

## Impact of asset quality on operational performance of select public sector banks in the pre and post-merger periods

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### Abstract

Asset quality is one of the most critical areas in determining the overall condition of the bank. The primary factor affecting overall asset quality is the quality of loan portfolio and the credit administration program. The operational performance of the banks has been analyzed using the financial ratios of the select public sector banks in the pre and post-merger periods. Mergers and Acquisitions as a phenomenon are implemented to strengthen the banking system, embrace globalization, improve healthy competition, exploit economies of scale, adopt advanced technologies, raise efficiency and improve profitability. The main objective of this study to investigate the impact of asset quality on operational performance of public sector banks in the pre and post-merger periods. The study period covers five years pre and post-merger of banks. The year of merger as a base year and hence, it is excluded from the evaluation in order to have consistency in evaluation of pre and post-merger performance of acquirer banks. The year of merger differs in all merger deals. For the purpose of the study, the census method has been adopted to select public sector banks namely the State Bank of India, Indian Overseas Bank, Bank of Baroda, Punjab National Bank, IDBI Bank and Oriental Bank of Commerce. The latest mergers have been taken for sample size of the study i.e. after the year 2000 has been considered. The data analysis is done using ratio analysis, descriptive statistics like mean, standard deviation, coefficient of variation, compound annual growth rate, paired t-test and multiple regression.

**Keywords:** asset quality, operational performance, mergers, descriptive statistics, public sector banks, paired t-test and multiple regression

### Introduction

Asset quality is one of the most critical areas in determining the overall condition of the bank. The primary factor affecting overall asset quality is the quality of loan portfolio and the credit administration program. Loans are usually the largest of the asset items and can also carry the greatest amount of potential risk to the bank's capital account. Securities can often be a large portion of the assets and also have identifiable risks. Other items which impact a comprehensive review of asset quality are other real estate, other assets, off- balance sheet items and to a lesser extent, cash and due from accounts, and premises and fixed assets. The asset quality rating reflects the quantity of existing and potential credit risk associated with the loan and investment portfolios, other estate owned, and other assets, as well as off- balance sheet transactions. The ability of management to identify, measure, monitor and control credit risk is also reflected here. The quality of assets is an important parameter to gauge the strength of the bank. The main motto behind measuring the asset quality is to ascertain the component of Non-Performing Assets (NPA) as a percentage of total assets. These NPAs should be considered against not just total asset but also against the advances because NPAs primarily arise from Advances. This indicates what type of advances of the banks has made to generate interest income. Thus, Asset Quality indicates the type of the debtors of the bank. The ratios suggested measuring Asset Quality under capital adequacy and profitability model.

### Model Framework

Model Frame Work of Asset Quality

- Gross NPAs to Gross Advances
  - Net NPAs to Net Advances
  - Total investment to Total assets
  - Net NPAs to Total Assets
- A – Asset quality

### Statement of the Problem

The asset quality that may indicate becomes the future time bomb for banks. In 1995, the "standard for safety and soundness," which was established by the United States Federal Reserve Board, became effective, requiring United States financial institutions to set up an asset quality monitoring systems for identifying possible emerging problems of banks asset quality, and demanding banks to regularly present the asset quality reports to the board of directors so as to evaluate the risk associated with asset quality deterioration. The success of a mergers lies in a lot of issues such business, appraisal, risk integration etc, however, merger activities in the Indian banking sector have a marvelous effect on the bank performance. There are various reasons behind firms going for mergers and acquisitions. The merger deals are frequent not only in the developed countries but also have become more apparent in the developing countries. In the pre-liberalization period, in India, the incident recorded and upsurge in the waken of liberalization measures resulting into shrinking the government controls, regulations and margins at which point the corporate houses got freedom to enlarge,

spread and modernize the operations by resorting to mergers, takeover etc. With increasing competition and the economy direction towards globalization, mergers and acquisitions are estimated to come about at a much larger scale than any time in the earlier period and have played a most important role in achieving the competitive edge in the dynamic market environment. This raises the following question.

- To what extent has asset quality affected the performance of banks in the pre and post-merger periods?

**Objective of the Study**

- To investigate the impact of asset quality on operational performance of public sector banks in the pre and post-merger periods.

**Hypothesis of the Study**

- There is no significant relationship in bank asset quality and operational performance of public sector banks between the pre and post-merger periods.

**Research Methodology**

**Sources of Data**

The present study is mainly based on secondary data. The data for this study is collected from CMIE prowest database and also from selected banks annual reports, annual reports published by the Reserve Bank of India (RBI), money control website and Department of banking supervision.

**Period of the Study**

The study period covers five years pre and post-merger of

banks. The year of merger as a base year and hence, it is excluded from the evaluation in order to have consistency in evaluation of pre and post-merger performance of acquirer banks. The year of merger differs in all merger deals.

**Selection of the Sample**

For the purpose of the study, the census method has been adopted to select public sector banks namely the State Bank of India, Indian Overseas Bank, Bank of Baroda, Punjab National Bank, IDBI Bank and Oriental Bank of Commerce. Merger in India has assumed great significance with the advent of the policy of deregulation initiated in the year of 1991 and in the selection of sample the latest mergers have been taken for sample size of the study i.e. after the year 2000 have been considered.

**Tools for Analysis**

The data analysis is done using ratio analysis, descriptive statistics like mean, standard deviation, coefficient of variation, compound annual growth rate, paired t test and multiple regression.

