Balanced Scorecard Evaluation of the Performance of Indian Public Sector Banks

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Abstract

This study used the balanced scorecard (BSC) concept developed by Kaplan and Norton (1992). The empirical study evaluated the performance of top three public sector banks in India namely, State Bank of India, Bank of Baroda, and Punjab National Bank using the balanced scorecard framework developed for these banks. Further, profitability of these banks during the period from 2006 - 2015 was measured in terms of return on assets *(RoA)* and return on equity *(RoE)*. In addition, this paper also examined the relationship between profitability and variables in the BSC framework using correlation and multiple regressions. The results revealed variance in the performance of the three banks in balanced scorecard perspectives. The outcomes also disclosed statistically significant relationship of the variables - capital adequacy ratio, net non-performing assets ratio, number of ATMs, and number of skilled employees with RoA. The variables - capital adequacy ratio, net non-performing assets ratio, number of ATMs, number of skilled employees, and ratio of wage bills to total income disclosed statistically significant relationship with *RoE*. The results of regression analysis revealed the variable - net non-performing assets ratio had a significant direct linear relationship with *RoA*. On the other hand, the variable - capital adequacy ratio was found to have a direct relationship and net non-performing assets ratio had an inverse relationship with *RoE*.

Key words : **balanced scorecard, public sector banks, performance and profitability**

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Perform or perish is the current mantra in work places around the world. With increasing pressures due to regulation and decline in the economy, commercial banks have been searching for new and innovative methods to improve their bottom lines. Performance management of commercial banks is of crucial significance owing to the opening of Indian economy post reforms in the year 1991. The banking sector in India, especially the public sector banks, are facing major challenges in the form of asset quality, capital adequacy ratio, technology (Mundra, 2015) and competition from private sector competitors. With the entry of many new players who have received banking licenses from RBI recently, the competitive challenge is set to increase dramatically. Unquestionably, the public sector banks need to manage costs better, expand relationships with customers, increase the market share and product mix, take pricing decisions to face the competition, and increase profitability.

As the banking sector is knowledge driven, managing employees to bring out the best from each and every employee helps the banks to stand against the competition. Performance management system is a means to measure and improve the performance of employees and the organization. As only measured performance can be

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managed better, performance measurement of the banks plays a major role in managing the performance. Traditional financial measures are the lagging indicators (Dave, 2011) which measure past performance and have no viewpoint over the future alignment with a continuously changing business environment. Banks need to take a forward looking windshield based approach to performance management rather than a backward looking rear-view mirror based one.

A balanced scorecard is a set of measures that gives top managers a fast yet comprehensive view of a business (Irala, Reddy, & Reddy, 2008).A balanced scorecard (BSC) is a strategic performance management tool (Kaplan & Norton, 1992) to view the holistic performance of an organization from different perspectives. It provides a framework which encourages managers to view business from four different perspectives: financial, customer satisfaction, internal business process, and learning & growth. This research paper attempts to address this issue from the perspective of bank performance management, and tries to evaluate the performance of the banks using different variables under the four perspectives of balanced scorecard. The use of BSC is limited to the banks studied. From the literature, it is understood that certain major international banks have effectively used balanced scorecard, which has enhanced their performance greatly.

The four perspectives of Kaplan and Norton's BSC (1992, 1996a, & 1996b) are :

(i) Financial Perspective : It is reflected in financial measures and is the most traditional and still most commonly used measurement tool by the firms. Under this perspective, managers are required to produce measures that answer the following question : To succeed financially, how should we appear to our shareholders? To provide excellent review of past performance, the measures typically focused on profitability are : ROI, cash flow, net operating income, revenue growth, etc.

(ii) Customer Satisfaction Perspective : It is a strategy for creating value and distinction from the perspective of the customer. The managers are obligated to produce measures to respond to the following question : To achieve our vision, how should we appear to our customers? These measures may include metrics such as customer complaints, customers' retention, introduction of new products, customer profitability, market share, multiple delivery channels, results from customer surveys (feedback) about customer satisfaction, and business from repeat customers, etc.

(iii) Internal Business Process Perspective : It includes measures related to the operational processes of the organization. Managers are required to offer measures that answer the following question: To satisfy our customers and shareholders, what business processes must we excel at? The key processes in which the firm must excel at in order to meet customer needs and add value to the customers are to be identified. The measures to track the progress achieved may include: lead-time reduction, cost of quality, service time, response time, cost of non - conformance, process innovation, etc.

(iv) Learning and Growth Perspective : This is a strategy to generate a climate that supports organizational change, innovation, and growth. Under this perspective, managers are obligated to answer the following question: To achieve our vision, how will we sustain our ability to change and improve? This perspective is related to the personnel of the organization, and it measures the extent to which the organization employs efforts to provide its employees with opportunities to develop and learn in their domain. The measures commonly used for this perspective are : employee empowerment, employee satisfaction, employee capabilities, information technology, etc.

Review of Literature

Kaplan and Norton (1992) understood from their study that there is no single measure that can provide a focused attention on key areas of the business with a clear performance target and devised a 'balanced scorecard' - as a means to link performance measures by looking at the business's strategic vision from four different perspectives: financial, customer, internal processes, and learning and growth. Chemical Bank's use of BSC after its merger with Manufacturers Hanover Corporation resulted in savings in cost leading to increased profits (Kaplan & Klien, 1996).

