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UNTANGLING THE EFFECTS OF MERGERS AND ACQUISITIONS ON CORPORATE PERFORMANCE IN INDIA'S FINANCIAL SECTOR

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Article Info

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Abstract

This study examines the impact of mergers and acquisitions (M&A) on the post-merger performance of financial sector firms in India between 2005 and 2015. The authors evaluate the extent to which M&A transactions add value to the acquiring companies and analyze the various accounting indicators to measure corporate profitability. Financial data from Bloomberg, Prowess database, and stock exchanges NSE and BSE were used to conduct the analysis. A sample of 23 firms was selected, and a two-sample paired t-test was performed to compare pre- and post-M&A data. The authors also used principal component analysis to identify highly correlated variables. The results suggest that the impact of M&A on corporate performance is mixed, and it is challenging to generalize beyond the financial sector or to other emerging markets. The article contributes to the ongoing discussion on whether M&As generate or diminish value and provides a framework for evaluating M&A strategies.

INTRODUCTION

The continuing rise in the volume of mergers and acquisitions, both in established and growing markets, has prompted more research into the effects of mergers and acquisitions on corporate profitability. Numerous scholars have studied the impact of company acquisitions on efficiency gains for a long time. However, it seems that there has been no unanimity on whether mergers increase corporate results. Academic publications mostly focus on the implications of Merger techniques in industrialized nations, keeping such consequences in emerging markets largely untouched. The characteristics of developing markets can affect the overall effectiveness of M&A agreements to a certain level. An inefficient institutional framework in emerging economies may prohibit firms from reaping the fruits of M&A agreements, resulting in M&A deals having a negative impact on corporate performance.

A series of researches in Western nations examining post-merger operating performance of enterprises have shown different findings, with the majority indicating minor business combination advantages to the acquirers. This

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research investigates the post-merger results of Indian firms that have been merged between 2005 and 2015. Using a range of financial indicators, we analyzed whether mergers yield major benefits for acquirers in this analysis of 23 financial sector deals. As a result, the goal of this research is to see if acquiring organizations perform better in the post-merger period than expected based on widespread views and expectations.

A large amount of Merger and acquisitions deals, along with both positive and competing viewpoints on this organizational strategic instrument, has sparked a raging academic discussion about whether mergers may generate or diminish value. Analyzing the impact on long-term performance became a central discussion in the literature. Different authors have focused on the accounting indicators before and after the merger to evaluate the how efficiency, profitability or activity has changed.

LITERATURE REVIEW

Ismail et al. (2014) Authors looked at the variation in efficiency utilizing standard financial indicators and discovered that in opposite to Vander Vennet (1996) the combination resulted in a considerable fall in the Return on assets 3 years post the deal. They discovered that low returns before to the merger might indicate that there is profit and efficiencies have not yet been exhausted, which could lead to an increase in cash flow returns. Additionally, they discovered that pre-merger low return values may indicate a potential to boost operating cash yields, as they indicate that income is being generated and productivity gains have not yet been utilized.

Caiazza et al. (2021) their findings show that success criteria in M&A transactions, are highly connected with longterm success, and that profitability measures improve substantially over time. Despite the complexities of M&A activities and the hurdles of integrating Business Moral Imperative into the acquirer's workplace culture, in regard to policy ramifications, they believe that, in order to achieve optimum ultimate result of the expansion, top management need to accept that, in the post-merger duration, the valuation for equity investors in terms of both financial and operational results is greater if the acquirer’s business begins with a better durable plan.

Sun (2018) According to the findings of this study, there are several factors that contribute to Chinese post-M&A convergence, including disparities in resources, competencies, perspective, and position amongst Chinese MNEs and absorbed enterprises. Post-merger and acquisition (M&A) convergence in Chinese reversed M&A is comprised of two stages: a top-down seamless integration begun by Chinese MNEs including both advantages and issues, and a bottom-up backward consolidation undertaken by the targeted enterprises.

Calipha et al. (2018) when studying the link between information and effectiveness in mergers and acquisitions, the approach advises that the distinctions amongst knowledge gained, transmitted information, and incorporated expertise be taken into consideration. Additionally, the study uncovers those numerous aspects that impact future skills absorption be taken into account at the pre-merger phase. If the three groups and the determinants are not taken into consideration, it is possible that prior studies have found that the purchase of knowledge-based skills is related with unfavorable announced benefits to the merged organization.

Chang (2018) the author highlighted that post-merger integrated phase has an influence on the resource allocation trends of both the acquired and acquirer enterprises before or throughout the post-merger convergence phase, based on a dynamic system and factual experiments. Considering reconstruction cost the model can generate additional consequences for the leverage behavior that occurs in the immediate aftermath of the merger. The study of the length of the post-merger integrating phase contributes to both the theories and practical studies by challenging the implicit assumption that the merger-related efficiency is achieved subsequently after the merger date has been reached. Unlike previous models, this one is the first to take into account the possibility that both the acquirer and the acquired enterprises might modify their corporate arrangement over time, allowing us to examine both their financing structures and when they should combine.

Ogada et al. (2016) Using a simulation model, researchers investigated the impact of mergers on business results. They discovered a favorable association with different synergies and business results of newly combined organizations. Because synergy facilitates earnings, it follows that acquisition action resulted in the numerous advantages: shared promotional strategies, shared workforce skills and abilities, source of finances and enhanced financial stability resulting from the liquid assets of both firms, as well as shared resources between the two firms.

