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Use of Data Driven Index for Profitability Measure of Indian Public Sector Banks

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ABSTRACT: A strong and sound financial system is a necessary precondition for accelerated growth of an economy. In a country like India, the banking system is the heart of the financial system since they infuse money in the system resulting in additional purchasing power. The rate of financial intermediation, capital formation and rate of economic growth are inextricably linked. Higher the rate of financial intermediation, higher the rate of capital formation and higher will be the economic growth rate and vice-versa. An organized, efficient, well-planned and viable banking system is, therefore, a demanded concomitant for development of a country. But all these requirements can be fulfilled while banks are sustaining a healthy bottom-line. In this backdrop, the present paper strives to suggest a data driven index to assess the profitability performance of Indian PSBs during the study period.

KEYWORDS: financial sector, public sector banks, data-driven index, profitability, bottom-line, growth.

I. INTRODUCTION

Financial system of an economy is composed of financial institutions, financial markets, financial instruments, financial services and money. A strong and sound financial system is a necessary precondition for accelerated growth rate of an economy. The rate of financial intermediation, capital formation and rate of economic growth are inextricably linked. Higher the rate of financial intermediation, higher the rate of capital formation and higher will be the economic growth rate and vice-versa. An organized, efficient, well-planned and viable banking system is a demanded concomitant for development of a country. In fact, banks play a pivotal role in undertaking the development as well as socio-economic transformation efforts through channelising funds for productive purposes and supporting financial and economic policies of the government.

In a country like India, the banking system is the heart of the financial structure since they infuse money in the system resulting in additional purchasing power. Indian banks have changed their business model from class banking to mass banking with a view to mobilising more funds form surplus units to deficit spending units. About two-third of financial resources are mobilized by the active role of commercial banks (Kheechee, 2011). By playing an all-round role as catalyst of development commercial banks act as the back-bone of economic growth and prosperity of the country. Particularly, the role of public sector banks (PSBs) is more commanding in the banking sector in India. In order to play their all-pervasive role, commercial banks need to sustain themselves, maintain or improve credit quality and grow at faster rates with efficient use of their resources. But all these needs to be achieved while sustaining a healthy bottom-line (Diwan and Mehta, 2013). In the present paper an attempt has been made to evaluate the profitability performance of selected PSBs during the study period with the help of a composite index derived by using a data-driven approach. The remainder of the paper is set out as follows. In the next section the previous literature in this field is briefly reviewed and objectives of the study are stated. The methodology adopted in the study is discussed in section 3. The results and discussion are presented in section 4. In section 5 concluding remarks are made.

II. LITERATURE REVIEW

A good number of researchers have conducted research work on the profitability of banks throughout the world. A brief review of some of the selective studies are presented as follows. Devanand and Prasad (2015) made a study on the performance of Indian public sector banks. The study used the technique of ratio analysis in assessing performance of banks. The researchers observed that in the post-reform period banks have shifted their focus towards increasing the productivity, profitability and improving operational efficiency. Spathis and Doumpos (2002), in their study, focused on the effectiveness of the Greek banks on the basis of size of assets of the bank. They used a multi-criteria methodology to classify Greek banks on the basis of banks' profitability and efficiency between small and large banks measured through return and operation factors of banks. Balasubramanin (2007) argued that private sector banks play a significant role in development of India. In the post-liberalization period, the banking sector has undergone major changes. RBI has permitted new banks to be opened in the private sector as per the recommendations

of the Narasimham Committee. Athma, Rao and Ibrahim (2018) conducted a study to identify the determinants of Indian banks' profitability. The study used random effects model to assess the impact of macroeconomic and bank-specific factors based on the CAMEL framework. Barua et al. (2017) found a negative link between profitability and market concentration. They also observed that capitalization, credit risk, leverage and ownership structure are the most important elements of the viability of Indian banks. Ozili (2017) investigated the determinants of African bank profitability. Using the static and dynamic panel estimation techniques, the author concluded that bank size, total regulatory capital and loan loss provisions are major elements of the ROA of listed banks in comparison to non-listed banks. Bansal, et al. (2018) made an effort to identify the major factors affecting profitability of Indian banking sector by using panel regression. The study observed that credit deposit ratio has negative influence on profitability whereas capital adequacy and advance to loan ratio have positive impact on the profitability of banks in India.

