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RESEARCH ARTICLE

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ANALYSIS OF COST EFFICIENCY UNSCHEDULED COMMERCIAL BANKS IN INDIA

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ABSTRACT

Before evaluating the outcomes, it winds up appropriate to investigate different parts of efficiency idea utilized in the present section. Efficiency is measured as the change of given inputs into most extreme feasible yields at any rate cost. Efficiency as a measure of execution might be identified with the destinations of the associations, for example, expansion of generation, amplification of income and minimization of expense. It tends to be evaluated as scale, extension, specialized and cost efficiency. Scale efficiency considers connection between the extent of DMU and its expense. The ideal size of the activities of a DMU is the place the expense is the most reduced. Extension efficiency is the connection between numerous item blend of the DMU and the expense.

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INTRODUCTION

The TE of any monetary foundation like a bank is its capacity to change numerous assets into different money related administrations .Then again, if the bank neglects to create numerous yields from their constrained and significant assets and works beneath the generation wilderness, it is viewed as actually wasteful. The TE is a critical measure of money related execution of the DMUs It is likewise significant that the connection between number of DMUs and the quantity of inputs and yields is administered by some standard guideline. The three thumb rules are (a) the quantity of DMUs is required to be bigger than the result of the quantity of inputs and yields so as to separate viably among effective and wasteful DMUs; (b) the example size of the information ought to be something like a few times bigger than the total of the quantity of inputs and yields; (c) the decision of number of inputs and yields and as for this, there is no explicit principle or strategy for the determination of inputs and yields. The investigation ought to regularly begin with a comprehensive rundown of number of

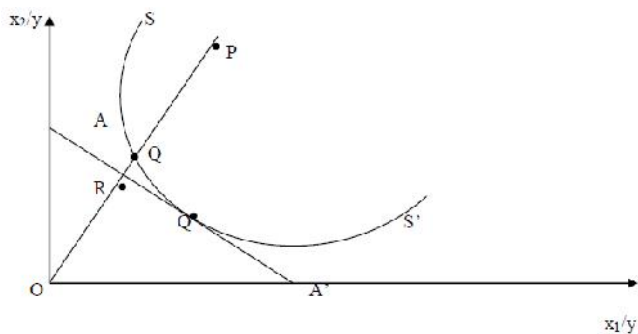
inputs and yields that are viewed as important for the examination. Be that as it may, diverse screening techniques have been done so as to lessen the numbers which are sensible to direct the examination (Coelli et al., 1998; Ramunathan, 2003; Ram Mohan and Ray, 2004; Kumar and Gulati, 2010). The measures for efficiency in DEA approach can be additionally isolated into input and yield oriented measures. The input oriented measure clarifies about the corresponding decrease in inputs without modifying the dimension of yields, and yet, there can be relative extension of yield without adjusting the inputs. In this manner, such cases can be considered in yield oriented measure.

INPUT ORIENTED MEASURE

To clarify this measure an outline incorporating DMU with two inputs 'x1' and 'x2' and single yield 'yah's been thought about with a presumption of CRS (which proposes innovation to be spoken to utilizing the unit is-quant). As there is no estimation for completely effective DMU by and by, consequently, the present model considers bend SS' as the is-quant of completely productive DMU that has been assessed from the example of DMUs.

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Be that as it may, using input, the DMU can deliver unit of yield characterized at point P. The specialized inefficiency of that DMU could be spoken to by separation QP. Numerically, this can be composed as $QP/OP \times 100$, which implies the rate by which inputs can be diminished to accomplish actually effective creation.



