USING RATIO ANALYSIS AND DATA ENVELOPMENT MODEL TO EVALUATE THE PERFORMANCE OF PUBLIC SECTOR BANKS IN INDIA

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Abstract: **In the present paper we will examine the financial performance of public sector banks in India. Their performance will be evaluated by the means of two financial tools, ratio analysis and data envelopment analysis (DEA). Various ratios like liquidity ratios, efficiency ratios, profitability ratios and solvency ratios will be evaluated and analysed. The main culprit of financial inefficiency, namely NPAs (Non-Performing assets) will also be discussed. Finally we will be evaluating the efficiency of these banks using the CCR (Charles Cooper Rhodes) method of DEA.**

Keywords: **data envelopment analysis (DEA), CCR (Charles Cooper Rhodes), public sector banks in India.**

1. INTRODUCTION

The first step in the making of PSBs (Public Sector banks) can be traced to 1955 when the Government of India took over the Imperial bank of India and renamed it as State Bank of India. PSUs are banks in which the government has a major holding. Other major milestones took place in 1960 and 1980 when fourteen and six banks were nationalised. The rationale behind this was so that the government could direct credit to sectors which it deemed fit. The financial liberalization wave hit India in the early 1990s. It implied relaxing various norms for banks. Banking reforms included relaxing interest control rates, reductions in reserve and liquidity ratios, relaxation of credit controls and introduction of inter-bank money. Before liberalization, PSBs dominated the banking sector. Post liberalization, private banks entered the scene. This increased competition for PSBs lead them to increasing their efficiency and profitability. The major challenges which PSBs face today are maintaining quality of assets and adequacy of capital. A main factor which is hampering the growth of PSBs are NPAs (Non-performing assets). A debt obligation where the borrower has not paid any previously agreed upon interest and principal repayments to the designated lender for an extended period of time. The nonperforming asset is therefore not yielding any income to the lender in the form of principal and interest payments.

2. RATIO ANALYSIS

There are various ratios which have been defined in literature. Ratios for an industry are basically performance indicators. They tell us that if an industry is utilising a particular amount of inputs, then how effectively can it utilise those inputs and generate outputs. We can define endless number of ratios according to our convenience. In the present paper we shall be looking at five ratios for public sector banks in India:

- Credit to deposit ratio
- Return on assets ratio
- NPA to net advances ratio
- Net business per employee ratio
- Capital adequacy ratio

All the data has been taken from Capitaline and ace equity.

1. CREDIT TO DEPOSIT (%)

S.no	Bank	2013	2012	2011	2010	2009
1	Allahabad Bank	72.45	69.64	70.99	67.52	69.7
2	Bank of Baroda	69.25	74.67	74.87	72.55	74.66
3	Bank of India	75.78	78.2	71.3	73.33	75.33
4	Canara Bank	68.05	71.09	72	72.16	73.19
5	IDBI Bank	86.43	85.79	87	82.15	92.03
6	Indian Bank	74.41	74.77	71.12	70.44	70.81
7	Indian Overseas bank	79.34	78.35	77	71.3	74.8
8	Punjab national Bank	78.84	77.39	77.38	74.84	73.35
9	State bank of India	86.94	83.13	81.03	78.85	73.11
10	State Bank of Mysore	78.87	79.37	78.73	75.97	77.82
11	UCO bank	73.97	75.02	68.19	67.4	68.65
12	HDFC	80.92	79.21	76.7	75.71	69.24

