The Effect of Mergers and Acquisitions on the Financial Performance of Manufacturing Companies in India

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ABSTRACT

The study aims to analyze the impact of mergers and acquisitions on the financial performance of manufacturing companies in India. The data set comprises 320 observations from the period 2005 to 2017. The companies that were merged during the years 2009-2013 are only considered. The study focuses on the manufacturing companies' profitability, leverage, and overall efficiencies. The techniques include paired t-test, regression, fixed effect model, pooled effect model, and Generalized Method of Moments (GMM). The findings of the study reveal that the Return on Equity (ROA), Return on Equity (ROE) and Return on Capital Employed (ROCE) have an impact on profitability, post Current ratio, and post-quick ratio on the liquidity, and leverage of the company has an insignificant impact. It is found that the overall efficiency of the companies during the post-merger is less volatile and stable when compared to the pre-merger overall efficiency thereby impacting the company's financial performance.

Keywords: Mergers and Acquisition; Return on Asset; Return on Equity; Return on Capital Employed; Net Profit Margin.

1.0 Introduction

The business environment is evolving quickly today in terms of competition, goods, people, markets, clients, and technology. In order to consistently maximize shareholder value, organizations must innovate and outperform their rivals rather than simply keeping up with these developments.

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In order for businesses to stay up with the changes, growth is necessary. There are two categories of growth strategy: organic and inorganic. The inorganic growth options for obtaining fast and consistent growth are mergers and acquisitions (M&A). Due to the contemporary situation's globalization, liberalization, technical advancements, and competitive corporate climate, it has grown in prominence throughout the world. The rising worldwide market competitiveness has compelled Indian businesses to pursue mergers and acquisitions as a strategy.

Mergers and acquisitions are one of the common strategies used by companies for corporate restructuring and strengthening the globalized economy. The increased competition in the Indian market has promoted companies in India to go for mergers and acquisitions. Around 85% of manufacturing companies in India are using Mergers and Acquisitions as a growth strategy. The number of mergers and acquisitions is not only increasing in India but also throughout the globe (Kumar & Bansal, 2008). The trends of mergers and acquisition in India has changed over the years. Some of the benefits of mergers and acquisitions are to have rapid access to technology, extended market share, enhanced market position, extended customer base, and strong financial position. Mergers and acquisitions are used to increase the market share, diversify the portfolio to lower business risk, enter new markets and geographies, and gain a competitive advantage over rival companies, mergers and acquisitions help businesses become more competitive.

1.1 Objectives of the study

- 1. To analyze the impact of mergers and acquisitions on the profitability of the selected companies
- 2. To analyze the impact of mergers and acquisitions on the liquidity of the selected companies
- 3. To analyze the impact of mergers and acquisitions on the leverage of the selected companies
- 4. To analyze the impact of mergers and acquisitions on the overall efficiency of the selected companies

2.0 Review of Literature

Global markets have continuously experienced increased mergers and acquisitions over the last decades (Ahmed & Ahmed, 2014; Akben-Selcuk & Altiok-Yilmaz, 2011; Cartwright & Cooper,1990; Leepsa & Mishra, 2012; Marembo, 2012; Moctar *et al.*, 2014; Tarasovich, 2014). Mergers and Acquisitions are continuously being

adopted for progressive company competitiveness by expanding market share (Mboroto, 2013; Zahid & Shah, 2011). The phenomenon of mergers and acquisitions is not localized; it has spread to every country in the world. Organizations today that want to compete in the modern, dynamic business world must meet this criterion (Waddock & Graves, 2006).

This section of the study examines how M&A activity affects a company's success. It has been discovered that some nations, including Brazil, China, and India, are more active in merger and acquisition agreements. Mantravadi & Reddy, (2008) discovered a connection between the industry type and the outcome of merger deals. The financial ratios were calculated using figures from three years after the merger and three years prior. They came to the conclusion that the performance of the operational sector will be impacted by mergers. Tambi (2005) discovered how mergers and acquisitions affected a company's success. Three factors—Profit after Tax, Return on Capital Employed, and Profit before Interest Tax, Depreciation, and Amortization—were used to determine how well the organizations performed (Gjirja, 2003).

