



Impact of mergers and acquisition on the performnce of Bank of Baroda- A comparison between Camel and Eagle Models

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Abstract

The mergers and acquisition often take place in banking sector for the purpose of expansion and development or to combine weak banks with large banks to avoid shut down situation. India recently i.e. in 2020 mergers and acquisition emerged as burning topic in banking. Therefore, present study emphasized on the how mergers affect the performance of the banks during post-merger period i.e. 2017-2024. The present study exclusively model comparison study between CAMEL and EAGLE model. The study applied the study applied t-test two paired two sample means to assess the effect on the variables of capital adequacy, earning quality, assess quality, management efficiency, growth and liquidity. In the study both CAMEL and EAGLE models produced similarly effect in capital adequacy, earning quality and asset quality which is insignificant effect of mergers. In contrast, different result observed in the management efficiency/growth and liquidity between CAMEL and EAGLE models.

Keywords: Mergers & acquisition, Camel and Eagle, Bank of Baroda etc

Introduction

Mergers and Acquisition is an effective corporate restructure tool in consolidation of banks and Financial Institutions (BFIs) which improves their capital base, business expansion and financial stability^[1]. Mergers and acquisitions are very popular corporate strategies in use for expansion and development of present firms to the next level of business. This gives advantage to both parties in business growth, operational and financial aspects etc. The M&A are regular phenomenon in corporate world, however, in banking sector this M&A takes place rarely and occasionally either to merge weak bank with financially strong bank or small bank with large bank. Indian Banking sector many private and public sector merged since liberalization phase started and which is continued in 2020 till. In Indian banking sector M&A took place often between weak bank and strong bank rather than small and large banks with an aim to stabilize the banking sector in the country. The M&A in banking sector leads to improvement in productivity, profitability, financial strength, reduce wasteful expenditure, eliminates industrial sickness, tax advantages^[15]. besides, it also improves liquidity, management efficiency.

The M&A in Indian banking sector emerged as prevalent strategy exclusively in public sector banking to reduce the number of banks, promote financial stability, increase customer satisfaction and service delivery^[18]. Besides, large scale of operation is another reason for mergers and acquisition in banking sector which result in better supplier bargaining power and effective use of resources^[12]. M&A also improves the asset quality and reduce non-performing assets in banking sector^[7, 4]. Revealed the cross-border M&A impact in banking sector such as improvement in operating and financial performance, technology up gradation, corporate governance, loan quality, expertise and ownership. It also improved the competency of the acquirer in the industry^[11]. Observed that positive effect of M&A led in provision of higher value to the stakeholder and assist in reaching top-tier position in the banking sector.

In India, mergers and acquisition in banking sector govern by the central bank (RBI) and companies Act of 2013. The RBI is primary regulatory of M&A in banking sector which can permit the voluntary mergers, forced mergers of financially weak banks and rise the amalgamation of nationalized banks. Besides, Sections 232-234, 391-394 of companies act deals with mergers of banks and amalgamation of banks in India.

Review of Literature

Camel model is proved successful model in measuring and estimating the future performance along with relative risk. It is also an effective, efficient and accurate tool for managing, decision making and controlling from accounting point of view^[13]. Earlier to the CAMEL model, Uniform Financial Institutions Rating System (UFIRS) had been used since 1979 which is proposed by bank regulatory agencies in the year 1988, the Basel Committee on Banking Supervision of the BIS designed and recommended CAMELS framework for assessment of performance of financial institutions^[6]. The CAMELS Models gain significance as international bank-rating system by using of banking regulators. In this model rating was assigned based on six parameters such as Capital adequacy, Asset quality, Management soundness, Earnings and profitability, and Liquidity and Sensitivity (added in 1997)^[5, 10]. analysed the impact of M&A of Bank of Baroda, Dena Bank & Vijaya Bank revealed that several challenges exist in realizing the objectives of M&A but, it sure leads to noteworthy value creation for stakeholders^[16]. has done comparative performance of few selected public and private sector banks through using EAGLE Model observed that private sector banks are highly efficient than public sector banks^[17]. applied both models in analysing the performance of conventional and Islamic banking during pre and post epidemic period and found that and revealed high stability of Islamic banking than conventional banking in the aspects of asset growth, third party funds and financing expansion^[8]. Analysed the performance of both private and public sector banks in India and revealed better performance