This is defined as the ratio of banks credit to its deposits. Deposits of a bank are it liabilities. These can be broadly classified as demand deposits and time deposits. Bank credit comprises whatever the bank gives out to people or corporations. These are assets for a bank. Credit deposit ratio tells us the amount of loans the bank generates from the deposits it receives. It is a mark of the liquidity position of a bank since it is simply the ratio of its assets to liabilities. Basically it is the capacity of banks to lend. Banks extend credit after allocating their deposits to cash reserves and their investments. Hence if these two rise, the capacity of banks to lend declines. We observe that for the past five years, these ratios have remained fairly constant without showing any significant fluctuations. Since 2000s, these ratios have shown a steady increase. This indicates that banks have been investing less in government securities and giving more credit to people. The high ratios are often a source of concern for analysts. These ratios are comparable to the ratios of private banks. Hence we can comment that the public sector banks have sound liquidity position.
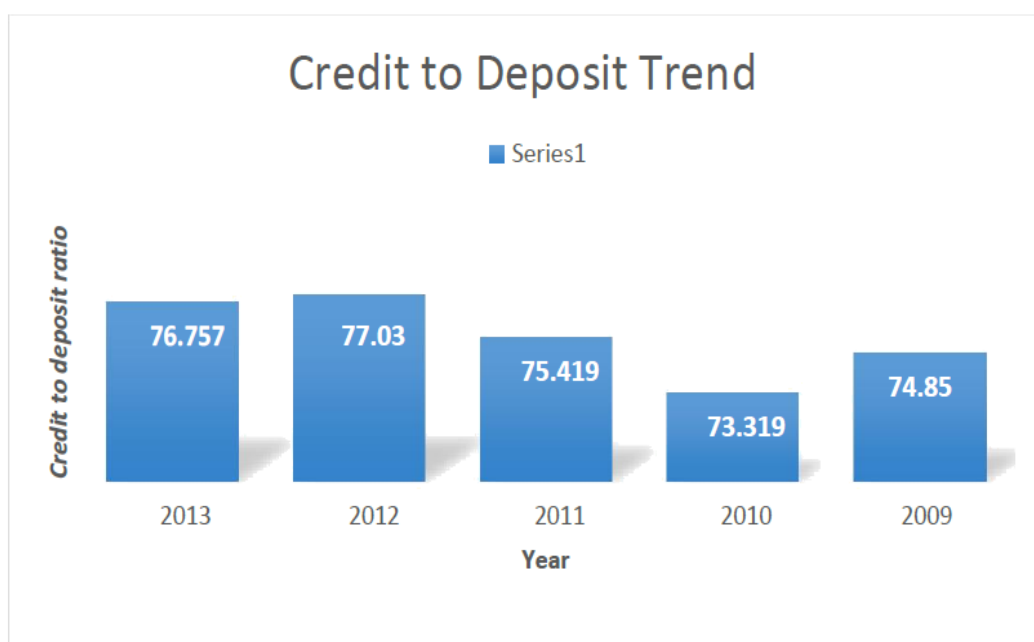
2. ROA: RETURN ON ASSETS (%)

S. no.	Bank	2013	2012	2011	2010	2009
1	Allahabad bank	0.64	1.02	1.11	1.16	0.90
2	Bank of Baroda	0.90	1.24	1.33	1.21	1.09
3	Bank of India	0.65	0.72	0.82	0.70	1.49
4	Canara Bank	2.18	1.46	1.10	1.06	1.09
5	IDBI Bank	0.72	0.83	0.73	0.53	0.62
6	Indian Bank	1.02	1.31	1.53	1.67	1.62
7	Indian Overseas bank	0.24	0.52	0.71	0.53	1.17
8	Punjab national Bank	1.00	1.19	1.34	1.44	1.39
9	State bank of India	0.91	0.88	0.71	0.88	1.04
10	State Bank of Mysore	0.66	0.67	1.03	1.06	0.91
11	UCO Bank	0.33	0.69	0.66	0.87	0.59
12	HDFC Bank	1.90	1.77	1.58	1.53	1.28

This ratio indicates shows the rupee mount of net income generated per rupee of assets and indicates how well the assets are utilized for generating revenue for the bank. It is a mark of profitability of banks. These ratios indicate that the banks have not been effectively utilising their assets as their counterparts. This is in stark contrast to the private sector as illustrated by HDFC bank. However Canara Bank has been a good performer, better than HDFC. This is because of rising number of non-performing assets (NPAs) which have been accumulating with the banks. Investopedia defines NPA as a debt obligation where the borrower has not paid any previously agreed upon interest and principal repayments to the designated lender for an extended period of time. The non-performing asset is therefore not yielding any income to the lender in the form of principal and interest payments. The ratio of NPAs to net advances has been showing a steady increase over the years. The RBI attributes the rise of NPAs to wilful default by borrowers.[1] Apart from this, the economic slowdown which hit India along with recession. Bad loans are a major problem faced by PSBs. Slowing economic growth and high interest rates crimp the ability of many borrowers to repay their debts, causing bad loans to pile up at banks. Some other reasons for rising NPAs are inefficient management, strained labour relations and delay in loan disbursement. PSBs also depend heavily on collateral and do not diligently follow up on loans. Political interference also hampers the disposal of NPAs in the form of legal impediments and delay. Some corporate debtors also unwieldy unjust authority over on banks to waive their dues and get favours from banks. NPAs hamper the efficiency of assets and are also the major reason of erosion of profitability of PSBs. To understand this better we shall have a look at the ways NPAs have accumulated over the years.