The application of BSC in National Westminster Bank (Nat West Bank) resulted in improved quality, service, and speed of transactions, and also assisted to overcome the traditional bias towards financial reporting in the banking sector by incorporating learning and innovation in the new system that can take a long-term view (Ashton, 1998). BSC is proposed to display a strategic reason in terms of cause and effect relations among the prevailing activities of an organization and its long-term success (Banker, Chang, & Pizzini, 2004). The emphasis of performance measures in relation to the reward system was explored by Krishnan, Ramasamy, and Joshi (2014) among different categories of Malaysian firms' strategic orientation, and it was concluded that BSC did have an impact on measures in relation to the compensation schemes.

Kochhar and Anand (2004) emphasized the role of balanced scorecard (BSC) in facing various challenges by the Indian banking industry and highlighted how BSC has helped ICICI Bank in achieving rapid growth, strategic steadiness in spite of scale & diversity, and meticulous and objective performance evaluation. The performance of the banks implementing BSC exceeded that of the banks not implementing BSC in a quasi-experiment design study of the performance of two American banks (Davis & Albright, 2004).

Technology efficiency of the commercial banks in India using the balanced score boards led to enhanced performance management (Harold, 2006). Merging the concepts of BSC and data envelopment analysis (DEA), Chiang and Lin (2009) developed an integrated framework and revealed that the combined effect of the BSC and the DEA explained the apt performance measures into management proposition.

Kumar (2010) studied about existing and new performance measurement systems prevalent in India, and revealed that due to liberalization in the banking sector, public sector banks have undergone transformation not only in financial perspectives of the BSC, but also in the non-financial perspectives. The significance of intangible aspects as a tool for performance measurement in the commercial banking sector of India was studied by Dave and Dave (2010) with a special focus on the State Bank of India (SBI).

Panicker and Seshadri (2013) developed BSC for evaluating the performance of Standard Chartered Bank (SCB) in India during 2009-2012 and concluded that the performance of the SCB looked average during the study period. BSC contributed to the combined effect of strategy and firm performance in a study by Asa, Prasad, and Htay (2013) who attempted to determine whether the implementation of a balanced scorecard tool contributed towards the improvement and collaboration of business strategy and firm performance.

Dependence on financial measures alone may mislead the banks as financial measures do not provide a holistic view. Though PSBs' management is not conscious of it, some of the new generation private banks like ICICI Bank and Axis Bank (Annual Report 2015-16) are in the process of taking the benefits of implementation of BSC, which is clearly visible in their performance.

The literature reveals that BSC, as a performance measurement tool, has not found much of its way to the banking sector in India, though its presence is much prevalent in the international banking arena. The current research contributes to the literature on banking studies written in the context of India. Further, this study shall address the problem of developing a BSC model to understand the holistic performance of the PSBs. The performance results can benefit the banks studied, the stakeholders, and the financial sector analysts.

Objectives of the Study

The following objectives are formulated keeping in view the importance of the study :

- To measure the performance of select public sector banks using balanced scorecard frame work.
- To evaluate the profitability of select public sector banks in terms of ROA and ROE.
- To examine the relationship between the profitability of select public sector banks and the variables in the balanced scorecard framework.

Methodology

The present study evaluates the performance of PSBs in India using the BSC framework based on the BSC designed by Kaplan and Norton (1992) for performance evaluation of organizations. The sample consists of top three banks in the public sector namely State Bank of India (SBI), Bank of Baroda (BoB), and Punjab National Bank (PNB) in terms of deposits and assets during the study period. As the economic and regulatory environment in which the banks are operating is uniform, common performance variables under the four perspectives of the balanced scorecard are used in the present study. Secondary data related to SBI, BoB, and PNB were collected from the annual reports of the respective banks and from statistical tables relating to the banking sector in India for the period from 2006 - 2015. In addition, profitability of PSBs is measured in terms of RoA and RoE. The relative performance is studied using mean values and standard deviation. Variance in the performance is analyzed using ANOVA analysis.

Lastly, the relationship between dependent variables (RoA and RoE) and the independent variables (13 variables of the BSC framework) is examined with the help of Pearson's correlation coefficient. The results of

Table 1. Balanced Scorecard Framework for Public Sector Banks (PSBs)