Source:

Figure 1.1. Cost Efficiency and its Components

Therefore, if

Technical Efficiency (TE_i) = QP/OP

Then,

Technical Inefficiency = $1 - QP/OP$,

Where, is input- oriented approach and the value of QP/OP equals to 1 means fully technical efficient. In addition to this if the price of inputs is also know and represented by the iso-cost line AA' then

Allocative Efficiency (AE_i) = OR/OQ

Thus, RQ is the proportional reduction in the cost if the firm needs to operate at the allocatively and technically efficient point and technically efficient point Q . Therefore,

Economic or Cost Efficiency (EE or CE) = OR/OP

or EE_i = Technical Efficiency \times Allocative Efficiency = $(QP/OP) \times (OR/OQ)$ $EE_i = OR/OP$

The relationship among these efficiency measures will incorporate slack into the allocative efficiency measures. This will give legitimization to the nearness of any improper input blend. Be that as it may, to test the essentialness of distinction in different types of efficiency measures crosswise over various bank gatherings, Kruskal-Wallis test is utilized. The suspicions of CRS are proper just when every one of the organizations or DMUs are working at the ideal scale level. The conditions for defective challenge, as, money related limitations, ecological imperatives, and so on may make issues for the DMUs. In this way, to come over this block, Banker recommended an augmentation demonstrate for CRS-DEA that thinks about the VRS presumptions. The CRS-DEA show expresses that expansion in the inputs will result the equivalent proportionate increment in the yield however in the event that DMUs don't work at ideal scale utilizing CRS for such DMUs will give TE scores influenced by SE. Consequently, the present investigation utilized VRS model to empty the SE impacts. It is to be kept into thought that the efficiency scores measured with the assistance of various models are especially touchy to the selection of inputs and yields made in evaluating the scores. Subsequently, the determination of inputs and yields made in evaluating the outcomes must be made

cautiously. Along these lines, so as to pick fitting blend of inputs and yields, the present examination drew closer with affectability investigation for eight Models. It is further worth referencing here that the blends of inputs and yields referenced in the present undertaking are generally utilized in the writing and have been considered by writers in various economies to measure the execution of keeping money area. In the wake of playing out the affectability examination show 2 that consolidates three yields (Other Income, Investments, Earning Advances/Performing Loan Assets) and four inputs (Number of Employees, Deposits, Fixed Assets, Equity) has been considered as the most favored case. In this way, the decision of input and yield factors is additionally fitting based on unfair intensity of the model in the present commitment. The yield variable, in particular, Other Income will be pay from reeling sheet exercises, while Investment incorporates the speculation made by banks crosswise over various activities and Earning Advances incorporate the advances short non-performing resources. Then again, quantities of representatives working in the banks, stores (time and request), settled resources and value (add up to capital + stores and excess) have been fused as the inputs.

COST EFFICIENCY MEASURES

Table 1.1 outlines the patterns of cost efficiency (in general efficiency) and its parts, specifically, specialized and allocative efficiencies of SCBs in India at a total dimension amid the post-deregulation period. Table 1.1 presents year-wise mean appropriation of cost, specialized and allocative efficiency scores of SCBs in India crosswise over different bank gatherings. From the assessment of the Table 1.1, it has been seen that there are recognizable varieties over the dimension of cost efficiency for SCBs in India. The dimension of CE differs from 48.3 percent in 2011 to 50.0 percent amid 2014-15. Subsequently, the Indian keeping money division seems to lie far from the productive cost boondocks. It has been, further, seen that the on a normal cost efficiency (inefficiency) of SCBs is 51.7 percent (48.3 percent), which ensnares that on a normal, banks in the example time of the investigation could have created a similar dimension of yield utilizing just 51.3 percent of assets really utilized, on the off chance that they were delivering on proficient boondocks than their present area.