In most of the existing studies, researchers have made efforts to analyse profitability of banks with the help of ratio analysis and statistical tools such as mean, standard deviation, coefficient of variation and so on. Several studies have also been made to identify the significant factors responsible for profitability of banks by using panel data regression analysis with its different variants such fixed effects model, random effects model and with static and dynamic panel estimation techniques. But no study has been found to prescribe any index for assessing profitability performance of banks in India by following a data driven approach. Keeping this gap in consideration the researcher, therefore, in this study has made an effort to derived an index by following the data driven approach for measuring profitability of Indian PSBs.

III. METHODOLOGY OF THE STUDY

A. Sample, study period, data sources and variables

The present study is based on twenty-six PSBs in India which were in operation throughout the entire study period 1999-2000 to the year 2016-17. In effect, we have constructed a panel data set consisting of 468 observations for each variable under study. The study period covers the initial two decades of the new millennium and the implementation stage of the recommendation of the Narasimham Committee-II report as well. The data used in the present study have mainly been collected from secondary sources, i.e., the Report on Trend and Progress of Banking in India and the Statistical Tables Relating to Banks in India as available in the official website of the RBI, and the Capitaline Corporate Database, Capital Market Publishers (I) Ltd., Mumbai as available in the Department of Commerce, The University of Burdwan, India. In the present study, we have selected four indicators of profitability for deriving the composite profitability index, viz., return on assets, net profit to total funds ratio, return on equity and inverse of cost of deposits ratio. The definitions of these variables are as follows.

Return on assets = (Net profit/Total assets) x100

Net profit to total funds = (Net profit/ Total funds) x100

Return on equity = (Net profit available for ordinary shareholders/ Net worth) x100

Inverse of cost of deposits = (Interest paid on deposits/ Deposits) x100

B. Method of constructing the index

In order to construct a composite score or index in respect of profitability performance of banks an equal weighted approach, i.e., assigning equal weight to every variable indicating profitability, could be applied. But, in the present study, instead of using equal weight, a data driven approach (Factor Analysis) has been used for determining the individual weight of a variable for the purpose of ascertaining the composite index in respect of profitability of banks. The present indexing technique follows the similar procedure as discussed in the Handbook On Constructing Composite Indicators: Methodology And User Guide jointly prepared by the OECD (the Statistics Directorate and the Directorate for Science, Technology and Industry) and the Econometrics and Applied Statistics Unit of the Joint Research Centre (JRC) of the European Commission in Ispra, Italy. The methodology used for arriving weights can be presented in the following steps:

1. Step-I: Standardisation of data

At first, each individual variable under consideration in the panel data set has been converted into its standardised form. Standardised form implies dividing the difference between the variable value and its arithmetic mean with the standard deviation of the variable. This standardised panel data set has been employed in the factor analysis for ascertaining the weights of individual variables reflecting profitability.

2. Step-II: Checking suitability of data set

In order to judge the suitability of the data set for factor analysis, we have used two statistical measures:

- Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy: The KMO measure of sampling adequacy is a measure that indicates the proportion of variance in the variables that might be caused by the underlying factors. A high value of it, closer to1, generally indicates that a factor analysis may be useful with the data. If the value is less than 0.50, the results of the factor analysis probably would not be very useful.

- Bartlett's Test of Sphericity: The Bartlett's test of sphericity tests the hypothesis that correlation matrix of the data set is an identity matrix which indicates that the variables are unrelated and hence not suitable for factor analysis. A smaller P-value (less than 0.05) indicates that a factor analysis may be useful with the data.

Decision rule: In the present study, we have considered the data set as suitable for factor analysis if any one of the above conditions is satisfied.