The study's findings indicated that merger and acquisition attempts had failed. Based on accounting data, efficiency, and profitability assess the evolution of merged companies' operating performance before and after the merger. Sujud & Hachem, (2018) discovered that ROA and ROE improved but only insignificantly, there was a significant increase in the EPS after merger in the Lebanese banks. (Ahmed & Ahmed, 2014) The results show that the acquiring companies have improved insignificantly. The profitability, liquidity, and capital position Improved insignificantly and the efficiency deteriorated during the post-merger era (Neethu *et al.*, 2018) Companies were merged or taken over by good management companies so they had a significant impact on the financial position of the merged companies (Gupta *et al.*, 2021). The results show that mergers and acquisitions will improve the synergy during the post-merger period (Sujud & Hachem, 2018) There was increased profitability during the post-merger period, and operating efficiency had a random pattern from this context, the importance of the effect on profitability, liquidity, leverage, and overall efficiency of the companies plays a vital role on financial performance of the companies.

3.0 Research Methodology

3.1 Research design

The study investigates the impact of mergers and acquisitions on the financial performance of manufacturing companies in India. The data is collected from Money control and financial statement of companies. Leading financial database considering 32

listed companies of India. The study period is 10 years from 2009 to 2013, both inclusive. There are a total of 320 observations i.e. (32companies*10years data).

3.2 Sources of data and analysis method

Statistic software like SPSS and EViews are employed for running various tests. Tests such as paired t-test, regression, fixed effect model, pooled effect model, difference GMM, and graphs are employed to analyze the impact of financial performance after Mergers and acquisitions. A paired t-test was conducted to compare the performance between pre and post-merger periods any significance value less than 0.05 had an impact on the financial performance of the companies. Regression models are used to compare and find the best-fit model. For regression, any variable significant value less than the tolerance level of 0.05 was considered an efficient model and had a significant impact. Difference GMM having a significance value less than 0.05 had a significant impact.

3.3 Hypothesis

- 1 H₀: Mergers and Acquisition have no impact on ROA H₁: Mergers and Acquisition have impact on ROA
- 2 H₀: Mergers and Acquisition have no impact on ROE H₁: Mergers and Acquisition have impact on ROE
- 3 H₀: Mergers and Acquisition have no impact on EBIT H₁: Mergers and Acquisition have impact on EBIT
- 4 H₀: Mergers and Acquisition have no impact on Asset Turnover H₁: Mergers and Acquisition have impact on Asset Turnover
- 5 H₀: Mergers and Acquisition have no impact on ROCE H₁: Mergers and Acquisition have impact on ROCE
- 6 H₀: Mergers and Acquisition have impact on Net profit Margin H₁: Merger and Acquisition have no impact on Net profit Margin
- H₀: Mergers and Acquisition have no impact on Current ratio
 H₁: Mergers and Acquisition have impact on Current Ratio
- 8 H₀: Mergers and Acquisition have no impact on Quick Ratio H₁: Mergers and Acquisition have impact on Quick Ratio
- 9 H₀: Mergers and Acquisition have no impact on Cash Ratio H₁: Mergers and Acquisitions have an impact on Cash Ratio

4.0 Analysis and Discussion

Paired t-test has been conducted. This is done to understand the difference between two variables for the same subject, but the two variables are separated by time.

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Variables like Return on Asset, Return on Equity, Return on Capital Employed, Asset Turnover, EBIT, Net Profit Margin. All these variables are considered for evaluating the impact of mergers and acquisitions on the profitability of the company. All these variables have a major contribution towards the profitability of the company. A company's primary goal is to have profitability. Without profitability, it is very difficult for the companies to survive in the long run. So here we are measuring the pre and postmerger and acquisition of the company.

	Variables	Mean	Std. Deviation	t-value	P-value
Dair 1	Pre-Net Profit Margin	-5.4709	323.38539	0 422	0.672
rall I	Post Net Profit Margin	5.3369	12.4072	-0.423	0.075
Dair 2	Pre-Return on Equity	16.3712	53.39663	2.061	0.041
Pair 2	Post Return on Equity	5.0161	45.53161	2.001	0.041
Dair 2	Pre-Return on Capital Employed	13.6424	16.10294	2 867	0
Pair 3	Post Return on Capital Employed	8.6625	11.47838	5.007	0
Dair 1	Pre-Return on Assets	6.8083	10.88767	2 285	0.024
rall 4	Post Return on Assets	4.7687	6.80495	2.203	0.024
Dain 5	Pre EBIT	-14.1541	273.23342	1 242	0.216
Fall 3	Post EBIT	12.6274	18.52192	-1.243	0.210
Pair 6	Pre-Asset Turnover Ratio	158.4202	629.79186	1 262	0.175
	Post Asset Turnover Ratio	89.7826	45.2164	1.302	0.175