METHODOLOGY

This research is based on financial data collected from sources such as Bloomberg, Prowess database, Stock exchanges NSE and BSE. The date related to M&A deals have been fetched from Bloomberg from 2006 to 2015 from announcement of deals to completion of deals. Kumar and Bansal (2008). To identify the impact of M&A, long-term data was evaluated for three years before and three years after the deal. Sharma and Ho (2002), Liou and Rao-Nicholson (2019), the 3-year period is taken as crucial in to assess the effectiveness of an M&A. Bianconi and Tan (2019). Hence, the analysis covered the years from 2003 to 2018. Because the year of the merger varies across the selected firms, the time period before and after M&A will vary. The period was chosen based on the acquiring corporation's 3-year pre- and post-M&A statistics. As a result, in order to analyze the data and for evaluation, the study contains 14 financial years from 2003 to 2018. The data has been subjected to a number of filters in order to make it more consistent with the requirements. To choose the final sample, the following are excluded:

- If the acquiring firm's controlling share is less than 51%
- If more than one merger deal executed in sample time frame
- Data is unavailable of the merged entity
- If the acquisition involves conflicting circumstances.

Since it is possible that a change in reporting methodologies could result in errors in financial reporting, the year of the merger and acquisition, or Year 0, has been removed from the list. As a result of these exclusions, we were left with a sample of 23 firms. The scope of this study is confined to deals where either acquirer or Target Company is from financial sector. The research covered the multiple financial ratios in order to provide a full picture of long-term value and performance following the merger and acquisition. Ratios like ROI, EBITDA to revenue, return on assets are just few of the ratios discussed in this paper. Additionally, a two-sample paired t-test was performed to compare pre- and post-M&A data. All tests are designed to determine if somehow the post-M&A mean level differs substantially from the pre-M&A mean. This suggests that the average value of the post-M&A phase is greater if the t-value is positive, and inversely.

PRINCIPAL COMPONENT ANALYSIS

The application of PCA helps the large data to reach to a definite conclusion while taking a smaller number of variables into study. Highly correlated variables will be removed with the help of this technique keeping the originality of the data intact. The goal of this techniques is to convert m-dimensional data to smaller dimensional data. The process of PCA is choosing vector in such a manner that it maximizes the variance.

$Y1 = \alpha 1\ r1 + \alpha 2\ r2 + \alpha 3\ r3 \ldots\ldots \alpha ij\ rj$

$Y^{1} = \sum_{j=1}^{m} \alpha_{ij}\ rj$

The main objective of this method is to increase the variance Y_1 of the factor using vector α and *i* the dimensional value. The above equation is the linear relationship between the vector and the variance of the variable. The goal of the PCA is to discover the possible values of vector so that Y_1 and Y_2 are not correlated to each other.

The Kaiser–Meyer–Olkin (KMO) test is an empirical method for determining whether or not dataset is suitable for factor analysis. The test assesses the sample appropriateness of each factor taken into study as well as the

whole model. This test measures the variation among all factors. Having KMO value more than 0.50 then it is suitable for the principal component analysis (Wang & Peng, 2021). We are getting KMO value more than 0.50.
Bartlett's test of Sphericity is applied to confirm the correlation among the variables by rejecting the null hypothesis that there is no correlation among the variables. Significant value less than 0.05 rejects the null hypothesis and confirm the presence of correlation and dataset is suitable to run principal component analysis (Wang & Peng, 2021). Significant value in our study is less than 0.05.
The paper analyzed the 11 different accounting ratios to determine the impact of M&A. Return on Investment (Surjit, 2002; Mantravadi & Reddy, 2007; Mantravadi & Reddy, 2008; Rani, Yadav, & Jain, 2015; Sinha & Gupta, 2011; Kumar, 2009). This metric measures the efficiency with which a corporation utilises the sources of finance that it has employed in its business. The mean of the opening and closing balances of Total Capital Employed is calculated as Average Capital Employed. It is calculated by dividing Net operating income after tax by average capital employed.
Tobin Q Ratio- This establishes the link between market cap and its replacement value. For want of a better term, this is an estimation method for determining if a certain firm or company is over- or undervalued. It's a metric that may be used as a benchmark for a company's worth from the standpoint of an investor. This has been used in many research papers to assert that business is worth of its replacement cost (Dua, 2016; Gugler et al., 2012). This is calculated by dividing the market value of company by its replacement cost.
EBITDA to revenue- In business, it is important to know how much profit was earned before interest taxes, depreciation, and amortization. This ratio provides us relationship between EBITDA and revenue. A low ratio indicates that a firm might have been experiencing profitability and cash flow issues, whereas a higher ratio indicates that the organization is operating in a stable environment with consistent returns (Surjit Kaur, 2002).
Return on Asset- demonstrates the amount of a firm's resources that are lucrative in terms of producing revenue. It measures the profitability in relation to the total amount of its assets. The return on assets (ROA) provides a management, shareholder, or researcher with an indication of how efficiently a company uses its resources to increase earnings. (Mantravadi & Reddy, 2007; Pawaskar, 2001; Sharma & Ho, 2002; Wadhwa & Syamala, 2015; Yeh & Hoshino, 2000; Rashid & Naeem, 2017; Akinbuli & Kelilume, 2013).
Return on Common Equity- it is referring to the amount of money those common stockholders receive in exchange for their capital. Only ordinary stock is used, not preference shares, and accumulated profits are excluded from the calculation. The ratio is extremely essential in assisting entrepreneurs and specialists in analyzing the financial health of a firm (Rani, Yadav, & Jain, 2015; Sinha & Gupta, 2011; Saboo & Gopi, 2009; Kar, Bhasin, & Soni, 2021; Wadhwa, & Syamala, 2015; Yeh, & Hoshino, 2000).
Profit Margin ratio- it is also known as return on sales ratio, is a profitability metric that evaluates the amount of profits received for every rupee of sales achieved by measuring a company's net profit and its sales revenue. This statistic is used by lenders and shareholders to assess a firm's ability to turn revenues into net earnings on a consistent basis (Akinbuli & Kelilume, 2013; Rashid & Naeem, 2017; Sinha & Gupta, 2011; Mantravadi & Reddy, 2008).
Efficiency ratio focuses on the operating expenses of the company in case of financial and banking industry and many of the financial experts uses this ratio to assess a company's short-term or present performance in order to forecast future success. Banks with low efficiency ratio considered as good because a bank's operational expenditures are included in the top and its income is included in the bottom (Yeh & Hoshino, 2000; Akinbuli & Kelilume, 2013).
Operating Margin ratio reveals how much operating profit a firm generates after deducting operating costs of operations like labour, materials, and so on from total revenue. A firm's ability to regulate the expenses involved

with its activities is demonstrated by the percentage of revenue. Moreover, that is the return obtained through normal activities alone, and it does not contain returns through special events (Mantravadi & Reddy, 2008; Pawaskar, 2001; Rani, Yadav, & Jain, 2015).

