



IMPACT OF SIZE ON THE OPERATIONAL PERFORMANCE OF PUBLIC SECTOR BANKS IN INDIA – AN EMPIRICAL ANALYSIS

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Abstract

The performance of Public Sector Banks (PSBs) in India is under scrutiny during the current year than ever before. The proposal for merger of PSBs into five or six bigger banks is frequently brought on to the fore and the relevance of size in relation to the operational performance assumed much prominence accordingly. Many of the research works in this area considered Return on Assets (RoA) as the measure of the ultimate performance of the bank. But measurement of operational performance through Operating Profit than the Return on Assets is considered in this study as the purposeful one. A comprehensive study of operational performance of all the 20 PSBs as assessed by Operating Profit to the Average Assets, as a measure of size of the bank, for a longer period of 12 years, i.e., 2005-06 to 2016-17 is undertaken.

The data indicated that Net Interest Margin (X14), Cost to Income (X16), Staff Cost to Total Income (X18) and Staff Cost to Other Income (X20) are important determinants for the operational performance of the PSBs under study. The study suggested that the managerial focus is required on Net Interest Margin and Cost to Income Ratio. Further, Staff Cost to Total Income and Staff Cost to Other Income are to be monitored very closely and desired managerial intervention shall be made for increasing the Operating Profit of the PSBs.

Key Words: Public Sector Banks, Operating Profit, Net Interest Margin, Cost To Income Ratio, Staff Cost.

Introduction

The proposal for merger of PSBs into five or six bigger banks is frequently brought on to the fore and the relevance of size in relation to the operational performance assumed much prominence accordingly. In this context, there is a compelling need to study the impact of size on the operational performance of PSBs.

Literature Review

The financial performance of banking sector in India was analyzed at length by classifying the banks based on their financial characteristics by R. Azhagaiah and S. Gejalakshmi (2012) considering 17 private and 19 public sector banks. The study revealed that banks with higher total capital, deposits and total assets do not always mean that they have better financial performance. Subhendu Dutta, et. al. (2013) in a study on Return on Assets (RoA) of Public Sector Banks (PSBs) in India noted that the most significant factors influencing RoA of PSBs are spread, operating expenses, provisions & contingencies and non-interest income. Ramana Rao and G V Chalam (2015), in a selective study on Cost to Income Ratio (CIR) and assets size of 20 PSBs for a short period 2009-14, took CIR as a measure of operational efficiency and observed negative correlation between CIR and log of assets indicating positive impact of size on operational efficiency, but the strength of the relationship was found to be not so strong.

Objective of the Paper

The main objective of the present study is to study the operational performance of the twenty public sector banks in India with reference to their size and analyze the factors contributing to such performance.

Methodology of the Study

To achieve the said objective of the study, the annual time series data for **12-year** period from 2005-06 to 2016-17 in respect of all the 20 public sector banks in India is collected from reliable secondary sources, viz., Data Base of Indian Economy (DBIE) of RBI and published annual reports. For measuring the size of the Bank, average of the total assets is taken into consideration as at the end of period under study.

The operational performance of the bank is assessed by operating profit and is measured by the ratio of operating profit to average assets. Having regard to the managerial approaches of the PSBs in India and regulatory environment prevailing upon them, twenty ratios, listed hereunder, are considered as the contributing factors in the present study:

Cash to Deposits Ratio (X1), Credit to Deposits Ratio (X2), Investments to Deposits Ratio (X3), Deposits to Total Liabilities Ratio (X4), CASA Ratio (X5), Borrowings to Total Liabilities (X6), Advances to Total Assets (X7), PSA to Total Advances (X8), Yield on Advances (X9), Yield on Investments (X10), Financial Return (X11), Cost of Deposits (X12), Financial Cost



(X13), Net Interest Margin (X14), Other Income to Total Income (X15), Cost to Income Ratio (X16), Staff Cost to Income Ratio (X17), Staff Cost to Total Income Ratio (X18), Staff Cost to Operating Expenditure Ratio (X19), Staff Cost to Other Income (X20).

The said 20 ratios (independent variables) and Operating Profit to Average Assets (dependent variable) are worked out independently by the researcher for all the 20 banks under study for 12-year period.

