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EFFICIENCY MEASUREMENT OF SCHEDULED COMMERCIAL BANKS STATE-WISE: A REGIONAL ANALYSIS

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Abstract

One of the principal goals of the Indian banking sector reforms was to enhance the efficiency of the banking industry. This article contributes to the banking efficiency literature by measuring the technical efficiency of scheduled commercial banks at the state level. This study estimates the technical efficiency of scheduled commercial banks (SCBs) at the state level for a time span of fifteen years using data envelopment analysis (DEA). Data for the same is obtained from the RBI website from 1996-97 to 2010-11. It is found that technical efficiencies of different states are different during different time periods indicating that some states are prompt, while, other states are slow in adopting the banking reforms. Super efficiency estimated for each state year-wise reveals that Uttar Pradesh is the leading state rank wise followed by Maharashtra, Rajasthan, and Gujarat. While the comparison of the rank of states with the gross state domestic product indicates that the states with higher banking efficiency are better in development.

1. Introduction

With a rapidly changing domestic and global economic environment, the banking sector in India has undergone a sea change since the commencement of the banking reforms introduced from the year 1992. One of the prime objectives of the banking liberalization program was to inculcate greater competition in the banking sector thereby enhancing the profitability, greater amount of funds utilized in better ways, service quality for consumers and greater safety in terms of improved capital buffer in absorbing risk (Berger et al., 1993). The efficiency of banks is necessary to sustain trust, confidence, and soundness in the banking system (Zeitun&Benjelloun, 2013). Also, greater efficiency in the banking system leads to greater financial stability, product innovation and access of households and firms to financial services, which in turn affects economic growth (Egesa, 2010). With the purpose to impart greater efficiency to the resource allocation process in the banking system, the policymakers gradually implemented a series of reform measures like the dismantling of administrated interest rate structure, reduction in statutory pre-emptions in the form of reserve requirements, and liberal entry of private banks and foreign banks. After

liberalization, different states in India have witnessed growth and development **at varying levels**.

A study by Ghosh, B.and De, P.(2004)shows that interstate disparities in physical, social and economic infrastructure facilities have remained at an alarmingly high level. Another study by Bhattacharya and Sakthivel (2004) reveals that Industrial states are growing much faster than backward states, and there is no evidence of convergence of growth rates among states. This is a cause of concern for the government. Hence, the government is eager to trap the factors responsible for **inequality** in economic growth and the development of various states.

One of the key factors for growth and development has been infrastructural development. A good banking system by itself is a major financial infrastructure required for development. The studies so far on the efficiency of banks in India have **concentrated on the macro level** i. e. at the banks on all India basis. However, with **regional development becoming a core necessity for maintaining a higher growth of 7% or more at the national level**, the development of an efficient banking system at the **state/regional** level is **inevitable**. As such, this study aims at analyzing the efficiency of **scheduledcommercial banks** which, along with other factors cater to the development of states as a whole between states and within the state.

2. RESEARCH PROBLEM

Impediments to efficient functioning were still aplenty. Over the decades, the public sector banks in India have been overshadowed by governmental bureaucratic clutches rather than being driven by the market rationale. The State bank of India (SBI), being the largest public sector bank, comprises none other than government nominees to constitute its board of directors thus leaving the bank with little or no room for independent functioning. This, in turn, obstructs the bank to achieve optimum productivity and efficiency in its overall operations. Same is the story with other banks, as well. Occasionally these banks are overstaffed and ill-managed, thereby adversely affecting the banks' profitability. The entrant of new private and foreign banks has added fuel to the fire. There are many challenges for the banking sector in India, hence there are particularly more challenges for a new foreign entrant in the Indian banking system.A lot of foreign banks have already burnt their fingers in the retail segment and have decided to move out of a few retail segments completely. Most of the public sector banks are either looking to pick up a smaller bank or waiting to be picked up by

a larger bank. The central government also seems to be encouraging public sector banksto merge or acquire other banks.

In the aftermath of liberalization, restructuring, and deregulation of financial markets not only in India but also around the world, the performance evaluation of financial institutions has become an issue of great research interest. Particularly the performance of commercial banking has been the cynosure of all eyes. The public sector banks (PSB) are not willing to lose the race. On the contrary, they have evolved sufficient flexibility in their system to embrace the cutting-edge technological changes in international commercial banking. The result of these initiatives can be noticed in the growth of net profit of the PSBs, which has nearly doubled during the financial year 2001-02 as compared to the financial year 2000-01 (Rs.4,316.94 crore in 2000-01 to Rs.8,301.24 crore). However, during the same period, the net profit for the new private sector banks increased from Rs.639.41 crore to Rs.774.62 crore, a meager increase of 21 percent. Thus measuring the efficiency of scheduled commercial banks which includes public sector banks, private sector banks, and foreign banks after banking liberalization may result in interesting outcomesat regional level.

3. Main Results

The analysis reveals that technical efficiency in the state of Maharashtra and Rajasthan was best among all states selected for study whereas the performance of scheduled commercial banks was worst in the state of Kerala. Regionally the technical efficiency of the remaining states needs improvement.Super efficiency of scheduled commercial banks reveals Uttar Pradesh, Maharashtra, Gujarat and Rajasthan were the four top ranking states. Comparison of super efficiency ranks with the gross state domestic product ranking of states year wise, reveals convergence between the two in case of Uttar Pradesh, Maharashtra, Gujarat, Rajasthan for almost entire study period.

4. Review of literature

In the pre-1991 period, the commercial banking sector in India operated under a regime of financial repression where the allocation of resources and pricing of deposits and loans were, to a large extent, administered by the government. In the nineties, however, the banking environment experienced radical transformation consequent to the dismantling of entry barriers, rate deregulation, the introduction of prudential accounting norm and the implementation of Basel I capital adequacy norms. These changes brought a competitive scenario in the Indian banking sector that compelled the commercial banks to provide

unprecedented attention towards the reduction in operating cost. Inter alia, improvement of asset quality became an important agenda for the commercial banks during the reform period. This gained further momentum in the following years, given the introduction of Basel II and Basel III norms.

The literature on the use of DEA for measuring banking efficiency can be broadly classified as the comparison between public sector banks, private banks, and foreign banks. Studies by Bhattacharyya et al. (1997b), Galagedera and Edirisuriya (2005), Sathye (2003), Ram Mohan and Ray (2004a) showed that technical efficiency of public sector banks was far better than private banks and foreign banks.

Work done by Mukherjee et al. (2002), Chatterjee and Sinha (2006), Sinha and Chatterjee (2008), Sinha (2008a), Sinha (2008b), and Kumar and Gulati (2009a) revealed that technical efficiency of private banks were more than both the public sector banks and foreign banks.