3. RATIO OF NPAS TO NET ADVANCES %:

| S.no.	Bank	2013	2012	2011	2010	2009
1	Allahabad bank	3.19	0.98	0.79	0.66	0.72
2	Bank of Baroda	1.28	0.54	0.35	0.34	0.31
3	Bank of India	2.06	1.47	0.91	1.31	0.44
4	Canara Bank	0.77	0.95	1.42	1.30	1.06
5	IDBI Bank	1.58	1.61	1.06	1.02	0.92
6	Indian Bank	2.26	1.33	0.53	0.23	0.18
7	Indian Overseas bank	2.50	1.35	1.19	2.52	1.33
8	Punjab national Bank	2.35	1.52	0.85	0.53	0.17
9	State bank of India	2.10	1.82	1.63	1.72	1.79
10	State Bank of Mysore	2.69	1.93	1.38	1.02	0.5
11	UCO Bank	3.17	1.96	1.84	1.17	1.18
12	HDFC BAnk	0.20	0.18	0.19	0.31	0.63

[1] Finacle, Infosys 2012
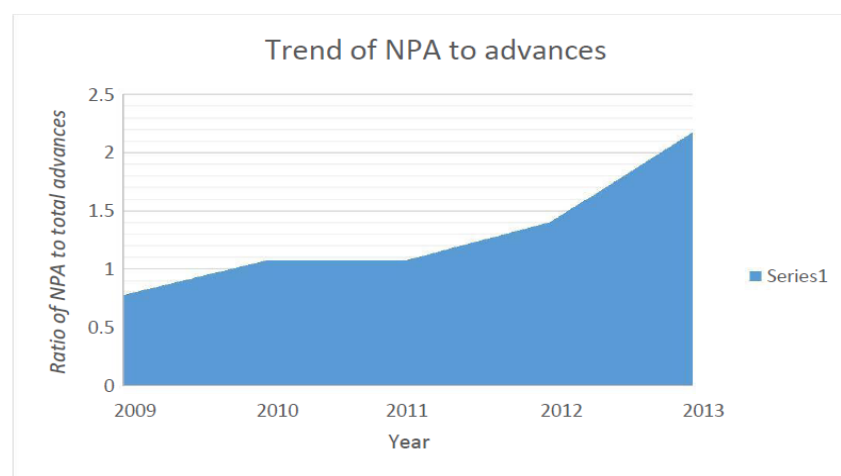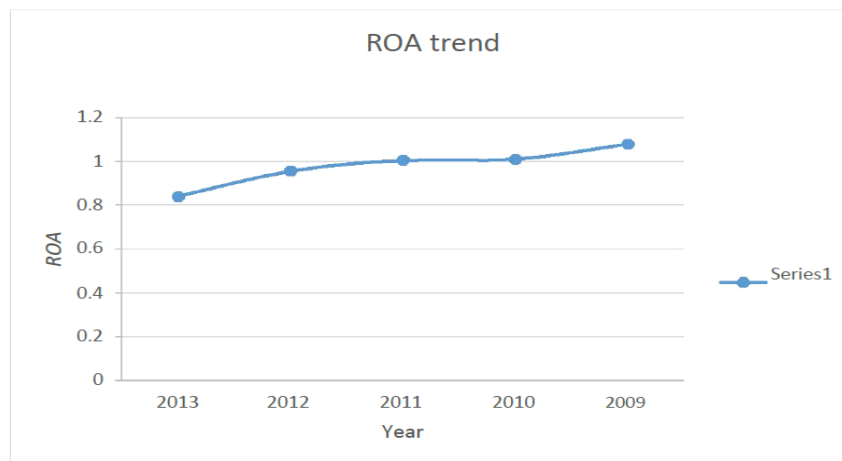
Since NPAs generate no income for the banks, they are required to make up for bad loans by drawing out from their profits. This affects liquidity also since banks have now lower funds to recycle. Several measures can be taken to tackle the problem of burgeoning NPAs. The RBI mandates that banks should follow income regulation i.e recognize payments only when actually incurred and only when backed by payments. Banks should also implement realistic repayment schedule which customers can meet so as to avoid the incidence of bad loans. The banks should also diversify their revenue stream. Excessive dependence on interest income make them vulnerable to the clutches of NPAs. They should exercise credit appraisal and post loan monitoring. Debt recovery tribunals should also be tightened.

4. NET BUSINESS/REVENUE PER EMPLOYEE (IN CRORE):

This ratio tells how much revenue the bank earns per an employee. It is calculated by dividing total revenue by total number of employees. This reflects efficiency of banks, i.e how effectively the banks are utilizing their workforce.

S.no.	Bank	2013	2012	2011	2010	2009	2008	2007	2006	2005
1	Allahabad bank	13.73	12.17	10.63	8.45	7.06	6.04	4.95	3.36	2.82
2	Bank of Baroda	16.89	14.66	12.29	9.81	9.14	7.10	5.55	3.96	3.16
3	Bank of India	15.82	13.60	12.84	10.11	8.33	6.52	4.98	3.81	3.20
4	Canara Bank	14.20	13.74	11.99	9.83	7.80	6.09	5.49	4.42	3.51
5	IDBI Bank	25.64	23.83	23.46	24.17	20.3	18.09	13.87	17.18	13.5
6	Indian Bank	13.01	11.14	9.30	7.61	6.17	4.88	3.64	2.95	2.46
7	Indian Overseas bank	12.88	11.76	10.05	7.12	6.89	5.83	4.67	3.55	2.69
8	Punjab national Bank	11.65	11.32	10.18	8.08	6.55	5.05	4.07	3.31	2.77
9	State bank of India	9.44	7.98	7.05	6.36	5.56	4.56	3.57	2.99	2.43
10	State Bank of Mysore	9.55	8.81	7.95	6.72	6.02	4.95	3.98	2.90	2.04
11	UCO Bank	11.89	11.64	10.69	8.64	7.32	5.80	4.64	3.87	3.21
	AVERAGE	14.06	12.78	11.49	9.718	8.28	6.81	5.4	4.75	3.79

