therefore crucial to benchmark the performance of banks operating in India. An efficient banking system contributes in an extensive way to higher economic growth in any country. Thus, studies of banking efficiency are very important for policy makers, industry leaders and many others who are reliant on the banking sector.

2. Objectives of the Study

1. To measure the operative efficiency of Public Sector Commercial banks in India.
2. To make few suggestion for inefficiency

3. Data and Methodology

The data of the selected 12banking companies for the period 2014-15 used in this study have been collected from secondary sources, i.e. Indian banks association's. For analyzing data a non-parametric linear programming (LP) method, Data Envelopment Analysis (DEA) has been used. The most common method of comparison and performance evaluation. These measures are often inadequate due to the multiple inputs and outputs related to different resources, activities and environmental factors. DEA provides a means of calculating apparent efficiency levels within a group of or organizations. In DEA study, efficiency of an organization or DMU (Decision Making Unit) is calculated relative to the group's observed best practice. DEA evaluates the input consumed and output produced by DMUs and identifies those units that comprise an efficient frontier and lie below this frontier.

The standard DEA models have an input and output orientation. An input orientation identifies the efficient consumption of input resources while holding output constant. An output orientation identifies the efficient level of output given existing resource consumption. The output orientation provides estimates of the amount by which output could be proportionally expanded given existing input levels. Two basic Data Envelopment Analysis (DEA) models namely; Charnes–Cooper–Rhodes (CCR) model for constant return to scale (CRS) and Banker–Charnes–Cooper (BCC) model for variable return to scale (VRS) have been applied to estimate the operative efficiency of the selected banking companies for the study period.

Scale Efficiency is Calculated as Follows

Scale Efficiency (SE) = (TE obtained from CRS/TE obtained from VRS)

This study has used output-oriented DEA model, which emphasized on the maximization of outputs and the inputs are held at their current levels.

The Critical Input and Output Components Used for the Analysis are:

Inputs: Operating Cost, Deposits

Outputs**:** Investments, Advances and Asset.

Sample Public Sector Banks and Data Used for Efficiency Analysis

Selected Public Sector Banks : Deposits Operating expenses are taken as input; Investment, Advances and Asset were taken output of DMU						
S. No	**Banks**	**Input Rs. In Crores**		**Output In Crores**		
		Deposits	**Operating expense**	**Investment**	**Advances**	**Assets**
1	Bank of Baroda	617560	29776	122320	428065	714989
2	Bank of India	531907	32086	119792	402026	618698
3	Canara Bank	473840	34086	145346	330036	548001
4	Central Bank of India	255572	19162	95474	188478	311940
5	Corporation Bank	199346	15486	63412	145066	225993
6	Indian Bank	169225	11392	45899	125864	192836
7	Indian Overseas Bank	246049	18554	81310	171756	285637
8	Punjab National Bank	501379	29760	151282	380534	603334
9	Syndicate Bank	255388	16095	69340	202720	303135
10	Union Bank of India	316870	13797	94093	255655	381616
11	State Bank of India	1576793	97382	495027	1300026	2048080
12	IDBI Ltd.	259836	22406	120963	208377	356031

Source: Indian Bank's association

4. Results and Interpretation

The efficiency measures computed in the present study are relative in nature. The performance of a bank is not assessed in an absolute manner but is compared with the best among the group i.e. benchmark with the purpose of improving it. The sources of inefficiency can be determined by comparing the relative sizes of various efficiency measures. Table 1 shows the Efficiency Analysis of Selected Public Sector Banks in India through Data Envelopment Analysis of the sample N = 12 banks.

Table 1: Operative Efficiency of Selected Public Sector Banks under both Variable Return to Scale (VRS) and Constant Return to Scale (CRS)

Efficiency scores of DMUs VRS		**Efficiency scores of DMUs under CRS**	
Bank of Baroda	1.0000	Bank of Baroda	0.9424
Bank of India	0.9265	Bank of India	0.9183
Canara Bank	0.8713	Canara Bank	0.8705
Central Bank of India	0.9317	Central Bank of India	0.9162
Corporation Bank	0.9463	Corporation Bank	0.8896
Indian Bank	1.0000	Indian Bank	0.9021
Indian Overseas Bank	0.8915	Indian Overseas Bank	0.8672
Punjab National Bank	0.9418	Punjab National Bank	0.9385
Syndicate Bank	1.0000	Syndicate Bank	0.9628
Union Bank of India	1.0000	Union Bank of India	1.0000
State Bank of India (SBI)	1.0000	State Bank of India (SBI)	1.0000
IDBI Ltd.becou	1.0000	IDBI Ltd.	1.0000

Table1 reveals that the researched used two basic model of DEA to examine the efficiency of Public sector Commercial banks. Under VRS model 50% (6 out of 12) of sample banks were efficient because the DMUs efficiency score is equal to 1, remaining 50% were inefficient. Bank of India, Canara Bank, Central Bank of India and corporation Bank , Indian overseas Bank and Punjab National banks. Main reason for inefficiency was theirs inputs are more than actual output. Under CRS model, the efficient banks (SBI, UBI and IDBI) have scores 1 and are shown in cells with a shade background. The value

0.9424 in the inefficient unit (Bank of Baroda) that its inputs can simultaneously reduced by a factor of 1-0.9424, i.e. 5.76%. Only three DMUs are efficient in both models.

Table 2: Scale Efficiency of Selected DMUs

DMUs	Scale Efficiencies
Bank of Baroda	0.9423
Bank of India	0.9911
Canara Bank	0.9991
Central Bank of India	0.9834
Corporation Bank	0.9401
Indian Bank	0.9021
Indian Overseas Bank	0.9727
Punjab National Bank	0.9965
Syndicate Bank	0.9628
Union Bank of India	1.0000
State Bank of India (SBI)	1.0000
IDBI Ltd.	1.0000

Table 2 show the scale efficiency of DMUs which is obtained Total Efficiency from CRS/ Total Efficiency obtained from VRS. Only 3 banks were efficient, remaining was close to scale efficiency.

5. Conclusion

Using secondary data, this paper worked out the operative efficiency score of public sector commercial banks in India for the year 2014-15. The scores were calculated using the non-parametric technique of Data Envelopment Analysis. The study shows that as per CRS and VRS output oriented model. SBI, UBI and IDBI have a higher efficiency score as compared to other banks in sample. As per Model VRS, there are 6 DMUs are efficient, whereas as per the model CRS only 3 DMUs are efficient. 6 DMUs (banks) namely Bank of India, Canara Bank, Central Bank of India, Corporation Bank, Indian Overseas Bank, Punjab National Bank are inefficient in both model (VRS&CRS). Canara Bank and Indian Overseas Banks have very low score than any other DMU in the sample due to their lesser amount of investment and less deposits. The study recommends that the existing policy of bringing down non-performing assets as well as curtailing the establishment expenditure through voluntary retirement scheme for bank staff and rationalization of rural branches are steps in the right direction that could help Indian banks improve efficiency over a period of time so as to achieve best practice.

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