On the other hand studies by Ketkar et al. (2003), Ataullah and Le (2006), Zhao et al. (2008), Sarkar et al. (1998), Chakrabarti and Chawla (2005), Das et al. (2005), Debasish (2006), Sanjeev (2006), Dash and Charles (2009) depicts that the foreign banks were more efficient as compared to private banks and public sector banks.It needs to be mention here that most of the authors have used input and output variables to their restricted choice and various studies in the literature depict approaches that are distinct to the theme of the research work.

4.1. New work in Indian Banking literature

Substantial research on efficiency and productivity of banking sector prevails in the literature. Research work on individual banks' efficiency, branch efficiency, cross- country bank efficiency, comparative study of banking performance on basis of the ownership group, impact of banking reforms on efficiency, financial liberalization and banking performance, the impact of financial crises on banking performance and productivity. However, in all the work done so far, no specific study deals with the regional analysis of banks at the state level and comparing the performance of states via banking efficiency.

In the present study, banking efficiency is estimated for various states over fifteen years from 1996 to 2011. Further, in the present study, the super efficiency of scheduled commercial banks is computed regionally to rank accordingly

5. Banking reforms

The first major step towards banking reforms was Nationalization of Banks in the year 1969. Further, in line of banking reforms were the Narasimham committees I and Narasimham committee II recommendations.

5.1. Nationalization of Banks

The banking system had made some progress in terms of deposit growth in the 1950s and the 1960s, but its spread was mainly concentrated in the urban areas. This had raised the number of scheduled bank branches under government control from 31 percent from 84 percent (Chakraborty, 2006, p.156).

The rapid increase in deposits concerning to their owned capital enabled the industrialist shareholders to enjoy immense leverage which sidelined the agricultural sector then. This converged in barely any development in rural India. So the government was forced to go for the nationalization of banks in the year 1969. The impact of nationalization of banks can be seen intable no. 1

Statistics of Credit and Deposit pre and post Nationalization

Tables No. 1

Year	No. of Banks	No. of Branches	Deposit	Credits
1951	566	4151	908	547
1969	89	8187	4646	3599
1991	277	59752	201199	121865

Source:Banking Commission 1971and Statistical Tables Relating to Banks in India (various issues, Rupees in crore)

During the post nationalization period, the banking sector suffered serious erosion in its efficiency and productivity (Dhar, 2003). Moreover, the sound banking system had been disturbed by the system of directed credit operation in the form of subsidized credit flow in the under-banked and priority areas, IRDP lending, loan festival, etc. The operational expenditure of the public sector banks had tremendously increased due to rise in the number of branches, poor supervision, rising staff level and high unit cost administering loan to the priority sector.

5.2. Narasimham Committee Report on Banking Reforms

Banking issues were many post nationalization of banks mentioned above and the financial crisis of 1991 compelled the government to move towards reform for the financial sector. As a counteraction to this, the government introduced financial sector reforms in the year 1991. Banking reforms were subsequently initiated by RBI in the year 1992. The process of liberalization of the banking sector and the policies changes commenced during 1992 and had continued their onwards with the goals to create a more diversified, profitable, efficient and robust banking system (Government of India,(1991), Narasimham Committee Report-I).

The Narasimham Committee Report I was aimed at bringing operational flexibility and functional autonomy to enhance efficiency, productivity, and profitability of the banking industry. The Narasimham Committee Report II focused on bringing structural changes to strengthen the banking system to counter the financial crisis globally as well as at the regional level.

The second generation of financial sector reforms was initiated by the Committee on Banking Sector Reforms (BIS) formed in 1998 under the chairmanship of M. Narasimham. The purpose was to review the banking reform progress and design a programme for further strengthening the financial system of India. The committee focused on various areas such as capital adequacy, bank mergers, and bank legislation. The highlighting point of Narasimham committee report II was that Central Bank's role should be separated from being the monetary authority to that of the regulatory body for the banking sector of the country.

As seen from Table No. **2**, the number of offices reveals a gradual increase in all states except Bihar. There has been a decline in the number of employees for SCB from 1996 to 2010 indicating that the operational efficiency of banks has improved. Also, implementation of computers and related technology in the banking sector in later 1990s has helped to get the right set of employees with the right skills (trained) which have also improved performance of banking sector.

A substantial upsurge in deposits of all states signifies mobilization of deposits has transpired as recommended by Narasimham committee. The escalation in credit outstanding among various states suggests that SCBs were observed as the prime source of fund raising institutes for economic, social and domestic requirements.

6. Data for study

The focus here is on the source of data, selection of data and selection of states used for research work. Empirical work on the state-wise measurement of efficiency and performance analysis requires input and output variables. Using the intermediate approach, the funds that come to banks should be utilized as financial resources for economic and social sectors. In this context, the input variables include deposits and borrowings, salary and other expenses. The output variables include loans and advances and investments.

6.1. Sourceand Selection of Data:

Data for Scheduled Commercial Banks (SCBs) are taken from Basic Statistical Returns (BSR) from RBI website. As the study is to assess the efficiency of these banks in comparison to its counterparts in other states, the need is to look for those variables that will help in this assessment. This study being on the banking sector, the rationale is to see the funds available to banks and the funds utilized by banks for various economic and social activities. In this context, both deposits and borrowings are treated as input variables. Also, the resources needed for operational processes are treated as input variables for the banks.

6.2. Variables for the Study

Going into the details of these variables, the study considers two input variables namely deposits and borrowings and second salary and other expenses.The funds utilized by banks are treated as output variables for the present study. In this context, the two output variables considered for the study are Investments[1], while the second being Loans[2] and advances.

Here, it needs to be informed that the present study considers all Scheduled Commercial Banks of a state together, so the **consolidated** data for all Scheduled Commercial Banks in a state form a DMU for that state. As an example, the output variable investment for SCB showing the data for the year 1996-97 for the state of Maharashtra is taken by adding the investments for all SCB banks in the state of Maharashtra for the year 1996-97. Likewise, values the other variable, namely loans and advances for each state year-wise are received from the same source using an identical method of adding. This data is available from RBI website state-wise and year wise for SCBs. A similar job is carried out

[1] Investment comprises of Investments in Government Securities and Investments Other than Government approved securities.
[2] Loan comprises of demand loans and term loans. Advances include overdraft facilities and cash credits for various economic and socio-economic activities.

for all input variables and output variables. Thus all data for the present study are necessarily secondary by choice.