The between gathering investigation uncovers that the dimension of cost efficiency (inefficiency) ranges from 41.8 percent (68.3 percent) to 67.4 percent (32.6 percent) for open part banks (PSBs), 39.3 percent (61.7 percent) to 57.7 percent (43.3 percent) for private area banks (PrSBs) and 44.4 percent (54.6 percent) to 79.6 percent (20.4 percent) for remote division banks (FSBs). In addition, the normal cost efficiency in the example time frame for PSBs gives off an impression of being 48.4 percent, PrSBs 47.9 percent and for FSBs 61.5 percent. In this manner, it has turned out to be clear that FSBs are moderately performing superior to their partners. Despite what might be expected, PSBs and PrSBs are for the most part failing to meet expectations and develop to lie far from the cost effective boondocks. These outcomes unmistakably delineates that over the period FSBs seems all around ok able than the banks working at the local market in the nation. These examples in FSBs are seen because of their more prominent access to know-how, innovation and lower cost of assets than local banks in India. Albeit, working in a comparable business condition, they display variety in cost efficiency level because

Table 1.1: Mean Cost, Technical and Allocative Efficiency of Scheduled Commercial Banks in India

Year		CE				ALL			PSBs	TE		PrSBs			FSBs			AE		
	ALL	PSB	PrSB	FSB	OTE	PTE	SE	OTE	PTE	SE	OTE	PTE	SE	OTE	PTE	SE	ALL	PSB	PrSB	FSB
1994-95	0.483	0.412	0.413	0.693	0.814	0.879	0.925	0.773	0.828	0.933	0.745	0.849	0.877	0.898	0.948	0.947	0.56	0.499	0.486	0.745
1995-96	0.678	0.674	0.577	0.796	0.871	0.903	0.964	0.899	0.917	0.98	0.778	0.835	0.931	0.895	0.922	0.97	0.759	0.735	0.691	0.864
1996-97	0.603	0.508	0.577	0.788	0.867	0.89	0.974	0.879	0.899	0.978	0.803	0.85	0.945	0.876	0.882	0.994	0.685	0.565	0.676	0.893
1997-98	0.553	0.483	0.531	0.688	0.888	0.899	0.987	0.906	0.912	0.994	0.85	0.876	0.97	0.862	0.868	0.993	0.623	0.53	0.606	0.793
1998-99	0.57	0.497	0.533	0.728	0.823	0.833	0.986	0.81	0.82	0.988	0.764	0.783	0.976	0.85	0.855	0.994	0.696	0.607	0.681	0.851
1999-00	0.417	0.418	0.403	0.444	0.823	0.841	0.978	0.805	0.817	0.986	0.771	0.786	0.981	0.835	0.867	0.963	0.415	0.38	0.377	0.512
2000-01	0.449	0.478	0.408	0.605	0.811	0.833	0.969	0.777	0.803	0.967	0.759	0.793	0.957	0.848	0.863	0.983	0.548	0.495	0.488	0.702
2001-02	0.501	0.447	0.46	0.629	0.892	0.906	0.984	0.873	0.89	0.981	0.892	0.906	0.985	0.878	0.891	0.986	0.562	0.504	0.511	0.71
2002-03	0.427	0.4	0.393	0.502	0.895	0.907	0.985	0.895	0.908	0.985	0.9	0.912	0.987	0.835	0.849	0.983	0.483	0.44	0.438	0.598
2003-04	0.515	0.468	0.468	0.641	0.879	0.891	0.986	0.878	0.888	0.989	0.843	0.859	0.981	0.883	0.894	0.987	0.584	0.527	0.544	0.717
2004-05	0.487	0.438	0.467	0.584	0.823	0.837	0.983	0.843	0.862	0.978	0.746	0.752	0.991	0.83	0.847	0.981	0.591	0.508	0.62	0.689
2005-06	0.503	0.464	0.492	0.57	0.795	0.841	0.944	0.825	0.869	0.948	0.737	0.813	0.907	0.753	0.779	0.966	0.61	0.534	0.606	0.732
2006-07	0.528	0.501	0.513	0.583	0.77	0.825	0.93	0.776	0.833	0.931	0.688	0.78	0.882	0.758	0.786	0.964	0.658	0.602	0.657	0.741
2007-08	0.557	0.524	0.532	0.63	0.733	0.816	0.897	0.702	0.802	0.877	0.618	0.747	0.828	0.819	0.841	0.974	0.699	0.654	0.712	0.749
2008-09	0.52	0.497	0.515	0.556	0.741	0.797	0.929	0.78	0.819	0.952	0.629	0.732	0.859	0.726	0.765	0.95	0.67	0.607	0.704	0.726
2009-10	0.581	0.542	0.557	0.663	0.828	0.87	0.953	0.865	0.89	0.972	0.748	0.82	0.912	0.809	0.848	0.954	0.678	0.608	0.679	0.783
2010-11	0.473	0.425	0.471	0.555	0.455	0.801	0.562	0.712	0.705	0.729	0.654	0.722	0.71	0.789	0.8	0.701	0.514	0.602	0.546	0.618
2011-12	0.49	0.499	0.43	0.504	0.432	0.751	0.565	0.679	0.68	0.709	0.677	0.767	0.708	0.789	0.802	0.703	0.539	0.523	0.445	0.697
2012-13	0.573	0.565	0.479	0.743	0.885	0.926	0.957	0.892	0.932	0.956	0.843	0.912	0.924	0.886	0.909	0.975	0.623	0.575	0.523	0.818
2013-14	0.5	0.514	0.438	0.548	0.876	0.918	0.954	0.887	0.926	0.958	0.843	0.922	0.915	0.825	0.865	0.955	0.553	0.555	0.475	0.633
Average	0.517	0.484	0.479	0.615	0.782	0.857	0.91	0.82	0.847	0.936	0.76	0.818	0.907	0.831	0.853	0.942	0.597	0.547	0.564	0.723