BSC Perspectives	Measures	Formula
Financial	Credit-Deposit Ratio *(CDR)*	(Total Advances/Total deposits)*100
Perspective	Net Interest Margin *(NIM)*	(Net Interest income/ Average Earning Assets)*100
	Capital Adequacy Ratio *(CAR)*	[(Tier I + Tier II + Tier III (Capital funds)) /Risk weighted assets]*100
	Net Non-performing assets to total advances Ratio *(NNPAR)*	(Net non-performing assets / Loans given) *100
Customer	Market Share in Deposits *(MSD)*	[Amount of deposits (Individual bank) /Total
Satisfaction		deposits of scheduled commercial banks (SCBs)]*100
Perspective	Ratio of Marketing Expenses to Volume of Business *(RMEVB)*	[Advertising and Publicity Expenses /Volume of business (deposits and advances)] *100
	Ratio of Priority Sector Advances to total Advances *(RPSATA)*	(Priority sector advances given by the bank /Total advances of the bank) *100
Internal	Cost to Income Ratio *(CIR)*	[Operating expenses / (NII + non-interest income)]*100
Business Process	Business per Employee *(BPE)*	Total Business /Total number of employees.(Percentage of BPE is calculated)
Perspective	Profit per Employee *(PPE)*	Profit after tax /Total number of employees.(Percentage of PPE is calculated)
Learning &	ATMs (No.of ATMs)	Natural logarithm of number of ATMs *(LNATMs)*
Growth	Skilled Employees *(SKE)*	Natural logarithm of number of Skilled employees *(LNSKE)*
Perspective	Ratio of Wage Bills to Total Income *(RWBTI)*	(Payments and Provisions to employees / Total income)*100.

Source: Developed by the authors based on BSC devised by Kaplan &Norton (1992)

correlation and *t* - test used to test the significance are reported through a correlation matrix table. Further, multiple regression analysis is used to study how far the explanatory variables are related with RoA and RoE. Significance of beta coefficients is tested using *t* - test and significance of the coefficient of determination (*R* square) is examined using ANOVA. The fitting of regression equation is reported with the help of *'F'* value. Data was summarized by using Microsoft Excel, and tests were conducted by using SPSS. The Table 1 is the BSC framework developed by us for usage in the study.

Analysis and Results

The performance of select public sector banks (PSBs), that is, SBI, BoB, and PNB is measured using BSC framework for the period from 2006 - 2015.

(1) Financial Perspective : The performance of SBI in *CDR* in Table 2 shows a rising trend during 2006-2013 and decreasing trend till 2015 and has a high mean value compared to the other two banks. The performance of BoB is good in two out of four variables considered for the study during 2006-2015. The mean value of *NNPAR* of BoB is the lowest of all the three banks under study, indicating good quality of assets of the bank. Along with asset quality, the bank is also maintaining a high *CAR* as compared to SBI and PNB, indicating the bank's ability to defend itself from risk against loss, both expected and unforeseen. The performance of PNB is the best in *NIM*, showing the profitability of the bank and efficiency in using low cost deposits. Consistency in the performance of BoB is observed in *CDR, NIM,* and *NNPAR*. ANOVA analysis in Table 3 reveals that there is a significant difference in the performance of the banks in the variables *CDR* and *NIM* as *p* - value is less than 0.05. No significant difference in the performance of the banks in *CAR* is observed as the *p* - value is more than 0.05.

(2) Customer Satisfaction Perspective : It is revealed from Table 4 that SBI's performance in *MSD* is higher than

Table 2. Performance of Select PSBs with Respect to Financial Perspective of the BSC Framework

(in percentages)

YEAR	*CDR*			*NIM*			*CAR*			*NNPAR*		
	SBI	BOB	PNB	SBI	BOB	PNB	SBI	BOB	PNB	SBI	BOB	PNB
2006	68.89	70.18	62.35	3.27	2.42	3.44	11.88	12.94	11.95	1.88	0.47	0.29
2007	77.46	74.46	69.07	2.84	2.52	3.39	12.34	14.05	12.29	1.56	0.31	0.76
2008	77.55	70.18	71.79	2.64	2.42	3.06	13.54	12.94	13.46	1.78	0.47	0.64
2009	73.11	74.46	73.75	2.48	2.52	3.06	14.25	14.05	14.03	1.79	0.31	0.17
2010	78.58	72.55	74.84	2.35	2.35	3.12	13.39	14.36	14.16	1.72	0.34	0.53
2011	81.03	74.87	77.38	2.86	2.76	3.5	11.98	14.52	12.42	1.63	0.35	0.85
2012	83.13	74.67	77.39	3.38	2.56	3.21	13.86	14.67	12.63	1.82	0.54	1.52
2013	86.94	69.25	78.86	3.34	2.28	3.17	12.92	13.3	12.72	2.1	1.28	2.35
2014	86.76	69.79	77.38	3.17	2.36	3.14	12.44	12.3	11.52	2.57	1.52	2.85
2015	82.44	69.31	75.9	3.16	2.31	2.87	12	12.6	12.21	2.12	1.89	4.06
Mean	79.59	71.97	73.87	2.95	2.45	3.2	12.86	13.57	12.74	1.9	0.75	1.4
Std.dev	5.72	2.45	5.02	0.37	0.15	0.19	0.86	0.86	0.88	0.3	0.59	1.29

Source: Annual reports of the banks and statistical tables relating to banks in India during 2006-2015.

