An Examination of Success of Mergers and Acquisitions in Manufacturing Sector in India Using Index Score

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ABSTRACT

Managers have to take various decisions when it comes to company performance in relation to M&A. The performance of manufacturing companies is influenced by simultaneous impact of number of factors. From the literatures on M&A, it is found that there are vast number of studies in different countries on the performance evaluation of companies involved in mergers and acquisitions in various sectors. From the literature, it is observed that various financial ratios are used to examine the impact of M&A. Essentially the studies measure the impact in terms of increase or decrease in particular financial ratio in post M&A period compared to pre M&A period. However, it is possible to get mixed results i.e. as per some criteria of performance, the impact can be positive and as per some criteria the impact can be negative. Therefore, the challenge is to develop a scientific approach that would deal with the multiple financial ratios. Thus, the objective of the study is to find out the factors affecting post mergers and acquisition performance of the manufacturing companies in India using a composite score that provide more stable measures of the underlying abilities of financial ratios (Anglim, 2009). In this study, a composite index score is developed using Principal Components Analysis for the pre and post M&A period separately by taking into account different financial ratios. The period of study is from 2000 to 2008. The dependent variable is the index score and the independent variables are M&A Experience, Industry Relatedness, Size of Acquirer, Method of Payment, pre M&A quick ratio, return on capital employed, total debt ratio, and interest coverage ratio. It is found that the determinants of M&A success and failure are the pre M&A return on capital employed, pre M&A total interest coverage ratio and pre M&A quick ratio.

Keywords: Mergers, Acquisitions, Manufacturing, Index Score, Linear Regression

1. INTRODUCTION

Managers have to take various decisions when it comes to company performance in relation to M&A. The performance of manufacturing companies is influenced by simultaneous impact of number of factors. From the literatures on M&A, it is found that there are vast number of studies in different countries on the performance evaluation of companies involved in mergers and acquisitions in various sectors. From the literature, it is observed that various financial ratios are used to examine the impact of M&A. Essentially the studies measure the impact in terms of increase or decrease in particular financial ratio in post M&A period compared to pre M&A period. However, it is possible to get mixed results i.e. as per some criteria of performance, the impact can be positive and as per some criteria the impact can be negative. Therefore, the challenge is to develop a scientific approach that would deal with the multiple financial ratios. Thus, the objective of the study is to find out the factors affecting post mergers and acquisition performance of the manufacturing companies in India using a composite score that provide more stable measures of the underlying abilities of financial ratios (Anglim, 2009). In this study, a composite index score is developed using Principal Components Analysis for the pre and post M&A period separately by taking into account different financial ratios. Hence, this study develops a framework to analyse the factors that affect the post M&A performance of the companies. In this framework, the base for performance is the post M&A index score. Using various indicators of financial performance, deal characteristics and acquirer characteristics on the sample firms, this study presents new evidence on corporate financial performance considering three years average results.

The rest of the paper is organized as follows. Section 2 presents the definition and concept of M&A. Section 3 discusses the past research works on M&A, finds the research gaps areas. Section 4 discusses the research methodology including research objectives, model specification and variables, statistical tools and techniques, sample design. Section 5 discusses the statistical results on post M&A performance and derives various inferences from the statistical results on the long-run performance of manufacturing companies. Section 6 concludes with the summary of findings Section 7shows the contribution, Section 8 indicates the managerial implications. The last Section 9 shows the and limitation of this study.

2. DEFINITION AND CONCEPT

Mergers and acquisitions are the important business strategies for the growth and development of the companies. A merger is defined as the integration of two or more firms into a legal unity. Acquisitions differ from mergers in the sense that a target is not integrated into the acquirer but becomes its subsidiary, so that it does not disappear as a company (Shim &Okamuro, 2011). Merger refers to merging of two previously separate organizations and their operations into one. In contrast to this, an acquisition refers to transactions in which an acquiring firm uses capital (e.g. stock debt or cash) to buy another company. In case of an acquisition, the size of the acquirer is usually greater than the target in terms of the market place or the going concern value whereas in merger both acquirers as well as target firm are of similiar size or position (Faulkner, et al., 2012). A merger or acquisition is a transaction where two or more companies are combined to become one (Weston& Copeland, 1992). A merger is a pooling of the interest of two companies into a new enterprise, requiring the agreement by both sets of

shareholders. Acquisition is a purchase by one company of a substantial part of the assets or securities of another, normally for the purpose of restructuring the operations of the acquired entity. The purchase may be of all or a substantial part of the target's voting shares or of a division of the target firm (Daga, 2007, p10).