Hypothesis Testing

Kruskal Wallis test		CE	TE	AE
Public Sector Banks vs Private Sector Banks	(H0: Distribution Public= Distribution Private)	3.169	(0.008) R	6.013 (0.014) R
Private Sector Banks vs Foreign Sector Banks	(H0: Distribution Private= Distribution Foreign)	12.558	(0.000) R	8.787 (0.052) R
Public Sector Banks vs Foreign Sector Banks	(H0: Distribution Foreign= Distribution Public)	12.672	(0.000) R	7.144 (0.004) R

Note: (i) CE, TE and AE stands for cost, technical and allocative efficiencies. (ii) PSB, PrSB and FSB stands for public, private and foreign sector banks (iii) R represents rejection of null hypothesis. (iv) Figures in braces represent p-values. (v) OTE, PTE and SE stands for overall technical efficiency, pure technical efficiency and scale efficiencies.

Table 1.2 Percentage Distribution of Cost Efficiency

Year / Range	0 CE<	0.20 CE	0.40 C	0.60 C	0.80 CE	NOCEB
1994-95	3(4.80)	19(30.60)	21(33.90)	8(12.90)	3(4.80)	8(12.90)
1995-96	0(0.00)	0(0.00)	21(33.90)	28(45.20)	3(4.80)	10(16.10)
1996-97	0(0.00)	4(6.50)	31(50.00)	16(25.80)	2(3.20)	9(14.50)
1997-98	0(0.00)	6(9.70)	42(25.80)	3(4.80)	4(6.50)	7(11.30)
1998-99	0(0.00)	4(6.50)	37(59.68)	10(16.10)	2(3.20)	9(14.50)
1999-00	4(6.50)	41(66.12)	5(8.10)	0(0.00)	0(0.00)	8(12.90)
2000-01	1(1.60)	27(43.55)	23(37.09)	3(4.80)	2(3.20)	6(9.70)
2001-02	1(1.60)	5(8.10)	42(25.80)	4(6.50)	2(3.20)	8(12.90)
2002-03	1(1.60)	31(50.00)	23(37.09)	2(3.20)	0(0.00)	6(9.70)
2003-04	1(1.60)	4(6.50)	46(74.2)	3(4.80)	4(6.50)	5(8.10)
2004-05	1(1.60)	10(16.10)	39(62.90)	7(11.30)	1(1.60)	5(8.10)
2005-06	0(0.00)	6(9.70)	47(75.80)	4(6.50)	1(1.60)	5(8.10)
2006-07	0(0.00)	4(6.50)	47(75.80)	3(4.80)	5(8.10)	4(6.50)
2007-08	0(0.00)	4(6.50)	47(75.80)	3(4.80)	3(4.80)	5(8.10)
2008-09	0(0.00)	6(9.70)	45(73.58)	7(11.30)	0(0.00)	5(8.10)
2009-10	0(0.00)	2(3.20)	45(72.58)	6(9.70)	1(1.60)	8(12.90)
2010-11	4(6.50)	27(43.55)	24(38.71)	2(3.20)	2(3.20)	4(6.50)
2011-12	2(3.20)	23(37.09)	32(51.61)	1(1.60)	1(1.60)	5(8.10)
2012-13	0(0.00)	7(11.30)	32(51.61)	6(9.70)	7(11.30)	11(17.74)
2013-14	1(1.60)	23(37.09)	20(32.25)	6(9.70)	4(6.50)	9(14.50)