**Asset Quality Ratios of Select Public Sector Banks in the Pre and Post Merger Periods**

**Gross NPA to Gross Advances Ratio of Select Public Sector Banks in the Pre and Post Merger Periods**

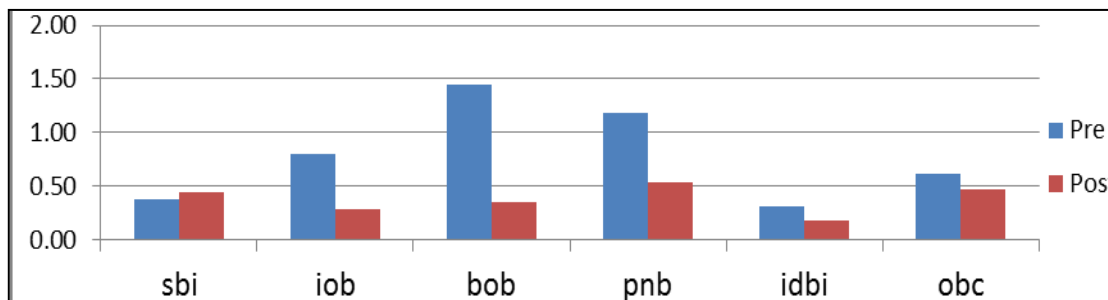
**H0<sub>2</sub>:** There is no significant difference in Gross NPA to Gross Advances of select public sector banks in the pre and post-merger periods

**Table 1:** Gross NPA to Gross Advances (In Ratio)

	SBI		IOB		BOB		PNB		IDBI		OBC	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	0.62	0.33	1.20	0.17	1.59	0.77	1.08	0.99	0.26	0.20	0.55	0.99
	0.37	0.46	1.09	0.26	1.60	0.40	0.99	0.62	0.29	0.19	0.57	0.63
	0.30	0.49	0.78	0.46	1.53	0.25	1.39	0.42	0.32	0.14	0.53	0.33
	0.31	0.51	0.55	0.28	1.33	0.18	1.23	0.35	0.41	0.15	0.67	0.23
	0.29	0.44	0.35	0.28	1.18	0.13	1.20	0.28	0.27	0.18	0.73	0.15
Mean	0.38	0.45	0.79	0.29	1.45	0.34	1.18	0.53	0.31	0.17	0.61	0.47
T value	-0.743		2.775		13.870		3.669		3.793		0.791	
Sig	0.499		0.050*		0.000*		0.021*		0.019*		0.473	

Source: Money Control and Department of Banking Control

\*indicates statistical significance at 5 percent level



**Fig 1:** Gross NPA to Gross Advances

The table 1 shows that the significant difference in the gross NPAs to gross advances at the pre and post-merger periods have been identified in Indian Overseas Bank, Bank of Baroda, Punjab National Bank and IDBI Bank. Since, the respective t-statistics is significant at the 5 percent level. Hence, the null

hypothesis is rejected. It indicates that there is a significant difference in the mean ratio of gross NPA to gross advances between the pre and post mergers periods. State bank of India and oriental bank of commerce are not significant at the 5 percent level.

**Net NPA to net Advances Ratio of Select Public Sector Banks in the Pre and Post-Merger Periods**

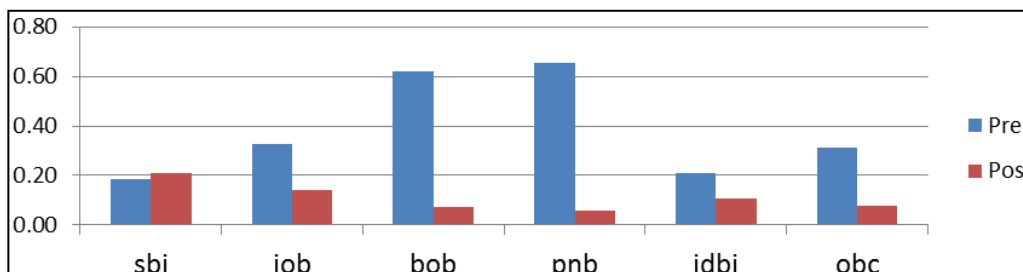
Advances of select public sector banks in the pre and post-merger periods

**H0<sub>2</sub>:** There is no significant difference in Net NPA to Net

**Table 2:** Net NPA to Net Advances (In Ratio)

	SBI		IOB		BOB		PNB		IDBI		OBC	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	0.26	0.16	0.63	0.06	0.69	0.14	0.64	0.10	0.17	0.12	0.39	0.13
	0.19	0.18	0.52	0.13	0.69	0.09	0.60	0.02	0.19	0.13	0.36	0.05
	0.16	0.21	0.28	0.25	0.67	0.06	0.85	0.03	0.21	0.09	0.36	0.06
	0.18	0.26	0.13	0.12	0.57	0.05	0.67	0.08	0.29	0.10	0.32	0.10
	0.14	0.21	0.06	0.14	0.48	0.03	0.53	0.06	0.19	0.11	0.14	0.06
MEAN	0.18	0.21	0.33	0.14	0.62	0.07	0.66	0.06	0.21	0.11	0.31	0.08
T value	-1.003		1.466		18.772		10.186		3.922		5.616	
Sig	0.372		0.217		0.000*		0.001*		0.017*		0.005*	

Source: Money Control and Department of Banking Control  
\*indicates statistical significance at 5 percent level



**Fig 2:** Net NPA to Net Advances

The table 2 reveals that the significant difference in the net NPAs to net advances at the pre and post-merger periods have been identified in Bank of Baroda, Punjab National Bank, IDBI Bank and Oriental Bank of Commerce. Since, the respective t-statistics is significant at the 5 percent level. Hence, the null hypothesis is rejected.

It indicates that there is a significant difference in the mean ratio of net NPAs to net advances between the pre and post

mergers periods. State bank of India and Indian overseas bank are not significant at the 5 percent level.