Table 3. Results of ANOVA

		Sum of Squares	*df*	Mean Square	*F*	Sig.
CDR	Between Groups	314.401	2	157.201	7.375	.003
	Within Groups	575.513	27	21.315		
	Total	889.914	29			
NIM	Between Groups	2.888	2	1.444	22.179	.000
	Within Groups	1.758	27	.065		
	Total	4.647	29			
CAR	Between Groups	4.062	2	2.031	2.724	.084
	Within Groups	20.128	27	.745		
	Total	24.190	29			
NNPAR	Between Groups	6.643	2	3.322	4.779	.017
	Within Groups	18.768	27	.695		
	Total	25.411	29			

Table 4. Performance of Select PSBs with Respect to Customer Satisfaction Perspective of the BSC Framework

(in percentages)

YEAR	*MSD*			*RMEVB*			*RPSATA*		
	SBI	BOB	PNB	SBI	BOB	PNB	SBI	BOB	PNB
2006	17.56	4.33	5.53	0.012	0.008	0.01	30.56	29.36	34.64
2007	16.15	4.63	5.19	0.017	0.017	0.008	30.24	28.76	35.79
2008	16.19	4.58	5.01	0.011	0.012	0.008	28.61	27.62	27.78
2009	18.26	4.74	5.16	0.018	0.013	0.009	26.48	26.7	28.14
2010	16.94	5.08	5.25	0.02	0.012	0.009	26.99	26.35	28.69
2011	16.63	5.44	5.57	0.016	0.011	0.007	30.61	24.01	28.99
2012	16.17	5.96	5.88	0.015	0.011	0.006	28.84	22.59	28.56
2013	16.19	6.38	5.27	0.034	0.009	0.004	25.28	24.21	24.62
2014	16.34	6.67	5.29	0.017	0.008	0.004	23.21	21.2	27.28
2015	16.71	6.55	5.31	0.011	0.007	0.006	22.23	22.31	24.82
Mean	16.71	5.43	5.35	0.02	0.01	0.01	27.3	25.31	28.93
Std.dev	0.71	0.89	0.25	0.007	0.003	0.002	3.01	2.84	3.65

Source: Annual reports of the banks and statistical tables relating to banks in India during 2006-2015.

the performance of BoB and PNB as the mean value is high. At the same time, consistency in the performance of PNB in *MSD* is observed as the deviation from the mean value is the lowest. The mean ratio of *RMEVB* of SBI is more than BoB and PNB. This high value may be due to the scale of marketing required for its wide spread network. Declining trend in values of *RMEVB* of all the three banks reveals that PSBs are focusing more on aggressive digital marketing to expand their network in the banking industry. The mean performance of PNB is higher than that of the other two banks in terms of *RPSATA*. ANOVA analysis in Table 5 reveals that the variance in the performance of the banks is significant in case of *MSD, RMEVB,* and *RPSATA* as the *p* - value is not more than 0.05.

Table 5. Results of ANOVA

		Sum of Squares	*df*	Mean Square	*F*	Sig.
MSD	Between Groups	854.776	2	427.388	947.901	.000
	Within Groups	12.174	27	.451		
	Total	866.950	29			
RMEVB	Between Groups	.001	2	.000	13.426	.000
	Within Groups	.001	27	.000		
	Total	.001	29			
RPSATA	Between Groups	65.748	2	32.874	3.234	.055
	Within Groups	274.441	27	10.164		
	Total	340.189	29			

Table 6. Performance of Select PSBs with Respect to Internal Business Process Perspective of the BSC Framework

(In percentages)

YEAR	*CIR*			*BPE*			*PPE*		
	SBI	BOB	PNB	SBI	BoB	PNB	SBI	BOB	PNB
2006	58.7	55.43	51.2	0.04662	0.00258	0.00170	0.0217	0.0213	0.0172
2007	54.18	51.3	49.00	0.04619	0.00266	0.00172	0.0237	0.0273	0.0174
2008	49.03	50.89	49.18	0.04779	0.00274	0.00176	0.0373	0.0394	0.0179
2009	46.62	45.38	43.41	0.04328	0.00272	0.00180	0.0474	0.0602	0.0182
2010	52.59	43.57	41.44	0.04429	0.00257	0.00185	0.0446	0.0801	0.0187
2011	47.6	39.87	42.69	0.04168	0.00230	0.00183	0.0385	0.1059	0.0188
2012	45.23	37.55	44.7	0.04177	0.00218	0.00168	0.0531	0.1187	0.0172
2013	48.51	39.79	42.63	0.04198	0.00211	0.00166	0.0645	0.1039	0.0170
2014	52.67	43.44	40.81	0.04085	0.00193	0.00160	0.0485	0.0987	0.0150
2015	49.85	43.63	40.74	0.04289	0.00181	0.00150	0.0602	0.0688	0.0163
Mean	50.5	45.09	44.58	0.04374	0.00236	0.00171	0.0439	0.0724	0.0173
Std.dev	4.05	5.76	3.83	0.00239	0.00034	0.00010	0.0140	0.0348	0.0011

Source: Annual reports of the banks and statistical tables relating to banks in India during 2006-2015.

(3) Internal Business Process Perspective : The performance of PNB in Table 6 in variable *CIR* is encouraging when compared to SBI and BoB. With a lowest mean value of *CIR*, PNB is able to earn highest *RoE* compared to SBI and BoB. Also, PNB is exhibiting consistent performance in all three variables. With wide network of operations, large number of ATMs, the *BPE* of SBI is higher, but performance of SBI in terms of *CIR* and *PPE* is alarming. Large amount of salaries due to large number of skilled employees (Table 7) account for a major part of its operating expenses, thus leading to higher *CIR* and lower *PPE*. With lower number of employees (Table 8) and good *MSD* (Table 4), the mean value of *PPE* in case of BoB is higher than SBI and PNB. ANOVA analysis in Table 7 reveals that the variance in the performance of the banks is significant in all the three variables, that is, *CIR, BPE,* and *PPE* as the p - value is less than 0.05.