Table 1: Paired t- test

Source: Authors Original Contribution

From Table 1, it is observed that the Net Profit Margin increased from -5.4709 to 5.3369 after the merger. The t-value is -0.423 and the p-value is 0.673 this reveals that the net profit margin divulges an insignificant impact of the merger on the Net profit margin. So, the null hypothesis accepted and rejects the alternative hypothesis

From Pair 2 Return on Equity decreased from 16.3712 to 5.0161 after the merger. The t-value is 2.061 and the p-value is 0.041 shows a significant impact of the merger on the return on equity. If the p-value is below 0.05, reject the null hypothesis and accept the alternative hypothesis

From Pair 3 Return on Capital Employed decreased from 13.6424 to 8.6625 after the merger. The t-value is 3.867 and the p-value is 0.00 showing a significant impact of consolidation on the Return on capital employed. The above table 5.1 found that the p-value is less than 0.05, so reject the null hypothesis and accept the alternative hypothesis

From Pair 4 Return on Assets has decreased from 6.8083 to 4.7687 after the merger. The t value is 2.285 and p value is 0.024, this shows that there is a significant impact of merger on the Return on Asset. The p-value is less than 0.05, hence reject the null hypothesis and accept the alternative hypothesis.

From Pair 5 EBIT has increased from -14.1541 to 12.6274 after the merger. The t-value is -1.243 and the p-value is 0.216 this shows that there is an insignificant impact of the merger on the EBIT. If the p-value is more than 0.05, hence accept the null hypothesis and reject the alternative hypothesis

From Pair 6 Asset Turnover ratio has decreased from 158.4202 to 89.7826 after the merge. The t-value is 1.362 and the p-value is 0.175, revealing that there is an insignificant impact of the merger on the Asset turnover ratio. The p-value is more than 0.05, hence accept the null hypothesis and reject the alternative hypothesis.

Concluding when comparing the pre and post-merger period. The companies Return on Equity, Return on Asset, Return on Capital Employed had a significant impact on the profitability of the companies in India.

For the second objective, regression technique is employed, this is conducted to know the relationship between two or more variables of interest the relationship between the dependent and independent variables.

4.1 Dependent variable- pre-quick ratio

Table 2: Model Summary - Regression

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.130ª	0.017	-0.022	780.34015

Source : Authors Original Contribution

From the Table 2 R value is not greater than 0.4 which means that the study cannot be taken for further analysis and the R square value is less than 0.5 which tells us that the model is ineffective and insufficient to determine the relationship between the variables.

Table 3: ANOVA

M	odel	Sum of Squares	Df	Mean Square	F	Sig.
	Regression	1592722.72	6	265453.79	0.436	.854 ^b
1	Residual	93166404.5	153	608930.75		
	Total	94759127.2	159			

The F value is not more than 1 and which shows that it is not a good and an ineffective model and the significance value is more than 0.05 which means that it has no significant impact on the variables. (Table 3).

Model		Unstar Coef	ndardized fficients	Standardized Coefficients	Т	Sig.
		В	Std. Error	Beta		
	(Constant)	77.064	85.467		0.902	0.369
	Pre Net Profit Margin	-0.423	0.533	-0.177	-0.794	0.429
	Pre Return on Networth / Equity	-0.756	2.25	-0.052	-0.336	0.737
1	Pre Return on Capital Employed	-7.187	9.729	-0.15	-0.739	0.461
	Pre Return on Assets	22.72	17.023	0.32	1.335	0.184
	Pre EBIT	0.376	0.553	0.133	0.68	0.497
	Pre Asset turnover ratio	0.02	0.101	0.016	0.198	0.844

Table 4: Coefficients

Source: Authors original contribution

Table 4 reveals that the significance value of all the variables are having significance value above 0.05. Hence, accept the null hypothesis which means that pre quick ratio has no impact on all the variables.