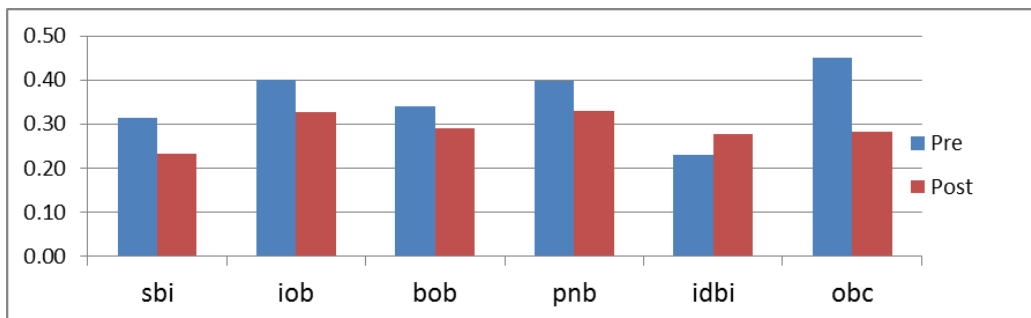
**Total Investment to Total Assets Ratio of Select Public Sector Banks in the Pre and Post Merger Periods**

**H0<sub>2</sub>:** There is no significant difference in Total Investment to Total Assets of select public sector banks in the pre and post-merger periods

**Table 3:** Total Investment to Total Assets (In Ratio)

	SBI		IOB		BOB		PNB		IDBI		OBC	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	0.43	0.24	0.43	0.28	0.34	0.39	0.39	0.41	0.14	0.25	0.46	0.34
	0.33	0.23	0.45	0.26	0.34	0.31	0.40	0.40	0.16	0.25	0.47	0.29
	0.26	0.22	0.43	0.29	0.29	0.24	0.41	0.28	0.16	0.29	0.45	0.27
	0.26	0.22	0.38	0.27	0.34	0.24	0.40	0.28	0.38	0.32	0.43	0.26
	0.29	0.24	0.32	0.53	0.39	0.23	0.39	0.27	0.31	0.27	0.43	0.26
Mean	0.31	0.23	0.40	0.33	0.34	0.28	0.40	0.33	0.23	0.28	0.45	0.28
T value	2.923		1.046		1.651		2.130		1.155		14.610	
Sig	0.043		0.354		0.174		0.100		0.312		0.000*	

Source: Money Control and Department of Banking Control  
\*indicates statistical significance at 5 percent level



**Fig 3:** Total Investment to Total Assets

The table 3 shows that the significant difference in the Total Investment to Total Assets at the pre and post-merger periods have been identified in State Bank of India and Oriental Bank of Commerce. Since, the respective t-statistics is significant at the 5 percent level. Hence, the null hypothesis is rejected. It indicates that there is a significant difference in the mean ratio of net NPAs to net advances between the pre and post mergers periods. Indian overseas bank, bank of Baroda,

Punjab national bank and IDBI bank are not significant at the 5 percent level.

**Total Investment to Total Assets Ratio of Select Public Sector Banks in the Pre and Post Merger Periods**

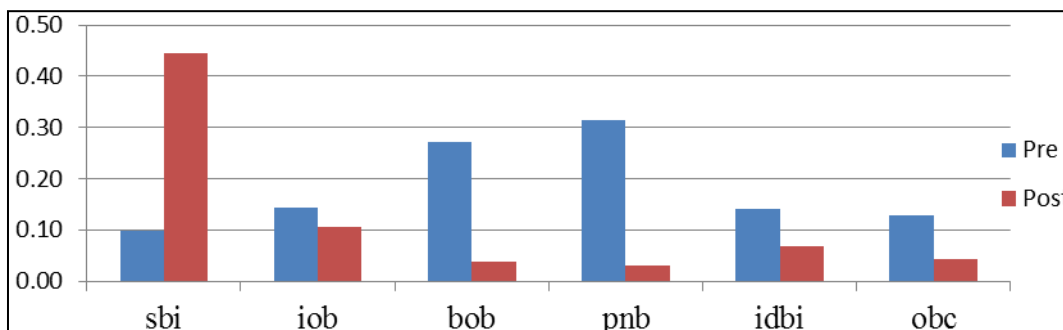
**Ho<sub>2</sub>:** There is no significant difference in Net NPA to Total Assets of select public sector banks in the pre and post-merger periods

**Table 4:** Net NPA to Total Assets (In Ratio)

	SBI		IOB		BOB		PNB		IDBI		OBC	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	0.12	0.10	0.27	0.04	0.29	0.07	0.34	0.04	0.12	0.07	0.15	0.06
	0.10	0.12	0.22	0.08	0.29	0.05	0.33	0.01	0.14	0.08	0.14	0.03
	0.09	0.14	0.12	0.15	0.29	0.04	0.36	0.01	0.16	0.06	0.15	0.03
	0.10	1.74	0.06	0.07	0.27	0.03	0.30	0.04	0.15	0.06	0.14	0.06
	0.08	0.13	0.04	0.18	0.22	0.02	0.25	0.04	0.10	0.07	0.07	0.04
Mean	0.10	0.45	0.14	0.11	0.27	0.04	0.31	0.03	0.13	0.07	0.13	0.04
T value	-1.077		0.580		25.715		11.817		5.123		5.483	
Sig	0.342		0.593		0.000*		0.000*		0.007*		0.005*	

Source: Money Control and Department of Banking Control

\*indicates statistical significance at 5 percent level



**Fig 4:** Net NPA to Total Assets

The table 4 deals that the significant difference in the Net NPA to Total Assets at the pre and post-merger periods have been identified in Bank of Baroda, Punjab National Bank, IDBI Bank and Oriental Bank of Commerce. Since, the respective t-statistics is significant at the 5 percent level. Hence, the null hypothesis is rejected.