This average ratio has risen over the years. The banks have shown good performance on this front. However the performance of SBI has been very poor compared to others. It is much below the national average. The IDBI bank is the best performer in the country in terms of business generated per employee. This is followed by bank of Baroda. In fact PSBs have been the better performers than their private counterparts.
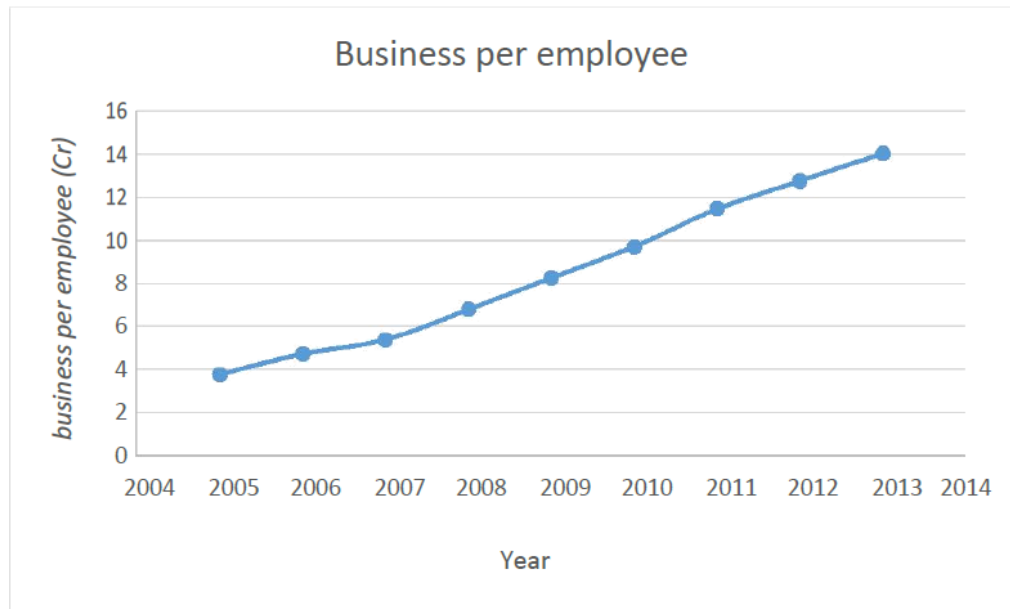
5. CAPITAL ADEQUACY RATIO:

This is defined as the capital to risk ratio. It determines the bank's capacity to meet liabilities and other risks like credit risk etc.

CAR= tier 1 capital +tier 2 capital/risk assets

TIER 1 CAPITAL = (paid up capital + statutory reserves + disclosed free reserves) - (equity investments in subsidiary + intangible assets + current & b/f losses)

TIER 2 CAPITAL = A) Undisclosed Reserves + B) General Loss reserves + C) hybrid debt capital instruments and subordinated debts

where Risk can either be weighted assets (a) or the respective national regulator's minimum total capital requirement.[2]

Sno.	Bank	2013	2012	2011	2010	2009	2008	2007	2006
1	Allahabad Bank	11.03	12.83	12.96	13.62	13.11	11.99	12.52	13.37
2	Bank of Baroda	12.09	12.95	13.02	12.84	12.88	12.91	11.8	13.65
3	Bank of India	11.35	11.57	11.42	12.63	13.21	12.04	11.75	10.75
4	Canara Bank	0	0	0	13.43	14.1	13.25	13.5	11.22
5	IDBI Bank	12.09	12.84	12.16	10.83	11.23	11.95	13.73	14.8
6	Indian Bank	11.59	12.67	12.83	12.16	13.27	12.74	14.14	13.19
7	Indian Overseas bank	10.74	11.95	13.28	14.26	12.7	11.93	13.27	13.04
8	Punjab national Bank	12.28	11.59	11.76	12.97	12.59	12.96	12.29	11.95
9	State bank of India	11.22	12.05	10.69	12	12.97	13.54	12.34	11.88
10	State Bank of Mysore	11.19	11.22	12.78	12.12	12.41	11.73	11.47	11.37
11	UCO Bank	12.43	11.03	11.87	11.35	9.75	10.09	11.56	11.12
	Average	10.55	10.97	11.16	12.56	12.56	12.28	12.57	12.39