State-wise Statistics of Scheduled Commercial Banks for the study period

Table No. 2

	No of Offices			No of Employees			Deposits*			Credits Outstanding*		
	Year			Year			Year			Year		
STATES	1996	2001	2010	1996	2001	2010	1996	2001	2010	1996	2001	2010
Andhra Pradesh	4969	5268	7132	75,893	66212	70147	2203645	5444552	24926361	1750358	3512765	21038480
Bihar	5003	3620	4142	50,564	32981	33,124	1797101	2680073	10036678	541577	554238	2330769
Delhi	1273	1492	2456	52,459	47773	44,791	4256910	10643796	56501341	2653121	7034929	35510300
Goa	286	332	443	5,224	4691	4,904	319657	714201	2919943	824,86	186463	631217
Gujarat	3575	3777	4733	61,719	54559	54,262	2535873	5504947	21521713	1342474	2670181	11900810
Haryana	1384	1529	2438	21,342	20343	24,194	899230	1988654	10917186	402206	815486	5336768
Himachal Pradesh	770	787	1017	7,702	7030	7,398	315583	741272	2688534	76258	157564	916204
Jammu Kashmir	807	829	1013	8,509	8811	9,511	371505	989243	3400264	106308	340963	1380293
Karnataka	4589	4881	6271	72,007	68782	63,457	2354111	5474249	28977498	1648942	3336877	19820396
Kerala	3161	3362	4390	49,564	44065	46,129	2010539	4417814	15209669	893903	1910833	8071383
Madhya Pradesh	4490	3524	4270	50,172	37924	38,723	1582609	2908430	11818274	889868	1384671	5752686
Maharashtra	6057	6498	8321	146,453	128463	126,543	8704962	17248918	120199142	6932688	14898912	91038963
Orissa	2187	2249	2876	24,143	23425	24,677	605641	1507160	8242456	338733	606531	3564619
Punjab	2353	2571	3595	40,760	36132	36,820	2029539	4429841	133,196	831576	1818580	7903364
Rajasthan	3275	3379	4242	36,254	33923	35,379	1219415	2753883	10,673,608	553580	1284050	7399139
Tamil Nadu	4728	4932	6474	86,659	76942	76,014	2909641	6306488	28363655	2762485	5711962	26532530
Uttar Pradesh	8854	8254	10475	108,821	89099	91,363	4177668	8537263	31226045	1413092	2412049	11111612
West Bengal	4423	4535	5368	88,195	79909	70,221	3122492	6793108	27613971	1723505	3025726	13876642

Source: RBI Basic Statistics, various years. Deposits show the figures are in lacs of rupees Credits Outstanding* show the figures are in lacs of rupees.*

6.3. Selection of Number of States:

The results of DEA are influenced by the size of the sample set i.e. DMUs. Cooper et.al. (2007) provides two rules to decide the number of DMUs that are given as follows:

$j \geq \max(i , p)$, $j \geq 3 * (i + p)$

where, j = number of states selected for study (DMUs),

i = number of input variables (two for the study) and

p = number of output variables (two for the study).

Care has been taken to see to it that the number of states satisfies these norms.

6.4. Selection of States:

The selection of states in the present study is dependent on the distribution of banks over the study period. We use the location quotient index (LQ^3 index) as it gives an idea about the penetration level of banks in a geographical region. With regard to the values of LQ index, the states selected for Scheduled Commercial Banks include Andhra Pradesh, Bihar, Delhi, Goa, Gujarat, Haryana, Himachal Pradesh, Jammu &Kashmir, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal.

7. Methodology

In methodology we discuss the theoretical aspect of DEA and the model used for computation of technical efficiency.

7.1 Theoretical Aspect of Efficiency Measurement

DEA methodology is a linear programming approach used to develop an efficient frontier, which is then used to generate relative efficiency of states. DEA calculates specific efficiency score for a state (DMU) **relative** to other DMUs and not an **absolute** value, unlike the stochastic approach. This is a non-parametric technique that requires no assumptions about the form of production technology or function used. It develops a frontier by enveloping all the observed input and output values.The DEA model employed in this study uses variable returns to scale (VRS) approach. The use of VRS specification helps to compute technical efficiency (TE) devoid of the influence of scale efficiency (SE). Technical efficiency refers to the conversion of physical inputs of banks, such as deposits and borrowings, into outputs like investments and loans and advances relative to the best-practice. Technical efficiency focuses on the ability of a bank to produce an existing level of output with the minimum inputs (input-oriented DEA[4]) or to produce maximal output from a given set of inputs (output-oriented DEA). In this study output-oriented DEA is used to measure technical efficiency. Thus, technical efficiency relates to the productivity of inputs (Sathye[5], 2001). Consequently, the technical efficiency of a bank is viewed as its ability to transform

[3] LQ index depicts the penetration level of banks state wise for the present study.
[4] Although there are two ways of measuring it, the present study uses output-oriented TE and input-oriented CE.

multiple resources into multiple financial services (Bhattacharyya[6] et al., 1997). A bank is technically inefficient if production occurs within the interior of the frontier generated.

7.2 Computation of Technical Efficiency for Scheduled Commercial Banks

Following are the sequence of steps to compute the VRS technical efficiency (i.e. VRS TE):

(1) Finding the radial efficiency for each state by solving the following LPP:

$$\theta_0{}^{*VRS} = \min \theta^{VRS}$$

$$\sum_{j=1}^{18} \lambda_j x_{ij} \leq \theta x_{io}, \qquad i = 1,2$$

$$\sum_{j=1}^{18} \lambda_j y_{qj} \leq y_{qo}, \qquad q = 1,2$$

$$\sum_{j=1}^{18} \lambda_j = 1,$$

$$\lambda_j \geq o, j = 1 \ldots \ldots 18 \quad \text{(Equ. 1)}$$

where is the technical efficiency of O[th] state, are coefficients, represents the *ith* input of the *jth* state, is the i^{th} input of O[th] state, is the q[th] output of the j^{th} state, and is the q[th] output of the O[th] state. This is done for step1 and the value is stored in, 1.

(2) In the second step maximize the sum of slacks

$$\max_{\lambda, s_i^-, s_q^+} g_o(\lambda, s_i^-, s_q^+) = -\left[\sum_{q=1}^{2} s_q^+ + \sum_{i=1}^{2} s_i^-\right]$$

Subject to constraints:

$$\sum_{j=1}^{18} \lambda_j y_{qj} - s_q^+ = y_{qo}$$

$$\sum_{j=1}^{18} \lambda_j x_{ij} + s_i^- = c x_{io}$$

$$\sum_{j=1}^{18} \lambda_j = 1$$

$$\lambda, s_i^-, s_q^+ \geq 0 \quad \text{(Equ. 2)}$$

where represent slack term for input access that remains in input i of state 'o' after the radial contraction was applied to state o's inputs and is the slack term for the output shortfall in the (production) servicing of state 'o', refers to i[th] input of the o[th] state which has been contracted by a factor of as derived from step 1.