It indicates that there is a significant difference in the mean ratio of net NPAs to net advances between the pre and post mergers periods. State bank of India and Indian overseas bank is not significant at the 5 percent level.

**Operational Performance of Select Public Sector Banks in the Pre and Post Merger Periods**

The operational performance of the banks has been analyzed using the financial ratios of the select public sector banks in the pre and post-merger periods. Ratio is the relationship expressed in mathematical terms between two figures connected with each other in some logical manner. Profitability is the most commonly used criterion to

determine the efficiency of banks and this can be measured by using different methods following different concepts.

The total assets of any bank mainly comprise the loans and advances and investments etc., which are expected to generate a desirable rate of return at minimum cost and expenditure. To assess the relative efficiency of the different categories of public sector banks different ratios of return on total assets and various heads of expenditures to total assets of public sector banks are analyzed.

The following indicators have been selected to assess the performance of select public sector banks during the pre and post mergers period.

1. Gross Profit on Total Assets
2. Net Return on Total Assets
3. Interest Income on Total Assets
4. Interest Expended on Total Assets
5. Net Interest Income on Total Assets
6. Provisions and Contingencies on Total Assets
7. Operating Expenses on Total Assets

**Table 5:** Operational Performance of State Bank of India in the Pre and Post-Merger Periods (In Percentage)

	GP to TA		NP to TA		INT INC to TA		IE to TA		N I INC to TA		P&C to TA		OE to TA	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	6.15	5.99	0.94	0.60	7.05	6.65	4.02	3.99	3.03	2.66	1.19	1.39	2.45	1.88
	6.34	7.10	0.89	0.88	7.25	7.98	4.08	4.73	3.17	3.24	1.37	1.49	2.40	1.95
	5.95	6.79	0.80	0.90	6.97	7.64	4.14	4.81	2.83	2.83	1.01	1.08	2.34	1.87
	6.06	6.65	0.93	0.61	6.78	7.61	4.43	4.86	2.36	2.75	0.70	1.18	2.02	1.99
	6.05	6.65	0.95	0.64	6.61	7.44	4.45	4.75	2.16	2.69	0.66	1.26	1.88	1.89
MEAN	6.11	6.64	0.90	0.73	6.93	7.46	4.22	4.63	2.71	2.83	0.98	1.28	2.22	1.92
SD	0.15	0.41	0.06	0.15	0.24	0.49	0.20	0.36	0.43	0.24	0.31	0.16	0.25	0.05
CV	2.41	6.10	6.61	20.67	3.52	6.62	4.75	7.76	15.95	8.39	31.12	12.60	11.40	2.79
CAGR	-0.003	0.021	0.002	0.012	-0.013	0.023	0.021	0.036	-0.065	0.002	-0.113	-0.020	-0.052	0.001

Source: Money Control and CMIE

**Test for difference in Operational Performance of State Bank of India**

**Ho<sub>2</sub>:** There is no significant difference in operational

performance of State Bank of India in the pre and post-merger periods

**Table 6:** Difference on operational performance of State Bank of India between the pre and post-Merger Periods

Ratio	GP to TA	NP to TA	INT INC to TA	IE to TA	N I INC to TA	P&C to TA	OE to TA
T value	-2.955	1.913	-2.264	-3.140	-0.786	-2.819	2.494
Sig	0.042*	0.128	0.086	0.035*	0.176	0.048*	0.067

Source: computed data

\*indicates statistical significance at 5 percent level

The table 6 shows that t- value is significant at 5 percent level. Hence, the null hypothesis is rejected. Therefore, it is concluded that there is significant difference in gross profit to

total assets ratio, interest earnings to total assets ratio and provisions and contingencies to total assets ratio between the pre and post-merger periods of State Bank of India

**Table 7:** Operational Performance of Indian Overseas Bank in the Pre and Post-Merger Periods (In Percentage)

	GP to TA		NP to TA		INT INC to TA		IE to TA		N I INC to TA		P&C to TA		OE to TA	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	7.95	7.31	0.65	1.18	8.95	7.83	6.21	5.20	2.74	2.63	1.09	0.93	2.50	1.58
	6.87	7.55	1.01	1.11	8.47	8.04	5.50	5.65	2.97	2.39	0.36	0.79	2.92	1.92
	6.45	6.20	1.09	0.54	7.96	7.89	4.57	5.45	3.39	2.44	0.79	0.21	3.25	2.61
	6.51	6.05	1.29	0.60	7.80	6.81	4.14	4.44	3.66	2.37	1.09	1.01	2.87	1.45
	6.21	15.55	1.32	1.00	7.44	16.95	3.95	12.20	3.49	4.75	0.94	2.35	2.46	3.00
MEAN	6.80	8.53	1.07	0.89	8.12	9.51	4.87	6.59	3.25	2.92	0.85	1.06	2.80	2.11
SD	0.69	3.98	0.27	0.29	0.59	4.19	0.96	3.17	0.38	1.03	0.30	0.79	0.33	0.67
CV	10.09	46.63	25.17	33.11	7.28	44.10	19.67	48.13	11.81	35.36	35.48	74.63	11.72	31.62
CAGR	-0.048	0.163	0.153	-0.034	-0.036	0.167	-0.087	0.186	0.050	0.125	-0.029	0.205	-0.003	0.136

Source: Money Control and CMIE

**Test for difference in Operational Performance of Indian Overseas Bank**

**Ho<sub>2</sub>:** There is no significant difference in operational

performance of Indian Overseas Bank in the pre and post-merger periods

**Table 8:** Difference on operational performance of Indian Overseas Bank between the pre and post Merger Periods

Ratio	GP to TA	NP to TA	INT INC to TA	IE to TA	N I INC to TA	P&C to TA	OE to TA
T value	-0.905	0.832	-0.676	-1.031	0.752	0.597	2.076
Sig	0.416	0.452	0.536	0.361	0.494	0.583	0.107

Source: computed data

\*indicates statistical significance at 5 percent level

The table 8 examines that t- value is not significant at 5 percent level. Hence, the null hypothesis is accepted. Therefore, it is concluded that there is no significant difference in gross profit to total assets ratio, net profit to total assets ratio, interest income to total assets ratio, interest

earnings to total assets ratio, net interest income to total assets ratio, provisions and contingencies to total assets ratio and operating expenses to total assets ratio between the pre and post-merger periods of Indian Overseas Bank.