Total Operating expenses as a percentage of sales- "A statistic of how total income generated is utilized. This ratio, which is obtained by dividing total operational expenditures by gross sales, shows what percentage of a company's revenue is utilized to fund overhead costs (Rani, Yadav, & Jain, 2015).

Sales to total assets ratio- The efficiency that a company utilizes its resources to create revenue is measured by total asset turnover ratio. This metric is perhaps most important to the organization since it reflects if the company's activities are profitable. A high asset turnover ratio shows the efficient utilization of the resources by the company (Wadhwa, Syamala, 2015; Rani, Yadav, & Jain, 2015).

Leverage ratio- This ratio shows the solvency of the entity by examining that what amount of fund originates from debt and how well it can satisfy its debt commitments. This ratio may also be defined as a measurement of the company's long-term strength and sustainability (Mantravadi & Reddy, 2007; Pawaskar, 2001; Kumar & Rajib, 2007, Yeh & Hoshino, 2000; Rashid & Naeem, 2017; Gugler et al., 2012).

This research is based on three years data before and after the merger. Descriptive analysis was performed on the secondary data collected. This study attempted to test theories regarding the influence of mergers and acquisitions on numerous criteria in order to come to a conclusion on whether mergers and acquisitions have had an influence on the operation of these businesses.

All tests are designed to determine if somehow the post-M&A mean of financial values differs substantially from the pre-M&A mean. This suggests that the average value of the post-M&A phase is greater if the t-value is positive, and inversely.

Table 1. List of the sample companies

Acquirer Name	**Target Name**
ICICI Ltd	Allied Business Portfolio
Bank of Baroda	BOB Housing Finance Ltd
Housing Development & Infrastructure Ltd	Property at Bhandup
State Bank of India	SBI Global Factors Ltd
Indiabulls Real Estate Ltd	Kenneth Builders and Developers Ltd
Ascendas India Trust	Office space in International Tech Park Bangalore
Religare Enterprises Ltd	Vistaar Capital Advisors Ltd
IVRCL Assets & Holdings Ltd	IVR Strategic Resources & Services Ltd,IVRCL Water Infrastructures Ltd
Emami Realty Ltd	FMCG Business
JM Financial Ltd	Infinite India Investment Management Ltd
Lodha Developers Ltd	DLF Cyber City Developers Ltd
Magma Fincorp Ltd	Home Equity Loan Portfolio
Arihant Capital Markets Ltd	Roselabs Finance Ltd
Dewan Housing Finance Corp Ltd	DLF Pramerica Life Insurance Co Ltd
IDFC Ltd	Ulundurpet Expressways Pvt Ltd
Phoenix Mills Ltd/The	Offbeat Developers Pvt Ltd

Godrej Properties Ltd	Godrej Developers Pvt Ltd
Avonmore Capital & Management Services Ltd	Almondz Insurance Brokers Pvt Ltd
KBS India Ltd	Poultry and packaging business operations
IFCI Ltd	Stock Holding Corp of India Ltd
Bajaj Finance Ltd	Bajaj Housing Finance Ltd
Brigade Enterprises Ltd	Brookefields Real Estates & Projects Pvt Ltd
Ascendas India Trust	aVance 3

RESULTS AND ANALYSIS

Paired t-test have been applied individually on all companies' data to check the impact of mergers and acquisition on the various parameters. We have taken 11 variables in our study based on the existing literature. There seems to be a high correlation between variables and principal component analysis have been applied for data reduction. Appropriateness of dataset for principal component analysis is checked by applying KMO and Bartlett's test of Sphericity.

We have applied PCA as data reduction tool on 11 variables of 23 companies and extracted 4 components having eigen value more than 1. We have also used varimax method for better clarity on the correlation amongst the variables. The purpose of varimax is to optimize the variation shared across the elements. The statistical difference is maximized, resulting in findings that more clearly portray how input correlates with each primary component. To optimize the variation this method increases correlation of values for one variable and at the same time decreasing the correlation of another variable.

Table 2. Total Variance Explained

Total Variance Explained

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.163	28.758	28.758	3.012	27.384	27.384
2	2.678	24.343	53.101	2.590	23.548	50.933
3	1.258	11.432	64.534	1.359	12.351	63.284
4	1.140	10.362	74.896	1.277	11.612	74.896

Extraction Method: Principal Component Analysis.

Table 2 shows the 4 components which carries eigen value more than 1 and cumulative variance covered by the 4 components is around 75% which says that 75% of variance in data is explained by the extracted components.

Table 3. Component Matrix

Component Matrix

	Component			
	1	2	3	4
RETURN_ON_ASSET	.013	.869	-.313	.034
RETURN_COM_EQY	-.035	.856	-.032	.072
RETURN_ON_INV_CAPITAL PROF_MARGIN	.035	.371 .454	-.773	.219 .123

EFF_RATIO	.061	.190 -.004		- .804
OPER_MARGIN	-.034 .997	-.135 -.038	.038	.017
TOTAL_OPEX_AS_A_PERCENTAGE_SALES	-.997	.040	-.036	-.023
SALES_TO_TOT_ASSET	-.139 .997	.663 -.041	-.278 .040	.038 .020
EBITDA_TO_REVENUE				-.088
TOBIN_Q_RATIO	.036	.702	.422	
TOT_DEBT_TO_COM_EQY	.009	-.101	.401	.743

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 5 iterations.

Table 3 contain the weights of different variables in 4 components and using the weights, we have taken out 6 variables out of 11 using principal component analysis. Variable which will be further used to find the impact of mergers and acquisitions are: - Return on Assets, Return on equity, Operating Margin, EBITDA to revenue, Tobin Q and Total debt to equity.