Table 7. Results of ANOVA

		Sum of Squares	*df*	Mean Square	*F*	Sig.
CIR	Between Groups	215.261	2	107.631	5.025	.014
	Within Groups	578.295	27	21.418		
	Total	793.556	29			
BPE	Between Groups	.012	2	.006	2972.542	.000
	Within Groups	.000	27	.000		
	Total	.012	29			
PPE	Between Groups	.000	2	.000	2253.153	.000
	Within Groups	.000	27	.000		
	Total	.000	29			

Table 8. Performance of Select PSBs with Respect to Learning & Growth Perspective of the BSC Framework

YEAR	*LNATMs*			*LNSKE*			*RWBTI (%)*		
	SBI	**BOB**	**PNB**	**SBI**	**BOB**	**PNB**	**SBI**	**BOB**	**PNB**
2006	8.36	6.45	6.77	10.98	9.42	9.82	18.71	18.63	13.62
2007	8.39	6.91	6.92	10.93	9.52	9.84	18.03	15.83	12.31
2008	8.67	7.01	7.32	10.96	9.54	9.86	13.51	13.73	11.61
2009	9.05	7.07	7.67	11.08	9.51	9.86	12.75	13.16	14.58
2010	9.70	7.18	8.17	11.17	9.58	9.90	14.84	12.05	12.47
2011	9.92	7.36	8.53	11.29	9.67	9.94	15.65	11.81	13.18
2012	10.01	7.61	8.70	11.29	9.74	10.04	14.04	9.02	15.14
2013	10.25	7.90	8.75	11.30	9.79	10.07	13.55	8.88	18.14
2014	10.69	8.76	8.85	11.29	9.89	10.08	14.53	9.54	19.48
2015	10.73	8.99	9.03	11.29	10.01	10.11	13.45	9.00	23.92
Mean	9.58	7.53	8.07	11.16	9.67	9.95	14.90	12.17	15.44
Std.dev	0.90	0.81	0.84	0.16	0.19	0.11	2.01	3.27	3.92

Source: Annual reports of the banks and statistical tables relating to banks in India during 2006-2015.

Table 9. Results of ANOVA

		Sum of Squares	*df*	Mean Square	*F*	Sig.
LNATMs	Between Groups	22.607	2	11.303	15.532	.000
	Within Groups	19.649	27	.728		
	Total	42.256	29			
LNSKE	Between Groups	12.529	2	6.265	260.009	.000
	Within Groups	.651	27	.024		
	Total	13.180	29			
RWBTI	Between Groups	61.873	2	30.937	3.086	.062
	Within Groups	270.690	27	10.026		
	Total	332.563	29			

(4) Learning & Growth Perspective : SBI is leading in variables *LNATMs* and *LNSKE* with high mean values among the banks under study (Table 8). It is also observed from the Table 8 that all the three banks are trying to increase their reach to the customers as increasing trend is observed in the ATMs of three banks during 2006-2015.Higher score in the number of skilled employees is observed in SBI than in case of BoB and PNB. The mean value of expenses ratio *RWBTI* is higher in case of PNB, displaying that the expense on wage bills is occupying a good share in the total income. The number of skilled employees in SBI is observed to be consistent during the study period. The ANOVA analysis in Table 9 reveals that variance in performance of the banks is significant in case of *LNATMs* and *RWBTI* as the *p* - value is less than 0.05 and is not significant in case of *LNSKE*.

(5) Profitability of PSBs : The overall performance expressed in Table 10 in terms of profitability of SBI, BoB, and PNB during 2006-2015 is assessed using return on assets *(RoA)* and return on equity *(RoE)*. Mean score of BoB's performance in case of *RoA* is higher than the mean scores of SBI's and PNB's *RoA*. PNB is observed to have low deviation from the mean. However, after 2008, declining *RoA* is witnessed in case of SBI, BoB, and PNB. PNB with its high mean score and low deviation in *RoE* is exhibiting good performance compared to SBI

Table 10. Profitability Analysis of Select PSBs

(in percentages)

Year	*RoA*			*RoE*		
	SBI	**BoB**	**PNB**	**SBI**	**BoB**	**PNB**
2006	0.89	0.89	1.09	17.04	14.58	16.41
2007	0.84	1.09	1.03	15.41	18.62	15.55
2008	1.01	0.89	1.15	16.75	14.58	18.01
2009	1.04	1.09	1.39	17.05	18.62	22.92
2010	0.88	1.21	1.44	14.04	21.86	24.12
2011	0.71	1.18	1.34	12.84	23.47	22.60
2012	0.88	1.12	1.19	14.36	20.64	19.80
2013	0.97	0.82	1.00	15.94	15.07	15.70
2014	0.65	0.69	0.64	10.49	13.36	9.75
2015	0.68	0.48	0.53	11.17	12.60	8.17
Mean	1.38	1.61	1.53	11.83	18.48	18.93
Std.dev	0.31	0.29	0.27	2.82	1.62	1.10