**Table 9:** Operational Performance of Bank of Baroda in the Pre and Post Merger Periods

	GP to TA		NP to TA		INT INC to TA		IE to TA		NI INC to TA		P&C to TA		OE to TA	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	7.46	5.62	0.77	0.71	8.36	6.79	5.43	3.65	2.93	3.15	0.75	1.26	2.13	2.55
	7.78	4.91	0.86	0.93	8.91	6.26	5.98	3.42	2.92	2.84	0.94	0.57	2.22	2.40
	7.67	5.47	0.43	0.72	9.09	6.44	6.03	3.79	3.06	2.64	1.20	0.96	2.54	1.94
	7.59	5.84	0.77	0.80	8.40	6.58	5.75	4.40	2.65	2.18	1.08	0.64	2.20	1.88
	6.95	6.16	1.01	0.98	7.98	6.64	5.23	4.38	2.75	2.25	0.72	0.80	2.68	1.69
MEAN	7.49	5.60	0.77	0.83	8.55	6.54	5.68	3.93	2.86	2.61	0.94	0.85	2.35	2.09
SD	0.32	0.47	0.21	0.12	0.45	0.20	0.35	0.44	0.16	0.41	0.21	0.28	0.24	0.37
CV	4.30	8.31	27.56	14.61	5.26	3.09	6.15	11.30	5.64	15.53	22.35	32.83	10.15	17.51
CAGR	-0.014	0.018	0.057	0.065	-0.009	-0.005	-0.008	0.037	-0.012	-0.065	-0.009	-0.088	0.047	-0.079

Source: Money Control and CMIE

**Test for difference in Operational Performance of Bank of Baroda**

**H<sub>0</sub>:** There is no significant difference in operational

performance of Bank of Baroda in the pre and post-merger periods

**Table 10:** Difference on operational performance of Bank of Baroda between the pre and post-Merger Periods

Ratio	GP to TA	NP to TA	INT INC to TA	IE to TA	NI INC to TA	P&C to TA	OE to TA
T value	5.587	-0.971	7.330	5.747	1.791	0.526	1.024
Sig	0.005*	0.387	0.002*	0.005*	0.148	0.627	0.364

Source: computed data

\*indicates statistical significance at 5 percent level

The table 10 exhibits that t- value is significant at 5 percent level. Hence, the null hypothesis is rejected. Therefore, it is concluded that there is significant difference in gross profit to

total assets ratio, interest income to total assets ratio and interest earnings to total assets ratio between the pre and post-merger periods of Bank of Baroda.

**Table 11:** Operational Performance of Punjab National Bank in the Pre and Post Merger Periods (In Percentage)

	GP to TA		NP to TA		INT INC to TA		IE to TA		NI INC to TA		P&C to TA		OE to TA	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	7.80	6.03	0.75	1.09	8.81	7.63	6.11	4.07	2.71	3.55	0.61	0.87	2.36	3.54
	7.72	5.60	0.74	1.12	9.31	6.72	6.50	3.54	2.81	3.18	0.72	0.95	2.68	2.59
	8.11	5.38	0.76	0.99	9.59	6.61	6.58	3.39	3.01	3.22	0.77	1.00	2.83	2.25
	7.59	5.52	0.73	0.95	9.28	7.12	6.06	3.71	3.23	3.40	0.81	0.86	2.96	2.42
	8.11	6.26	0.77	1.04	9.16	7.22	6.00	4.42	3.16	2.80	1.34	0.80	2.48	1.98
MEAN	7.87	5.76	0.75	1.04	9.23	7.06	6.25	3.83	2.98	3.23	0.85	0.89	2.66	2.56
SD	0.23	0.37	0.02	0.07	0.28	0.41	0.27	0.42	0.22	0.28	0.28	0.08	0.25	0.60
CV	2.95	6.42	2.47	6.62	3.03	5.79	4.35	10.93	7.46	8.74	33.41	8.60	9.33	23.29
CAGR	0.008	0.007	0.006	-0.009	0.008	-0.011	-0.004	0.017	0.031	-0.046	0.171	-0.017	0.010	-0.110

Source: Money Control and CMIE

**Test for difference in Operational Performance of Punjab National Bank**

**H<sub>0</sub>:** There is no significant difference in operational

performance of Punjab National Bank in the pre and post-merger periods

**Table 12:** Difference on operational performance of Punjab National Bank between the pre and post-Merger Periods

Ratio	GP to TA	NP to TA	INT INC to TA	IE to TA	NI INC to TA	P&C to TA	OE to TA
T value	12.495	-9.0228	7.105	8.220	-1.227	-0.304	0.318
Sig	0.000*	0.001*	0.002*	0.001*	0.271	0.776	0.776

Source: computed data

\*indicates statistical significance at 5 percent level

It could be observed from table 12 that the t- value is significant at 5 percent level. Hence, the null hypothesis is rejected. Therefore, it is concluded that there is significant difference in gross profit to total assets ratio, net profit to

total assets ratio, interest income to total assets ratio and interest earnings to total assets ratio between the pre and post-merger periods of Punjab National Bank.