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[2] Wikipedia

We observe that CAR remained constant initially and then fell. Canara bank shows an alarming CAR of zero in later years. It is this ratio of public sector banks which requires infusion of huge funds from Govt to continue surviving. Bankers and industry analysts believe the dip in capital adequacy ratios was primarily on account of sudden rise in credit demand. The industry credit growth accelerated to 16.6 per cent on a year-on-year basis to Rs 5,614,926 crore at the end of October 18, 2013. The increase was more than the Reserve Bank of India's (RBI) forecast of 15 per cent year-on-year growth in bank advances in 2013-14. According to the banking regulator, the increase in money market rates, including discount rates on commercial papers, and subdued primary market conditions have persuaded domestic corporates to borrow money from banks leading to a rise in loan demand. Bankers and industry analysts believe the dip in capital adequacy ratios was primarily on account of sudden rise in credit demand. The industry credit growth accelerated to 16.6 per cent on a year-on-year basis to Rs 5,614,926 crore at the end of October 18, 2013. The increase was more than the Reserve Bank of India's (RBI) forecast of 15 per cent year-on-year growth in bank advances in 2013-14. Higher provision requirements amid deterioration in credit quality have also contributed to the fall in capital adequacy ratios. [3]

[3] Business Standard, Saturday, April 19, 2014 | 07:24 PM IST

Let us compare these values with those of private sector banks. For this let us consider three major private banks of India: Axis Bank, HDFC and ICICI bank.

Sno.	Bank	2013	2012	2011	2010	2009	2008	2007	2006
1	Axis Bank	17	13.66	12.65	15.8	13.69	13.73	11.57	11.08
2	HDFC	15.94	15.71	15.32	16.45	15.09	13.6	13.08	11.41
3	ICICI	16.9	16.26	17.63	19.14	15.92	13.97	11.69	13.35
	AVERAGE	16.61	15.21	15.2	17.13	14.9	13.76	12.11	11.94

We observe that private banks perform really well in this case. This means they are well cushioned from risks and provide better financial stability. To compare private and public banks more effectively, we use the Gap Index Model used by Kumar and Sreemalu (2007). It is defined as:

GAP Index = Variable (Pvt Bank) - Variable (Public Bank) / Variable (Pvt Bank) + Variable (Public Bank) [4]

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[4] International Journal in Multidisciplinary and Academic Research (SSIJMAR) Vol. 2, No. 3, May-June (ISSN 2278 – 5973)
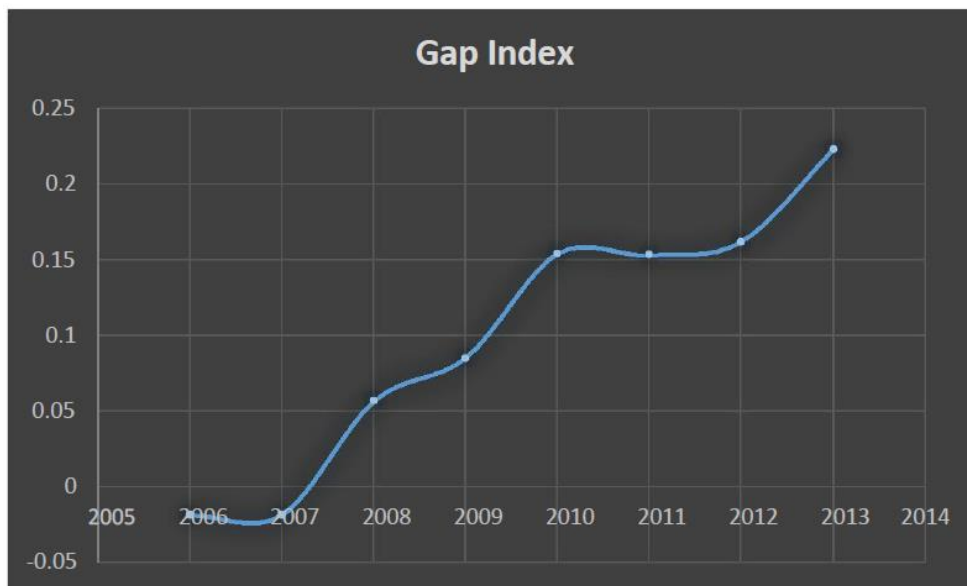
The gap index shows an alarming trend. In 2006 the private banks had CAR lower than public banks. However this has reversed now and the public sector banks are performing very poorly as compared to private banks. The reasons were discussed above. To tackle this, RBI announced in October 2013 that it would inject Rs 14000 crore in 20 state run banks. SBI would be getting the largest share of 2000 crore while IDBI was granted 1800 crore. [5]