For the current study, mergers and acquisitions have been defined according to definition provided by CMIE Prowess data base, since most of the data are collected from this database. Acquisitions are the takeover transactions where an acquirer company takes over a substantial part of shares of another (target) company. It can be defined in another way as acquisitions are those where a company is being targeted for substantial acquisition of shares by another (acquirer) company. Mergers are transactions where an acquirer company is merging with another company or a target company is being merged into another company.

3. REVIEW OF LITERATURE

Mergers and acquisitions are growing not only in volume but also in value.). While M&A are inevitable part of corporate growth, whether that M&A helps improve financial performance of companies or not. This puzzle remains and a conclusive evidence is yet to be found. Literature review is made as follows:

Table 1 Post M&A Financial Performance

Past Studies	Evidence
Acquisitions are not value-enhancing for shareholders of acquiring firm that experience a statistically significant wealth loss over after M&A deal completion.	(Morck, et al. 1990); (Agrawal, et al., 1992); (Sudarsanam& Gao, 2003); (Halpern, 1973); (Mandelkar, 1974); (Ellert, 1976); (Brailsford& Knights, 1998); (Maletesta, 1983 cited from Bruner, 2004); (Kyriazis, 2010).
Acquisitions increases shareholder wealth. During acquisitions announcements, Shareholders of target firms earn large positive cumulative abnormal Mergers and acquisitions show positive cumulative abnormal returns to the shareholders of both acquiring firm and target firms	(Mulherin& Boone, 2000); (Loderer& Martin, 1992); (Frederikslust, et al., 2005); (Dutta & Jog, 2009); returns (Dodd &Ruback, 1977); (Asquith, et al. 1983); (Dennis & McConnell, 1986); (Leeth& Borg, 2000); (Moeller, et al. 2004); (Berkovitch& Narayana, 1993); (Bradley, et al., 1982).
Results are mixed for stock market approach and accounting based approach. The analysis of pre and post-merger profitability and efficiency ratios for the acquiring firms shows that there is a differential impact of mergers for different ratios and different sectors.	(Paul, et al., 2001); (Kithinji&Waweru, 2007). (Kukalis, 2007); (Agarwal, et al., 2010); (Selcuk& Yilmaz, 2011).

In nutshell, it is observed that company performance after M&A are situational and the performance vary accordingly influenced by different factors relating to M&A. Thus, to overcome the situation, the factors affecting M&A needed to be determined and how it can affect need to be explored so as to act accordingly.

Table 2 Determinants of Post M&A Performance

Determinants	Definition	Possible Impact	Evidence
Type of Deal	Merger or Acquisition	Merger improves performance than acquisition. States a merger is generally better and preferred because of various reasons. Firstly, a merger does not need cash consideration and might result in tax free affair for both acquirer and target firms. Secondly, a merger allows the	Mastracchio&Zunitch (2002)

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Determinants	Definition	Possible Impact	Evidence
		shareholders of smaller firms to get the smaller share of a larger firm, increasing their overall net worth. Thirdly, a merger allows the acquirer to avoid many of the costly and time-consuming aspects of asset purchases.	
M&A Experience	Acquisition experience means any prior M&A deals done in relation to the current M&A under study.	The acquirer with no or little experience creates more value than more experienced bidders	(Patrick, et al., 2003); (Phelan &Mantecon, 2005)
Industry Relatedness	Industry relatedness means both the target as well as acquirer are engaged in same industry.	Unrelated acquisitions give poor returns than related acquisitions.	(Jensen, 1986); (Morck, et al., 1990); (Nail, et al., 1998); (Daga, 2007)
Size of Acquirer	The size has been defined in terms of either total assets or market capitalization in the year prior to takeover is defined as size.	The size of the acquirer is negatively associated with returns for the acquirer and combined firms giving lower returns. Smaller acquirers may realise higher returns than larger acquirers.Acquirer returns may be higher when the size of the acquisition is large relative to buyer and small relative to seller	(Bild, et al., 2002); (Selcuk& Yilmaz, 2011); (Moeller et al., 2004); (Asquith et al., 1983); (Frick & Torres, 2002); (Moeller, et al., 2004); (Hackbarth&Morellec, 2008); (Gell, et al., 2008); (Kumar, 2009); (Gorton, et al., 2009); (Depamphilis, 2010).
Method of Payment	Payment of the acquisition in cash or payment in shares	Payment of the acquisition in cash in comparison to payment in shares provides better returns on average to both the shareholders of the bidding company and the takeover target. Acquirer's returns from equity financed acquisitions of public firms is often less than cash financed deals in US while the reverse is observed in European countries.	(Healy, et al., 1992); (Pautler, 2001); (Frederikslust, et al., 2005); (Kaplan &Weisbach, 2012); (Carline, et al., 2004). (Linn & Switzer, 2001); (Chang, 2002) ; (Heron & Lie, 2002) ; (Shleifer&Vishny, 2003); (Megginson, et al., 2004) ; (Martynova&Renneboog, 2008) ; (Officer, et al., 2009); (Depamphilis, 2010).