4.2 Dependent variable- post quick ratio

Table 5: Model Summary

1 .338 ^a 0.115 0.08 0.93883	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
	1	.338ª	0.115	0.08	0.93883

Source: Authors Original Contribution

Table 5 the R value is not greater than 0.4 which means that the study cannot be taken for further analysis and the R square value is less than 0.5 which tells us that the model is ineffective and insufficient to determine the relationship between the variable Table 5: ANOVA.

Table 6: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	17.44	6	2.907	3.298	.004 ^b
1	Residual	134.855	153	0.881		
	Total	152.295	159			

From the Table 6 the F value is greater than 1 which shows that it is a good and efficient model. The significance value is below 0.05 and it has a significant impact on the variables.

	Model	Unstan Coefi	dardized ficients	Standardized Coefficients	t	Sig.
		В	Std. Error	Beta		
	(Constant)	0.954	0.197		4.834	0
	Post Net Profit Margin	0.002	0.011	0.024	0.168	0.867
	Post Return on Networth / Equity	-0.003	0.002	-0.125	-1.388	0.167
1	Post Return on Capital Employed	-0.057	0.018	-0.663	-3.137	0.002
	Post Return on Assets	0.126	0.032	0.875	3.896	0
	Post EBIT	0	0.006	-0.002	-0.023	0.982
	Post Asset Turnover Ratio	-2.77E-05	0.002	-0.001	-0.014	0.989

Table 7: Coefficients

Source: Authors Original Contribution

Table 7 shows that significant values after the regression analysis are obtained and it is found that ,Post return on capital employed and Post return on assets significance value is less than 0.05 which means null hypothesis is rejected and shows that there is a significant relationship between the dependent and independent variables.

4.3 Dependent variable – pre-current ratio

From the Table 8, the R value is not greater than 0.4 which means that the study cannot be taken for further analysis and the R square value is less than 0.5 which reveals that the model is ineffective and insufficient to determine the relationship between the variables.

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.248ª	0.061	0.025	1.67934

Source: Authors Original Contribution

From the Table 9, the F value is greater than 1 which shows that it is a good and efficient model. The significance value is not below 0.05 and it has an insignificant impact on the variables.

Table 9: ANOVA

Ν	Iodel	Sum of Squares	Df	Mean Square	F	Sig.
	Regression	28.197	6	4.7	1.666	.133 ^b
1	Residual	431.49	153	2.82		
	Total	459.687	159			

Source: Authors Original Contribution

From the Table 10, the significance value is not less than 0.05 which means null hypothesis is accepted and shows that there is a significant relationship between the dependent and independent variables.

Table 10: Coefficients

	Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		В	Std. Error	Beta		_
	(Constant)	1.987	0.184		10.803	0
	Pre Net Profit Margin	-0.002	0.001	-0.307	-1.406	0.162
	Pre Return on Networth / Equity	0.007	0.005	0.221	1.451	0.149
1	Pre Return on Capital Employed	-0.054	0.021	-0.513	-2.589	0.111
	Pre Return on Assets	0.052	0.037	0.333	1.418	0.158
	Pre EBIT	0.002	0.001	0.289	1.508	0.134
	Pre Asset turnover ratio	0	0	0.109	1.362	0.175

Source: Authors Original Contribution

4.4 Dependent variable- post current ratio

The Table 11, the R value is not greater than 0.4 which means that the study cannot be taken for further analysis and the R square value is less than 0.5 which tells us that the model is ineffective and insufficient to determine the relationship between the variables.

Table 11: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.381ª	0.145	0.112	1.03507

From the Table 12, the F value is greater than 1 which shows that it is a good and efficient model. The significance value is below 0.05 and it has a significant impact on the variables.

	Model	Sum of Squares	Df	Mean Square	F	Sig.
	Regression	27.91	6	4.652	4.342	.000 ^b
1	Residual	163.92	153	1.071		
	Total	191.829	159			

Table 12: ANOVA

Source: Authors Original Contribution

From the Table 13, it is observed that Post return on capital employed and Post return on assets significance value is less than 0.05 which means null hypothesis is rejected and shows that there is a significant relationship between the dependent and independent variables.