Table 4. Correlation

Correlations							
		RETURN_ON_ASSET	RETURN_COM_EQY	OPER_MARGIN	EBITDA_TO_REVENUE	TOBIN_Q_RATIO	TOT_DEBT_TO_COM_EQY
RETURN_ON_ASSET	Pearson Correlation	1	.757**	-.037	-.041	.404**	-.177*
	Sig. (2tailed)		.000	.642	.605	.000	.025
	N	161	161	161	161	161	161
RETURN_COM_EQY	Pearson Correlation	.757**	1	-.063	-.067	.408**	.044
	Sig. (2tailed)	.000		.427	.401	.000	.577
	N	161	161	161	161	161	161
OPER_MARGIN	Pearson Correlation	-.037	-.063	1	1.000**	.015	.052
	Sig. (2tailed)	.642	.427		.000	.855	.516
	N	161	161	161	161	161	161
EBITDA_TO_REVENUE	Pearson Correlation	-.041	-.067	1.000**	1	.014	.057
	Sig. (2tailed)	.605	.401	.000		.860	.470
	N	161	161	161	161	161	161
TOBIN_Q_RATIO	Pearson Correlation	.404**	.408**	.015	.014	1	-.071
	Sig. (2tailed)	.000	.000	.855	.860		.369
	N	161	161	161	161	161	161
TOT_DEBT_TO_COM_EQY	Pearson Correlation	-.177*	.044	.052	.057	-.071	1

	Sig. (2tailed)	.025	.577	.516	.470	.369	
	N	161	161	161	161	161	161
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Table 4 shows the correlation between retained variables and it is significant for most of the variables and having significance value less than 0.05.

Paired sample T test was applied on the extracted variables using PCA. Data of each pair of company is being analyzed and checked for significant change in three-year pre and three years post the event year.

Table 5. Return on Assets

Paired Samples Test						
		Paired Differences			t	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean		
Pair 1	RETURN_ON_ASSET_PRE_1 - RETURN_ON_ASSET_POST_1	.70721333	.14337268	.08277626	8.544	.013
Pair 2	RETURN_ON_ASSET_PRE_2 - RETURN_ON_ASSET_POST_2	-.13430000	.39612083	.22870047	-0.587	.617
Pair 3	RETURN_ON_ASSET_PRE_3 - RETURN_ON_ASSET_POST_3	14.96623333	18.82545426	10.86888108	1.377	.302
Pair 4	RETURN_ON_ASSET_PRE_4 - RETURN_ON_ASSET_POST_4	6.08229333	1.24991182	.72163693	8.428	.014
Pair 5	RETURN_ON_ASSET_PRE_5 - RETURN_ON_ASSET_POST_5	.11160000	.14080213	.08129215	1.373	.303
Pair 6	RETURN_ON_ASSET_PRE_6 - RETURN_ON_ASSET_POST_6	.43273667	1.22906754	.70960247	0.610	.604
Pair 7	RETURN_ON_ASSET_PRE_7 - RETURN_ON_ASSET_POST_7	3.63710000	2.04592501	1.18121535	3.079	.091
Pair 8	RETURN_ON_ASSET_PRE_8 - RETURN_ON_ASSET_POST_8	6.27763333	3.38002775	1.95145993	3.217	.085
Pair 9	RETURN_ON_ASSET_PRE_9 - RETURN_ON_ASSET_POST_9	.71616000	1.84667793	1.06618000	0.672	.571
Pair 10	RETURN_ON_ASSET_PRE_10 - RETURN_ON_ASSET_POST_10	12.62333333	26.33904390	15.20685409	0.830	.494
Pair 11	RETURN_ON_ASSET_PRE_11 - RETURN_ON_ASSET_POST_11	-.06813333	.32873876	.18979741	-0.359	.754
Pair 12	RETURN_ON_ASSET_PRE_12 - RETURN_ON_ASSET_POST_12	.39890000	.67234684	.38817963	1.028	.412
Pair 13	RETURN_ON_ASSET_PRE_13 - RETURN_ON_ASSET_POST_13	5.18556667	2.88960740	1.66831561	3.108	.090
Pair 14	RETURN_ON_ASSET_PRE_14 - RETURN_ON_ASSET_POST_14	-.42286667	1.44819747	.83611720	-0.506	.663
Pair 15	RETURN_ON_ASSET_PRE_15 - RETURN_ON_ASSET_POST_15	2.31003333	1.48638335	.85816383	2.692	.115

Pair 16	RETURN_ON_ASSET_PRE_16 - RETURN_ON_ASSET_POST_16	1.20213333	1.50839685	.87087332	1.380	.302
Pair 17	RETURN_ON_ASSET_PRE_17 - RETURN_ON_ASSET_POST_17	1.26050000	2.21322897	1.27780834	0.986	.428
Pair 18	RETURN_ON_ASSET_PRE_18 - RETURN_ON_ASSET_POST_18	-2.09100000	3.62171824	2.09100000	-1.000	.423
Pair 19	RETURN_ON_ASSET_PRE_19 - RETURN_ON_ASSET_POST_19	.06710000	.11622061	.06710000	1.000	.423
Pair 20	RETURN_ON_ASSET_PRE_20 - RETURN_ON_ASSET_POST_20	2.88936667	2.11575520	1.22153184	2.365	.142
Pair 21	RETURN_ON_ASSET_PRE_21 - RETURN_ON_ASSET_POST_21	-.14556667	.19638891	.11338519	-1.284	.328
Pair 22	RETURN_ON_ASSET_PRE_22 - RETURN_ON_ASSET_POST_22	.18063333	.68237703	.39397056	0.458	.692
Pair 23	RETURN_ON_ASSET_PRE_23 - RETURN_ON_ASSET_POST_23	-4.99973333	1.43354925	.82766005	-6.041	.026