Note: (i) CE stands for cost efficiency (ii) NOCEB represents number of cost efficient banks, the banks haing CE scores =1 are termed as efficient banks

Table 1.3. Percentage Distribution of Returns to Scale

Year>Returns to Scale	IRS	CRS	DRS	LCS's scale
1994-95	42	16	4	0.087
1995-96	31	21	10	0.244
1996-97	31	24	7	0.184
1997-98	31	26	5	0.139
1998-99	39	19	4	0.093
1999-00	33	21	8	0.195
2000-01	45	15	2	0.043
2001-02	30	23	9	0.231
2002-03	31	25	6	0.162
2003-04	36	17	9	0.200
2004-05	21	17	24	0.533
2005-06	41	14	7	0.146
2006-07	45	14	3	0.063
2007-08	47	11	4	0.078
2008-09	45	13	4	0.082
2009-10	39	18	5	0.114
2010-11	35	19	8	0.186
2011-12	48	8	6	0.111
2012-13	15	27	20	0.571
2013-14	14	31	17	0.548
Average	35(56.37)	19 (30.56)	8 (13.06)	0.200

of the distinctions in the administrative aptitudes and practices, nature of business, government support, innovation, nature of tasks, proprietorships, hierarchical structures and capacities, capital and resource soundness, and so on.

Along these lines, it has been suggested that there is significant space for the enhancement in the dimension of efficiency by the administration because of picking the inputs in cost proficient and profitable way in their everyday activities.

The outcomes additionally feature that open, private and remote part banks are working over the dimension of normal cost efficiency for the time of ten years, along these lines mirroring that the blend of development and decrease in the efficiency level after the post-deregulation period. Besides the investigation delineates that the time of upwards and descending pattern in the dimension of cost efficiency for open, private and outside area banks is same with special case to a few years in the present commitment. Besides, it tends to be presumed that banks (on a normal) can work at in general proficient cost wilderness by making the utilization of just 48.4 percent, 47.9 percent and 61.5 percent of their inputs to create a similar dimension of yields which are by and by utilized, in this way, demonstrating potential cost sparing of 51.6 percent for PSBs, 52.1 percent for PrSBs and 38.5 percent for FSBs, individually. When all is said in done, saving money area in India needs to work at by and large cost efficiency outskirts by making the utilization of 51.7 percent of their inputs just keeping the yield level consistent. Consequently, slow increment in dimension of CE has been found amid the commencement of changes pursued by decay after and from that point, slight enhancements have been knowledgeable about the terminal years. It uncovers that banks in India (up to some degree over the period) have attempted to get balanced with the progression arrangement, improved challenge and prudential controls executed for making the sound activity in the economy.