Statistical tools, viz., Multiple Regression and Factor Analysis are used employing SPSS Statistics version 20 software. Significance in Correlation is put at 0.05% significance level and stepwise elimination method is selected under Multiple Regression Analysis as it is considered better than other methods in reducing the problem of multicollinearity. The acceptance level of Variance Inflation Factor (VIF) is taken as 5.000 and accordingly regression models that are having VIF above 5.000 for one or more independent variables are discarded and the last model in the stepwise method with acceptable level of VIF is taken for study. Dropping of independent variable from the regression equation that is exhibiting higher VIF is not considered as the same may distort the results of multiple regressions.

In Factor Analysis, the study adopted Principal Component Analysis as the extraction method and Varimax with Kaiser Normalization as the rotation method and components are grouped under different factors without any bench mark for inclusion in a factor.

Data Analysis

The 20 PSBs under the study are divided into three groups, viz., Group A, Group B and Group C based on the size as measured by the size of Average Assets and listed in Table-1.

Table-1: List of Public Sector Banks and Their Average Assets as On 31.03.2017

Code No	Name of the Bank	Average Assets (Rs. Crores)
Group A		
A1	Punjab National Bank	693860
A2	Bank of Baroda	683126
A3	Bank of India	618112
A4	Canara Bank	568240
A5	Union Bank of India	428700
Group B		
B1	IDBI Bank Ltd	368070
B2	Central Bank of India	319434
B3	Syndicate Bank	303520
B4	Indian Overseas Bank	260802
B5	Oriental Bank of Commerce	245303
B6	Corporation Bank	241377
B7	UCO Bank	238111
B8	Allahabad Bank	236433
B9	Andhra Bank	211044
B10	Indian Bank	210972
Group C		
C1	Bank of Maharashtra	160141
C2	Vijaya Bank	150145
C3	United Bank of India	135242
C4	Dena Bank	131533
C5	Punjab and Sind Bank	99612

(Source: Published Annual Reports)



Group A consists of five banks with average assets more than Rs.4crores, Group B consiststen banks with average assets of more than Rs.2 crores and Group C with 5 banks by an average assetof less than Rs.2crores.

Multiple Regression Analysis

The results of Multiple Regression Analysis carried under stepwise elimination model, indicating significant independent variables, are summarized hereunder in Table-2.

Table -2: Results of Multiple Regression Analysis of the select Public Sector Banks with VIF values

Sl. No	Name of Bank	Variable	B	p value	VIF
Group A					
A1	Punjab National Bank	Constant	0.705	0.000	
		net interest margin	0.923	0.000	2.241
		staff cost to other income	-0.010	0.000	2.241
A2	Bank of Baroda	Constant	1.208	0.000	
		net interest margin	1.062	0.000	2.214
		staff cost to other income	-0.011	0.000	1.685
		casa to total deposits	-0.029	0.000	1.798
A3	Bank of India	Constant	0.146	0.700	
		cost to income	-0.027	0.000	2.598
		net interest margin	0.406	0.001	3.156
		other income to total income	0.051	0.000	2.437
		yield on advances	0.162	0.002	3.366
A4	Canara Bank	Constant	1.770	0.000	
		net interest margin	0.785	0.000	2.400
		staff cost to other income	-0.008	0.000	1.846
		cost to income	-0.022	0.000	1.522
A5	Union Bank of India	constant	1.222	0.000	
		cost to income	-0.036	0.000	2.702
		net interest margin	0.576	0.000	4.878
		other income to total income	0.049	0.000	3.735
		financial cost	0.060	0.000	2.213
Group B					
B1	IDBI Bank Ltd	Constant	0.629	0.000	
		net interest margin	0.566	0.000	1.000
B2	Central Bank of India	Constant	1.807	0.000	
		cost to income	-0.029	0.000	1.119
		net interest margin	0.399	0.000	1.434
		other income to total income	0.025	0.000	1.568
B3	Syndicate Bank	Constant	1.840	0.000	
		net interest margin	0.452	0.000	1.055
		cost to income	-0.032	0.000	2.385