**Table 13:** Operational Performance of IDBI Bank in the Pre and Post Merger Periods (In Percentage)

	GP to TA		NR to TA		INT INC to TA		I E to TA		N I INC to TA		P&C to TA		OE to TA	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	10.21	6.27	0.96	0.62	9.68	6.23	9.19	5.59	0.49	0.65	0.06	0.06	0.70	1.00
	10.00	6.75	0.64	0.57	9.94	6.23	9.38	5.72	0.56	0.51	-0.01	0.46	0.77	0.85
	9.48	6.82	0.75	0.50	9.14	6.83	8.64	6.05	0.50	0.78	0.09	0.27	0.62	0.87
	12.02	6.71	0.89	0.45	10.72	6.59	11.14	5.61	-0.42	0.98	-0.01	0.65	0.85	0.89
	3.53	7.33	0.51	0.66	3.26	7.37	3.03	5.68	0.23	1.70	-0.02	1.00	0.52	0.90
MEAN	9.05	6.77	0.75	0.56	8.55	6.65	8.28	5.73	0.27	0.92	0.02	0.49	0.69	0.90
SD	3.23	0.38	0.18	0.09	3.01	0.47	3.08	0.19	0.41	0.47	0.05	0.36	0.13	0.06
CV	35.72	5.58	24.56	15.29	35.19	7.14	37.17	3.23	148.82	50.60	218.00	73.91	18.94	6.30
CAGR	-0.191	0.032	-0.119	0.012	-0.195	0.034	-0.199	0.003	-0.141	0.213	-1.776	0.758	-0.060	-0.021

Source: Money Control and CMIE

**Test for difference in Operational Performance of IDBI Bank**

**Ho:** There is no significant difference in operational performance of IDBI Bank in the pre and post-merger periods

**Table 14:** Difference on operational performance of IDBI Bank between the pre and post-Merger Periods

Ratio	GP to TA	NP to TA	INT INC to TA	I E to TA	N I INC to TA	P&C to TA	OE to TA
T value	1.437	1.817	1.239	1.841	-2.011	-2.601	-3.233
Sig	0.224	0.143	0.283	0.139	0.115	0.060	0.032*

Source: computed data

\*indicates statistical significance at 5 percent level

The table 14 examines that t- value is significant at 5 percent level. Hence, the null hypothesis is rejected. Therefore, it is concluded that there is significant difference in only

operating expenses to total assets ratio between the pre and post-merger periods of IDBI Bank.

**Table 15:** Operational Performance of Oriental Bank of Commerce in the Pre and Post-Merger Periods (In Percentage)

	GP to TA		NR to TA		INT INC to TA		I E to TA		N I INC to TA		P&C to TA		OE to TA	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	7.89	5.32	0.99	1.34	9.13	6.61	6.25	3.79	2.89	2.82	0.83	0.19	1.67	1.78
	9.17	5.83	1.14	0.95	10.02	6.99	7.11	4.27	2.90	2.72	0.93	0.62	1.74	1.65
	9.28	6.29	0.75	0.79	10.19	6.99	7.27	4.70	2.92	2.29	1.26	0.81	1.94	1.19
	9.34	6.71	0.99	0.39	9.42	7.54	6.41	5.68	3.01	1.85	1.93	0.64	1.64	0.98
	8.37	7.50	1.34	0.81	9.69	7.93	6.15	6.15	3.54	1.79	0.88	0.55	2.99	1.39
MEAN	8.81	6.33	1.04	0.85	9.69	7.21	6.64	4.92	3.05	2.29	1.17	0.56	2.00	1.40
SD	0.65	0.84	0.22	0.34	0.43	0.52	0.52	0.98	0.28	0.48	0.46	0.23	0.57	0.33
CV	7.35	13.20	20.99	40.08	4.43	7.26	7.78	19.94	9.12	20.76	39.61	41.01	28.38	23.27
CAGR	0.012	0.071	0.064	-0.096	0.012	0.037	-0.003	0.102	0.042	-0.087	0.013	0.240	0.123	-0.048

Source: Money Control and CMIE

**Test for difference in Operational Performance of Oriental Bank of Commerce**

**Ho:** There is no significant difference in operational

performance of Oriental Bank of Commerce in the pre and post-merger periods

**Table 16:** Difference on operational performance of Oriental Bank of Commerce between the pre and post-Merger Periods

Ratio	GP to TA	NP to TA	INT INC to TA	I E to TA	N I INC to TA	P&C to TA	OE to TA
T value	5.827	1.050	8.497	3.026	2.416	3.332	1.999
Sig	0.004*	0.353	0.001*	0.039*	0.073	0.029*	0.116

Source: computed data

\*indicates statistical significance at 5 percent level

It could be observed from table 16 that t- value is significant at 5 percent level. Hence, the null hypothesis is rejected. Therefore, it is concluded that there is significant difference in gross profit to total assets ratio, interest income to total assets ratio, interest expenses to total assets ratio and provisions and contingencies ratio between the pre and post-merger periods of Oriental Bank of Commerce.