Source: Annual reports of the banks from 2006-2015

Table 11. Results of ANOVA

		Sum of Squares	***df***	**Mean Square**	***F***	**Sig.**
ROA	Between Groups	.256	2	.128	2.330	.117
	Within Groups	1.484	27	.055		
	Total	1.740	29			
ROE	Between Groups	52.741	2	26.371	1.612	.218
	Within Groups	441.658	27	16.358		
	Total	494.400	29			

and PNB. The volatility in *RoE* may be due to high NPA ratio of PSBs, which is leading to declining growth rate of net profits in these banks. However, ANOVA analysis in Table 11 reveals that the variance in the performance of the banks is not statistically significant in case of both variables *RoA* and *RoE* as the p - value is greater than 0.05.

(6) Association Between *RoA*, *RoE*, and Variables of the BSC Framework : The relationship between the profitability, that is, *RoA* and *RoE* and 13 variables of the BSC framework of the banks SBI, BoB, and PNB during 2006 -2015 is assessed using correlation and multiple regression analysis. Independent variables which show

Table 12. Correlation Matrix

		ROA	ROE	CDR	NIM	CAR	NNPAR	MSD	RMEVB	RPSATA	CIR	BPE	PPE	LNATMs	LNSKE	RWBTI
ROA	Pearson Correlation	1														
	Sig. (2-tailed)															
ROE	Pearson Correlation	.937**	1													
	Sig. (2-tailed)	.000														
CDR	Pearson Correlation	-.152	-.204	1												
	Sig. (2-tailed)	.422	.280													
NIM	Pearson Correlation	.216	.050	.302	1											
	Sig. (2-tailed)	.251	.795	.104												
CAR	Pearson Correlation	.594**	.664**	-.015	-.407*	1										
	Sig. (2-tailed)	.001	.000	.936	.025											
NNPAR	Pearson Correlation	-.713**	-.749**	.480**	.180	-.535**	1									
	Sig. (2-tailed)	.000	.000	.007	.342	.002										
MSD	Pearson Correlation	-.328	-.327	.536**	.128	-.164	.442*	1								
	Sig. (2-tailed)	.077	.078	.002	.502	.386	.014									
RMEVB	Pearson Correlation	-.020	-.025	.478**	-.024	.197	.028	.630**	1							
	Sig. (2-tailed)	.918	.896	.008	.899	.297	.884	.000								
RPSATA	Pearson Correlation	.347	.181	-.304	.429*	-.200	-.324	-.014	-.015	1						
	Sig. (2-tailed)	.061	.338	.103	.018	.289	.081	.941	.938							
CIR	Pearson Correlation	-.168	-.249	-.024	.095	-.337	-.032	.479**	.379*	.445*	1					
	Sig. (2-tailed)	.375	.185	.899	.616	.069	.868	.007	.039	.014						
LBPE	Pearson Correlation	-.296	-.308	.547**	.129	-.147	.405*	.990**	.645**	.040	.537**	1				
	Sig. (2-tailed)	.112	.097	.002	.498	.439	.026	.000	.000	.832	.002					
PPE	Pearson Correlation	.351	.136	-.023	.706**	-.295	.122	-.263	-.415*	.432*	-.167	-.269	1			
	Sig. (2-tailed)	.057	.474	.905	.000	.114	.522	.161	.022	.017	.378	.151				
LNATMs	Pearson Correlation	-.492**	-.496**	.771**	.257	-.330	.743**	.727**	.362*	-.394*	.016	.675**	-.020	1		
	Sig. (2-tailed)	.006	.005	.000	.170	.075	.000	.000	.050	.031	.932	.000	.917			
LNSKE	Pearson Correlation	-.373*	-.409*	.657**	.286	-.271	.579**	.963**	.569**	-.039	.375*	.945**	-.086	.853**	1	
	Sig. (2-tailed)	.042	.025	.000	.125	.148	.001	.000	.001	.837	.041	.000	.652	.000		
RWBTI	Pearson Correlation	-.252	-.385*	.218	.282	-.432*	.511**	.109	-.079	.275	.313	.162	.310	.118	.177	1
	Sig. (2-tailed)	.179	.036	.247	.131	.017	.004	.566	.679	.142	.093	.393	.096	.534	.348	

Note : *. Correlation is significant at the 0.05 level (2-tailed).

higher association with the dependent variables are identified. To examine the extent of influence of the highly associated independent variables on the dependent variables, that is, *RoA* and *RoE*, multiple regression analysis is employed.

Correlation results are shown in the correlation matrix in Table 12. It can be observed that out of 13 independent variables, only four variables are found to have statistically significant correlation with *RoA*. They are *CAR* and *NNPAR* under financial perspective and *LNATMs* and *LNSKE* under learning & growth perspective. The remaining nine variables are found to not have statistically significant correlation with *RoA*. Among the variables which are statistically significant, three variables, that is, *NNPAR, LNATMs,* and *LNSKE* are negatively correlated and *CAR* is positively correlated with *RoA*.