Step 1 and 2 helps us to find efficient and inefficient states. All states with efficiency score and no slacks are the efficient states. States with at least one non-zero slack variable(s) form the slack set for further analysis.

(3) In this step, the focus is on finding all those states in the slack set in which input variables may have some slacks. This is done by solving i linear programming problems one for each input.

$$\boldsymbol{min\ \theta}$$

Subject to constraints:

$$\sum_{j=1}^{18} \lambda_j\, x_{ij}^{eff} \le \theta c x_{io}, \qquad i = 1,2$$

$$\sum_{j=1, i\neq j}^{18} \lambda_j\, x_{ij}^{eff} \le c x_{io}, \qquad j = 1, \ldots\ldots\ldots\ldots 17,$$

$$\sum_{j=1}^{18} \lambda_j\, y_{qj}^{eff} \le y_{qo}, \qquad q = 1,2$$

$$\lambda_j \ge 0. \qquad j = 1, \ldots\ldots\ldots\ldots 18$$

. (Eq. 3)

where is the i^{th} input of the j^{th} state, being the efficiency score calculated in step 1, is the i^{th} input of o^{th} state which has been contracted by a factor of as expressed in step1. The main purpose of step 3 is to identify the input dimensions in which slacks exist. So no actual changes occur in the projected points (computed in step 1). This information turns out to be handy in the subsequent step. Initially, it was thought that one may be able to determine the potential directions of slack by simply noting down the non-zero slack variables from step 2 results (and hence one could discard step 3). However, it became evident, that the slacks identified in step 2 need not identify all dimensions in which potential slack exists. Hence, step 3 is a necessity. Here it also needs to be noted that step 3 can generate some difficulty in the computation if some inputs are zero.

(4) In this step (for the i[th] state in the slacks set) run the LP which seeks a radial reduction in all inputs identified as having potential slack (in step 3). The LP, in this case, is expressed as follows:

$\boldsymbol{min\ \theta}$

Subject to constraints:

$$\sum_{j=1}^{18} \lambda_j\, x_{ij}^{eff} \le \theta c x_{io}, \qquad i = 1,2$$

$$\sum_{j=1,}^{18} \lambda_j\, x_{ij}^{s,eff} \le c x_{io}^{s}, \qquad i = 1,2$$

$$\sum_{j=1}^{18} \lambda_j\, y_{qj}^{ns,eff} \le y_{qo}^{ns}, \qquad q = 1,2\,.$$

$$\lambda_j \ge o \text{(Eq.4)}$$

where the superscript **s** indicates the subset of inputs consisting of the potential slacks and **ns** indicates the remaining inputs. The starting point of radial reduction is the projected point (as depicted by step 1).

(5) Having performed the radial reduction in step 4, it's likely that there may still exist some slacks in a few input variables. So taking the projected points identified in step 4 (for the o[th] state) and repeat steps 3 and 4 until no slacks remain in any input variables.

(6) Considering projected point from step 5 (for the o[th] state) and repeating steps 3-5, and conducting radial expansion in output slack dimensions until no output slack remains. The final projected point will be on the efficient surface. The peers of the state can then be identified from the λ's of the final projected point and the slacks may be calculated by subtracting the final projected point from the projected point as given in step 1.

The multi-stage DEA approach outlined above selects more appropriate peers compared to stage one and stage two DEA approach. In this approach, one seeks efficient projection points by moving along the surface of the facet radially.

However, in case of some states the technical efficiency shows a score of 1 for a few years. Thus, to compare the efficiency of states, it's necessary to estimate super efficiency. This is done using the DEA solver for each year to get rankings of states year-wise.

8. Analysis and Results

As the study period is vast, to get a deeper understanding of regional growth in the banking sector, the spectrum of banking efficiency is divided into three periods. The first period covers 5 years from 1996-97 to 2000-01, the second period consists of 6 years from 2001-02 to 2006-07 while the third period has four years starting from 2007-08 to 2010-11. The first period is selected to view the implementation process of banking reforms brought in by the first Narsimham Committee in the year 1992 and its subsequent impact. Literature also calls this as the Basel I period. Therefore, this could be considered as the effects of Basel I norms. The second period which starts from 2001-02 to 2006-07 is selected to comprehend the effects of reform process of second Narsimham Committee report, recommendations of which commenced from 1998-99 onwards. Here again, as the period is sighted as Basel II process, the period could analyze the impact of Basel II norms. Lastly, the third period consisting of the years 2007-08 to 2010-11, looks into the post-Basel II period.

The outcome of distribution of technical efficiency for Scheduled commercial banks can be seen in **table no. 3A, 3B and 3C**for the first, second and third period respectively. Observing **table no. 3A** for the first period, Maharashtra, Orissa, Rajasthan, and Uttar Pradesh have been consistently efficient throughout the first period, while Jammu and Kashmir and Gujarat were found to be efficient for 85% and 71% of the period respectively. Again, while Haryana and Madhya Pradesh were efficient for more than half of the first period, Andhra Pradesh and Himachal Pradesh were efficient for little less than half of the first period. Similarly, states like Bihar and Goa were efficient for little more than one-fourth of the first period. Delhi and Karnataka were efficient for only a little more than one-tenth of the first period. Remaining states like Kerala, Punjab and West Bengal were found to be inefficient throughout the first period.

Looking at **table no. 3B** for the second period, states like Gujarat, Haryana, Himachal Pradesh, Maharashtra, Rajasthan, and Uttar Pradesh were found to be efficient for the entire second period whereas Delhi and Orissa were efficient for less than three fourth of the period. Andhra Pradesh and Bihar were efficient only for 33% and 16% of the period respectively. Inefficient states for the entire second period were Goa, Jammu & Kashmir, Karnataka, Kerala, Madhya Pradesh, Punjab, Tamil Nadu, and West Bengal.

For the third period, **table no.3C** show that Himachal Pradesh, Maharashtra, Rajasthan, and West Bengal were efficient while Andhra Pradesh, Gujarat, and Haryana were

efficient for three fourth of the third period. Goa and Uttar Pradesh were efficient for half of the third period although Madhya Pradesh, Orissa, and Punjab were efficient for only 25% of the period. Among the inefficient states for the entire third period were Bihar, Delhi, Jammu and Kashmir, Karnataka, Kerala, and Tamil Nadu.

