

**ANALYSIS OF INDIAN BANKS' EFFECTIVENESS IN PROMOTING FINANCIAL
INCLUSION FROM THE VANTAGE POINT OF A DEVELOPING MARKET**

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Abstract

The purpose of this research is to use data envelopment analysis to compare how well 25 different banks carry out their duties under the PMJDY program. The seven-year study will have its genesis in the 2014–2015 academic year and run through the 2020–2021 academic year. The data shows that public sector banks were more successful than private banks in achieving PMJDY's goal of expanding financial inclusion. The PMJDY plan has not made much headway since most banks have performed poorly, as measured by the scheme's projection and deficit of bank outputs. This is shown by the fact that only a fraction of banks have really been successful. Overall, the results of the research point to a need for underperforming financial institutions to increase their efforts to reach out to those with lower incomes. Consistent evaluation of effectiveness would aid in the efficient identification and execution of the essential actions to overcome the hurdles to reaching the objectives associated to financial inclusion. As a result, the efficiency of the currently underperforming institutions would improve. Financial firms also have a moral obligation to carry out effectively the policies and programs imposed by the state.

Keywords : Bank efficiency, PMJDY, Technical efficiency, Analysis of Data envelopment

Introduction

Having a bank account is essential, but not sufficient, for financial inclusion. Financial inclusion occurs when all people in a nation have access to the banking system. The mere fact of having a bank account does not guarantee that it will be used effectively. Authorities in India are paying attention to the issue of financial inclusion for three main reasons. The primary goal is to help those with lower incomes start saving money. Third, to close the gaps and leaks that allow for waste, fraud, and abuse in government assistance programs. As a result, in 2014, the government of India launched the PMJDY project to increase people's access to financial services. The scheme's huge success may be attributed to its zero-balance checking accounts and low verification requirements. The plan also called for the installation of ATMs and bank branches in hitherto unbanked rural areas (Shetty and Deokar, 2014). Access to financial services throughout India is crucial to the success of this plan, thus it is imperative that the banking industry be efficient in its operations and makes optimum use of the resources. The success of a country's economy depends on the quality of its baked goods. Economic growth is good because it helps the government meet the demands of its citizens.

Review of Literature

The PMJDY is "a big bang action plan" that will provide a voice to the very last person in the very last row of the Indian economy while also putting an end to financial untouchability, poverty, and slowing down progress. Those at the bottom of the economic pyramid, Agarwal (2018) argues, will benefit the most from the strategy. Despite PMJDY's success in expanding access to bank accounts, new findings from Banerjee and Gupta (2019) suggest that this may not always translate into greater financial inclusion. This is because just a tiny fraction of account holders really put their money to good use. Many low-income households still seek out loans from money lenders and SHGs. The insurance and overdraft advantages available under the program were mostly unknown to low-income families. Furthermore, Singh et al. (2021) found that underuse of financial services increased after the PMJDY program was launched. Dr. Naveen Prasadula (2023) suggested allocating additional funds to financial education initiatives and appropriate savings products as ways to increase the PMJDY's impact. Some banks' deployments of the program have resulted in quick growth, while others' have been more stable or even stagnant (Titus, 2018). As a result, it's clear that research on the efficiency and cost differences across banks is warranted.