Similarly, it can be observed from the correlation matrix in Table 12 that out of 13 factors, five factors are found to have statistically significant correlation with *RoE*. They are *CAR* and *NNPAR* under financial perspective and *LNATMs, RWBTI,* and *LNSKE* under learning & growth perspective. The remaining eight variables are found not to have statistically significant correlation with *RoE*. Among the variables which are statistically significant, four of them, that is, *NNPAR, LNATMs, RWBTI,* and *LNSKE* are negatively correlated and only one variable, that is, *CAR* is positively correlated with RoE.

The regression analysis is done using the following equations:

$$ROA\ (Y) = a0 + a3\ (NNPATA) + a4\ (CAR) + a11(LNATMS) + a12\ (LNSKE) + €$$
$$ROE\ (Y) = a0 + a3\ (NNPATA) + a4\ (CAR) + a11\ (ATMS) + a12\ (SKE) + a13\ (RWBTI) + €$$

where, dependent variables = *ROA* and *ROE.*

The results are shown in the Table 13.The critical value of *'t'* at 0.05 level of significance is 2.05.The calculated value of *'t'* shown in Table 13 reports that beta coefficients of *CAR, LNATMs, and LNSKE* are not statistically significant, since the calculated value of *'t'* value falls within the acceptance region. Hence, *CAR, LNATMs,* and *LNSKE* are not significant explanatory variables of *RoA*. However, beta coefficient of *NNPAR* falls out of the acceptance region. Hence, *NNPAR* is a significant explanatory variable of *RoA* in select PSBs. It is also revealed from the Table 13 that beta coefficient of *NNPAR* is negative, indicating inverse relationship with *RoA*.

Table 13. Summary of Multiple Regression Analysis

a. Dependent Variable: ROA				
Model 1		**Beta (Standardized Coefficients)**	***t***	***Sig.***
Balanced Scorecard Framework	(Constant)		-.030	.976
Financial Perspective	*CAR*	.295	1.889	.071
	NNPAR	-.582	**-2.613**	**.015**
Learning & Growth Perspective	*LNATMs*	.002	.007	.995
	LNSKE	.042	.165	.870

Table 14. Model Summary

Model	***R***	***R Square***	***Adjusted R Square***	***Std. Error of the Estimate***	***Change Statistics***				
					R Square Change	***F Change***	***df1***	***df2***	***Sig. F Change***
1	.757[a]	.573	.505	.17236	.573	8.397	4	25	.000

a. Predictors: (Constant), *LNSKE, CAR, NNPAR, LNATMs*; b. Dependent Variable : *RoA*

Table 15. Summary of Multiple Regression Analysis

a. Dependent Variable: ROE				
Model 1		**Beta (Standardized Coefficients)**	***t***	***Sig.***
Balanced Scorecard Framework	(Constant)		-.285	.778
Financial Perspective	***CAR***	.384	**2.734**	**.012**
	NNPAR	-.784	**-3.184**	**.004**
Learning & Growth Perspective	*LNATMs*	.336	1.051	.304
	LNSKE	-.168	-.707	.486
	RWBTI	.172	1.057	.301

Table 16. Model Summary *(ROE)*

Model	***R***	***R Square***	***Adjusted R Square***	***Std. Error of the Estimate***	***Change Statistics***				
					R Square Change	***F Change***	***df1***	***df2***	***Sig. F Change***
1	.823[a]	.678	.611	2.57667	.678	10.093	5	24	.000

a. Predictors: (Constant), *RWBTI, LNATMs, CAR, LNSKE, NNPAR* ; Dependent Variable: *RoE*

To examine whether the regression model as a whole is significant, coefficient of determination, that is, *R*-square is calculated. The Table 14 reports that 57.3% of the variation in *RoA* is explained by the regression line. The calculated *F*-value, 8.397 as reported in the Table 14, is greater than the critical *F*-value 2.76, which suggests that the model as a whole is statistically significant at the 5% level of significance. Multiple regression analysis was conducted to examine the extent of influence of the independent variables on the dependent variable *RoE* and the results are shown in the Table 15.

The critical value of *'t'* at 0.05 level of significance is 2.05.The calculated value of *t* shown in Table 15 reports that beta coefficients of *LNATMs* and *LNSKE* are not statistically significant, since the calculated value of *'t'* value falls within the acceptance region. Hence, *LNATMs* and *LNSKE* are not significant explanatory variables of *RoA*. However, beta coefficients of *CAR* and *NNPAR* fall out of the acceptance region. Hence, *CAR* and *NNPAR* are significant explanatory variables of *RoE* in PSBs. It can also be revealed that beta coefficient of *NNPAR* is negative, indicating inverse relationship with *RoE*. At the same time, positive beta coefficient is reported for *CAR*, which indicates positive relationship with *RoE*.

To examine whether the regression model as a whole is significant, coefficient of determination, that is, *R*-square is calculated. The Table 16 reports that 67.8% of the variation in *RoE* is explained by the regression line. The calculated value of *F* - ratio, 10.093 as reported in the Table 16, is greater than the critical value of *F*-ratio 2.76, which suggests that the model as a whole is statistically significant at the 5 % level of significance.