		other income to total income	0.031	0.005	2.435
B4	Indian Overseas Bank	Constant	1.198	0.001	
		net interest margin	0.796	0.000	2.938
		staff cost to other income	-0.005	0.001	2.854
		staff cost to income	-0.027	0.002	1.686
B5	Oriental Bank of Commerce	Constant	1.188	0.000	
		net interest margin	0.528	0.000	2.001
		cost to income	-0.034	0.000	1.692
		other income to total income	0.051	0.000	2.241
		financial return	0.047	0.000	2.217
B6	Corporation Bank	Constant	3.695	0.000	
		staff cost to income	-0.157	0.000	1.001
		staff cost to total income	0.191	0.000	1.001
B7	UCO Bank	constant	2.119	0.000	
		cost to income	-0.029	0.000	1.170
		net interest margin	0.363	0.000	1.170
B8	Allahabad Bank	constant	7.633	0.000	
		cost to income	-0.074	0.000	1.755
		staff cost to total income	0.097	0.000	2.019
		deposits to total liabilities	-0.039	0.012	1.622
B9	Andhra Bank	Constant	2.315	0.000	
		net interest margin	0.479	0.000	1.016
		cost to income	-0.046	0.000	1.542
		other income to total income	0.047	0.000	1.526
B10	Indian Bank	Constant	-0.840	0.002	
		net interest margin	1.022	0.000	1.219
		staff cost to other income	-0.008	0.000	1.023
		advances to total assets	0.016	0.000	1.221
	Group C				
C1	Bank of Maharashtra	Constant	4.513	0.000	
		cost to income	-0.072	0.000	2.556
		staff cost to total income	0.074	0.000	2.556
C2	Vijaya Bank	constant	2.629	0.001	
		casa to total deposits	0.026	0.016	3.853
		cost to income	-0.045	0.000	2.106
		staff cost to total income	0.050	0.005	2.339
C3	United Bank of India	Constant	4.173	0.000	
		cost to income	-0.062	0.000	1.948
		staff cost to total income	0.065	0.000	1.879



		other income to total income	0.013	0.002	3.075
		advances to total assets	-0.006	0.026	4.696
C4	Dena Bank	Constant	0.178	0.425	
		net interest margin	0.911	0.000	1.336
		staff cost to other income	-0.006	0.000	1.336
C5	Punjab and Sind Bank	Constant	0.221	0.132	
		other income to total income	0.161	0.000	1.000

(Source: Data Analysis with SPSS 20)

5.2 Factor Analysis

The results of the factor analysis are listed in Table-3 hereunder:

No	Independent Variable	Punjab National Bank				Bank of Baroda					Bank of India				
		Component				Component					Component				
		1	2	3	4	1	2	3	4	5	1	2	3	4	
X1	Cash deposits			0.777				-0.648						-0.836	
X2	Credit deposits	0.814						0.810			0.700				
X3	Investment deposits		0.687			0.783								0.614	
X4	Deposits_total_liabilities			0.701						-0.645					-0.952
X5	Casa_total_deposits	-0.758					0.676				-0.942				
X6	Borrowings_total_liabilities			-0.843						0.770			0.607		
X7	Advances_total_assets	0.797						0.834			0.762				
X8	Psa_total_advances	-0.682					0.803				-0.829				
X9	Yield advances	0.873								0.784		0.757			
X10	Yield_investments				0.870			-0.746						-0.681	
X11	Financial_return	0.911								0.664		0.722			
X12	Cost deposits	0.956								0.947		0.739			
X13	Financial cost	0.953								0.937		0.722			
X14	Net_interest_margin		0.930			0.853								0.778	
X15	Other_income_total_income		-0.628				0.973				-0.759				
X16	Cost_income				0.659			-0.700				-0.921			
X17	Staff_cost_income		0.793			0.693						-0.954			
X18	Staff_cost_total_income		0.787			0.780						-0.600			
X19	Staff_cost_operating_expd		0.929			0.772								0.900	
X20	Staff_cost_oi		0.915			0.888							-0.951		
	No of iterations	6				16					13				