Research Gap

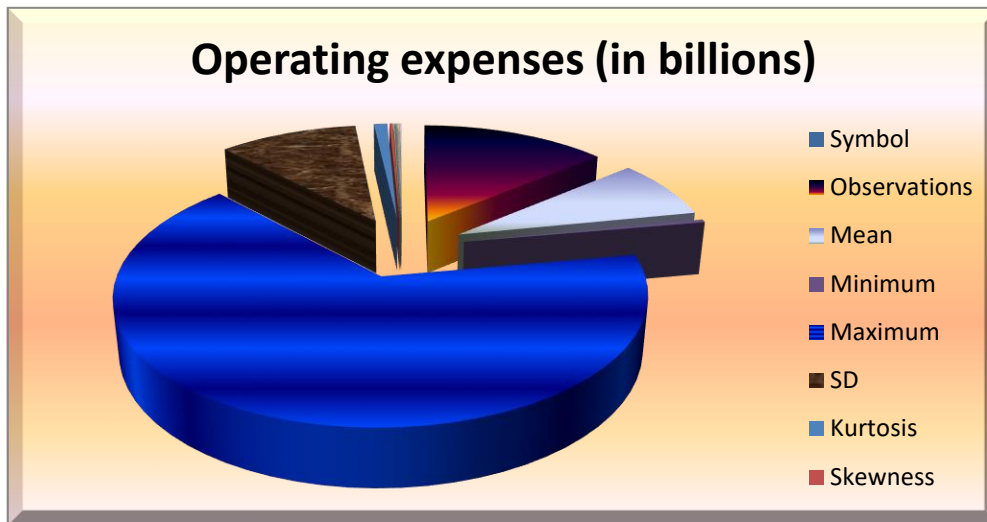
As the availability of bank branches and bank accounts has increased, the PMJDY program has been able to gradually extend into new regions. But studies on how long-lastingly inclusive banks can be haven't even started. There has been a serious paucity of study on how successful Indian banks have been in increasing poor people's access to banking services despite the PMJDY plan's existence for seven years. The efficacy of banks in broadening access to financial services is also the subject of very few empirical research. When evaluating banks' effectiveness just on the basis of their financial performance, these output criteria might be helpful. Therefore, it is clear from the literature study that although the current research have included a diverse range of input-output factors, the vast majority have disregarded the financial inclusion criteria. Banks play a key role in society by facilitating access to financial services for everyone. Consequently, the capacity of a bank to increase financial inclusion should be considered while evaluating its efficacy. Examining how well Indian banks promoted financial inclusion through the PMJDY project was the major focus of this study.

Data Analysis

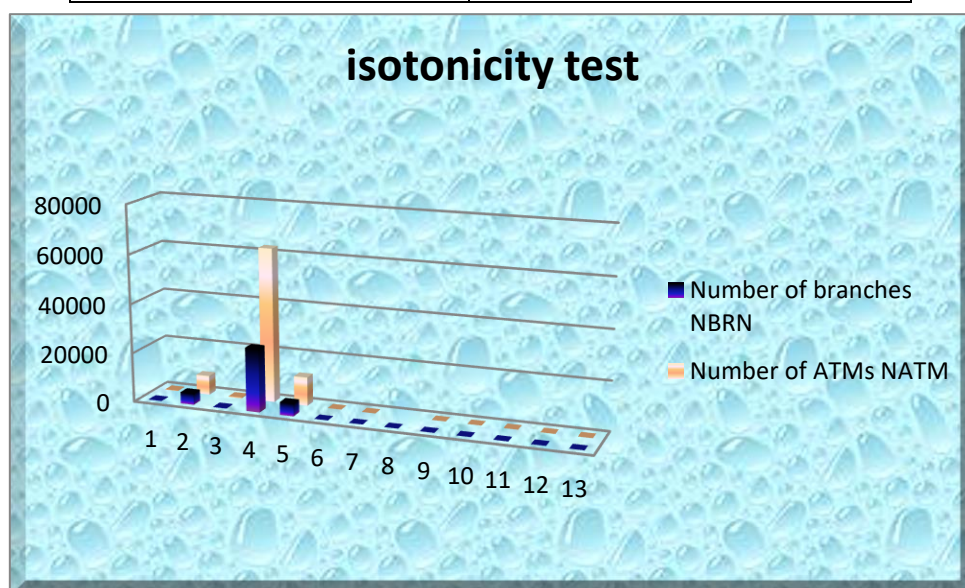
Twenty-five different financial institutions were taken into account for this analysis of India's banking system's effectiveness. All 12 PSBs and 13 PVBs in the nation at present are represented in the sample. The information was gathered from publicly accessible sources, including the Reserve Bank of India's database, the PMJDY scheme's performance reports, and the annual reports of the sample banks. In order to determine the amount of efficiency attained by the banks (in expanding access to banking services), the sample was gathered over the course of seven years, beginning in 2014 and continuing through 2020 and 2021.