Discussion and Conclusion

Majority of the Indian banking performance evaluation studies done previously evaluated only financial performance in terms of profitability and productivity (lagging indicators) and very less number of studies evaluated the holistic performance of a bank which included lagging (financial) as well as leading indicators (non-financial measures) of performance. Along with holistic performance, it is also important for a bank to understand the relationship between profitability and variables in balanced scorecard framework, since performance can be improved if the influencing factors are known. Hence, this paper presents a model to evaluate the holistic performance of a bank and understand the influence of variables in the BSC framework on profitability. Holistic

performance was analyzed using variables in four perspectives of BSC framework (*CDR, NIM, CAR, NNPANAR, MSD, RMEVB, RPSATA, CIR, BPE, PPE, LnATMs, LnSKE,* and *RWBTI)* and profitability was measured in terms of *RoA* and *RoE.* We did not come across the studies that explained the influence of variables of BSC framework on profitability of the banks. Thus, the present model not only provides information about comprehensive performance of the banks, but also gives details of variables influencing the profitability significantly.

With a sample of three public sector banks (SBI, BoB, and PNB), the present study reports that the performance of SBI during the period 2006 to 2015 was impressive with respect to customer satisfaction and learning & growth perspectives and was not impressive with respect to financial and internal business perspectives of the BSC framework. Higher NPA ratios affected the financial performance of SBI. The performance of BoB was impressive with respect to the financial perspective, poor in learning & growth perspective of the BSC framework, and reasonable in other two perspectives. Adequate capital *(CAR)* and diversified transactions helped BoB to reduce the gross non-performing assets (NPAs) and improve the financial performance. However, it did not totally expand in scale to reach the public and provide services, and thus, had a low market share. The performance of PNB was moderate in all the four perspectives of the BSC framework during the study period.

With cost-to-income ratio being less than 45%, PNB was able to turn resources into revenue at low cost but recorded relatively low performance in business per employee ; with high wage bills, the bank experienced low profit per employee. Significant difference exists between the performance of public sector banks SBI, BoB, and PNB in all the four perspectives of the BSC framework developed for the purpose.

Further, during the period of the study, public sector banks' profitability in terms of both *RoA* and *RoE* reported a declining trend. Also, there is a significant relationship between profitability of the public sector banks and variables under financial and learning & growth perspectives during the period from 2006-2015. As majority share of the banking assets in the Indian economy is with public sector banks, reduction in the corporate earnings due to slow down in the economy during the study period resulted in growing non-performing assets and thus resulted in low performance in *RoA* of the PSBs. Insufficient capital compared to rising NPAs led to decrease in profitability in terms of *RoE*. Thus, rise in NPAs on one side and inadequate capital to face the situation on the other side resulted in a decline in the profitability of PSBs.

Research Implications

The empirical results of the current study reveal a number of managerial implications. The holistic performance of select PSBs during the study period is measured using balanced scorecard designed for the purpose. It is found that the overall performance of the select PSBs during the study period was not remarkable. As traditional methods of financial performance analysis are lopsided and focus on short term earnings, the management of the public sector banks should focus on holistic performance measures for measuring the overall performance. New generation private sector banks in the country like ICICI Bank, HDFC Bank, and Axis Bank are adopting the balanced scorecard framework for their performance management. The evidence of their overall performance is visible in their performance. Similarly, PSBs can also develop holistic measurement systems like BSC that captures the many interrelated variables that drive success. Usage of such contemporary and holistic performance measurement systems helps to improve the overall performance of the PSBs in various parameters and since PSBs account for 70% of the banking business, there would be an impact on the development of the economy.

The profitability of the select PSBs deteriorated during the study period. The significant factors that are influencing the profitability are the non-performing assets and capital adequacy ratio. Management should focus on reducing NPAs and improving the capital adequacy ratio by: focusing on retail banking to reduce the percentage of NPAs and simultaneously improve income generating capacity ; increasing the proportion of total number of officers with set business targets to increase business per employee ; increasing low cost CASA

deposits to reduce the cost of funds and strengthening credit monitoring systems. In addition, the government should take up capital infusion into state-owned banks to increase their capital adequacy ratio and thus help the banks to earn profits and increase the credit flow to the industry and help in economic growth of the nation.

Limitations of the Study and Scope for Further Research

The present study is confined only to the selected PSBs and PVBs from the Indian banking industry and is also limited to a 10 years period. Hence, generalization of the findings of current research should be done very carefully. Also, the current research considers selected performance indicators under four perspectives of the balanced scorecard, however, there may exist still the possibility of missing certain performance indicators under financial and non-financial perspectives. The information based on the secondary data may suffer from all the limitations inherent with the use of secondary data.

The present study used the balanced scorecard with only bank specific factors, that is, internal factors for evaluating the performance of the banks. Future studies can be done including external determinants such as gross domestic product, interest rates, and inflation etc. There still remains a viable prospect for further research to include private and foreign banks along with public sector banks for assessing the holistic performance of Indian banking sector. Furthermore, it can also serve as a starting point on which future related studies can be done in the context of balanced scorecard in the banking sector.

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