of SBI and BOB than ICICI and Axis banks during the study period of 2009-2014 [3].examined the impact of M&A on the financial status of Bank of Kathmandu (BOKL) and PRVU Bank Limited in Nepal during pre- and post-M&A periods. The study observed significant improvement in profitability and liquidity of merger bank but no other significant changes [9]. Observed the UBI pre and post-merger behaviour during 2017-2023 through adoption of EAGLE model and revealed that higher earnings potential and improved asset quality by reduction in NPAs [14]. Also focused on evaluation of post-merger performance of Canara bank for the period of 2017-2024 through EAGLE model. The study found that, significant positive differences in the growth of advances, deposits, ROA and EPS and assets quality during post-merger period.

Research Problem: Mergers and acquisition emerged as important corporate restructuring tool in expansion and development of organization and improve the competency in the industry. However, there is poor research evidence in measuring the impact of M&A on the operation and financial aspects of organization particularly in banking sector. Earlier studies focused on the measuring of effect on profitability, liquidity, assets quality, customer satisfaction etc. Very few studies focused on the adoption of camel and eagle model, however, they adopted individually and analyzed result independently. No study is focused on the measuring the impact of M&A on financial performance of banks as comparison between camel and eagle model which paved a way for the present research study. Thus, present study focused on the adoption of both camel and eagle models for measuring the effect of M&A on the as pre and post-merger performance of BOB and interpretation of variation in outcomes under both models.

Research Objectives: The present study is aimed at

- To assess the effect of M&A on the performance of Bank of Baroda through CAMEL during 2017-2024

- To assess the effect of M&A on the performance of Bank of Baroda through EAGLE Model during 2017-2024
- To examine the impact of M&A on the growth, earnings quality, asset quality, capital adequacy, liquidity, management efficiency in both models of camel and eagle.

Hypothesis: The study formulated and examined the following hypothesis with appropriate statistical tools (null hypothesis

H1: There is significant impact of M&A on the capital adequacy/equity of BOB.

H2: There is significant impact of M&A on the Earnings Quality of BOB.

H3: There is significant impact of M&A on the Asset Quality of BOB.

H4: There is significant impact of M&A on the Management Efficiency/Growth of BOB.

H5: There is significant impact of M&A on the Management Liquidity of BOB.

Research Methodology: Research methodology is blue print of research work done by the researcher. The present research study is an empirical research work done purely based on the secondary data calculated from the data collected of RBI and bank annual reports. The study analyzed the pre-merger (2017-2020) and post-merger (2021-2024) performance of Bank of Baroda which is selected by purposeful sampling technique. The study used both camel and eagle model in measuring the BOB performance. The performance in both models is measured in the parameters of capital adequacy, growth, equity, liquidity, earnings quality, asset quality and management efficiency. The study examined the hypothesis through using the statistical technique of t-test paired two sample for means.