Table – 3: Results of Factor Analysis for The Select Twenty Public Sector Banks

No	Independent Variable	Canara Bank				Union Bank of India				IDBI Bank Ltd			
		Component				Component				Component			
		1	2	3	4	1	2	3	4	1	2	3	4
X1	Cash_deposits		0.793						0.845		0.831		
X2	Credit_deposits		-0.915			0.727				-0.948			
X3	Investment_deposits				0.809	-0.760				-0.929			
X4	Deposits_total_liabilities			0.681					-0.823	0.933			
X5	Casa_total_deposits	-0.948						-0.693			0.858		
X6	Borrowings_total_liabilities	0.613				0.899				-0.928			
X7	Advances_total_assets		-0.842			0.721							-0.805
X8	Psa_total_advances	-0.615						-0.747		0.849			
X9	Yield_advances	0.925						0.933				0.791	
X10	Yield_investments				0.693	0.710				0.913			
X11	Financial_return	0.894						0.912		0.642		0.650	
X12	Cost_deposits	0.926						0.700		0.636		0.709	
X13	Financial_cost	0.933						0.712				0.906	
X14	Net_interest_margin	-0.659				-0.768				0.689			
X15	Other_income_total_income	-0.806					-0.826			-0.719			
X16	Cost_income		0.887			0.725							0.860
X17	Staff_cost_income		0.915				0.804						0.948
X18	Staff_cost_total_income	-0.888					0.914				0.691		
X19	Staff_cost_operating_expnd			0.838			0.911					0.549	
X20	Staff_cost_oi			0.914			0.956			0.665			
	No of iterations	6				7				6			

No	Independent Variable	Central Bank of India					Syndicate Bank			Indian Overseas Bank				
		Component					Component			Component				
		1	2	3	4	5	1	2	3	1	2	3	4	5
X1	Cash_deposits					0.962	0.776							0.903
X2	Credit_deposits			-0.798			-0.983			-0.854				
X3	Investment_deposits		0.703				0.767		0.701					
X4	Deposits_total_liabilities	-0.914					0.835			0.798				
X5	Casa_total_deposits		0.611				0.718		0.792					
X6	Borrowings_total_liabilities	0.877					-0.910			-0.812				
X7	Advances_total_assets			-0.876			-0.946			-0.754				
X8	Psa_total_advances			0.811				0.663		0.875				
X9	Yield_advances	0.822						-0.895	-0.838					
X10	Yield_investments			0.587			-0.757							0.575
X11	Financial_return	0.922						-0.941	-0.775					
X12	Cost_deposits	0.725					-0.818		-0.949					
X13	Financial_cost	0.714					-0.764		-0.929					



X14	Net_interest_margin		0.853				0.873			0.703			
X15	Other_income_total_income	-0.541							0.838				-0.906
X16	Cost_income				0.936				0.823			0.960	
X17	Staff_cost_income				0.919				0.642			0.941	
X18	Staff_cost_total_income		0.805				0.812			0.853			
X19	Staff_cost_operating_expd		0.871				0.819			0.643			
X20	Staff_cost_oi		0.708				0.868						0.758
	No of iterations	14					3			7			

No	Independent Variable	Oriental Bank of Commerce				Corporation Bank			UCO Bank				
		Component				Component			Component				
		1	2	3	4	1	2	3	1	2	3	4	
X1	Cash_deposits	-0.640					0.649						0.843
X2	Credit_deposits	0.658						0.760		0.878			
X3	Investment_deposits			0.884			-0.857			-0.758			
X4	Deposits_total_liabilities	0.776				0.836			0.745				
X5	Casa_total_deposits	-0.903				-0.859							0.845
X6	Borrowings_total_liabilities		0.910				-0.955		-0.863				
X7	Advances_total_assets	0.744						0.821		0.901			
X8	Psa_total_advances		0.765				0.899						0.683
X9	Yield_advances	0.950				0.940				0.754			
X10	Yield_investments	-0.762					0.797						0.911
X11	Financial_return	0.948				0.897				0.904			
X12	Cost_deposits	0.956				0.968						-0.618	
X13	Financial_cost	0.956				0.988				0.676			
X14	Net_interest_margin			0.745		-0.936						0.881	
X15	Other_income_total_income			-0.685		-0.713						-0.625	
X16	Cost_income				0.900			0.705		0.934			
X17	Staff_cost_income				0.834			0.878	0.948				
X18	Staff_cost_total_income	-0.870				-0.985			0.848				
X19	Staff_cost_operating_expd		0.859				-0.922		0.786				
X20	Staff_cost_oi			0.922				0.983				0.816	
	No of iterations	7				5			11				