**Impact of Asset Quality on Operational Performance of Select Public Sector Banks  
Multiple Regression Analysis of State Bank of India in the Pre and Post-Merger Periods**

**Ho:** There is no significant difference in Asset Quality on Operational Performance of State Bank of India

Table 17

Pre-Merger							Post-Merger					
Ratios	R squire	Adjusted R squire	Std. Error	R Square Change	F Change	Sig. F Change	R squire	Adjusted R squire	Std. Error	R Square Change	F Change	Sig. F Change
GP to TA	.967	.867	.05344	.967	9.727	.230	.335	-.330	.46729	.335	.504	.665
NR to TA	.279	-1.885	.10429	.279	.129	.931	.876	.752	.07507	.876	7.049	.124
Int Inc to TA	.463	-1.148	.36149	.463	.287	.841	.378	-.243	.55241	.378	.609	.622
Int Exps to TA	.482	-1.073	.29060	.482	.310	.830	.417	-.167	.38922	.417	.714	.583
Net Int Inc to TA	.445	-1.222	.64689	.445	.267	.852	.226	-.548	.29376	.226	.292	.774
P & C to TA	.478	-1.090	.44425	.478	.305	.832	.357	-.286	.18511	.357	.555	.643
O E to TA	.468	-1.128	.36854	.468	.293	.838	.636	.272	.04418	.636	1.747	.364

a. Predictors (Constant), Operational Performance  
 b. Dependent variable: Asset Quality

\*indicates statistical significance at 5 percent level

The table 17 shows that the significant difference in the operational performance at the pre and post mergers periods have been identified in state bank of India, since the respective regression statistics analysis is not significantly changes at the five percent level. Hence the null hypothesis is accepted. It indicates that there is a no impact of asset quality and operational performance of state bank of India, between

the pre and post mergers periods.

**Multiple Regression Analysis of Indian Overseas Bank in the Pre and Post-Merger Periods**

**Ho<sub>2</sub>:** There is no significant difference in Asset Quality on Operational Performance of Indian Overseas Bank

Table 18

Pre-Merger							Post-Merger					
Ratios	R squire	Adjusted R squire	Std. Error	R Square Change	F Change	Sig. F Change	R squire	Adjusted R squire	Std. Error	R Square Change	F Change	Sig. F Change
GP to TA	.858	.717	.36514	.858	6.058	.142	.999 <sup>a</sup>	.998	.990	.39035	.998	.042*
NR to TA	.910	.821	.11420	.910	10.168	.090	.743	-.029	.30051	.743	.963	.617
Int Inc to TA	.964	.927	.15987	.964	26.421	.036*	.997	.988	.46561	.997	107.684	.050*
Int Exps to TA	.995	.990	.09372	.995	207.454	.005*	.996	.984	.39929	.996	83.737	.038*
Net Int Inc to TA	.983	.965	.07108	.983	56.777	.017*	.999	.996	.06632	.999	321.498	.041*
P & C to TA	.268	-.465	.36654	.268	.366	.732	.961	.845	.30945	.961	8.296	.249
O E to TA	.973	.946	.07615	.973	35.855	.027*	.943	.771	.32072	.943	5.483	.302

a. Predictors (Constant), Operational Performance  
 b. Dependent variable: Asset Quality

\*indicates statistical significance at 5 percent level

The table 18 reveals that the significant difference in the interest income to total asset ratio, interest expenses to total asset ratio, operating expenses to total assets ratio and net interest income to total assets ratio at the pre-merger period have been identified in Indian overseas bank, and since the respective regression statistics is significant at the 5 percent level. The r squire value of these ratios at more than 95 percent influences the dependent variable. In post-merger period the Gross profit to total assets ratio, interest income to total asset ratio, interest expenses to total asset ratio and net

return to total assets ratio is significant at the 5 percent level. The r squire value of these ratios at more than 95 percent influences the dependent variable. Hence the null hypothesis is rejected.

**Multiple Regression Analysis of Bank of Baroda in the Pre and Post-Merger Periods**

**Ho<sub>2</sub>:** There is no significant difference in Asset Quality on Operational Performance of Bank of Baroda

Table 19

Pre-Merger							Post-Merger					
Ratios	R squire	Adjusted R squire	Std. Error	R Square Change	F Change	Sig. F Change	R squire	Adjusted R squire	Std. Error	R Square Change	F Change	Sig. F Change
GP to TA	.878	.511	.22627	.878	2.395	.436	.634	-.462	.56215	.634	.579	.720
NR to TA	.978	.911	.06364	.978	14.587	.041*	.870	.478	.08839	.870	2.222	.450
Int Inc to TA	.812	.248	.38891	.812	1.440	.534	.544	-.825	.27224	.544	.397	.789
Int Exps to TA	.686	-.254	.38891	.686	.730	.674	.946	.785	.20506	.946	5.862	.293
Net Int Inc to TA	1.000	.998	.00707	1.000	697.533	.028*	.994	.975	.06364	.994	53.978	.010*
P & C to TA	.895	.579	.13435	.895	2.837	.405	.370	-1.520	.43841	.370	.196	.891
O E to TA	.983	.930	.06364	.983	18.821	.046*	.942	.766	.17678	.942	5.366	.305

a. Predictors (Constant), Operational Performance  
 b. Dependent variable: Asset Quality

\*indicates statistical significance at 5 percent level

It could be observed from table 19 that the significant difference in the net return to total assets ratio, net interest

income to total assets ratio and operating expenses to total assets ratio at the pre-merger period have been identified in

Bank of Baroda, since the respective regression statistics is significant at the 5 percent level. The r square value of these ratios at more than 95 percent influences the dependent variable. Hence the null hypothesis is rejected. In post-merger period the net interest income to total assets ratio is significant at the 5 percent level. The r square value of this ratio at more than 95 percent influences the dependent

variable. Hence the null hypothesis is rejected.