Table 13: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		В	Std. Error	Beta		
	(Constant)	1.341	0.218		6.161	0
1	Post Net Profit Margin	0.01	0.013	0.113	0.791	0.43
	Post Return on Networth / Equity	-0.003	0.002	-0.117	-1.325	0.187
	Post Return on Capital Employed	-0.071	0.02	-0.744	-3.583	0
	Post Return on Assets	0.15	0.036	0.929	4.211	0
	Post EBIT	-0.004	0.006	-0.07	-0.657	0.512
	Post Asset Turnover Ratio	0.001	0.002	0.038	0.414	0.68

Source: Authors Original Contribution

4.5 Dependent variable - pre-cash ratio

From the Table 14, the R value is not greater than 0.4 which means that the study cannot be taken for further analysis and the R square value is less than 0.5 which tells us that the model is ineffective and insufficient to determine the relationship between the variables.

Table 14 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.130ª	0.017	-0.022	780.34015

From the Table 15, the F value is greater not than 1 it shows that it is not a good and inefficient model. The significance value is not below 0.05 and it has insignificant impact on the variables

	Model	Sum of Squares	Df	Mean Square	F	Sig.
	Regression	1592722.72	6	265453.79	0.436	.854 ^b
1	Residual	93166404.5	153	608930.75		
	Total	94759127.2	159			

Table 15: Anova

Source: Authors Original Contribution

From Table 16, it is observed that the significance values of all the variables are above 0.05. There is no significant relationship between the dependent and independent variables.

Model		Unstandardized Coefficients		Standardized Coefficients	Т	Sig.
		В	Std. Error	Beta		
	(Constant)	77.064	85.467		0.902	0.369
	Pre Net Profit Margin	-0.423	0.533	-0.177	-0.794	0.429
	Pre Return on Networth / Equity	-0.756	2.25	-0.052	-0.336	0.737
1	Pre Return on Capital Employed	-7.187	9.729	-0.15	-0.739	0.461
	Pre Return on Assets	22.72	17.023	0.32	1.335	0.184
	Pre EBIT	0.376	0.553	0.133	0.68	0.497
	Pre Asset turnover ratio	0.02	0.101	0.016	0.198	0.844

Table 16: Coefficients

Source: Authors Original Contribution

4.6 Dependent variable-post cash ratio

From the Table 17, it is observed that the R value is not greater than 0.4 which means that the study cannot be taken for further analysis and the R square value is less than 0.5 which tells us that the model is ineffective and insufficient to determine the relationship between the variables

Table 17: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.163ª	0.026	-0.012	2084.24221

From the Table 18, it is observed that the F value is greater not than 1 it shows that it is not a good and inefficient model. The significance value is not below 0.05 and it has insignificant impact on the variables.

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	18088747.2	6	3014791.19	0.694	.655 ^b
1	Residual	664642037	153	4344065.6		
	Total	682730784	159			

Table 18: ANOVA

Source: Authors original contribution

From Table 19, it is observed that the significance value of all the variables is above 0.05 hence there is no significant relationship between the dependent and independent variables

Table 19: Coe	efficients
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Model		Unstandardized Coefficients		Standardized Coefficients	Т	Sig.
		В	Std. Error	Beta		
	(Constant)	137.508	438.211		0.314	0.754
	Post Net Profit Margin	-11.775	25.457	-0.071	-0.463	0.644
	Post Return on Networth / Equity	-2.412	4.289	-0.053	-0.562	0.575
1	Post Return on Capital Employed	-37.252	40.014	-0.206	-0.931	0.353
	Post Return on Assets	123.303	71.673	0.405	1.72	0.087
	Post EBIT	0.186	12.782	0.002	0.015	0.988
	Post Asset Turnover Ratio	-1.672	4.487	-0.036	-0.373	0.71

Source: Authors original contribution

The generalized method of moments is one of the statistical methods when we are not sure of the distribution of the dependent variable and there is a presence of invigilating in the regression model GMM model is used.