COMPONENTS OF COST EFFICIENCY

To measure the dependable segments of by and large inefficiency for SCBs in India over the timeframe, execution as far as two fundamentally unrelated segments, to be specific, specialized and a locative efficiency have been measured. These parts give a knowledge to encourage whether there exists wasteful administration functionalities or an off base blend of inputs given their individual costs. Table 1.1 presents the year-wise dissemination of TE and AE scores evaluated and found the middle value of crosswise over various proprietorships. This segment additionally gives and talks about the substance of specialized efficiency regarding generally specialized efficiency (OTE) and two fundamentally unrelated and non-added substance parts, in particular, PTE and SE. It is further to be remembered that the dimension of OTE and PTE catches under-use of inputs. In any case, contrasted with the OTE, dimension of PTE is without scale impacts. Accordingly, the dimension of efficiency measures examined as the segment of cost efficiency in type of PTE uncovers the execution of the board which is equipped for changing over the startle inputs into yields by methods for creation.

For OTE (which turns out be in every case not exactly or equivalent to PTE scores), the dimension of inefficiency for the banks are reflected by both specialized and scale inefficiency. Subsequently, PTE scores equivalent to 1 mirrors that the bank is actually proficient, yet may not be scale productive. The dimension of measure as far as SE demonstrates whether the banks work at the ideal and most profitable scale estimate (MPSS) or not. The Table 1.1 speaks to that on a normal, the SCBs displayed mean OTE scores of 78.2 percent, in this way, proposing the saving money industry in India all in all have performed great in the change of inputs into yields and acquiring misuse of about 21.8 percent of inputs.

This suggests for SCBs in India, on a normal 21.8 percent decline in inputs is plausible with the present dimension of innovation and unaltered yield amounts for the investigation time frame thought about. While moving towards various possessions, it very well may be construed from the outcomes that over the period, PSBs have displayed mean OTE scores of 82.0 percent alongwith PrSBs 76.0 percent and FSBs 83.1 percent, consequently, proposing that managing an account part in India have performed moderately well in its fundamental working of change of inputs into yields with an input misuse of 18.0 percent, 24.0 percent and 16.9 percent, individually. The outcomes affirm that FSBs are performing superior to their partners as far as OTE scores. The purposes for these outcomes can be because of the sound resource structure of FSBs and their activities in various economies of the world. In the interim, these banks have room schedule-wise to time kept up their dimension of exercises and tasks in the Indian keeping money division moreover. Likewise, it is additionally noticed that throughout the years, normal OTE scores for PSBs is lower than the FSBs pursued by PrSBs, which developed as the minimum entertainer. The likely explanation for these outcomes is the nearness of extensive branch organizing, tasks in the residential field and the nonstop mergers and securing of banks over the timeframe. What's more, a slow decrease has been seen amid 2011-12 and 2012-13 in the investigation.

It may be obviously because of the aggressive weights, money related consideration push, need division NPAs bookkeeping 58 percent and 23 percent for PSBs and Press, separately (Reserve Bank of India, 2012) and change in the financing costs as an outcome of monetary log jam looked by the world after 2008-09. These stuns and changes may have brought about banks to assimilate more limits and cause higher input cost related with particular branches conclusion and incorporation into single framework. As referenced before, DEA licenses to disintegrate OTE into PTE and SE measures. This deterioration permits a knowledge for estimating the principle wellspring of specialized wasteful aspects. From Table 1.1, it has been encountered that TE measure as far as PTE for all SCBs in India over the period is 85.7 percent show the wastage of inputs by 14.3 percent underway process while working off the effective creation boondocks. While evaluating the gathering impacts wilderness over the period, the normal PTE for PSBs, PrSBs and FSBs are individually, 84.7 percent, 81.8 percent and 85.3 percent. In light of these figures, PSBs, PrSBs and FSBs, on a normal, have made over the work of inputs by 15.3 percent, 18.2 percent and 14.7 percent, individually. Then again, normal SE of 91.0 percent portrays the wasteful scale measure task by 9.0 percent. In a similar setting, normal SE of 93.6 percent, 90.7 percent and 94.2 percent for PSBs, PrSBs and FSBs are likewise evaluated from the examination. These figures support wasteful task at beneficial scale estimate by 6.4 percent, 9.3 percent and 5.8 percent, individually. Henceforth, results pass on that the wellspring of specialized inefficiency in Indian saving money industry exudes principally because of administrative underperformance in controlling the misuse of inputs underway process pursued by inability to work at ideal scale estimate. As it were, the deterioration of OTE into PTE and SE scores outline that the dimension of PTE on a normal is moderately better when contrasted with the OTE. It is intriguing to layout that banks from 1995-96 to 2012-13 are generally working at the profitable scale estimate. Be that as it may, then again, directors of various banks in different