3. Step-III: Eigenvalue and variance contribution rate of factors

After passing through the test conditions in Step-2, eigenvalue and variance contribution rate of each factor have been retrieved with principal component method. A factor with an eigenvalue greater than or equal to unity or very close to unity (say, more than 0.90) and variance contribution rate greater than or equal to 10% has been retained for further analysis. This step stipulates the maximum number of factors to be considered for further data analysis.

4. Step-IV: Factor rotation and assigning variable with factor

It is a standard practice to perform rotation so as to enhance the interpretability of the results. Rotation does not affect the sum of eigenvalues but by changing the axes, it will alter the eigenvalues of particular factors and will change the factor loadings (association between variable and factor score). The idea in transforming the factorial axes is to obtain a "simpler structure" of the factors (ideally a structure in which each indicator is loaded exclusively on one of the retained factors). There are various rotational strategies proposed in literature. The most common rotation method is the "varimax rotation" (OECD Handbook and JRC, UC). In this paper also, we rerun the analysis for extracting the desired number of common factors with rotated component matrix by using varimax rotation technique. A variable is considered associated with a particular common factor with which it has the highest loading.

5. Step-V: Factor weight

In this step, we take square of the rotated factor loadings, and its sum total with respect to each factor, which indicates variance explained by the factor in the factor solution. Thereafter, the summation of squared factor loadings (rotated) of a factor is expressed as a proportion of the grand total of squared loadings of all the factors. This proportional value of a factors represents the factor weight (fw) of a variable if the variable shares highest rotated factor loadings with that particular factor, ignoring the negative sign, if any.

6. Step-VI: Domain weight

After obtaining factor weight (*fw*) for a variable, the domain weight of a variable has been derived in this step. Here, we convert the squared rotated factor loadings of a factor in such a way that sum of loadings of the factor equals to unity, called scaled to unity sum. Now, this scaled factor loading of the corresponding factor with which a variable has been assigned to, is the domain weight (*dw*) of that variable.

7. Step-VII: Final weight

After obtaining the domain weight (*dw*) and the factor weight (*fw*) in respect of each variable, the weighted score of each variable has been ascertained by multiplying its domain weight with the associated common factor's weight. On the basis of this weighted score the weight of a particular variable has been ascertained by scaling the weighted score to sum of unity.

Symbolically,

Final weight $(Fw) = (dw \times fw)/ (\sum dw \times fw)$

8. Step-VIII: Composite index

After obtaining the final weights of the selected profitability indicators, the variable values in respect of each of the PSBs have been standardised (bank-wise); thereafter, the profitability index has been ascertained by summing up the product of standardised variable values with respective weights of the variables.

IV. RESULTS AND DISCUSSION

In Table 1, the KMO measure of sampling adequacy and the Bartlett's test of sphericity of the standardised panel data on the profitability variables of the selected Indian PSBs during the period under study have been presented. This table depicts that the KMO measure of sampling adequacy is 0.522 (i.e., more than 0.50) and the $\chi 2$ value of Bartlett's test of sphericity is 771.042; which is found to be statistically significant at the 0.01 level of significance. The net outcome derived from the analysis of KMO measure of sampling adequacy and Bartlett's test of sphericity indicates that the standardised panel data on profitability of the selected PSBs in India are suitable for performing factor analysis.

Table 2 depicts the initial eigenvalues, the percentage of total variance explained by a common factor and the cumulative percentage of explained variance. It is observed from this table that initial eigenvalues for the first two common factors are greater than 1. The eigenvalues for the rest of factors are lower than 1. Moreover, this table also shows that the individual variance contribution rates for the first two factors are more than 10% accumulating together a 76.16% of total variance in the original data. Therefore, the first two common factors have been retained for further analysis.

Table 1: KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	Bartlett's Test of Sphericity		
	Approx. Chi-Square	Degrees of Freedom	P-Value
0.522	771.042	6	0.000
Source: Author's own calculation.			