Table 5 shows the paired sample test applied on return on assets and individual company results have been shown as pair. Out of the 23 pairs analyzed, only three companies result show the significant change in the pre and post return on assets

Table 6. Return on Equity

Paired Samples Test

		Paired Differences			t	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean		
Pair 1	RETURN_COM_EQY_PRE_1 - RETURN_COM_EQY_POST_1	14.1941667	2.0705760	1.1954476	11.874	.007
Pair 2	RETURN_COM_EQY_PRE_2 - RETURN_COM_EQY_POST_2	-2.9074333	7.9283990	4.5774633	-0.635	.590
Pair 3	RETURN_COM_EQY_PRE_3 - RETURN_COM_EQY_POST_3	100.2334667	16.7333075	9.6609796	10.375	.009
Pair 4	RETURN_COM_EQY_PRE_4 - RETURN_COM_EQY_POST_4	10.9892333	2.1516096	1.2422324	8.846	.013
Pair 5	RETURN_COM_EQY_PRE_5 - RETURN_COM_EQY_POST_5	2.3584333	2.4804260	1.4320746	1.647	.241
Pair 6	RETURN_COM_EQY_PRE_6 - RETURN_COM_EQY_POST_6	-0.2052000	1.7982827	1.0382390	-0.198	.862
Pair 7	RETURN_COM_EQY_PRE_7 - RETURN_COM_EQY_POST_7	21.1621667	7.7005805	4.4459322	4.760	.041
Pair 8	RETURN_COM_EQY_PRE_8 - RETURN_COM_EQY_POST_8	23.8506667	15.9328351	9.1988266	2.593	.122
Pair 9	RETURN_COM_EQY_PRE_9 - RETURN_COM_EQY_POST_9	12.7487667	9.9562322	5.7482333	2.218	.157
Pair 10	RETURN_COM_EQY_PRE_10 - RETURN_COM_EQY_POST_10	29.5431000	65.9230349	38.0606819	0.776	.519

Pair 11	RETURN_COM_EQY_PRE_11 - RETURN_COM_EQY_POST_11	8.7513000	8.4991109	4.9069640	1.783	.216
Pair 12	RETURN_COM_EQY_PRE_12 - RETURN_COM_EQY_POST_12	6.5611667	8.6621742	5.0011086	1.312	.320
Pair 13	RETURN_COM_EQY_PRE_13 - RETURN_COM_EQY_POST_13	10.8170667	6.4436765	3.7202584	2.908	.101
Pair 14	RETURN_COM_EQY_PRE_14 - RETURN_COM_EQY_POST_14	-3.5319333	19.5930941	11.3120781	-0.312	.784
Pair 15	RETURN_COM_EQY_PRE_15 - RETURN_COM_EQY_POST_15	10.4235333	8.5748223	4.9506759	2.105	.170
Pair 16	RETURN_COM_EQY_PRE_16 - RETURN_COM_EQY_POST_16	10.4235333	8.5748223	4.9506759	2.105	.170
Pair 17	RETURN_COM_EQY_PRE_17 - RETURN_COM_EQY_POST_17	0.3948000	3.9630603	2.2880740	0.173	.879
Pair 18	RETURN_COM_EQY_PRE_18 - RETURN_COM_EQY_POST_18	-2.4838667	4.3021833	2.4838667	-1.000	.423
Pair 19	RETURN_COM_EQY_PRE_19 - RETURN_COM_EQY_POST_19	0.0729000	0.1262665	0.0729000	1.000	.423
Pair 20	RETURN_COM_EQY_PRE_20 - RETURN_COM_EQY_POST_20	15.1119333	8.0054552	4.6219517	3.270	.082
Pair 21	RETURN_COM_EQY_PRE_21 - RETURN_COM_EQY_POST_21	1.7304333	1.0412512	0.6011667	2.878	.102
Pair 22	RETURN_COM_EQY_PRE_22 - RETURN_COM_EQY_POST_22	-2.4928333	2.5256019	1.4581569	-1.710	.229
Pair 23	RETURN_COM_EQY_PRE_23 - RETURN_COM_EQY_POST_23	-11.7207667	3.0825814	1.7797292	-6.586	.022

The Table 6 described the results of paired sample t test of 23 sample companies and only five companies' data shown the significant change. For most of the company's return on equity remains same. For companies 1,3,4,7 and 23, ttest showed a significant difference where mean difference ranges from -11.720 to 100.23.

Table 7. Operating Margin

Paired Samples Test

		Paired Differences			t	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean		
Pair 1	OPER_MARGIN_PRE_1 - OPER_MARGIN_POST_1	13.0457444	5.6197308	3.2445531	4.021	.057
Pair 2	OPER_MARGIN_PRE_2 - OPER_MARGIN_POST_2	-19.7500000	6.1898993	3.5737400	-5.526	.031
Pair 3	OPER_MARGIN_PRE_3 - OPER_MARGIN_POST_3	-105.5265667	83.6432578	48.2914574	-2.185	.160
Pair 4	OPER_MARGIN_PRE_4 - OPER_MARGIN_POST_4	11.3241756	53.8660813	31.0995966	.364	.751