Summarized data and 'isotonicity' analysis may be found in Table 1. Author's Mathematical Work

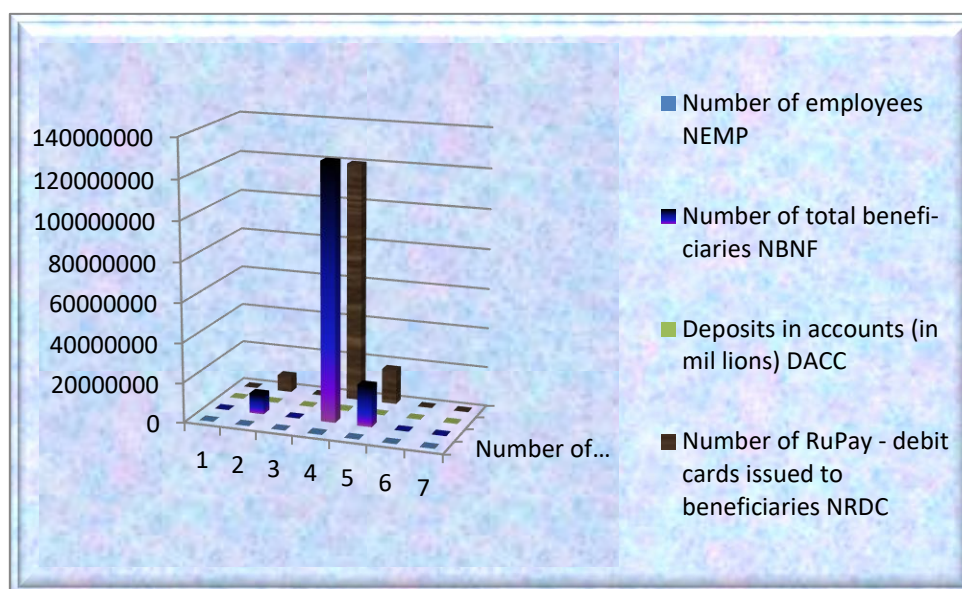
“	Operating expenses (in billions)	Number of branches
Symbol	OEXP	NBRN
Observations	175	175
Mean	99.968	4664.006
Minimum	5.079	193
Maximum	826.522	25,840
SD	130.431	5255.964
Kurtosis	12.695	5.934
Skewness	3.267	2.288
OEXP	1	
NBRN	0.895	1
NATM	0.965	0.924
NEMP	0.957	0.948
NBNF	0.882	0.88
DACC	0.758	0.764
NRDC	0.881	0.861



Number of branches	Number of ATMs
NBRN	NATM
175	175
4664.006	7855.149
193	341
25,840	62,617
5255.964	11,664.42
5.934	12.288
2.288	3.358
1	
0.924	1
0.948	0.971
0.88	0.869
0.764	0.687
0.861	0.858



Number of employees	Number of total beneficiaries	Deposits in accounts (in millions)	Number of RuPay
			- debit cards issued to beneficiaries
NEMP	NBNF	DACC	NRDC
175	175	175	175
48,197.98	10,019,886.71	25,972.07	8,113,199.55
3465	11,109	5.875	0
284,633	128,517,334	368,343.99	120,159,412
54,841.74	20,605,200.26	53,427.45	17,419,994.10
7.906	16.596	14.685	20.366
2.576	3.857	3.515	4.174