Table 2: Eigenvalues of the Factors and their Respective and Cumulative Percentage of Total Variance Explained

Factors	Initial Eigenvalues	Percentage	Cumulative Percentage
Factor 1	2.033	50.858	50.858
Factor 2	1.011	25.302	76.160
Factor 3	0.856	21.414	97.573
Factor 4	0.097	2.427	100.000
Extraction Method: Principal Component Analysis.			
Source: Author's own calculation.			

Table 3 shows the factor loadings of all the profitability variables under factors 1 and 2. As mentioned in the methodology section, with a view to enhancing the interpretability of the results and to minimize the number of variables that have a high loading on the different factors, the varimax rotation technique has been used. Table 4 depicts the rotated factor loadings of the selected profitability variables under each factor extracted. Factor loading (absolute value) in this table with bold face is higher among two loadings of a variable under two factors. Table 4 discloses that the rotated factor loadings of net profit to total funds ratio, return on equity and inverse of cost of deposits ratio are maximum under factor 1 whereas the same in respect of return on assets is higher under factor 2. The above results infer that net profit to total funds ratio, return on equity and inverse of cost of deposits ratio are described by factor 1, and return on assets is described by factor 2.

In order to obtain the weights of the latent factors under consideration each rotated factor loadings have been squared in Table 5. It is observed that the total variance explained by factor 1 is 2.031 and that by factor 2 is 1.016. The proportion of this explained variance of a factor indicates its weight (fw) in the solution. Table 5 discloses that the factor 1 has the weight of 0.666 while the weight of factor 2 is 0.334.

In Table 6, the squared rotated factor loadings have been scaled to unity sum in respect of each factor. The factor loadings in this table with bold faces (which is the corresponding cell with bold faces in Table 4) indicate the domain weight of the respective variable. It is observed from Table 6 that the domain weights (dw) of return on assets, net profit to total funds ratio, return on equity and inverse of cost of deposits ratio are 0.8237, 0.4519, 0.4305 and 0.1092 respectively.

After obtaining the domain weight and the factor weight, an attempt has been made in Table 7 to obtain the weight (Fw) of a particular variable for constructing the profitability index of the Indian PSBs under study. Table 7 discloses that the weights of return on assets, operating profit ratio, and return on equity are 0.29, 0.32 and 0.31 respectively while inverse of cost of deposits ratio captures the least weight of 0.08 for constructing the profitability index.

In Table 8 we have made an effort to derive the profitability index of all the banks under study for each year. The highlighted cells in this table indicates that the maximum or minimum index value with respect to each bank. The maximum and minimum index years and average profitability index of the banks under study have been presented in Table 9. It is observed from Table 9 that average profitability index of all the banks under study are negative. Indian Bank occupies the top most position

Table 3: Factor Loading of Extracted Factors

Profitability Indicators	Factor Loading	
	Factor 1	Factor 2
Return on Assets	0.175	0.905
Net Profit to Total Funds	0.957	0.011
Return on Equity	0.939	0.028
Inverse of Cost of Deposits	0.450	-0.434
Extraction Method: Principal Component Analysis. Two Factors extracted.		
Source: Author's own calculation.		

Table 4: Rotated Factor Loading of Extracted Factors

Profitability Indicators	Rotated Factor Loading	
	Factor 1	Factor 2
Return on Assets	0.131	**0.915**
Net Profit to Total Funds	**0.958**	0.059
Return on Equity	**0.935**	0.075
Inverse of Cost of Deposits	**0.471**	-0.412
Extraction Method: Principal Component Analysis. **Rotation Method:** Varimax with Kaiser Normalization. Rotation converged in 3 iterations.		
Source: Author's own calculation.		

in respect of average index whereas State Bank of Hyderabad and State Bank of Mysore jointly are placed in the worst position in respect of profitability index amongst others during the period under study. Table 9 also reveals that the 2004 was the golden year for PSBs in India because the maximum index year for almost all the banks excepting Indian Bank, Indian Overseas Bank, Punjab and Sind Bank, State Bank of India, and State Bank of Patiala. Another interesting finding that can be derived from Table 9 that profitability performance of most of the Indian PSBs was very poor during the last two years of the study period because presence of years 2016 and 2017 is the most in "min index year" column of Table 9.