Pair 5	OPER_MARGIN_PRE_5 - OPER_MARGIN_POST_5	4.2788333	4.2698500	2.4651990	1.736	.225
Pair 6	OPER_MARGIN_PRE_6 - OPER_MARGIN_POST_6	-1.7457356	2.4442423	1.4111840	-1.237	.342
Pair 7	OPER_MARGIN_PRE_7 - OPER_MARGIN_POST_7	.4466333	50.1947892	28.9799751	.015	.989
Pair 8	OPER_MARGIN_PRE_8 - OPER_MARGIN_POST_8	16.8424000	5.1705502	2.9852186	5.642	.030
Pair 9	OPER_MARGIN_PRE_9 - OPER_MARGIN_POST_9	5104.8253867	5011.1145011	2893.1683062	1.764	.220
Pair 10	OPER_MARGIN_PRE_10 - OPER_MARGIN_POST_10	-6.1990667	52.1393493	30.1026674	-.206	.856
Pair 11	OPER_MARGIN_PRE_11 - OPER_MARGIN_POST_11	-5.0266333	1.5748920	.9092643	-5.528	.031
Pair 12	OPER_MARGIN_PRE_12 - OPER_MARGIN_POST_12	5.9349000	12.0792991	6.9739866	.851	.484
Pair 13	OPER_MARGIN_PRE_13 - OPER_MARGIN_POST_13	-2.3803333	7.7893074	4.4971587	-.529	.649
Pair 14	OPER_MARGIN_PRE_14 - OPER_MARGIN_POST_14	10.0886000	9.9094605	5.7212297	1.763	.220
Pair 15	OPER_MARGIN_PRE_15 - OPER_MARGIN_POST_15	20.0398667	7.4356868	4.2929958	4.668	.043
Pair 16	OPER_MARGIN_PRE_16 - OPER_MARGIN_POST_16	10.1154667	6.4525490	3.7253809	2.715	.113
Pair 17	OPER_MARGIN_PRE_17 - OPER_MARGIN_POST_17	10.1573667	3.8534965	2.2248172	4.565	.045
Pair 18	OPER_MARGIN_PRE_18 - OPER_MARGIN_POST_18	-31.7779000	44.2772701	25.5634938	-1.243	.340
Pair 19	OPER_MARGIN_PRE_19 - OPER_MARGIN_POST_19	8.6142333	267.8448353	154.6402877	.056	.961

Pair 20	OPER_MARGIN_PRE_20 - OPER_MARGIN_POST_20	125.5594667	65.5809141	37.8631584	3.316	.080
Pair 21	OPER_MARGIN_PRE_21 - OPER_MARGIN_POST_21	-6.5972900	.2768558	.1598428	-41.274	.001
Pair 22	OPER_MARGIN_PRE_22 - OPER_MARGIN_POST_22	-.5700333	3.3464846	1.9320938	-.295	.796
Pair 23	OPER_MARGIN_PRE_23 - OPER_MARGIN_POST_23	-2.4251333	1.8076481	1.0436461	-2.324	.146

Table 7 represents the paired t-test applied on operating margin of 23 companies between three-year pre and post data. Calculated t-value is greater than 4.303 in six companies. Above table shows that in pair 2,8,11,15,17,21, the significant value is less than 0.05, where merger has made a significant impact on these companies.
EBITDA to revenue is one of the parameters to know the performance efficiency of the company it accounts the profit earned by the company before interest, taxes, depreciation and amortization.

Table 8. EBITDA to Revenue

Paired Samples Test						
		Paired Differences			t	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean		
Pair 1	EBITDA_TO_REVENUE_PRE_1 - EBITDA_TO_REVENUE_POST_1	13.333	5.508	3.180	4.193	.052
Pair 2	EBITDA_TO_REVENUE_PRE_2 - EBITDA_TO_REVENUE_POST_2	-19.333	6.110	3.528	-5.480	.032
Pair 3	EBITDA_TO_REVENUE_PRE_3 - EBITDA_TO_REVENUE_POST_3	-108.667	81.292	46.934	-2.315	.147
Pair 4	EBITDA_TO_REVENUE_PRE_4 - EBITDA_TO_REVENUE_POST_4	17.000	59.908	34.588	.491	.672
Pair 5	EBITDA_TO_REVENUE_PRE_5 - EBITDA_TO_REVENUE_POST_5	4.333	4.041	2.333	1.857	.204
Pair 6	EBITDA_TO_REVENUE_PRE_6 - EBITDA_TO_REVENUE_POST_6	-1.333	3.055	1.764	-.756	.529
Pair 7	EBITDA_TO_REVENUE_PRE_7 - EBITDA_TO_REVENUE_POST_7	-2.333	24.132	13.932	-.167	.882
Pair 8	EBITDA_TO_REVENUE_PRE_8 - EBITDA_TO_REVENUE_POST_8	14.000	5.000	2.887	4.850	.040
Pair 9	EBITDA_TO_REVENUE_PRE_9 - EBITDA_TO_REVENUE_POST_9	5116.333	5010.293	2892.694	1.769	.219
Pair 10	EBITDA_TO_REVENUE_PRE_10 - EBITDA_TO_REVENUE_POST_10	-19.000	42.579	24.583	-.773	.520

Pair 11	EBITDA_TO_REVENUE_PRE_11 - EBITDA_TO_REVENUE_POST_11	-6.333	3.055	1.764	-3.591	.070
Pair 12	EBITDA_TO_REVENUE_PRE_12 - EBITDA_TO_REVENUE_POST_12	3.000	4.583	2.646	1.134	.374
Pair 13	EBITDA_TO_REVENUE_PRE_13 - EBITDA_TO_REVENUE_POST_13	-4.000	9.165	5.292	-.756	.529
Pair 14	EBITDA_TO_REVENUE_PRE_14 - EBITDA_TO_REVENUE_POST_14	3.667	6.807	3.930	.933	.449
Pair 15	EBITDA_TO_REVENUE_PRE_15 - EBITDA_TO_REVENUE_POST_15	4.667	2.082	1.202	3.883	.060
Pair 16	EBITDA_TO_REVENUE_PRE_16 - EBITDA_TO_REVENUE_POST_16	13.333	6.028	3.480	3.831	.062
Pair 17	EBITDA_TO_REVENUE_PRE_17 - EBITDA_TO_REVENUE_POST_17	10.000	3.606	2.082	4.804	.041
Pair 18	EBITDA_TO_REVENUE_PRE_18 - EBITDA_TO_REVENUE_POST_18	-23.000	37.162	21.455	-1.072	.396
Pair 19	EBITDA_TO_REVENUE_PRE_19 - EBITDA_TO_REVENUE_POST_19	-2.333	250.859	144.834	-.016	.989
Pair 20	EBITDA_TO_REVENUE_PRE_20 - EBITDA_TO_REVENUE_POST_20	46.333	24.007	13.860	3.343	.079
Pair 22	EBITDA_TO_REVENUE_PRE_22 - EBITDA_TO_REVENUE_POST_22	2.667	1.528	.882	3.024	.094
Pair 23	EBITDA_TO_REVENUE_PRE_23 - EBITDA_TO_REVENUE_POST_23	-2.667	2.082	1.202	-2.219	.157

Table 8 Provides the paired sample test results, where calculated t-value is more than the t-value from table considering degree of freedom. Pair for companies 2,8,11 and 17 have given significant results, where mean difference is substantially different form the pre-merger data.