An autoregressive panel data model is formed $y_{itit} = \alpha y_{i.t-1} + \beta'_1 x_{it} + \beta'_2 x_{it-1} + \eta_i + v_{it}$ For i = 1, ..., N and t = 2, ..., T $u_{it} = n_i + v_{it}$ it is the usual decomposition of 'fixed effects' of the error team; where N is larger, T is fixed and $|\alpha| < 1^1$. This has the corresponding common factor which is restricted to $(\beta_2 = -\alpha\beta_1)$ from $Y_{it} = \beta'_1 x_{it} + f_i + \zeta$ $Y_{it} = \beta'_1 X_{it} + f_i + \zeta_{it}$ with $\zeta_{it} = \alpha \zeta_{i.t-1} + v_{it}$ and $n_i = (1 - \alpha)f_i$ In this study of panel data we allow for the inclusion of x_{it} regressors but for the evaluation of various estimators we also use an AR(1) model with unabsorbed individual specific effects.

 $y_{itit} = ay_{i.t-l} + \eta_i + v_{it} \text{ for } i = 1, \dots, N \text{ and } t = 2. \text{ We only focus on the role of initial conditions we will assume that } \eta_i \text{ and } v_{it} \text{ are independently distributed across } i \text{ and have the familiar error components structure in which} \\ E((\eta)_i = 0, E(v_{it}) = 0, E(v_{it}\eta_i) = 0 \text{ for } i = 1, \dots, N \text{ and } t = 2, \dots, T \text{ and} \\ E(v_{it}v_{is}) = 0 \text{ for } i = 1, \dots, N \text{ and } t \neq S \\ \text{Generalized Method of momentum} \\ nQ_n(\theta) = [\sqrt{nf\theta}] \text{ (Est.Asy.Var } [\sqrt{nf_n(\theta_0)}]^{-1} [\sqrt{nf_n(\theta_0)}] \\ \text{ Notice that this is a wald statistic and under the Null} \\ H_0: E[f(x, \theta_0)] = 0 \\ H_1: E[f(x, \theta_0)] \neq 0 \end{aligned}$

4.7 Pooled effect model

Table 20 shows the pooled effect model which has the F statistic value of 1.18.

Variable	Coefficient	Standard Error	t-statistic	prob
С	-2.54	3.93	-6.449702	0
Pre-debt to capital ratio	2.17	2	10.87421	0
Pre-debt to asset ratio	-1.76	2.02	-8.743134	0
Pre-debt to equity ratio	1	1.7	5.87	0
R squared	1	Mean dependent var	0.717733	
Adjusted R squared	1	S.D dependent var	8.530066	
S.E of regression	1.8	Akaike info criterion	-65.03608	3
Sum squared resid	5.04	Schwarz criterion	-64.95887	7
Log likelihood	5174.368	Hannan Quinn criter	-65.00473	
F statistic	1.18	Durbin-Watson stat	2.04032	
prob(f statistic)	0			

Table 20: Pooled Effect Model

Source: Authors Original Contribution

4.8 Fixed effect model

Table 21 shows the Fixed effect model which has the F statistic value of 7.78. So, the value of Fixed f statistic is deducted with Pooled F statistic. The value is not

close to the fixed f statistic. Hence, it is recommended to do the difference Generalized method of moments

Variable	Coefficient	Standard Error	t-statistic	prob
С	-4.93	7.9	-6.243111	0
Pre-debt to capital ratio	-5.28	2.67	-1.979437	0.05
Pre-debt to asset ratio	1.28	2.7	4.747605	0
Pre-debt to equity ratio	1	2.17	4.61	0
R squared	1	Mean dependent var	0.7177	3
Adjusted R squared	1	S.D dependent var	8.53006	56
S.E of regression	2.06	Akaike info criterion	-64.602	81
Sum squared resid	5.2	Schwarz criterion	-63.907	96
Log likelihood	5171.923	Hannan Quinn criter	-64.32064	
F statistic	7.78	Durbin-watson stat	2.479828	
prob (f statistic)	0			

Table 21: Fixed Effect Model

Source: Authors Original Contribution

4.9 Difference GMM

Table 22 reveals that as the difference GMM model indicates that all the probability values are not less than 0.05. It suggests us to accept the null hypothesis. The Prob(J-statistic) is 0 which means it is inefficient.

Variable	Coefficient	Standard Error	t-statistic	prob
Leverage (-1)	2.6	3.74	0.695136	0.4921
Pre debt to capital ratio	-2.63	3.93	-0.671299	0.507
Pre debt to asset ratio	-2.04	3.01	-0.676581	0.5037
Pre debt to equity ratio	1	3.31	3.02	0
Mean Dependent Variable	-1.212417	S D dependent var	10.6	2795
S.E of regression	2.76	Sum squared resid	6.86	
J-statistic	1.89	Instrument rank	20	
Prob(J-statistic)	0			

Table 22: Difference GMM

Source: Authors Original Contribution

4.10 For post leverage pooled effect model

Table 23 shows the pooled effect model has the F statistic value of 1.02.