Table 5: Square of Rotated Factor Loading of Extracted Factors

Profitability Indicators	**Rotated Factor Loading**	
	Factor 1	**Factor 2**
Return on Assets	0.017	0.837
Net Profit to Total Funds	0.918	0.003
Return on Equity	0.874	0.006
Inverse of Cost of Deposits	0.222	0.170
Explained Variance	**2.031**	**1.016**
Proportion of Variance	**0.666**	**0.334**
Source: Author's own calculation.		

Table 6: Square of Rotated Factor Loading Scaled to Unity Sum

Profitability Indicators	**Rotated Factor Loading**	
	Factor 1	**Factor 2**
Return on Assets	0.0084	**0.8237**
Net Profit to Total Funds	**0.4519**	0.0034
Return on Equity	**0.4305**	0.0055
Inverse of Cost of Deposits	**0.1092**	0.1673
Sum	**1**	**1**
Source: Author's own calculation.		

Table 7: Weights Assigned to Each Profitability Indicators of the PSBs in India

Profitability Indicators	**Domain Weight** (d_w)	**Factors Weight** (f_w)	**Weighted Score** $(d_w * f_w)$	**Final Weight** (F_w)
Return on Assets	0.8237	0.3340	0.2751	**0.29**
Net Profit to Total Funds	0.4519	0.6660	0.3010	**0.32**
Return on Equity	0.4305	0.6660	0.2867	**0.31**
Inverse of Cost of Deposits	0.1092	0.6660	0.0727	**0.08**
Source: Author's own calculation.				

V. CONCLUSION

The present work suggests a data-driven approach to arrive at an index for profitability performance of PSBs in India. It enumerates the entire procedure to compute a composite index in a step-by-step manner. By using the approach suggested in the study, the paper also computes the profitability indexes of all the selected banks during the entire study period. On the basis of the computed profitability index, it is found that the average index values for all the banks are negative. Moreover, the top bank in terms of profitability, as measured by average index, is Indian Bank whereas State Bank of Mysore and State Bank of Hyderabad are the worst performers amongst others.

Table 8: Profitability Index Computed Based on Final Weights of the Selected Variables

Sl. No.	**Public Sectors Banks**	**Years**								
		2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
1	Allahabad Bank	-1.13	-1.37	-0.81	-0.27	1.56	1.35	0.82	0.29	0.41
2	Andhra Bank	-0.33	-0.99	-0.1	1.33	1.67	1.47	0.24	0.13	-0.15
3	Bank of Baroda	-0.15	-0.84	-0.2	0.46	1.3	0.38	0	-0.05	0.02
4	Bank of India	-0.84	-0.63	0.32	1.14	1.3	-0.31	0.07	0.44	0.88
5	Bank of Maharashtra	0.12	-0.88	0.73	1.4	1.63	0.02	-1.25	0.48	0.32
6	Canara Bank	-0.69	-0.53	0.57	1.01	1.61	0.68	0.6	0.15	-0.22
7	Central Bank of India	-0.7	-0.69	-0.08	0.55	1.9	1.09	0.32	0.63	0.17
8	Corporation Bank of India	0.52	0.66	0.61	1.11	1.11	0.28	0.2	0.08	0.08
9	Dena Bank	-0.29	-1.74	-0.45	0.35	1.14	-0.04	0.21	0.54	0.74