Data Analysis and Interpretation

Camel Approach											
Parameter	Ratios	Pre-Merger Period					Post Merger Period				
		2016-17	2017-18	2018-19	2019-20	AVG	2020-21	2021-22	2022-23	2023-24	AVG
Capital Adequacy	CAR (%)	12.24	12.13	13.42	13.30	12.77	14.99	15.68	16.24	16.31	15.81
	Advances to Total Assets (%)	55.16	59.37	60.03	59.60	58.54	61.13	60.81	64.52	67.21	63.42
Asset Quality	GNPAs to Gross Advances (%)	11.15	13.21	10.29	10.05	11.18	9.44	6.96	3.91	2.99	5.83
	GNPAs to NNPA's (%)	2.36	2.41	3.09	3.22	2.77	3.06	4.04	4.38	4.41	3.97
	GNPAs to Total Assets (%)	6.15	7.84	6.18	5.99	6.54	5.77	4.23	2.52	2.01	3.63
	NNPA's to Total Assets (%)	2.60	3.26	2.00	1.86	2.43	1.89	1.05	0.57	0.45	0.99
	Total Investment to Total Assets (%)	18.66	22.66	23.34	23.72	22.10	22.61	24.71	24.85	23.32	23.87
Management Efficiency	Total advances to Total Deposits (%)	63.70	72.28	73.40	72.95	70.58	73.04	74.30	78.18	80.32	76.46
	Business Per Employee (Rs Lakhs)	1749	1766	1888	1877	1820.0	1957	2205	2666	3046	2468.5
	Profit Per Employee (Rs Lakhs)	3.00	-4.0	8.0	1.0	2.00	1.0	9.0	18.0	24.0	13.00
Earnings Quality	Operating profit to Total Assets (%)	1.61	1.70	1.80	1.69	1.70	1.83	1.84	1.96	2.03	1.92
	ROA (%)	-0.78	0.20	-0.34	0.06	-0.22	0.07	0.60	1.03	1.17	0.72
	Interest Income to Total Income (%)	86.20	86.77	88.77	88.04	87.45	84.50	85.89	89.94	88.60	87.23
	Non-interest income to total	13.80	13.23	11.23	11.96	12.56	15.50	14.11	10.06	11.40	12.77

	income (%)										
Liquidity Position	Liquidity Assets to Total Assets (%)	3.49	3.86	3.99	3.22	3.64	3.74	5.99	4.15	3.54	4.36
	Liquidity Assets to Total Deposits (%)	4.03	4.70	4.88	3.95	4.39	4.47	7.32	5.02	4.23	5.26
	Balance at Bank and RBI To Total Assets (%)	3.28	3.15	3.41	2.82	3.17	3.36	5.57	3.76	3.46	4.04

Source: RBI and computed by Author

Eagle Approach											
Parameter	Ratios	Pre-Merger Period					Post Merger Period				
		2016-17	2017-18	2018-19	2019-20	AVG	2020-21	2021-22	2022-23	2023-24	AVG
Earnings quality	ROA (%)	-0.78	0.20	-0.34	0.06	-0.22	0.07	0.60	1.03	1.17	0.72
	Interest Income to Total Income (%)	86.20	86.77	88.77	88.04	87.45	84.50	85.89	89.94	88.60	87.23
	Interest Income to Total Assets (%)	6.18	6.17	6.63	6.78	6.44	6.10	5.74	6.55	7.40	6.45
Asset quality	GNPA Ratio (%)	10.0	12.0	10.0	9.00	10.25	9.00	7.00	3.79	2.92	5.68
	NNPA Ratio (%)	4.72	5.49	3.33	3.13	4.17	3.09	1.72	0.89	0.68	1.60
	Govt Securities to Total Income (%)	226.69	279.85	283.43	282.80	268.2	271.84	335.85	316.09	253.46	294.31
	Total Investment to Total Asset (%)	18.66	22.66	23.34	23.72	22.10	22.61	24.71	24.85	23.32	23.87
Growth	Growth of deposits (%)	4.81	-1.72	8.01	48.11	14.80	2.22	8.16	15.08	10.24	8.93
	Growth of advances (%)	-0.13	11.53	9.68	47.20	17.07	2.34	10.03	21.08	13.26	11.68
	Growth in assets (%)	3.50	3.62	8.47	48.26	15.96	-0.22	10.61	14.13	8.72	8.31
Liquidity	Liquid Assets to Total Deposits (%)	4.03	4.70	4.88	3.95	4.39	4.47	7.32	5.02	4.23	5.26
	Cash with Bank to Total Assets (%)	0.43	0.42	0.43	0.41	0.42	0.36	0.35	0.26	0.25	0.31
	Liquid Assets to Total Assets (%)	3.49	3.86	3.99	3.22	3.64	3.74	5.99	4.15	3.54	4.36
	Liquid Assets to Demand deposit (%)	57.09	60.28	66.48	57.82	60.42	48.59	86.20	58.14	46.61	59.89
Equity	Capital Adequacy Ratio (%)	12.24	12.13	13.42	13.30	12.77	14.99	15.68	16.24	16.31	15.81
	Advances to Total Assets (%)	55.16	59.37	60.03	59.60	58.54	61.13	60.81	64.52	67.21	63.42