Variable	Coefficient	Standard Error	t-statistic	prob
С	-5.62	3.69	-1.528342	0.1285
Post debt to capital ratio	1	2.01	4.97	0
Post debt to asset ratio	0	1.7	0	1
Post debt to equity ratio	0	1.7	0	1
R squared	1	Mean dependent var	2.6519	904
Adjusted R squared	1	S.D dependent var	6.1940)36
S.E of regression	1.41	Akaike info criterion	-65.52	677
Sum squared resid	3.1	Schwarz criterion	-65.44	199
Log likelihood	5246.142	Hannan Quinn criter	-65.49556	
F statistic	1.02	Durbin-watson stat	1.176376	
prob(f statistic)	0			

Table 23: Pooled Effect Model

Source: Authors Original Contribution

4.11 Fixed effect model

Table 24 shows the Fixed effect model has the F statistic value of 8.63 Deduct the value of Fixed f statistic with Pooled F statistic. The value is not close to the f statistic value of fixed. So, we are recommended to do the difference Generalized method of moments.

Table 24 Fixed effect model

Variable	Coefficient	Standard Error	t-statistic	prob
С	-9.61	1.13	-8.499	0
Post debt to capital ratio	1	2.49	4.01	0
Post debt to asset ratio	5.69	5.75	9.891864	0
Post debt to equity ratio	-4.14	5.42	-7.630476	0
R squared	1	Mean dependent var	2.651904	
Adjusted R squared	1	S.D dependent var	6.194036	
S.E of regression	1.42	Akaike info criterion	60.73627	
Sum squared resid	2.5	Schwarz criterion	-60.04435	
Log likelihood	4894.901	Hannan Quinn criter	-60.4553	
F statistic	8.63	Durbin-watson stat	1.128551	
prob(f statistic)	0			

4.12 Difference GMM

Table 25 reveals that , the difference GMM model indicates that all the probability values are not less than 0.05. It suggests us to accept the null hypothesis, which means that there is no impact. The Prob (J-statistic) is 0 which means it is inefficient (Blundell & Bond, 1998).

Variable	Coefficient	Standard Error	t-statistic	prob
Leverage (-1)	-2.21	1.21	-1.821029	0.0783
Post debt to capital ratio	1	4.9	2.04	0.4421
Post debt to asset ratio	3	2.83	1.059227	0.2977
Post debt to equity ratio	-2.79	2.83	-0.986442	0.3316
Mean Dependent Variable	-0.133055	S D dependent var	1.072495	
S.E of regression	5.42	Sum squared resid	2.67	
J-statistic	1.78	Instrument rank	20	
Prob(J-statistic)	0			

Table 25: Difference GMM

Source: Authors Original Contribution

4.13 Objective 4

Ratio analysis is done to analyse the overall efficiency of the companies. We have calculated the revenue and expenses.

$Overall \, Efficiency = \frac{Expenses}{Revenue}$

Figure 1 and 2 represents the post and pre-efficiency. It is clearly evident that the premerger efficiency is more volatile compared to the post-merger efficiency. During the post-merger efficiency, the values are constant and the companies are performing well.

Figure 1: Pre Efficiency of Company



Source: Authors Original Contribution

The Effect of Mergers and Acquisitions on the Financial Performance of115Manufacturing Companies in India





Source: Authors Original Contribution

5.0 Result and Discussion

With 320 observations and panel data covering the years 2009 to 2013, the study analyzed the impact of mergers and acquisition on the financial performance of the companies in India. The study's main objective is to identify the variables that are impacting the financial performance of the companies in India. The findings indicate that when comparing the pre and post-merger period. The companies Return on Equity, Return on Asset, Return on Capital Employed had a significant impact on the profitability of the companies in India. For liquidity pre and post cash ratio had no significant impact. When comparing pre and post current ratio. Variables like Return on capital employed and Return on Asset had impact on post current ratio. When comparing the pre and post quick ratio, variables like return on capital employed and Return on Asset had impact.