10	IDBI Bank	0.67	0.34	0.28	0.72	1.51	-0.35	-0.26	-0.34	-0.26
11	Indian Bank	-1.98	-1.76	-1.05	-0.36	0.29	0.31	0.35	0.99	1.02
12	Indian Overseas Bank	-0.99	-0.63	0.05	0.58	1.07	1.22	1.1	0.82	0.83
13	Oriental Bank of Commerce	0.23	-0.32	0.6	1.17	1.97	1.34	0.27	-0.09	-0.66
14	Punjab and Sind Bank	-0.23	-0.89	-0.53	-0.23	-0.75	-1.03	0.49	1.13	1.45
15	Punjab National Bank	-0.66	-0.68	-0.28	0.64	1.14	0.38	0.13	0.2	0.14
16	State Bank of Bikaner and Jaipur	0.34	-0.53	0.66	0.84	2.35	0.46	-1.22	0.15	-0.46
17	State Bank of Hyderabad	0.08	-0.21	0.74	1.19	1.66	-0.59	0.42	0.36	-0.34
18	State Bank of India	-0.41	-1.54	-0.27	0.6	1.09	1.35	0.67	0.07	0.46
19	State Bank of Mysore	-0.33	-1.32	-0.14	1.12	1.59	1.49	0.94	0.46	0.29
20	State Bank of Patiala	1.46	0.3	0.63	0.81	1.08	0.27	-0.03	-0.02	-0.37
21	State Bank of Travancore	-0.62	-0.26	0.05	0.66	1.43	1.03	0.46	0.23	0.04
22	Syndicate Bank	-0.23	-0.4	-0.25	0.64	1.69	0.4	0.47	0.33	0.02
23	UCO Bank	-1.07	-1.13	-0.02	0.37	1.36	0.61	-0.13	-0.06	-0.22
24	Union Bank of India	-1.55	-1.28	-0.11	1.07	1.4	0.94	0.03	0.31	0.85
25	United Bank of India	-1.14	-1.1	-0.37	1.17	1.25	1.21	0.59	0.62	-0.04
26	Vijaya Bank	-0.76	-0.39	0.19	0.99	2.58	1.54	-0.16	0.44	-0.1
Public Sectors Bank Group (Average)		**-0.41**	**-0.72**	**0.03**	**0.73**	**1.38**	**0.59**	**0.2**	**0.32**	**0.19**

Source: Author's own calculation.

Note: Profitability Index = Return on Assets x 0.29 + Net Profit to Total Funds x 0.32 + Return on Equity x 0.31 + Inverse of Cost of Deposit x 0.08

Contd.

Table 8: Profitability Index Computed Based on Final Weights of the Selected Variables

Sl. No.	Public Sectors Banks	Years								
		2009	2010	2011	2012	2013	2014	2015	2016	2017
1	Allahabad Bank	0.19	0.72	0.64	0.5	-0.45	-0.41	-0.6	-1.44	-1.05
2	Andhra Bank	-0.17	0.45	0.46	0.06	-0.39	-1.34	-1.16	-1.18	-1.22
3	Bank of Baroda	0.5	0.62	0.94	0.66	-0.01	-0.34	-0.71	-2.55	-1.29
4	Bank of India	1.2	0.01	0.17	-0.04	-0.15	-0.36	-0.88	-2.32	-1.38
5	Bank of Maharashtra	0.2	-0.03	-0.57	0.05	0.47	-0.84	-0.63	-1.22	-1.88
6	Canara Bank	0.17	0.64	0.75	-0.22	-0.56	-0.85	-0.9	-2.21	-1.21
7	Central Bank of India	-0.11	0.39	0.54	-0.32	-0.08	-1.47	-0.47	-1.66	-1.7
8	Corporation Bank of India	0.21	0.31	0.24	-0.14	-0.45	-1.33	-1.4	-2.1	-1.36
9	Dena Bank	0.6	0.57	0.66	0.66	0.33	-0.61	-0.89	-1.78	-1.52
10	IDBI Bank	-0.38	-0.19	0.25	0.14	0.2	-0.14	-0.33	-1.86	-1.63
11	Indian Bank	0.9	1.06	0.99	0.59	0.1	-0.34	-0.46	-0.65	-0.34
12	Indian Overseas Bank	0.68	-0.32	0.14	-0.21	-0.56	-0.66	-1.15	-1.97	-1.79
13	Oriental Bank of Commerce	-0.4	-0.15	0.15	-0.6	-0.47	-0.6	-1.05	-1.38	-1.6
14	Punjab and Sind Bank	1.19	0.97	0.69	-0.13	-0.3	-0.58	-0.9	-0.33	-0.46
15	Punjab National Bank	0.61	0.88	0.81	0.42	-0.09	-0.57	-0.78	-2.28	-1.12
16	State Bank of Bikaner and Jaipur	-0.12	-0.25	-0.05	-0.05	-0.26	-0.65	-0.6	-0.61	-2.23
17	State Bank of Hyderabad	-0.43	0.05	0.72	0.29	-0.36	-1.34	-0.84	-1.42	-2.44
18	State Bank of India	0.6	-0.14	-0.15	0.55	0.18	-0.96	-0.7	-1.39	-1.29