Table 9. Tobin Q

Paired Samples Test						
		Paired Differences			t	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean		
Pair 1	TOBIN_Q_RATIO_PRE_1 - TOBIN_Q_RATIO_POST_1	.035742333	.068034514	.039279745	.910	.459
Pair 2	TOBIN_Q_RATIO_PRE_2 - TOBIN_Q_RATIO_POST_2	.009533333	.029214608	.016867062	.565	.629
Pair 3	TOBIN_Q_RATIO_PRE_3 - TOBIN_Q_RATIO_POST_3	1.780886667	.527158888	.304355326	5.851	.028
Pair 4	TOBIN_Q_RATIO_PRE_4 - TOBIN_Q_RATIO_POST_4	1.635344333	.336144344	.194073027	8.426	.014
Pair 5	TOBIN_Q_RATIO_PRE_5 - TOBIN_Q_RATIO_POST_5	-.012600000	.031969830	.018457790	-.683	.565
Pair 6	TOBIN_Q_RATIO_PRE_6 - TOBIN_Q_RATIO_POST_6	-.054900000	.117050068	.067578888	-.812	.502
Pair 7	TOBIN_Q_RATIO_PRE_7 - TOBIN_Q_RATIO_POST_7	.171471000	.252074119	.145535061	1.178	.360

Pair 8	TOBIN_Q_RATIO_PRE_8 - TOBIN_Q_RATIO_POST_8	-.072509000	.263002102	.151844334	.478	.680
Pair 9	TOBIN_Q_RATIO_PRE_9 - TOBIN_Q_RATIO_POST_9	-.037993333	.004228112	.002441102	15.564	.004
Pair 10	TOBIN_Q_RATIO_PRE_10 - TOBIN_Q_RATIO_POST_10	.325833333	.320560483	.185075681	1.761	.220
Pair 11	TOBIN_Q_RATIO_PRE_11 - TOBIN_Q_RATIO_POST_11	.051900000	.025574010	.014765162	3.515	.072
Pair 12	TOBIN_Q_RATIO_PRE_12 - TOBIN_Q_RATIO_POST_12	.104833333	.236458587	.136519429	.768	.523
Pair 13	TOBIN_Q_RATIO_PRE_13 - TOBIN_Q_RATIO_POST_13	-.011933333	.053232446	.030733767	-.388	.735
Pair 14	TOBIN_Q_RATIO_PRE_14 - TOBIN_Q_RATIO_POST_14	.148900000	.023321878	.013464893	11.058	.008
Pair 15	TOBIN_Q_RATIO_PRE_15 - TOBIN_Q_RATIO_POST_15	-.114900000	.088442750	.051062445	-2.250	.153
Pair 16	TOBIN_Q_RATIO_PRE_16 - TOBIN_Q_RATIO_POST_16	.374666667	.804113564	.464255182	.807	.504
Pair 17	TOBIN_Q_RATIO_PRE_17 - TOBIN_Q_RATIO_POST_17	-.109933333	.317891323	.183534641	-.599	.610
Pair 18	TOBIN_Q_RATIO_PRE_18 - TOBIN_Q_RATIO_POST_18	.010366667	.017955593	.010366667	1.000	.423
Pair 19	TOBIN_Q_RATIO_PRE_19 - TOBIN_Q_RATIO_POST_19	-.010600000	.020491218	.011830610	-.896	.465
Pair 20	TOBIN_Q_RATIO_PRE_20 - TOBIN_Q_RATIO_POST_20	-.738780000	.038546801	.022255006	-33.196	.001
Pair 21	TOBIN_Q_RATIO_PRE_21 - TOBIN_Q_RATIO_POST_21	-.236133333	.157162474	.090737797	-2.602	.121
Pair 22	TOBIN_Q_RATIO_PRE_22 - TOBIN_Q_RATIO_POST_22	.037966667	.071893347	.041507643	.915	.457

Announcement of merger affects the share prices of acquirer as well of target and in long term merged entity's share price grow with performance of the company which helps in gaining the confidence of the shareholders. Tobin Q measures the market value to replacement value of assets, which is considered to be the good tool to analyze the performance of the company. Paired sample t-test shows that for companies 3, 4, 9, 14 and 20 resulted in significant change in the market value of the merger company in comparison to the acquirer+ target pre-merger data

Table 10. Debt to Equity

Paired Samples Test

		Paired Differences			t	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean		
Pair 1	TOT_DEBT_TO_COM_EQY_PRE_1 - TOT_DEBT_TO_COM_EQY_POST_1	222.820482333	80.540895405	46.500307643	4.792	.041
Pair 2	TOT_DEBT_TO_COM_EQY_PRE_2 - TOT_DEBT_TO_COM_EQY_POST_2	-118.696766667	54.769665942	31.621281375	-3.754	.064
Pair 3	TOT_DEBT_TO_COM_EQY_PRE_3 -	29.183433333	21.282986451	12.287737957	2.375	.141