After confirming that the isotonicity assumptions hold true, the research moves on to calculating the efficiency ratings for the DMUs (PSBs and PVBs) using the CCR and BCC models shown in Tables 2 and 3, respectively. From 2014-2015 to 2020-2021, the DMUs' OTE scores are shown in Table 2. The last column displays the average OTE rating achieved by the DMUs. The table shows that BARB (0.956), BKID (0.982), PUNB (0.977), SBIN (0.991), and UCBA (0.998) all have very high mean efficiency ratings for PSBs. Scores for the PVBs are often lower than for other groups. The total technical efficiency first dropped in 2015–2016, as shown by the year-wise mean in the final row of Table 2, and has since stayed more or less stable. Similar results are shown in Fig. 1.

The DMUs' PTE results are shown in Table 3 of the research. Since SBIN, UCBA, CIUB, and RATN all have PTE mean ratings of 1, they are the most technically efficient banks overall. Tables 2 and 3 confirm the excellent efficiency of SBIN and UCBA, among other DMUs. Again, the average PTE score over time has followed a pattern consistent with that shown in the average OTE score over time (Table 2). There was a dip in DMU efficiency in 2015–2016, followed by a minor improvement in 2016–2017 and a plateau in subsequent years (Figure 2).

Table 4 also shows the order of DMUs based on their efficiency ratings and consistency coefficient (the AM/SD ratio). According to Table 4, UCBA came out on top when the rank was calculated using the AM values, followed by SBIN and BKID. DMU, UTIB reached a settlement

for the empty slot at the end. The CC value-based rankings also showed that UCBA, SBIN, and BKID were the top, second, and third places, while YESB was at the very bottom. When all the points were added together, UCBA came out on top, followed by SBIN, BKID, and YESB.

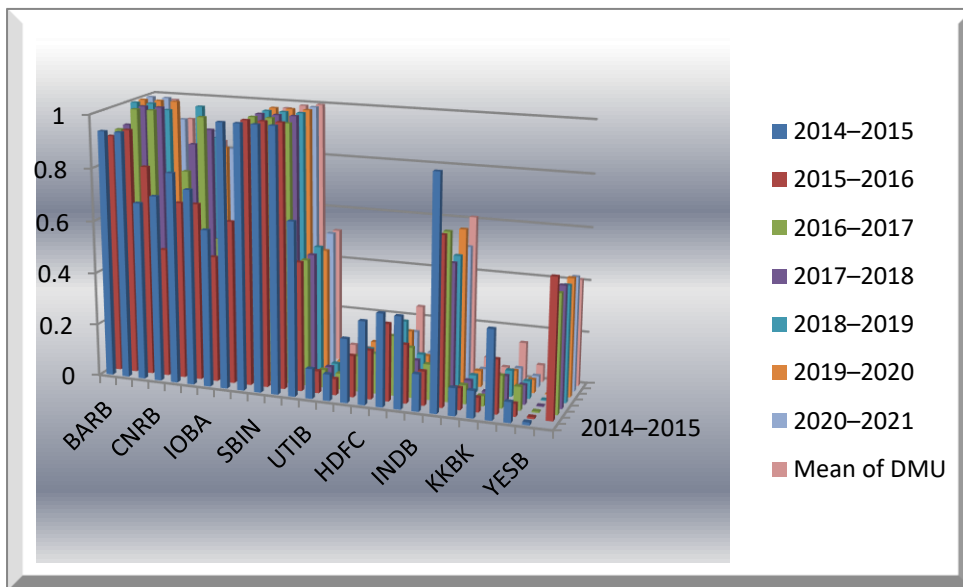
Table 5 provides a yearly summary of information about the most effective financial institutions (in terms of OTE). According to the data in the table, none of the PVBs performed well during the course of the investigation. Only around 3–6 PSB banks were proven to be effective per year. Figures 1 and 2 depict an overall efficiency trend that shows PVBs' performance to be much worse than that of PSBs.