Technical Efficiency 1996-97 to 2000-01

Table No: 3A

	Freq of		Distribution of TE from 1996-97 to 2000-01					Ave,.
STATES	States with	% Time	1996-97	1997-98	1998-99	1999-00	2000-01	over
▼	TE =1							Years
Andhra Prade	3	60	0.817	0.817	1	1	1	0.9268
Bihar	0	0	0.991	0.991	0.898	0.752	0.899	0.9062
Delhi	1	20	0.274	0.274	0.297	0.303	1	0.4296
Goa	1	20	0.592	0.592	1	0.393	0.042	0.5238
Gujarat	3	60	1	1	0.961	0.844	1	0.961
Haryana	3	60	0.534	0.534	1	1	1	0.8136
Himachal Pra	3	60	1	1	0.284	0.229	1	0.7026
Jammu & Ka	4	80	1	1	1	1	0.247	0.8494
Karnataka	0	0	0.803	0.803	0.854	0.794	0.706	0.792
Kerala	0	0	0.62	0.62	0.638	0.617	0.578	0.6146
Madhya Prad	2	40	1	1	0.898	0.83	0.839	0.9134
Maharashtra	5	100	1	1	1	1	1	1
Orissa	5	100	1	1	1	1	1	1
Punjab	0	0	0.502	0.502	0.602	0.596	0.565	0.5534
Rajasthan	5	100	1	1	1	1	1	1
Tamil Nadu	0	0	0.782	0.782	0.952	0.95	0.92	0.8772
Uttar Pradesh	5	100	1	1	1	1	1	1
West Bengal	0	0	0.815	0.815	0.924	0.919	0.88	0.8706
Freq. of Years TE=1			8	8	8	7	9	
% Years			44.4444	44.44444	44.4444	38.88889	50	
Ave. Over States			0.81833	0.818333	0.85044	0.790389	0.8153333	

Note: (1) Frequency of states is viewed as the number of times a state is efficient (TE = 1) for the period. (2) Fequency of years indicate the total number of states that are efficient (TE = 1) for a year. (3) %Time is the percent of time span for the period during which TE=1. (4) % states is the percent of states among all states for which TE = 1.

Technical Efficiency 2001-02 to 2006-07

Table No: 3B

STATES ▼	Freq of States with TE =1	% Time	Distribution of TE from 2001-02 to 2006-07						Ave,. over Years
			2001-0	2002-0	2003-04	2004-0	2005-0	2006-07	
Andhra Prade	2	33.3333	0.987	0.948	0.931	0.949	1	1	0.96917
Bihar	0	0	0.872	1	0.734	0.808	0.702	0.681	0.7995
Delhi	4	66.6667	1	1	1	1	0.321	0.327	0.77467
Goa	0	0	0.042	0.043	0.047	0.053	0.415	0.494	0.18233
Gujarat	6	100	1	1	1	1	1	1	1
Haryana	6	100	1	1	1	1	1	1	1
Himachal Pra	6	100	1	1	1	1	1	1	1
Jammu & Ka	0	0	0.258	0.304	0.264	0.244	0.677	0.71	0.4095
Karnataka	0	0	0.701	0.681	0.627	0.675	0.703	0.689	0.67933
Kerala	0	0	0.566	0.583	0.559	0.555	0.702	0.69	0.60917
Madhya Prad	0	0	0.832	0.802	0.72	0.753	0.807	0.798	0.78533
Maharashtra	6	100	1	1	1	1	1	1	1
Orissa	4	66.6667	1	1	0.983	0.831	1	1	0.969
Punjab	0	0	0.562	0.535	0.504	0.469	0.58	0.592	0.54033
Rajasthan	6	100	1	1	1	1	1	1	1
Tamil Nadu	0	0	0.87	0.834	0.811	0.884	0.956	0.998	0.89217
Uttar Pradesh	6	100	1	1	1	1	1	1	1
West Bengal	0	0	0.924	0.915	0.899	0.862	0.897	0.872	0.89483
Freq. of Years TE=1			8	9	7	7	8	8	
% Years			44.444	50	38.8889	38.889	44.444	44.4444	
Ave. Over States			0.8119	0.8136	0.78217	0.7824	0.82	0.82506	

Note: (1) Frequency of states is viewed as the number of times a state is efficient (TE = 1) for the period. (2) Fequency of years indicate the total number of states that are efficient (TE = 1) for a year. (3) %Time is the percent of time span for the period during which TE=1. (4) % states is the percent of states among all states for which TE = 1.

Technical Efficiency 2007-08 to 2010-11

Tables No: 3C

	Freq of	Distribution of TE from 2007-08 to 2010-11					Ave.
STATES	States with	% Time	2007-08	2008-09	2009-10	2010-11	over
▼	TE =1						Years
Andhra Prade	3	75	0.974	1	1	1	0.9935
Bihar	0	0	0.929	0.658	0.666	0.681	0.7335
Delhi	0	0	0.932	0.359	0.362	0.352	0.50125
Goa	2	50	1	0.6	0.536	1	0.784
Gujarat	3	75	1	1	1	0.97	0.9925
Haryana	3	75	1	0.892	1	1	0.973
Himachal Prad	4	100	1	1	1	1	1
Jammu & Kas	0	0	0.988	0.79	0.72	0.733	0.80775
Karnataka	0	0	0.999	0.7	0.684	0.678	0.76525
Kerala	0	0	0.932	0.722	0.721	0.657	0.758
Madhya Prad	1	25	0.965	1	0.8	0.741	0.8765
Maharashtra	4	100	1	1	1	1	1
Orissa	1	25	1	0.864	0.885	0.846	0.89875
Punjab	1	25	1	0.69	0.722	0.762	0.7935
Rajasthan	4	100	1	1	1	1	1
Tamil Nadu	0	0	0.983	0.914	0.977	0.969	0.96075
Uttar Pradesh	2	50	1	1	0.896	0.795	0.92275
West Bengal	4	100	1	1	1	1	1
Freq. of Years TE=1			10	8	7	7	4
% Years			55.556	44.4444	38.889	38.889	
Ave. Over States			0.9834	0.84383	0.8316	0.8436	

Note: (1) Frequency of states is viewed as the number of times a state is efficient (TE = 1) for the period. (2) Fequency of years indicate the total number of states that are efficient (TE = 1) for a year. (3) %Time is the percent of time span for the period during which TE=1. (4) % states is the percent of states among all states for which TE = 1.