3. SHORTCOMINGS OF RATIO ANALYSIS

Ratios are the most widely used indicators for evaluating performance of banks and other corporations. However ratios take into account only one input and output. However in evaluating the output of a unit, more than one input might need to be taken into account. For this another technique was developed by Charles Cooper and Rhodes in 1978. It is called **Data Envelopment Method (DEA)**.This method takes into account multiple inputs and outputs. For the purpose of DEA we will use the term DMU (Data Management Unit). DEA is used for calculating efficiency of DMUs. DEA takes into account multiple inputs and outputs for comparing the efficiencies of DMUs. DEA compares DMUs and categorizes them as efficient and non-efficient. DEA identifies the most efficient units and then compares other units with them. Another highlight of this method that it tells that how far other units are operating from the maximum efficiency There is no thing as absolute efficiency but here the relative efficiency is considered. The units which are the most efficient out of the group of DMUs being considered are assigned an efficiency value of one. This means that they are relatively efficient. The inefficient units have an efficiency of less than one. CCR is an input oriented model of DEA. Here the output is kept constant while inputs are maximised.

4. USING DEA

Now we shall use DEA to calculate the efficiencies of DMUs. We shall be utilising excel solver for this purpose.

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[5] Business Today, Sat, April 19, 2014 16:33 IST

Using DEA, we are able to calculate the efficiency of any company/organization with respect to its respective industry or a group of companies. Usually, using ratio analysis we aim to find out the certain ratios (for a company) which are considered critical to the industry and compare them with the observed leader of the industry. However, the word 'observed' signifies that there is true leader in any industry and if one company might be doing very well considering one ratio, it has to be lacking in some other ratio. Here, the importance of DEA comes into picture as it calculates the efficiency taking into account the various inputs consumed and outputs produced by different companies/units and identifies the efficient ones while we can analyze the ones which are supposedly below the efficient companies. This can be done by separately looking into the various inputs and outputs so as come up with the inputs which can be reduced without affecting the output or the outputs which can be increased without requiring any additional inputs.

There are two methods of coming up with a DEA model namely, input orientation and output orientation. As their respective names suggest, the input and output orientation models manipulate the inputs and outputs to generate the most efficient picture for the company. In the input orientation method, we hold the output constant and manipulate the inputs in order to locate the point of maximum efficiency where we can utilize our input resources to the max and still have the output unchanged. In the output orientation, we do exactly opposite. We try to maximize the output with the same amount of input resources. We identify the most efficient unit in the industry and try to proportionally expand the output to its maximum.

In our, study, we have used output oriented CCR model for constant returns to scale (CRS) to analyse the various PSUs and private banks. We have taken 2 outputs, interest income and other incomes. Other income for banking sector is also known as non-interest income, signifying that truly these two are the only major source of incomes for banks. Interest on bills, income from investments & inter-bank funds account for the interest income whereas other income incorporates net profit/loss on sale of investments, on revaluation of investments, on sale of fixed assets etc. It also includes commission and exchange, brokerage etc. In case of the inputs, we have taken the 4 main important inputs that the banks need to invest in as well as the ones which the banks strive to improve consistently. They are interest expenses, administrative expenses, employee payments, and other expenses.

In our study, we aim to compare various PSU banks, with one another considering them an industry as well as some well-known PSU banks to private sector banks comparing the financial health and efficiency of various banks with respect to one another. We, also, aim to create a benchmark using about half a dozen public sector banks, so that we can calculate the efficiency of other smaller PSU banks using the benchmarks set by the banks.

PSU & Private Banks –

Banks (Pub	Interest Expenses	Employees Payments	Administrative Expenses	Other Expenses		Interest Income	Other Income	1		Eff
			Comparing PSU & Priv.							
SBI	75,325.80	18,380.90	5,489.37	15,405.37		119,657.10	16,034.84		0	1.06632387479973000
Canara Bank	26,198.94	3,253.56	1,055.01	2,861.64		34,077.94	3,153.00	1.06632	0.216892235	0.99999999999999900
PNB	27,036.82	5,674.72	1,188.72	5,368.73		41,893.33	4,215.92		2.376010032	0.99999999999999900
Deutsche Bank	706.9	512.05	318.69	265.37		2,703.09	936.38		7.644218137	0.99999999999999200
ICICI	26,209.18	3,893.29	2,196.78	4,242.20		40,075.60	8,345.70		0	1.00000000000000000
HDFC	19,253.75	3,965.38	2,845.42	5,450.65		35,064.87	6,852.62		0	1.00000000000000000
		Benchmarking		Constraints						
IE		75325.8		75325.8						
EP		18103.08544		18380.9						
AE		5489.37		5489.37						
OE		15405.37		15405.37						
II		127593.2225		127593.2225						
OI		17858.82241		17098.33272						

We first attempt to compare 3 most earning PSU banks, namely SBI, Canara Bank & PNB with 3 private sector banks, Deutsche, ICICI, and HDFC. Our aim is to calculate the efficiency of the public and private sector banks in comparison with each other.