possessions are not ready to influence the utilization of restricted assets in the ideal extent to aside from PSBs. The reason might be the abnormal state of focus in the Indian managing an account part with contribution of around 90 percent of the residential activities in the Indian saving money industry. Despite the fact that, the hole between the specialized efficiency and inefficiency is extensive for all the SCBs and diverse proprietorship gatherings, yet this hole limits with the progression of time in the event of both PTE and SE (aside from 2011-12 and 2012-13). These holes fundamentally exhibit that FSBs outflank PSBs and PrSBs in all efficiency measures over the timeframe. The upgrades in the OTE might be because of the presentation of new changed approaches started by the legislature of India that further have presented solid challenge in the Indian managing an account industry. Then again, the likely purpose behind inefficiency might be generally because of improper administration rehearses and particularly amid most recent couple of years, it is because of the financial emergency and continuous changes in bank rates and different approaches which upgraded the dimension of rivalry among the banks amid these years. These progressions prompted the slow decrease in total store (funds) and venture level from 19.9 percent, 18.7 percent amid 2008-09 to 13.5 percent and 15.7 percent amid 2011-12 (as support in the prior part). In this manner, being the mandatory segments of the execution of keeping money segment in India, these markers have prompted the wasteful execution of banks in the course of the most recent couple of years and consequently, showed up as one of hotspots for decrease in development rate of India economy. Further, the examination featured that the normal dimension of AE for SCBs is 59.7 percent, consequently, reflecting 40.3 percent more creation cost by picking off base blend of inputs (given their costs in India). Thus, results demonstrate that in the wake of starting money related changes, the normal efficiency of banks in India for AE has enlisted a few enhancements yet a slow and reasonable decay has been seen in the measure of efficiency till 2005-06.

A short time later, slight enhancement has been delineated in the efficiency scores for the all SCBs and diverse proprietorship gatherings. On the comparable lines, normal AE measure for PSBs is 54.7 percent, for PrSBs is 56.4 percent and for FSB is 72.3 percent. Subsequently, moving towards the extending of post-deregulation period, it has been seen that normal a locative inefficiency for PSBs, PrSBs and FSBs is 45.3 percent, 43.6 percent and 27.7 percent separately, which affirms nearness of hotspot for the general inefficiency of banks by attempted wrong input blend over the timeframe. These figures show that on a normal, a locative inefficiency scores among the banks in their separate possessions over the time of study are the prevailing wellspring of inefficiency. These outcomes show that the presentation of budgetary changes amid 1991-92 and 1997-98 along with mechanical changes amid 2002-03 for SCBs in India, there appears harmoniousness with advancement, exhaustive market structure and improved challenge level. In this manner, it has been seen that the wellspring of inefficiency was principally the a locative inefficiency as opposed to the specialized inefficiency. Consequently, managing an account segment in India needs to acquire most extreme yield from a given arrangement of inputs, and utilize the inputs in ideal extents, given their individual costs and the creation innovation so as to work on the effective boondocks. Clearly, there exists huge space for huge cost sparing if Indian banks use and allot their profitable and significant inputs all the more productively.