Source: RBI and computation by Author

Stastical Result: T-Test Paired Sample Means

	Camel approach			Eagle approach			Hypothesis accept/reject	
		varibale 1	variable 2		varibale 1	variable 2	camel	eagle
Capital adequacy/equity	Mean	35.655	39.615	Mean	35.655	39.615	Reject alternative hypothesis	Accept null hypothesis
	Variance	1047.44645	1133.35605	Variance	1047.44645	1133.35605		
	Observations	2	2	Observations	2	2		
	df	1		df	1			
	t Stat	-4.304347826		t Stat	-4.304347826			
P(T<=t) two-tail	0.145323598		P(T<=t) two-tail	0.145323598				
Earnings quality	Mean	25.3725	25.66	Mean	31.22333333	31.46666667	Reject alternative hypothesis	Accept null hypothesis
	Variance	1744.38	1714.202733	Variance	2382.167433	2340.370233		
	Observations	4	4	Observations	3	3		
	df	3		df	2			
	t Stat	-1.19561		t Stat	-0.68621025			
P(T<=t) two-tail	0.31774		P(T<=t) two-tail	0.563453029				
Asset Quality	Mean	9.004	7.658	Mean	76.1775	81.365	Reject alternative hypothesis	Accept null hypothesis
	Variance	66.09793	85.11472	Variance	16441.56383	20247.31		
	Observations	5	5	Observations	4	4		
	df	4		df	3			
	t Stat	1.022185652		t Stat	-0.730442756			
P(T<=t) two-tail	0.364481448		P(T<=t) two-tail	0.517993549				
Management Efficiency/Growth	Mean	630.86	852.6533333	Mean	15.94333333	9.64	Reject null hypothesis	Accept alternative hypothesis
	Variance	1061716.259	1959227.131	Variance	1.288433333	3.2173		
	Observations	3	3	Observations	3	3		

	df	2		df	2			
	t Stat	-1.03953384		t Stat	9.169246037			
	P(T<=t) two-tail	0.407731247		P(T<=t) two-tail	0.011686047			
LIQUIDITY	Mean	3.733333333	4.553333333	Mean	17.2175	17.455	Accept alternative hypothesis	Reject null hypothesis
	Variance	0.378633333	0.400133333	Variance	832.5017583	804.9591		
	Observations	3	3	Observations	4	4		
	df	2		df	3			
	t Stat	-16.4		t Stat	-0.71001706			
	P(T<=t) two-tail	0.003697417		P(T<=t) two-tail	0.528907843			

Source: Computed by Author

Discussion on the Result

- Capital Adequacy/Equity:** The study observed both CAMEL and EAGLE models measured the capital adequacy and availability of equity to absorb unforeseen losses in two major ratios i.e. Capital to Risk weighted Assets Ratio and advances to total assets ratio. Consequently, in both model’s capital adequacy is similar during pre and post-merger period i.e. average CAR 12.77% and 15.81 % and average advances to total assets ratio 58.54 percent and 63.42 percent. The t-test paired two sample means result that P value of 0.1453, this is higher than level of significance value of 0.05 which means there is insignificant impact of mergers on the capital adequacy of BOB during the study period.
- Earnings Quality:** The quality of earnings is measured by four ratios in CAMEL approach and three ratios in EAGLE approach. The four ratios under CAMEL approach are Operating profit to Total Assets, ROA, Interest Income to Total Income & Non-interest income to total income where pre-merger average values are 1.70%, -0.22%, 87.45% & 12.56% respectively and post-merger average values are 1.92%, 0.72%, 87.23% & 12.77% respectively. On the other hand, in EAGLE approach three ratios included ROA, Interest Income to Total Income, and Interest Income to Total Assets. The different ratio is interest income to total assets ratio which is 6.44% pre-merger and 6.45% post-merger period. The t-test paired two sample means result in camel model is P value of 0.31774 and in EAGLE model is 0.56345, these is higher than level of significance value of 0.05 which means both models reported similar result, there is insignificant impact of mergers on the earnings quality of BOB during the study period.
- Asset Quality:** Asset quality is third parameter commonly used in both models. In CAMEL model Asset quality is measured in the ratios of GNPA to Gross Advances, GNPA to NNPA, GNPA to Total Assets, NNPA to Total Assets and Total Investment to Total Assets ratios which reported pre-merger average ratios of 11.18%, 2.77%, 6.54%, 2.43% and 22.10% respectively, and post-merger ratios of 5.83%, 3.97%, 3.63%, 0.99% and 23.87% respectively. On the other hand, in EAGLE model asset quality is measured in ratios of GNPA Ratio, NNPA Ratio, Govt Securities to Total Income Govt Securities to Total Income and Total Investment to Total Asset ratio which stood pre-merger period of average 10.25%, 4.17%, 268.2 % and 22.10 % and post- merger ratios of 5.68%, 1.60%, 294.31%