During the entire study period from 1996 to 2011 which is a combination of the three periods, Maharashtra and Rajasthan were seen as efficient states (**table no.5**). Further, Uttar Pradesh and Gujarat were found to be efficient for 88% and 82% of the study period respectively. Both Haryana and Himachal Pradesh were efficient for marginally above three fourth of the entire study period. Orissa was observed to be technically efficient for almost 70% of the study period. States like Andhra Pradesh and Jammu & Kashmir were efficient for less than half of the study period. Each of the states Delhi and Madhya Pradesh were found efficient for slightly above one-fourth of the study period whereas Goa and West Bengal were efficient for a period below one-fourth of the study period. The state of Bihar was seen to be technically efficient for only 17% of the study period. On the other hand, Karnataka, Punjab and Tamil Nadu were barely efficient throughout the study period. Kerala was the only inefficient state for the entire study period.

Summary: Distribution of TE (Percentage time) period wise

Table No.: 5

% Time	First period	Second Period	Third Period
100%	Maharasthra,	Gujarat, Haryana	Himachal Pradesh
	Oriisa	Himachal Pradesh	Maharashtra
	Rajasthan	Maharashtra	Rajasthan
	Uttar Pradesh	Rajasthan	West Bengal
		Uttar Pradesh	
99%-66%	Jammu & Kashmir	Delhi	Andhra Pradesh
	Gujarat	Orissa	Gujarat, Haryana
65%- 50%	Haryana		Goa
	Madhya Pradesh		Uttar Pradesh
5%-25%	Andhra Pradesh	Andhra Pradesh	Madhya Pradesh
	Hiachal Pradesh		Orissa, Punjab
	Bihar, Goa		
<25%	Delhi	Bihar	
	Karnataka		
	Tamil Nadu		
o%	Kerala	Goa, Karnataka, Kerala	Bihar, Delhi
	Punjab	Jammu & Kashmir	Jammu & Kashmir
	West Bengal	Madhya Pradesh	Karnataka, Kerala
		Punjab, Tamil Nadu	Tamil Nadu
		West Bengal	

Change in (Period wise) performance of States with regard to Technical Efficiency score

Table No. 6.

Technical Efficiency SCB	States
Best Technical Efficiency Score	Maharashtra
	Rajasthan
Improvement	Andhra Pradesh
seen in Technical Effciency	Goa
score from	Gujarat
first period to third period	Haryana
	Himachal Pradesh
	Uttar Pradesh
	West Bengal
Marginal	
Improvement	Punjab
in Technical Effciency	Tamil Nadu
score is seen from	
first period to third period	
Decline	Jammu & Kashmir
in Technical Effciency	Karnataka
score is seen from	Kerala
first period to third period	Bihar
	Delhi
	Madhya Pradesh
	Orissa

Table No. 7

	Super Efficiency Scheduled Commercial Banks														
Years →	**1996-1997**	**1997-1998**	**1998-1999**	**1999-2000**	**2000-2001**	**2001-2002**	**2002-2003**	**2003-2004**	**2004-2005**	**2005-2006**	**2006-2007**	**2007-2008**	**2008-2009**	**2009-2010**	**2010-2011**
States ↓	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Andhra Prad	10	10	4	4	9	9	10	9	8	5	5	14	5	9	3
Bihar	9	9	13	13	11	11	6	12	12	13	15	18	16	10	15
Delhi	18	18	17	17	6	6	7	5	5	18	18	16	18	8	18
Goa	15	15	5	16	18	18	18	18	18	17	17	8	17	2	5
Gujarat	4	4	9	10	3	3	3	2	3	6	4	6	4	17	8
Haryana	16	16	3	1	6	6	7	5	5	7	7	8	10	3	5
Himachal Pra	6	6	18	18	6	6	7	5	5	7	7	8	8	3	5
Jammu & Ka	6	6	5	5	17	17	17	17	17	15	12	12	12	18	14
Karnataka	12	12	14	12	14	14	14	14	14	12	14	11	14	7	16
Kerala	14	14	15	14	15	15	15	15	15	14	13	17	13	15	17
Madhya Pra	5	5	12	11	13	13	13	13	13	11	11	15	7	14	13
Maharashtra	3	3	2	3	2	2	2	3	2	2	2	1	1	1	1
Orissa	6	6	5	5	5	5	4	8	11	4	6	5	11	12	10
Punjab	17	17	16	15	16	16	16	16	16	16	16	7	15	5	12
Rajasthan	2	2	5	5	4	4	5	4	4	3	3	4	3	16	2
Tamil Nadu	13	13	10	8	12	12	12	11	9	9	9	13	9	11	9
Uttar Prades	1	1	1	2	1	1	1	1	1	1	1	2	6	6	11
West Benga	11	11	11	9	10	10	11	10	10	10	10	3	2	13	4
SE →Super Efficiency Rank															

8.1. State wise Super Efficiency

As seen from the table no.**7,** Uttar Pradesh is the leading state followed by Maharashtra, Rajasthan and Gujarat with regard to the super efficiency rank. Next in line are Orissa, Haryana and Himachal Pradesh. Surprisingly, states like Punjab Karnataka and Kerala are at the lower end of ranking.

8.2. Super Efficiency of Banks and Status of States

Banks are one of the leading sources of finance in the development of a state or a region. As such when a state develops and has higher ranking in the status of states/regions, the efficiency of banks could be a source for this status.

Comparing the efficiency of banks in different states and their development status, one could arrive at the extent to which the banks could play a role in the development of states. Therefore, this study compares the super efficiency of banks in different states and the status of states. For this the efficiency of banks has been ranked using super efficiency and states have been ranked on the basis of the GSDP at factor cost. These have been tabulated to form 15 different tables one each for each of the 15 years of the study period. The following sub-section gives an analysis of matching between the super efficiency and gross state domestic product.