While assessing productive wilderness for the banks over the timeframe, it winds up relevant to check whether to pool the information in like manner benchmark or not. By and by, there is no suitable strategy to check such disseminations. In this manner to test whether the distinction in the normal cost efficiency and its segments among banks are measurably huge or not, different parametric and non-parametric test are referenced and utilized in the writing. As the present investigation pursued non-parametric methodology that does not accept a typical circulation not at all like the comparable to parametric tests, subsequently, the examination connected non-parametric test for testing the speculation. There are distinctive non-parametric tests material as per the example circulation. It incorporates one example test.

The present study consists of sample that belongs to three ownership groups and to test difference in the cost efficiency and its components, either Mann-Whitney test or Kruskal-Wallis test has been employed in the existing literature. On the basis empirical evidences in literature, Kruskal-Wallis test seems to be more helpful in measuring and testing the level of differences in average efficiency of banks in India. As can be seen from the Table 1.1, that the difference in the distribution for public sector bank vs private sector bank, private vs foreign sector banks as well as foreign vs public sector banks are found to be statistically significant at 5 per cent level of significance level, thereby depicting the rejection of null hypothesis of no differences in average cost efficiency levels between the banking sectors in India. The results also confirms that public, private and foreign sector banks uses different technology to operate in the competitive environment and also make use of respective frontiers so as to set up an benchmark for efficient utilization of inputs. Therefore, it can be concluded that the difference in the distribution of technical efficiency scores and allocative efficiency scores of different banks groups has been statistically significant. This indicates that public, private and foreign banks uses different production technology while operating at production frontier, thus, the aforementioned findings suggest that there exists an efficiency level difference across different bank groups over the period of time.

To ascertain more elaborate picture about the trends of CE, the Table 1.2 provides year-wise frequency and percentage distribution of CE scores across SCBs. The range has been segregated into six different categories (i) $0 < CE < 0.20$, (ii) $0.20 < CE < 0.40$, (iii) $0.40 < CE < 0.60$, (iv) $0.60 < CE < 0.80$, (v) $0.80 < CE < 1.00$ and (vi) number of cost efficient banks (if $CE = 1.00$) for different banks over the years. The perusal of the Table 1.2 reveals that there has been wide variation across CE scores for Indian banking industry. The figures confirm that most of the banks fall under the efficiency scores ranging from 40 per cent to 80 per cent. It is further noted down from the Table 1.2 that banks over the period of time are unable to make use of optimal resources, thereby, making operations far from the efficient frontier. Moreover, as the level of efficiency mostly ranges from 40.0 per cent to 60 per cent, thus, there is an adequate room for the banking industry in India to cut back their operational cost while maintaining the level of output intact. The results from the Table 1.2 also confirms that 12.90 per cent of the scheduled commercial banks are cost efficient banks during the year 1994-95 albert with continuous fluctuation over the period of time. However, slight recovery has been observed during the terminal years with 9 (14.50 per cent) cost efficient banks formulating an

efficient production frontier. Hence, it is worth mentioning from the discussion that the economic reforms measures undertaken by government of India have tried to reduce efficiency gaps across ownership groups, but a lot can be done in future. The banks need to improve their level of cost efficiency by appropriate allocation of productive resources. The order of ownership groups in terms of CE appears as FSBs> PSBs>PrSBs (similar results are also corroborated by Ramathilagam and Preethi, 2010; Kalluru and Bhat, 2009; Rezvanian et al., 2008; Das et al., 2005)

CONCLUSION

The estimation of cost efficiency and its segments has been completed for the Indian saving money division amid the post-deregulation period. The outcomes have further, been tried by various speculation expecting that the execution of banks has enhanced amid the post-deregulation period. It tends to be inferred that banks, on a normal, can work at the generally speaking proficient cost wilderness by making the utilization of just 48.4 percent, 47.9 percent and 61.5 percent of their inputs to create a similar dimension of yields in this manner, demonstrating potential cost sparing of 51.6 percent for PSBs, 52.1 percent for PrSBs and 38.5 percent for FSBs, separately. It is disclosed from the outcomes that banks in India over the timeframe have endeavored to get balanced with the progression strategy, improved challenge and prudential directions actualized for making the sound task in the economy.

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