Next, we examined the average OTE and PTE scores of the PSBs and PVBs to see whether there is a statistically significant difference between the two groups (Table 6). Welch t test was used since sample sizes and group variances were not comparable. The t-statistics in Table 6 are significantly different from zero at the 1% level, as can be shown. This means that H0 cannot be correct. This suggests that there is a notable difference between the PSBs' and PVBs' degrees of efficiency.

In the output-oriented method, the ends (or outputs) reached by the DMUs are emphasized. Therefore, Table 7 measures projections and production shortfalls for each DMU to determine whether the Indian banks are effective in maximizing outputs. If there is no production deficiency, then the DMU is efficient (Marschall and Flessa, 2011). The data in Table 7 shows that just 5 (or 25%) of the 25 DMUs (data mining units) are successful.

DMUs	2014–2015	2015–2016	2016–2017	2017–2018	2018–2019	2019–2020	2020–2021	Mean of DMU
BARB	0.937	0.907	0.92	0.926	1	1	1	0.956
BKID	0.937	0.934	1	1	1	1	1	0.982
MAHB	0.677	0.8	1	1	0.979	1	0.921	0.911
CNRB	0.708	0.49	0.393	0.369	0.344	0.358	0.342	0.429
CBIN	0.8	0.674	0.779	0.869	1	0.831	0.882	0.833
IDIB	0.743	0.675	0.987	0.928	0.885	0.836	0.819	0.839
IOBA	0.598	0.48	0.533	0.48	0.494	0.473	0.416	0.496
PSIB	1	0.62	0.469	0.389	0.473	0.462	0.294	0.53
PUNB	1	1	1	1	1	1	0.839	0.977
SBIN	1	1	1	1	1	1	0.937	0.991
UCBA	1	1	0.985	1	1	1	1	0.998
UBIN	0.659	0.491	0.482	0.485	0.499	0.469	0.519	0.515
UTIB	0.114	0.084	0.068	0.058	0.05	0.04	0.033	0.064
CIUB	0.101	0.062	0.061	0.053	0.047	0.042	0.033	0.057
FDRL	0.243	0.158	0.136	0.12	0.123	0.13	0.114	0.146
HDFC	0.316	0.186	0.153	0.134	0.156	0.152	0.114	0.173

ICIC	0.352	0.294	0.228	0.247	0.245	0.187	0.165	0.245
IBKL	0.348	0.223	0.191	0.122	0.124	0.098	0.089	0.171
INDB	0.141	0.13	0.135	0.088	0.077	0.054	0.039	0.095
JAKA	0.88	0.64	0.636	0.504	0.514	0.597	0.515	0.612
KVBL	0.105	0.083	0.072	0.067	0.066	0.062	0.048	0.072
KKBK	0.103	0.055	0.039	0.033	0.026	0.021	0.016	0.042
RATN	0.337	0.206	0.124	0.101	0.1	0.078	0.067	0.145
SIBL	0.078	0.049	0.09	0.074	0.067	0.051	0.044	0.065
YESB	0.011	0.007	0.005	0.003	0.003	0.003	0.002	0.005
Mean of the year		0.527	0.45	0.459	0.442	0.451	0.438	0.41



Effective algorithms include (BARB, BKID, PUNB, SBIN, and UCBA). In terms of effectiveness, only PSBs exist. The study's previous conclusions, namely, that the PVBs are ineffective, have been confirmed by these new data.