If we look at the last column, which is titled Eff (standing for efficiency) gives the values of efficiency of the banks. We have used the output oriented method to for these results. In output oriented method, efficiency stands for the factor which in proportion with the current output produces the maximum output that the bank should be able to generate without increasing its inputs. Therefore, for the bank to be the most efficient its efficiency value should be the lowest. This is because a high efficiency value signifies the need to increase the current output which means that the current output is not up to standards of the industry or its competitors.

From the efficiency values, we can safely say that Deutsche Bank is the most efficient among the banks that we have evaluated.

We further analyse some more critical points. Firstly, to say that the difference in the efficiency of the banks is marginal is an understatement. The theoretical difference exist but apart from that if we exclude SBI for a moment we realize that all the other 5 banks have same efficiencies. This goes onto emphasize what we deduced using ratio analysis that is in terms of performance, these banks are extremely close. Secondly, SBI is looking gravely inefficient when compared to the other banks but to be fair to SBI that factor is not too high in relative terms. A closer look at SBI's balance sheet shows us that the major contributor to this inefficiency are the NPA

(Non-Performing Assets) of the bank. Comparatively, the NPAs of other banks are very low and hence, the high efficiency.

Bank	Efficiency Factor
SBI	1.06632387479973000
Canara Bank	0.99999999999999900
PNB	0.99999999999999900
Deutsche Bank	0.99999999999999200
ICICI	1.00000000000000000
HDFC	1.00000000000000000

Major PSU Banks -

	A	B	C	D	E	F	G	H	I	J	K	L	M
				Comparing Major PSUs									
	Banks (Pub	Interest Expenses	Employees Payments	Administrative Expenses	Other Expenses		Interest Income	Other Income		6 I		Eff		
	SBI	75,325.80	18,380.90	5,489.37	15,405.37		119,657.10	16,034.84		0	1.00000000000		
	Canara Bank	26,198.94	3,253.56	1,055.01	2,861.64		34,077.94	3,153.00	1.03	0.11669	1.00000000000		
	PNB	27,036.82	5,674.72	1,188.72	5,368.73		41,893.33	4,215.92		0.242464	1.00000000000		
	IDBI	19,745.90	1,538.50	905.75	3,347.77		25,064.30	3,219.51		0.149737	1.00000000000		
	OBC	13,003.62	1,576.09	594.38	2,530.61		17,704.78	1,654.71		0	1.00000000000		
	Allahabad Bank	12,569.28	1,985.94	594.92	2,136.93		17,435.69	1,476.91		0	1.02589580467		
		Benchmarking		Constraints									
	IE	12569.28		12569.28									
	EP	1985.94		1985.94									
	AE	546.9542821		594.92									
	OE	2136.93		2136.93									
	II	17887.20122		17887.20122									
	OI	1872.209042		1515.155773									

In this spreadsheet, we have compared some major PSU banks with one another to evaluate their efficiencies. This above process is also useful for benchmarking which is used and explained in the next segment. As we know from the above segment, we have used output orientation method. Therefore, the bank with the least number in efficiency is actually doing extremely well.

This leads us to 2 major conclusions. Firstly, according to this calculation more or less all the banks are on the same page as far as efficiency is concerned. As a matter of fact, the Allahabad bank is marginally underperforming and it has a factor which when proportionated to the current earnings will increase their output. This one fact which has been consistently resurfacing that the banks have been extremely competitive, which is evident from the ratio analysis as well as the DEA. Secondly, a major observation regarding DEA is that SBI in this case performs as well as Canara as well as the PNB. It must be noted that this wasn't the case with first spreadsheet. The reason for this is that results from the DEA are dependent on the context. While still the NPAs of the SBI will be greater than the other two banks and the shortcomings continue to persist but when the other public sector banks are brought into the picture, those shortcomings are effectively covered.

In this sheet, if we look at columns for Interest Income and other income for Allahabad Bank and then in the II and OI under constraints column, we realize that the amount in the constraints column is more than in the original columns. This is because in the constraints column the amount has been proportionated by the number under efficiency and actually shows the output that the bank should strive to attain given the current resources for maximum efficiency.