Comparing the leverage of pre-merger and post-merger there is insignificant impact during the pre and post-merger. This also tells us that the leverage has no impact on the financial performance of companies after mergers and acquisition.

Overall efficiency was calculated by dividing the expenses over revenue and we could find the overall efficiency for companies. Line graph was constructed to check the efficiency. So we can tell that the pre efficiency was volatile and high fluctuation were observed when compared to the post-merger period, it is concluded that the post overall efficiency is constant and performing well when compared to the pre overall efficiency.

Hence, it is concluded that during the post-merger and acquisition the manufacturing companies have performed well and has impact on the financial

performance. This indicates that Mergers and Acquisition is the key strategy for any company to survive in the market and increase its market share.

6.0 Limitations

- The overall study of the listed companies is considered for the study. It can further be explored on the particular sectors like energy sector, paper industries, etc.
- The period of study is only for 5 years pre-merger and 5 years post-merger. It can extend the years of study so that to help to analyze it more effectively and efficiently.
- Multiple mergers can also be considered for the study (One company merging with one or more companies can also be considered for the study)

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References

Ahmed, M., & Ahmed, Z. (2014). Merger and acquisitions: effect on financial performance of banking institutions of Pakistan. *Journal of Basic and Applied Scientific Research*, 4(4), 249-259.

Akben-Selcuk, E., & Altiok-Yilmaz, A. (2011). The impact of mergers and acquisitions on acquirer performance: Evidence from Turkey. *Business and Economics Journal*, 22, 1-8.

Blundell, R. & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of Econometrics*, 87(1), 115-114.

Cartwright, S. & Cooper, C. L. (1990). The impact of mergers and acquisitions on people at work: Existing research and issues. *British Journal of Management*, 1(2), 65-76.

Gjirja, M. (2003). Assessing the efficiency effects of bank mergers in Sweden: A panelbased Stochastic Frontier Analysis. Goteborg University, Department of Economics.

Gupta, I., Raman, T. V., & Tripathy, N. (2021). Impact of merger and acquisition on financial performance: Evidence from construction and real estate industry of India. *FIIB Business Review*, *12*(1), 74-84.

Kumar, S., & Bansal, L. K. (2008). The impact of mergers and acquisitions on corporate performance in India. *Management Decision*, 46(10), 1531-1543.

Leepsa, N. M., & Mishra, C. S. (2012). Post merger financial performance: A study with reference to select manufacturing companies in India. *International Research Journal of Finance and Economics*, 83(83), 6-17.

Mantravadi, D. P., & Reddy, A. V. (2008). Post-merger performance of acquiring firms from different industries in India. *International Research Journal of Finance and Economics*, 22, 192-204

Marembo, J. O. (2012). The impact of mergers and acquisition on the financial performance of commercial banks in Kenya (Doctoral dissertation, University of Nairobi).

Mboroto, S. N. (2013). The effect of mergers and acquisitions on the financial performance of petroleum firms in Kenya (Doctoral dissertation, University of Nairobi).

Moctar, N. B., & Xiaofang, C. H. E. N. (2014). The impact of mergers and acquisition on the financial performance of West African Banks: A case study of some selected commercial banks. *International Journal of Education and Research*, 2(1), 1-10.

Neethu, T. C., Viswanathan, R. & Arun, T. C. (2018). Mergers and acquisitions waves in India. *International Journal of Management Studies*, 5(4), 17-22.

Sujud, H., & Hachem, B. (2018). Effect of mergers and acquisitions on performance of Lebanese banks. *International Research Journal of Finance and Economics*, *166*(2), 69-77.

Tambi, M. K. (2005). Impact of mergers and amalgamation on the performance of Indian Companies. *Econ WPA Finance*. Retrieved from https://ideas.repec.org/p/wpa/wuwpfi/ 0506007.html.

Tarasovich, B. M. (2014). The impact of mergers and acquisition premiums on financial performance. *Journal of Theoretical Accounting Research*, *10*(1), 1-39.

Waddock, S., & Graves, S. B. (2006). The impact of mergers and acquisitions on corporate stakeholder practices. *Journal of Corporate Citizenship*, 22, 91-109.

Zahid, N. & Shah, A. M. (2011). Mergers and acquisitions in international business. *European Scientific Journal*, 22, 43-56.