Name of banks and their symbols

Sr. No.	DMUs	Symbol
1	Bank of Baroda	BARB
2	Bank of India	BKID
3	Bank of Maharashtra	MAHB
4	Canara Bank	CNRB
5	Central Bank of India	CBIN
6	Indian Bank	IDIB
7	Indian Overseas Bank	IOBA
8	Punjab & Sind Bank	PSIB
9	Punjab National Bank	PUNB
10	State Bank of India	SBIN
11	UCO Bank	UCBA
12	Union Bank of India	UBIN
13	Axis Bank Ltd	UTIB
14	City Union Bank Ltd	CIUB
15	Federal Bank Ltd	FDRL
16	HDFC Bank Ltd	HDFC
17	ICICI Bank Ltd	ICIC
18	IDBI Bank Ltd	IBKL
19	IndusInd Bank Ltd	INDB
20	Jammu & Kashmir Bank Ltd	JAKA
21	Karur Vysya Bank	KVBL
22	Kotak Mahindra Bank Ltd	KKBK
23	RBL Bank Ltd	RATN
24	South Indian Bank Ltd	SIBL
25	Yes Bank Ltd	YESB

provided insight into how well India's financial institutions are doing at "banking the unbanked," a goal of the Indian government. Evidence from the study points to a long road ahead for Indian financial institutions. According to the data we gathered, only a small fraction of banks really contributed to the goals of the PMJDY program. The research team behind this study set out to examine a trifecta of aims. The primary purpose of the research was to chart the progression of Indian PSB and PVB efficiency from the PMJDY program's commencement. The results show that both PSBs and PVBs had a dip in technical efficiency in the outset, but that PSBs have since recovered somewhat and kept their performance relatively consistent. However, PVB efficiency did not rise but fell much worse in the years that followed. Because of their focus on making a profit, private banks are often hesitant to become involved in government social programs like PMJDY. Nonetheless, the decline is not precipitous, suggesting that private banks have made efforts to maintain a stable performance. Overall, the performance curve for all DMUs decreased in 2015–2016, increased slightly in 2016–2017, and has been essentially flat ever since. The initial drop might have been caused by the banks' inability to effectively communicate the PMJDY scheme's advantages to the intended audience. Banks may have received lower efficiency rankings because of PMJDY account deposits being fewer than expected due to the weak banking habits of the target population (Agarwala et al. 2022).

The study's efficiency ratings also aided in doing a comparison analysis, which found that PSBs and PVBs had noticeably different efficiency levels. When compared to PVBs, PSBs have shown to be more effective in their promotion of financial inclusion. Possible explanation: PSBs are more likely to grow in under-served communities with high rates of financial exclusion.

DMUs	2021–2022	Mean of DMU
BARB	1	0.996
BKID	1	0.986
MAHB	1	0.964

CNRB	0.35	0.46
CBIN	0.91	0.848
IDIB	0.844	0.884
IOBA	0.684	0.613
PSIB	1	1
PUNB	0.86	0.98
SBIN	1	1
UCBA	1	1
UBIN	0.521	0.537
UTIB	0.14	0.14
CIUB	1	1
FDRL	0.597	0.545
HDFC	0.185	0.223
ICIC	0.239	0.294
IBKL	0.454	0.421
INDB	0.296	0.297
JAKA	1	0.961
KVBL	0.845	0.715
KKBK	0.289	0.247
RATN	1	1
SIBL	0.908	0.786
YESB	0.442	0.325
Mean of the year	0.704	0.703