Table No. 8

	Super Efficiency Scheduled Commercial Banks														
Years →	**1996-1997**	**1997-1998**	**1998-1999**	**1999-2000**	**2000-2001**	**2001-2002**	**2002-2003**	**2003-2004**	**2004-2005**	**2005-2006**	**2006-2007**	**2007-2008**	**2008-2009**	**2009-2010**	**2010-2011**
States ↓	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Andhra Prad	10	10	4	4	9	9	10	9	8	5	5	14	5	9	3
Bihar	9	9	13	13	11	11	6	12	12	13	15	18	16	10	15
Delhi	18	18	17	17	6	6	7	5	5	18	18	16	18	8	18
Goa	15	15	5	16	18	18	18	18	18	17	17	8	17	2	5
Gujarat	4	4	9	10	3	3	3	2	3	6	4	6	4	17	8
Haryana	16	16	3	1	6	6	7	5	5	7	7	8	10	3	5
Himachal Pra	6	6	18	18	6	6	7	5	5	7	7	8	8	3	5
Jammu & Ka	6	6	5	5	17	17	17	17	17	15	12	12	12	18	14
Karnataka	12	12	14	12	14	14	14	14	14	12	14	11	14	7	16
Kerala	14	14	15	14	15	15	15	15	15	14	13	17	13	15	17
Madhya Pra	5	5	12	11	13	13	13	13	13	11	11	15	7	14	13
Maharashtra	3	3	2	3	2	2	2	3	2	2	2	1	1	1	1
Orissa	6	6	5	5	5	5	4	8	11	4	6	5	11	12	10
Punjab	17	17	16	15	16	16	16	16	16	16	16	7	15	5	12
Rajasthan	2	2	5	5	4	4	5	4	4	3	3	4	3	16	2
Tamil Nadu	13	13	10	8	12	12	12	11	9	9	9	13	9	11	9
Uttar Prades	1	1	1	2	1	1	1	1	1	1	1	2	6	6	11
West Benga	11	11	11	9	10	10	11	10	10	10	10	3	2	13	4
SE→Super Efficiency Rank															

8.2Comparison of Super Efficiency of Scheduled commercial banks and Status of States

Table No. 8(A)

Comparing the Ranking of Super Efficiency and GSDP of States for SCB TE

	1996-97	1996-97		1997-98	1997-98		1998-99	1998-99		1999-00	1999-00
	SE	GSDP	States	SE	GSDP	States	SE	GSDP	States	SE	GSDP
States	**Rank**	**Rank**		**Rank**	**Rank**		**Rank**	**Rank**		**Rank**	**Rank**
Andhra Prad	**10**	**3**	**Andhra Pr**	**10**	**3**	**Andhra Pr**	**4**	**2**	**Andhra Pr**	**4**	**5**
Bihar	9	14	Bihar	9	14	Bihar	13	14	Bihar	13	14
Delhi	18	12	Delhi	18	12	Delhi	17	12	Delhi	17	12
Goa	15	18	Goa	15	18	Goa	5	18	Goa	16	18
Gujarat	**4**	**5**	**Gujarat**	**4**	**5**	**Gujarat**	**9**	**5**	**Gujarat**	**10**	**6**
Haryana	16	13	Haryana	16	13	Haryana	3	13	Haryana	1	13
Himachal Pra	6	17	Himachal P	6	17	Himachal P	18	17	Himachal P	18	17
Jammu & Ka	6	16	Jammu & K	6	16	Jammu & K	5	16	Jammu & K	5	16
Karnataka	12	7	Karnataka	12	7	Karnataka	14	7	Karnataka	12	7
Kerala	14	11	Kerala	14	11	Kerala	15	11	Kerala	14	10
Madhya Pra	**5**	**9**	**Madhya P**	**5**	**9**	Madhya Pr	12	9	Madhya Pr	11	9
Maharashtra	**3**	**1**	**Maharash**	**3**	**1**	**Maharash**	**2**	**1**	**Maharash**	**3**	**1**
Orissa	6	15	Orissa	6	15	Orissa	5	15	Orissa	5	15
Punjab	17	10	Punjab	17	10	Punjab	16	10	Punjab	15	11
Rajasthan	**2**	**8**	**Rajasthan**	**2**	**8**	**Rajasthan**	**5**	**8**	**Rajasthan**	**5**	**8**
Tamil Nadu	13	4	Tamil Nadu	13	4	**Tamil Nad**	**10**	**4**	**Tamil Nad**	**8**	**4**
Uttar Prades	**1**	**2**	**Uttar Prad**	**1**	**2**	**Uttar Prad**	**1**	**3**	**Uttar Prad**	**2**	**2**
West Bengal	11	6	West Beng	11	6	West Beng	11	6	**West Beng**	**9**	**3**
Number of Matching States		**6**			**6**			**6**			**7**

Observing the table no. **8(A), 8(B), 8(C)** and **8(D)**, it is found that in these 15 years, while one year showed 8 states match with the top 10 ranks of both status of states and bank efficiency for 4 years, 7 states match with top 10 rankings of both status and bank efficiency. Again for 6 and 3 years each, 6 and 5 states respectively match with top 10 rankings of both status of states and bank efficiency only for 1 year and 4 states match with top 10 rankings both status and banking efficiency. This clearly indicates that bank efficiency plays a major role in the development of the states. Better is the efficiency higher is the status of the states in development. Thus banks play a key role in the development of regions.

The matching states where Andhra Pradesh, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. While Maharashtra matched the status of states and banking efficiency for all the 15 years, Andhra Pradesh, Gujarat, Rajasthan, and West Bengal matched the two rankings for 14 years of the study. West Bengal, Tamil Nadu, and Madhya Pradesh matched the two rankings for 10, 6 and 3 years respectively.

Table No. 8(B)

Comparing the Ranking of Super Efficiency and GSDP of States for SCB TE

	2000-01	2000-01		2001-02	2001-02		2002-03	2002-03		2003-04	2003-04
	SE	GSDP	States	SE	GSDP	States	SE	GSDP	States	SE	GSDP
States	Rank	Rank		Rank	Rank		Rank	Rank		Rank	Rank
Andhra Prad	**9**	**4**	**Andhra Pr**	**9**	**7**	Andhra Pra	10	4	**Andhra Pr**	**9**	**3**
Bihar	11	14	Bihar	11	13	Bihar	6	14	Bihar	12	14
Delhi	6	12	Delhi	6	11	Delhi	7	13	Delhi	5	13
Goa	18	18	Goa	18	18	Goa	18	18	Goa	18	18
Gujarat	**3**	**6**	Gujarat	3	14	**Gujarat**	**3**	**6**	**Gujarat**	**2**	**6**
Haryana	6	13	Haryana	6	12	Haryana	7	12	Haryana	5	12
Himachal Pra	6	17	Himachal P	6	17	Himachal P	7	17	Himachal P	5	17
Jammu & Ka	17	16	Jammu & K	17	16	Jammu & K	17	16	Jammu & K	17	16
Karnataka	14	7	Karnataka	14	9	Karnataka	14	7	Karnataka	14	7
Kerala	15	11	Kerala	15	2	Kerala	15	9	Kerala	15	10
Madhya Prad	13	9	Madhya Pr	13	1	Madhya Pr	13	10	Madhya Pr	13	9
Maharashtra	**2**	**1**	**Maharash**	**2**	**3**	**Maharash**	**2**	**1**	**Maharash**	**3**	**1**
Orissa	5	15	Orissa	5	15	Orissa	4	15	Orissa	8	15
Punjab	16	10	Punjab	16	8	Punjab	16	11	Punjab	16	11
Rajasthan	**4**	**8**	**Rajasthan**	**4**	**10**	**Rajasthan**	**5**	**8**	**Rajasthan**	**4**	**8**
Tamil Nadu	12	3	Tamil Nadu	12	6	Tamil Nadu	12	5	Tamil Nadu	11	5
Uttar Prades	**1**	**2**	**Uttar Prad**	**1**	**5**	Uttar Prade	1	2	**Uttar Prad**	**1**	**2**
West Benga	**10**	**5**	**West Ben**	**10**	**4**	West Beng	11	3	**West Ben**	**10**	**4**
Number of Matching States		**6**			**5**			**5**			**6**