19	State Bank of Mysore	-0.23	0.24	0.29	-0.64	-0.58	-1.13	-0.89	-1.15	-2.46
20	State Bank of Patiala	-0.35	-0.26	0.02	-0.13	-0.46	-0.75	-0.8	-1.4	-1.43
21	State Bank of Travancore	1.09	0.76	0.44	-0.59	-0.67	-1.43	-1.4	-1.22	-2.3
22	Syndicate Bank	-0.08	-0.4	0.29	0.25	0.4	-0.15	-0.51	-2.47	-1.36
23	UCO Bank	-0.09	0.44	0.59	0.27	-0.13	0.8	0.34	-1.94	-1.17
24	Union Bank of India	0.79	0.78	0.44	-0.03	-0.25	-1.01	-1.03	-1.36	-1.52
25	United Bank of India	-0.34	-0.2	0.45	0.47	0.02	-1.38	-0.16	-1.04	-0.43
26	Vijaya Bank	-0.45	-0.01	-0.14	-0.37	-0.56	-0.93	-0.95	-0.93	-0.64
Public Sectors Bank Group (Average)		**0.22**	**0.27**	**0.38**	**0.06**	**-0.19**	**-0.75**	**-0.76**	**-1.53**	**-1.42**
Source: Author's own calculation.										
Note: Profitability Index = Return on Assets x 0.29 + Net Profit to Total Funds x 0.32 + Return on Equity x 0.31 + Inverse of Cost of Deposit x 0.08										

Table 9: Average Profitability Index and Maximum and Minimum Profitability Index Year

Public Sector Banks	Max Index Year	Min Index Year	Average Profitability Index
Allahabad Bank	2004	2016	-0.06
Andhra Bank	2004	2014	-0.07
Bank of Baroda	2004	2016	-0.07
Bank of India	2004	2016	-0.08
Bank of Maharashtra	2004	2017	-0.10
Canara Bank	2004	2016	-0.07
Central Bank of India	2004	2017	-0.09
Corporation Bank of India	2003 & 2004	2016	-0.08
Dena Bank	2004	2016	-0.08
IDBI Bank	2004	2016	-0.09
Indian Bank	2010	2000	-0.02
Indian Overseas Bank	2005	2016	-0.10
Oriental Bank of Commerce	2004	2017	-0.09
Punjab and Sind Bank	2008	2005	-0.03
Punjab National Bank	2004	2016	-0.06
State Bank of Bikaner and Jaipur	2004	2017	-0.12
State Bank of Hyderabad	2004	2017	-0.14
State Bank of India	2005	2001	-0.07
State Bank of Mysore	2004	2017	-0.14
State Bank of Patiala	2000	2017	-0.08
State Bank of Travancore	2004	2017	-0.13
Syndicate Bank	2004	2016	-0.08
UCO Bank	2004	2016	-0.07
Union Bank of India	2004	2000	-0.08
United Bank of India	2004	2014	-0.02
Vijaya Bank	2004	2015	-0.04
Source: Author's own calculation.			

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