Banks	Efficiency Factor
SBI	1.00000000000
Canara Bank	1.00000000000
PNB	1.00000000000
IDBI	1.00000000000
OBC	1.00000000000
Allahabad Bank	1.02589580467

Other PSU Banks (Benchmarking) -

Banks (Pub	Interest Expenses	Employees Payments	Administrative Expenses	Other Expenses		Interest Income	Other Income	I
SBI	75,325.80	18,380.90	5,489.37	15,405.37		119,657.10	16,034.84	0.00
Canara Bank	26,198.94	3,253.56	1,055.01	2,861.64	7.00	34,077.94	3,153.00	0.24
PNB	27,036.82	5,674.72	1,188.72	5,368.73	Eff	41,893.33	4,215.92	0.08
IDBI	19,745.90	1,538.50	905.75	3,347.77	0.96	25,064.30	3,219.51	0.04
OBC	13,003.62	1,576.09	594.38	2,530.61		17,704.78	1,654.71	0.00
Allahabad Bank	12,569.28	1,985.94	594.92	2,136.93		17,435.69	1,476.91	0.00
Benchmark	9152.67	1286.98	380.9400308	1240.51		12421.28063	1211.873165	
PSU under eval.	9152.67	1286.98	422.42	1240.51		12421.28063	1007.802819	
SBM	4,125.28	640.24	193.34	860.49		5,965.48	595.59	0.991327
SBH	8,529.90	1,415.46	382.23	1,485.01		12,447.80	975.61	0.988246
SBP	7,113.43	959.49	318.43	894.64		9,564.26	758.82	0.994318
United Bank of I	6,764.23	932.52	282.95	1,786.64		9,251.49	1,066.57	0.942109
Punjab & Sind	5,699.10	773.51	181.63	566.65		7,340.12	417.16	0.81572
Maha Bank	6,580.08	1,187.82	338.54	1,001.93		9,613.43	912	0.97738
Andhra Bank	9,152.67	1,286.98	422.42	1,240.51		12,909.69	1,047.43	0.962167

In this sheet, we have calculated the efficiency of other PSU banks as compared to first six PSU banks. This is called benchmarking. We use the first six banks as a benchmark to evaluate the performance of the other PSU banks. In this sheet, the efficiency factor for the public sector banks is calculated in the last column. With an efficiency factor of 0.81572, Punjab & Sind Bank is the most efficient bank among these public sector banks. Theoretically, Punjab & Sind Bank is the best bank using DEA. In the column I, the numbers stand for wieghts alloted for the actual benchmarks for a bank. A non-zero number means that the bank is an actual benchmark for the PSU under evaluation. For example, the number 7 in F4 shows that Anhdra Bank is under consideration and the non-zero numbers under Canara Bank, IDBI, PNB show that for Andhra Bank they are the real benchmarks.

More importantly, what we analyse from this sheet is that all the efficiency factors are less than 1 signifying that essentially all these smaller PSU banks are comparatively more efficient than the larger public sector banks. The categorisation of the smaller and the larger is done solely on the basis of the total income earned by the bank.

The reason for the lower efficiency of the larger banks has to blamed upon NPAs. We note that the larger banks have considerable amount of NPAs which are essentiallly the debts to big companies/conglomerates as well as some of these debts public sector companies which are not yielding any returns. We realise that many a times the big banks have to provide loans as part of obligations towards the government and some of these might turn out to be poor investments. The above seems to be the only plausible reason and actually using DEA we are able to understand that in banking sector, the banks have extremely marginal differences in efficiencies and little room for improvement when compared to one another.

Bank	Efficiency Factor
SBM	0.991327
SBH	0.988246
SBP	0.994317
United Bank of India	0.942109
Punjab & Sind Bank	0.815720
Maharashtra Bank	0.977380
Andhra Bank	0.962167

5. CONCLUSION

We have evaluated and compared the financial performance of public sector banks in India using ratio analysis and DEA. For ratio analysis we considered ten major public sector banks of India. We have observed that the banks have performed fairly well on the liquidity position by showing good figures of credit to deposit ratio. The banks have not shown good performance on the profitability front as reflected by return of assets ratio. This is because of the rising number of NPAs which the banks have been accumulating over the years. This was well illustrated by the stacked area representation of NPAs to net advances ratio. This is the main area in which these banks have been lagging and the cause of requirement of huge funding by the government. The ratios of business per employee were good for PSBs. This means that they have been fairly utilising their workforce. The capital adequacy ratio of the PSBs is very low.

The average of the public sector was compared with the average for private sector and the gap index was calculated. This area requires a lot of working on by the PSBs and the government.

The DEA method was used to evaluate the efficiency of banks by considering expenses as input and income as output. Since DEA uses the concept of relative efficiency, when we evaluated the efficiency of PSBs with the private sector, we got some comprehensible efficiency figures which were higher for the private sector. However when we calculated the efficiency by considering only PSBs, the figures were equal and good because all PSBs perform more or less the same as was also reflected by ratio analysis.

Additionally, comparing smaller banks by benchmarking the larger banks shows us that the smaller banks are actually performing slightly better that the larger banks. While we do blame the accumulation of NPAs, we can also safely say that evaluation of the efficiency of the various inputs and outputs separately can help in identifying the real source of inefficiency in case of larger banks. Though for now, an overview tells us that the NPAs are to be blamed and the identification of the problem is beyond the scope of this paper.

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