**Multiple Regression Analysis of Punjab National Bank in the Pre and Post-Merger Periods**

**Ho<sub>2</sub>:** There is no significant difference in Asset Quality on Operational Performance of Punjab National Bank

**Table 20**

Pre-Merger							Post-Merger					
Ratios	R square	Adjusted R square	Std. Error	R Square Change	F Change	Sig. F Change	R square	Adjusted R square	Std. Error	R Square Change	F Change	Sig. F Change
GP to TA	.238	-2.050	.41040	.238	.104	.947	.684	-.263	.41684	.684	.723	.676
NR to TA	.234	-2.064	.02768	.234	.102	.948	.899	.596	.04437	.899	2.964	.398
Int Inc to TA	.971	.943	.09655	.971	11.101	.042*	.959	.838	.16518	.959	7.879	.255
Int Exps to TA	.862	.448	.19985	.862	2.084	.462	.794	.177	.37880	.794	1.288	.557
Net Int Inc to TA	.936	.745	.11218	.936	4.898	.318	.863	.451	.20919	.863	2.095	.461
P & C to TA	.849	.395	.22090	.849	1.870	.482	.997	.986	.00921	.997	97.598	.044*
O E to TA	.765	.060	.23830	.765	1.085	.592	.999	.995	.04258	.999	259.501	.046*

- a. Predictors (Constant), Operational Performance \*indicates statistical significance at 5 percent level
- b. Dependent variable: Asset Quality

Table 20 examines that the significant difference in the interest income to total assets at the pre-merger period have been identified in Punjab National Bank, since the respective regression statistics is not significant at the 5 percent level. The r square value of these ratios at more than 94 percent influences the dependent variable. Hence the null hypothesis is rejected. In post-merger period the provisions and contingencies ratio and operating expenses to total asset ratio

are significant at the 5 percent level. The r square value of the ratios at more than 95 percent influences the dependent variable. Hence the null hypothesis is rejected

**Multiple Regression Analysis of IDBI Bank in the Pre and Post Merger Periods**

**Ho<sub>2</sub>:** There is no significant difference in Asset Quality on Operational Performance of IDBI Bank

**Table 21**

Pre-Merger							Post-Merger					
Ratios	R square	Adjusted R square	Std. Error	R Square Change	F Change	Sig. F Change	R square	Adjusted R square	Std. Error	R Square Change	F Change	Sig. F Change
GP to TA	.978	.912	.95563	.978	14.896	.188	.978	.912	.95563	.978	14.896	.704
NR to TA	.900	.601	.11531	.900	3.011	.395	.900	.601	.11531	.900	3.011	.710
Int Inc to TA	.961	.845	1.18494	.961	8.273	.249	.481	-1.074	.68586	.481	.310	.830
Int Exps to TA	.965	.861	1.14734	.965	9.266	.236	.798	.194	.16738	.798	1.320	.552
Net Int Inc to TA	.998	.991	.03760	.998	155.992	.043*	.150	-2.402	.86140	.150	.059	.974
P & C to TA	.543	-.827	.06718	.543	.396	.790	.483	-1.068	.51848	.483	.311	.829
O E to TA	.773	.093	.12219	.773	1.137	.582	.921	.683	.03266	.921	3.879	.353

- a. Predictors (Constant), Operational Performance \*indicates statistical significance at 5 percent level
- b. Dependent variable: Asset Quality

Table 21 shows that the significant difference in the net interest income to total assets ratio at the pre-merger period has been identified in IDBI bank since the respective regression statistics is significant at the 5 percent level. The r square value of these ratios at more than 99 percent influences the dependent variable. Hence the null hypothesis is rejected. In post-merger period the asset quality no impact on operational performance, since the respective regression

statistics is not significant at the 5 percent level. Hence the null hypothesis is accepted.

**Multiple Regression Analysis of Oriental Bank of Commerce in the Pre and Post Merger Periods**

**Ho<sub>2</sub>:** There is no significant difference in Asset Quality on Operational Performance of Oriental Bank of Commerce

**Table 22**

Pre-Merger							Post-Merger					
Ratios	R square	Adjusted R square	Std. Error	R Square Change	F Change	Sig. F Change	R square	Adjusted R square	Std. Error	R Square Change	F Change	Sig. F Change
GP to TA	.882	.530	.44323	.882	2.503	.428	.787	.149	.76982	.787	1.233	.566
NR to TA	.821	.283	.18415	.821	1.525	.043*	.905	.619	.21090	.905	3.165	.387
Int Inc to TA	.972	.888	.14478	.972	11.520	.213	.851	.402	.40246	.851	1.898	.480
Int Exps to TA	.987	.949	.11684	.987	25.619	.044*	.870	.480	.70645	.870	2.230	.449

Net Int Inc to TA	.996	.984	.03556	.996	80.509	.022*	.906	.624	.29217	.906	3.217	.384
P & C to TA	.871	.483	.33020	.871	2.244	.448	.900	.598	.14501	.900	2.987	.397
O E to TA	.921	.685	.31877	.921	3.897	.353	.959	.837	.13212	.959	7.829	.256

- a. Predictors (Constant), Operational Performance  
 b. Dependent variable: Asset Quality

\*indicates statistical significance at 5 percent level

It could be observed from table 22 that the significant difference in the net return to total assets ratio, interest expenses to total assets ratio and net interest income to total asset ratios at the pre-merger period have been identified in oriental bank of commerce, since the respective regression statistics is significant at the 5 percent level. The r square value of these ratios at more than 95 percent influences the dependent variable. Hence the null hypothesis is rejected. In post-merger period the asset quality no impact on operational performance, since the respective regression statistics is not significant at the 5 percent level. Hence the null hypothesis is accepted.

**Suggestions**

- From the study, state bank of India should take necessary steps to recover their loans through proper channels.
- From the study, after merger of select public sector banks in India they earned more profit, at the same time in relation to the operational performance they made only a slight change. So, the banks should concentrate to increase their total assets.

**Conclusion**

The banking industry has been undergoing major mergers in recent years with a number of global players emerging through successive mergers. The present study indicates that during the study period the operational performance and asset quality of merger banks showed a healthy picture and an upward trend and the Non-Performing Assets has been decreased post mergers (except the State Bank of India) when compared to pre mergers.

The impacts of mergers were examined to establish the extent to which the benefits accrue as a viable factor in enhancing the bank performance. This study identified the areas of improvement for volume of the business, asset quality and operational performance for this select public sector banks in India.

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