	TOT_DEBT_TO_COM_EQY_POST_3					
Pair 4	TOT_DEBT_TO_COM_EQY_PRE_4 - TOT_DEBT_TO_COM_EQY_POST_4	-18.680878000	8.328272916	4.808330610	-3.885	.060
Pair 5	TOT_DEBT_TO_COM_EQY_PRE_5 - TOT_DEBT_TO_COM_EQY_POST_5	-17.103600000	3.307443746	1.909553537	-8.957	.012
Pair 6	TOT_DEBT_TO_COM_EQY_PRE_6 - TOT_DEBT_TO_COM_EQY_POST_6	-14.638793333	27.069707983	15.628703191	-0.937	.448
Pair 7	TOT_DEBT_TO_COM_EQY_PRE_7 - TOT_DEBT_TO_COM_EQY_POST_7	-68.729100000	248.561122158	143.506830788	-0.479	.679
Pair 8	TOT_DEBT_TO_COM_EQY_PRE_8 - TOT_DEBT_TO_COM_EQY_POST_8	50.786633333	204.704358605	118.186116545	0.430	.709
Pair 9	TOT_DEBT_TO_COM_EQY_PRE_9 - TOT_DEBT_TO_COM_EQY_POST_9	-744.382986667	715.675003561	413.195155958	-1.802	.213
Pair 10	TOT_DEBT_TO_COM_EQY_PRE_10 - TOT_DEBT_TO_COM_EQY_POST_10	-113.579900000	80.312943153	46.368699349	-2.449	.134
Pair 11	TOT_DEBT_TO_COM_EQY_PRE_11 - TOT_DEBT_TO_COM_EQY_POST_11	619.752566667	13.999514329	8.082623366	76.677	.000
Pair 12	TOT_DEBT_TO_COM_EQY_PRE_12 - TOT_DEBT_TO_COM_EQY_POST_12	150.325400000	188.921455855	109.073853394	1.378	.302
Pair 13	TOT_DEBT_TO_COM_EQY_PRE_13 - TOT_DEBT_TO_COM_EQY_POST_13	3.849733333	6.668547671	3.850087793	1.000	.423
Pair 14	TOT_DEBT_TO_COM_EQY_PRE_14 - TOT_DEBT_TO_COM_EQY_POST_14	47.857466667	196.117260243	113.228352994	0.423	.714
Pair 15	TOT_DEBT_TO_COM_EQY_PRE_15 - TOT_DEBT_TO_COM_EQY_POST_15	-136.843900000	86.343954110	49.850705148	-2.745	.111
Pair 16	TOT_DEBT_TO_COM_EQY_PRE_16 - TOT_DEBT_TO_COM_EQY_POST_16	-100.654200000	51.514421233	29.741864966	-3.384	.077
Pair 17	TOT_DEBT_TO_COM_EQY_PRE_17 - TOT_DEBT_TO_COM_EQY_POST_17	-57.484200000	44.540861676	25.715678479	-2.235	.155
Pair 18	TOT_DEBT_TO_COM_EQY_PRE_18 - TOT_DEBT_TO_COM_EQY_POST_18	0.415166667	14.868097948	8.584100352	0.048	.966
Pair 19	TOT_DEBT_TO_COM_EQY_PRE_19 - TOT_DEBT_TO_COM_EQY_POST_19	0.014966667	0.025923027	0.014966667	1.000	.423
Pair 20	TOT_DEBT_TO_COM_EQY_PRE_20 - TOT_DEBT_TO_COM_EQY_POST_20	-8.893666667	73.520473500	42.447065166	-0.210	.853
Pair 21	TOT_DEBT_TO_COM_EQY_PRE_21 - TOT_DEBT_TO_COM_EQY_POST_21	211.474083333	47.471729784	27.407815969	7.716	.016
Pair 22	TOT_DEBT_TO_COM_EQY_PRE_22 - TOT_DEBT_TO_COM_EQY_POST_22	-60.599933333	24.530983368	14.162969851	-4.279	.051
Pair 23	TOT_DEBT_TO_COM_EQY_PRE_23 - TOT_DEBT_TO_COM_EQY_POST_23	-19.335733333	6.497120330	3.751114172	-5.155	.036

Total Debt to equity is the leverage ratio which measures the long-term debt or loans in connection with total equity. Significant change in the post-merger data of debt and equity changes the leverage position of the company. Results from paired t-test shows that for companies 1, 5, 11, 21 and 23 there is substantial change in the debt-to-equity ratio results. Calculated t-value is more than the table value at 5% significance level and we

reject the null hypothesis & accept the alternative hypothesis that there is a change in the post-merger data of the company where significance value is less than the 0.05.

CONCLUSION

The research was conducted to check whether the merger and acquisition has made significant impact on the performance and efficiency of the merged entity. Post-merger data has been compared to the pre-merger data. Different variables like Return on asset, Return on Equity, Tobin Q, and EBITDA to revenue, Debt to equity etc., have been considered to evaluate the impact of combinations. This study used the 11 different relative measures based on the existing literature and later reduced to six variables with the help of PCA as there was high correlation amongst the variables.

An empirical assessment of the change after merger has been conducted on the 23 sample data companies from financial sector. Out of the 23 sample entities only 4 to 5 companies have resulted into the significant change. Return on assets resulted in substantial change in case of ICICI Ltd, State bank of India while for remaining there was no significant impact on this. Other variables like return on equity, Operating margin, EBITDA to revenue have shown significant change in case of ICICI Ltd., JM Financials and Godrej Properties.

Companies like Housing Development & Infrastructure Ltd, State bank of India, Emami reality and Dewan Housing Finance Corp Ltd were able to gain the confidence of the investors and shareholders as the market value of shares have improved substantially, in result Tobin Q measure have improved and shown significant result where calculated tvalue was more than the 4.303.

On average, organization's post-merger financial data for some companies looks to have increased. This suggests that following the merger, the businesses will earn greater additional operational cash flows per unit sales revenue. This indicates that sales revenue are now generating bigger profits. This might also be attributed to size effects, or the efficiencies achieved by the amalgamated enterprises, which seems to have reduced operating expenses. On contrary, it does not appear that the businesses' average total revenue has changed as a result of the merger. As a result, we cannot assume that sales revenue per unit of asset employed rose after the merger, i.e., our data do not indicate a rise in the efficiency of asset usage to create greater net sales. To summarize, this study reinforces or renews faith in the Indian management community's ability to use mergers and acquisitions as efficient mechanisms of business growth plan.

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