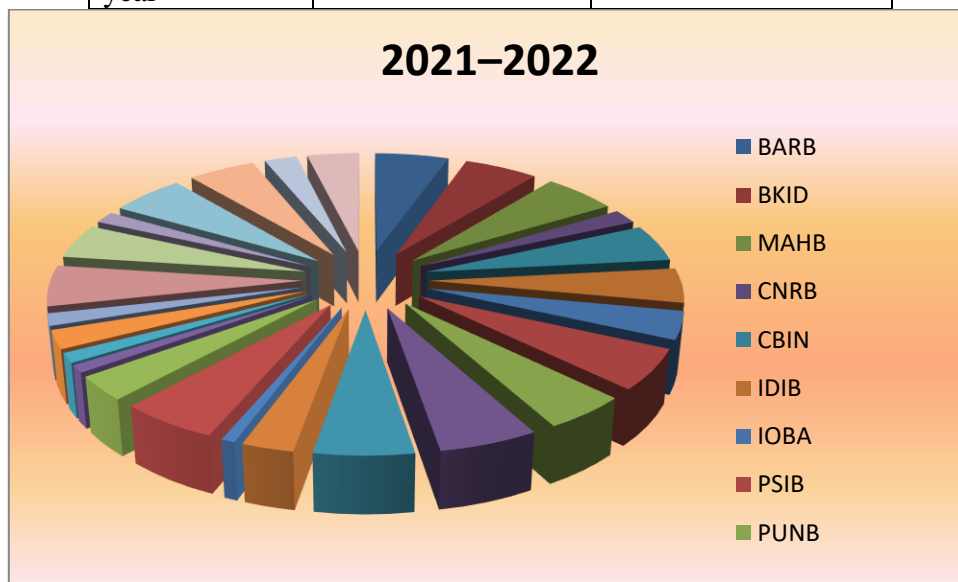
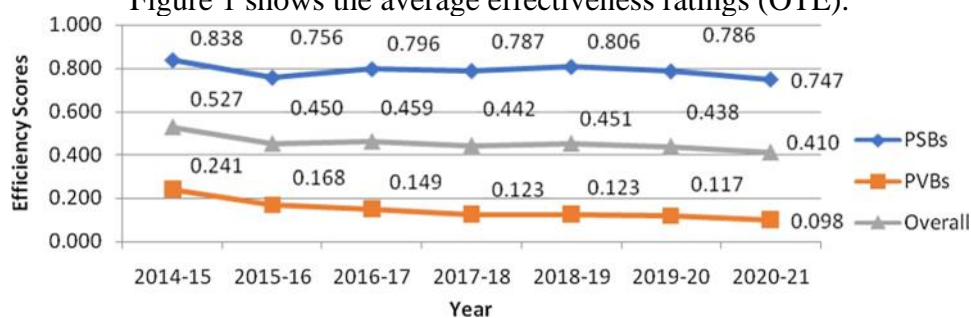


Figure 1 shows the average effectiveness ratings (OTE).



PTE (Percent Time Effective) Averages, Fig. Authors' Notes: Research Team

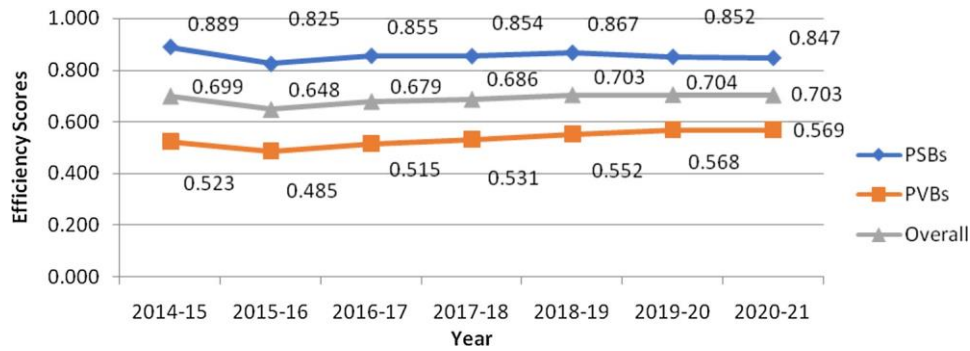


Table 4: Ordering metrics include consistency coefficient and efficiency ratings.