and 23.87%. The t-test paired two sample means result in CAMEL model is P value of 0.364481 and in EAGLE model is 0.5179935 these is higher than level of significance value of 0.05 which means both models reported similar result, there is insignificant impact of mergers on the asset quality of BOB during the study period.

- Management Efficiency/Growth:** The management efficiency/Growth is another important parameter used in both models to measure the efficiency of management. In CAMEL model management efficiency is measured in three parameters such as total advances to total deposits, business per employee and profit for employee, the pre-merger average ratios are 70.58 %, Rs 1820 Lakhs and two Lakhs respectively and post-merger average ratios are 76.46 %, Rs 2468.50 lakhs and Rs 13 Lakhs respectively. In EAGLE model growth is measured in growth of three parameters such as deposits, advances and assets which reported pre-merger average growth rates of 14.80%, 17.07% and 15.96% respectively and post-merger average growth rates of 8.93%, 11.68% and 8.31% respectively. The t-test paired two sample means result in CAMEL and EAGLE model reported different result. In CAMEL model is P value of 0.407731 which is higher than the significance level of 0.05 and indicates insignificant effect of mergers on the management efficiency of the BOB and in EAGLE model is 0.0116860 which is lower than the level of significance value of 0.05 this means significant impact of mergers on the growth of BOB during the study period.
- Liquidity:** The liquidity refers to the ability of the firm to meet its short-term obligations on due date. Liquidity is final parameters in both models. In CAMEL model liquidity is measured in the ratios of Liquidity Assets to Total Assets, Liquidity Assets to Total Deposits, Balance at Bank and RBI to Total Assets which reported pre-merger average ratios of 3.64%, 4.39% and 3.17% and post-merger average values of 4.36%, 5.26% and 4.04 %. On the other hand, in EAGLE model liquidity is measured in four ratios such as Liquid Assets to Total Deposits, Cash with Bank to Total Assets, Liquid Assets to Total Assets and Liquid Assets to Demand deposit which reported pre-merger average values of 4.39%, 0.42%, 3.64% and 60.42% and post-merger average values of 5.26%, 0.31%, 4.36% and 59.89%. In CAMEL model is P value of 0.0036974 which is lower than the significance level of 0.05 and indicates significant effect of mergers on the liquidity of the BOB and on the contrary, in EAGLE

model is 00.528990 which is higher than the level of significance value of 0.05 this means insignificant impact of mergers on the liquidity of BOB during the study period. This indicates two models reported two different result regarding liquidity of BOB

Conclusion

The presents study emphasized on the variation in model outcomes in measuring the impact of mergers on the selected variables in the banking sector particularly Bank of Baroda during pre and post-merger period of 2017 to 2024. The study applied t-test two paired two sample means. In the study CAMEL and EAGLE model are selected and found similar result i.e. insignificant impact of mergers on capital adequacy, earning qualify and asset quality and produced different result i.e. insignificant impact on management efficiency and liquidity in CAMEL models but significant impact on growth and liquidity under EAGLE models. Therefore, the study proved that, researcher should carefully use these two ratios before applying in research.

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