	Independent Variable	Allahabad Bank				Andhra Bank				Indian Bank			
		Component				Component				Component			
		1	2	3	4	1	2	3	4	1	2	3	4
X1	Cash_deposits		-0.653			-0.896							0.804
X2	Credit_deposits		0.959			0.895				-0.952			
X3	Investment_deposits		-0.906				0.848			0.913			
X4	Deposits_total_liabilities		-0.847						-0.927				0.778
X5	Casa_total_deposits	-0.951				-0.959				0.801			
X6	Borrowings_total_liabilities		0.837			0.812							-0.923
X7	Advances_total_assets		0.919			0.927				-0.952			
X8	Psa_total_advances	-0.904							-0.641	0.828			
X9	Yield_advances	0.972				0.895						0.775	
X10	Yield_investments			0.695			0.758				0.903		
X11	Financial_return	0.881				0.977				-0.735			
X12	Cost_deposits	0.730				0.938				-0.952			
X13	Financial_cost	0.800				0.958				-0.946			
X14	Net_interest_margin			0.726				0.883				0.798	
X15	Other_income_total_income			-0.839		-0.846				0.815			
X16	Cost_income	-0.636				-0.784					0.840		
X17	Staff_cost_income			0.869		-0.655					0.908		
X18	Staff_cost_total_income			0.578		-0.919				0.865			
X19	Staff_cost_operating_expd	0.662						0.633				0.837	
X20	Staff_cost_oi			0.936				0.857			0.878		
	No of iterations	7				8				6			

No	Independent Variable	Bank of Maharashtra					Vijaya Bank				United Bank of India			
		Component					Component				Component			
		1	2	3	4	5	1	2	3	4	1	2	3	4
X1	Cash_deposits				0.708				-0.805					0.763
X2	Credit_deposits	0.948								0.876		-0.724		
X3	Investment_deposits				0.463		0.501					0.698		
X4	Deposits_total_liabilities	-0.853						0.611				0.635		
X5	Casa_total_deposits					0.829	0.797					0.880		
X6	Borrowings_total_liabilities	0.863								0.841			0.618	
X7	Advances_total_assets	0.854								0.726		-0.692		
X8	Psa_total_advances	-0.766					0.558					0.906		
X9	Yield_advances	0.762					-0.846						0.743	
X10	Yield_investments		0.892						-0.557					0.680
X11	Financial_return	0.892					-0.860						0.934	
X12	Cost_deposits	0.824					-0.957				-0.876			



4. Net Interest Margin (X14) and Cost to Income (X16) are found to be the major determinants of Operating Profit in case of twelve banks out of the total twenty banks.
5. Thus, it is inferred that Net Interest Margin (X14), Cost to Income (X16), Staff Cost to Total Income (X18) and Staff Cost to Other Income (X20) are the important determinants of the operating performance of the public-sector banks under study.

On critical analysis of the findings made group-wise, it is concluded that size as measured by the average assets of the bank (or as known as size of the balance sheet in common parlance) has little impact on the operational performance of the public-sector banks in India as the factors contributing significantly to the operating profit ratio remained more or less the same.

Factor Analysis

The study has not revealed any significant pattern in the variables getting grouped as different factors. Grouping of ratios drawn from profit and loss account with Net Interest Margin and Cost to Income Ratio is quite common as they are interrelated with them basically and hence the study focused on grouping of ratios drawn from the balance sheet, viz., X1 to X8.

The findings have not indicated any significant relation between any of the balance sheet ratios under study and Net Interest Margin and/or Cost to Income Ratio, by way of preponderance in grouping with them and no distinct pattern is noticed among group-wise either. However, it is noticed that Investments to Deposits Ratio (X3) has exhibited relationship with Net Interest Margin in case of eleven out of the total twenty banks, by getting grouped in the same factor and it may provide scope for further research.

It is derived that the focus had to be on interest income, other income, interest expenditure and other expenditure, more particularly staff cost, in order to improve the operating profit ratio, irrespective of the size of the balance sheet.

Conclusions

The findings suggest that notwithstanding the components involved, viz., Yield on Advances, Yield on Investments, Cost of Deposits and Cost of Borrowings, it is the resultant Net Interest Margin that needs focus by the management of public sector banks. Similarly, notwithstanding the components involved, viz., Interest Income, Interest Expenditure, Other Income and Other Expenditure, it is the resultant Cost to Income that needs aspecial focus.

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