DMUs	AM (BCC & CCR)	SD	CC	Rank based on AM	Rank based on CC	Sum of rank	Final efficiency rank
BARB	0.976	0.036	26.851	5	4	9	4.5
BKID	0.984	0.027	36.376	3	3	6	3
MAHB	0.937	0.103	9.085	6	6	12	6
CNRB	0.444	0.154	2.971	15	14	29	13
CBIN	0.841	0.097	8.67	8	8	16	8
IDIB	0.862	0.096	8.957	7	7	14	7
IOBA	0.555	0.083	6.646	12	10	22	10
PSIB	0.765	0.293	2.64	10	15	25	12
PUNB	0.979	0.055	17.865	4	5	9	4.5
SBIN	0.996	0.017	59.185	2	2	4	2
UCBA	0.999	0.004	253.009	1	1	2	1
UBIN	0.526	0.076	6.93	14	9	23	11
UTIB	0.102	0.044	2.296	25	16	41	23
CIUB	0.529	0.489	1.08	13	24	37	18.5
FDRL	0.346	0.213	1.619	18	19	37	18.5
HDFC	0.198	0.063	3.124	21	13	34	16
ICIC	0.279	0.059	4.56	20	11	31	14
IBKL	0.296	0.145	2.039	19	17	36	17
INDB	0.199	0.104	1.805	22	18	40	22

	6	9					
JAKA	0.78 7	0.20 5	3.83	9	12	21	9
KVBL	0.39 4	0.34 4	1.144	17	22	39	20.5
KKBK	0.14 4	0.11 2	1.285	24	20	44	24
RATN	0.57 2	0.44 9	1.276	11	21	32	15
SIBL	0.42 5	0.38 7	1.099	16	23	39	20.5
YESB	0.16 5	0.17 2	0.955	23	25	48	25"

Mean (AM), Variance (SD), and Coherence Coefficient (CC)

When compared, PVBs are more likely to construct branches in affluent areas and shy away from economically depressed areas where the majority of population have low incomes. The poor performance of the PVBs is now clear. Looking at the demand-side financial inclusion projection and deficit has shown that PVBs need to control the deficit in order to increase efficiency. In particular the very deficient banking institutions. According to the forecast and shortfall analysis, just five banks had a zero production deficit, indicating that they were the most successful in expanding access to banking services.

Conclusion

India's goal of expanding access to banking services inspired the creation of the PMJDY initiative. The success or failure of the project may be largely attributed to public and private banks. The results show the same thing, showing that PSBs are better at achieving the Government's goal of financial inclusion than PVBs are. Most PVBs are motivated primarily by financial gain. As a result, initiatives like the PMJDY scheme are being implemented, and flaws are being identified and addressed. As a result, our understanding of the competitiveness of the Indian banking sector will be enhanced. The effect of the COVID-19 pandemic on financial institutions' productivity may be considered in future research. A more complete picture of Indian banks' effectiveness might be painted by comparing their performance before and after the epidemic. It is crucial that all banks actively engage in programs like PMJDY, particularly for individuals at the bottom of the income pyramid (Agarwala et al. 2022). In addition, the ability of the banking sector is tested at exceptional periods like the COVID-19 epidemic. Maintaining a steady flow of financial services into the economy is dependent on a reliable banking system. Making bank accounts more easily available to the underprivileged does not seem to be enough. Policies should be developed to promote its implementation. Based on the results, we conclude that a lack of knowledge and experience with formal banking is likely to blame for people's reluctance to utilize it. Awareness of the advantages of PMJDY accounts should be increased, and the learning process should be sped up (Singh and Ghosh 2021). The measures implemented after an expansion of trade would do much to stimulate the economy. To encourage more people to use their accounts, policymakers may provide discounts after a certain number of first transactions. Financial goods like health or other general insurance might be offered as incentives to savers who are consistent account holders. Existing insurance plans (related to PMJDY) might also have their coverage amounts enhanced. To lessen the opportunity costs of utilizing a bank account, a global network of access points might be put up. The study's findings have implications for promoting greater financial inclusion. These might be investigated in next research. Therefore, we will have a better grasp of the levels of competition in the Indian banking market. Future studies may investigate how the COVID-19 epidemic has impacted the efficiency of banking organizations. By comparing how they fared before and after the pandemic, we may get a clearer understanding of the Indian banks' efficiency.

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