Table No. 8(C)

Comparing the Ranking of Super Efficiency and GSDP of States for SCB TE

	2004-05	2004-05		2005-06	2005-06		2006-07	2006-07		2007-08	2007-08
	SE	GSDP	States	SE	GSDP	States	SE	GSDP	States	SE	GSDP
States	Rank	Rank		Rank	Rank		Rank	Rank		Rank	Rank
ndhra Prade	8	7	Andhra Pr	5	7	Andhra Pr	5	7	Andhra Pra	14	7
Bihar	12	14	Bihar	13	15	Bihar	15	15	Bihar	18	15
Delhi	5	11	Delhi	18	11	Delhi	18	11	Delhi	16	11
Goa	18	18	Goa	17	18	Goa	17	18	Goa	8	18
Gujarat	**3**	**5**	**Gujarat**	**6**	**4**	**Gujarat**	**4**	**4**	**Gujarat**	**6**	**4**
Haryana	5	13	Haryana	7	12	Haryana	7	12	Haryana	8	13
Himachal Pra	5	17	Himachal P	7	17	Himachal P	7	17	Himachal P	8	17
Jammu & Ka	17	16	Jammu & K	15	16	Jammu & K	12	16	Jammu & K	12	16
Karnataka	14	6	Karnataka	12	6	Karnataka	14	6	Karnataka	11	6
Kerala	15	9	Kerala	14	9	Kerala	13	9	Kerala	17	9
Madhya Prad	13	10	Madhya Pr	11	10	Madhya Pr	11	10	Madhya Pr	15	10
Maharashtra	**2**	**1**	**Maharash**	**2**	**1**	**Maharash**	**2**	**1**	**Maharash**	**1**	**1**
Orissa	11	15	Orissa	4	14	Orissa	6	14	Orissa	5	14
Punjab	16	12	Punjab	16	13	Punjab	16	13	Punjab	7	12
Rajasthan	**4**	**8**	**Rajasthan**	**3**	**8**	**Rajasthan**	**3**	**8**	**Rajasthan**	**4**	**8**
Tamil Nadu	**9**	**3**	**Tamil Nad**	**9**	**3**	**Tamil Nad**	**9**	**3**	Tamil Nadu	13	3
Uttar Prades	**1**	**2**	**Uttar Prad**	**1**	**2**	**Uttar Prad**	**1**	**2**	**Uttar Prad**	**2**	**2**
West Benga	**10**	**4**	**West Ben**	**10**	**5**	**West Ben**	**10**	**5**	**West Ben**	**3**	**5**
Number of											
Matching States		**7**			**7**			**7**			**5**

Table No. 8(D)

Comparing the Ranking of Super Efficiency and GSDP of States for SCB TE

	2008-09	2008-09		2009-10	2009-10		2010-11	2010-11
	SE	GSDP	States	SE	GSDP	States	SE	GSDP
States	Rank	Rank		Rank	Rank		Rank	Rank
Andhra Prad	**5**	**7**	**Andhra**	**9**	**7**	**Andhra Pr**	**3**	**8**
Bihar	16	15	Bihar	14	15	Bihar	15	14
Delhi	18	11	Delhi	3	12	Delhi	18	12
Goa	17	18	Goa	3	18	Goa	5	18
Gujarat	**4**	**4**	**Gujarat**	**10**	**4**	**Gujarat**	**8**	**4**
Haryana	10	12	Haryana	17	11	Haryana	5	11
Himachal Pra	8	17	Himachal	13	17	Himachal P	5	17
Jammu & Ka	12	16	J& K	8	16	Jammu & K	14	16
Karnataka	14	6	**Karnataka**	**5**	**6**	Karnataka	16	6
Kerala	13	9	Kerala	11	9	Kerala	17	9
Madhya Pra	**7**	**10**	Madhya	15	10	Madhya Pr	13	10
Maharashtra	**1**	**1**	**Maharash**	**1**	**1**	**Maharash**	**1**	**1**
Orissa	11	14	Orissa	16	14	Orissa	10	15
Punjab	15	13	Punjab	12	13	Punjab	12	13
Rajasthan	**3**	**8**	Rajasthan	18	8	**Rajasthan**	**2**	**7**
Tamil Nadu	**9**	**3**	**TamilNad**	**7**	**3**	**Tamil Nad**	**9**	**3**
Uttar Prades	**6**	**2**	**UttarPrad**	**2**	**2**	Uttar Prad	11	2
West Benga	**2**	**5**	**WestBeng**	**6**	**5**	**West Ben**	**4**	**5**
Number of								
Matching States		**8**			**7**			**6**

9.Conclusions

Looking at the technical efficiency state-wise period wise as seen from table no. **6**, Maharashtra and Rajasthan are the best performers. Uttar Pradesh, Gujarat, Haryana, Himachal Pradesh, Andhra Pradesh, and West Bengal are the states with moderate improvement in technical efficiency scores from the first period to the third period. Punjab and Tamil Nadu show a marginal improvement in technical efficiency scores from the first period to the third period. Madhya Pradesh, Jammu & Kashmir, Bihar, Delhi, Goa, Karnataka, Kerala**,** and Orissa depict a decline in technical efficiency score from the first period to the third period.

Further, the comparison between super efficiency and gross state domestic product depicts that Uttar Pradesh, Maharashtra, Gujarat, Rajasthan, Andhra Pradesh, and West Bengal are matching the ranks for a longer duration for the study period. This indicates that the states have been able to capitalize on the banking reform process much better than the other states.

10. Limitations of the Study and Scope of Further Research

The effect of banking reforms varies in different states based on their adoption time and implementation period and exposure of banks to the agriculture sector, industry sector service sector and socio-economic sector. This study does not focus on the effect of banking reforms on the movement of non-performing assets (NPA) regionally as well as the digitalization of banking processes regionally. Hence, it may be considered for further research.

Another outlook for the future study could be to evaluate the performance of Indian banks regionally by taking into account loan commitments, securitization, and derivatives with a larger set of the data sample.

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