From the above literature review it is found that there have been quite intensive studies on M&A. But there are certain issues on which empirical research has been insignificant. Most of the studies use traditional performance measures. As far as literature review is concerned, there are inconsistent results; it might be because the performance of M&A is not centered on the financial aspect of the business but also the non-financial aspect. Again, every merger and acquisition deal is different from each other and thus the objective of each deal also differs. So going deep into the objectives that the companies have framed for specific M&A deals and finding out whether they have accomplished the objectives or not can show whether M&A as a strategy gives better results for the companies or not. Many studies have been made to know whether M&A are value creating or value destroying in nature and on the factors influencing

M&A. There is still scope to do a study about the factors affecting the success and failure of M&A by finding out the combinations of factors that can make a particular merger or acquisition deal successful.

4. RESEARCH METHODOLOGY

The objective aim of the study is to determine financial as well as non financial factors affecting performance of manufacturing companies in the post M&A period. In the light of this objective, the research methodology is discussed as below:

4.1. Sources of Data and Period of Study

The study investigates the pre and post M&A performance of manufacturing companies in India that have gone for M&A deals during the period from 1st January 2000 to 31st December 2008. The data for analysis are collected from various sources such as CMIE Prowess, CMIE Business Beacon, AceEquity database and Capitaline. The data available in the Business beacon database provide useful information on the volume and value of M&A deals announced in India. However, data collected from Centre for Monitoring Indian Economy (CMIE) Prowessdatabase are used to collect data about M&A deals as well as financial data on acquirer and target firms. The firms under analysis represent those where both acquiring and target firms belong to manufacturing companies. The manufacturing sector is selected because highest number of M&A deals are done in this sector. Taking M&A deals only from manufacturing sector would bring heterogeneity in the sample (Sorensen, 2000).

The data were further filtered to find out if financial data for both acquirer and target firm for three year before as well as after M&A event are available or not. For the entire study, data from year ending 31st March 1997 to 31st March 2011 are taken for the performance evaluation of the manufacturing companies. This study uses the long term period in terms of three years to evaluate firm performance. A suitably long period is essential to investigate the impact of M&A, since the effect of M&A is not felt effectively (Healy, et al., 1992); (Rau &Vermaelen, 1998); (Ghosh, 2001); (Rahman &Limmack, 2004); Ramakrishnan, 2008). In the study, the year of M&A event data is not used for analysis because during this year there could be changes in the financial reporting (Healy, et al., 1992); (Ramakrishnan, 2007). Thus, the final sample consists of 407 M&A deals (290 merger deals and 117 acquisition deals). Table 3 shows the sample of year wise M&A:

Table 3 Sample as per the Type of Deal

Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	Total
Merger	27	39	33	29	29	42	43	30	18	**290**
Acquisition	11	7	8	9	10	15	18	28	11	**117**
Total	38	46	41	38	39	57	61	58	29	**407**
Source: Compiled from CMIE Prowess Database										

The industry classification is made based on the CMIE Prowess industry classification that categorises the manufacturing sector into nine industries as given in Table 5. Industry types as per the Prowess classification are under Chemical, Diversified, Food and Beverage, Machinery, Metals & Metal Products, Miscellaneous, Non Metallic Mineral Products, Textiles, Transport Equipment industries. Table 4 shows the sample as per different categories of deal characteristics:

Table 4 Sample as per different categories of Deal Characteristics

Categories	Merger	%	Acquisition	%	Total	%
Related Deals	224	73%	81	27%	305	75%
Unrelated Deals	66	65%	36	35%	102	25%
With M&A Experience	159	67%	80	33%	239	59%
Without M&A Experience	131	78%	37	22%	168	41%
Large Target	31	67%	15	33%	46	11%
Small Target	259	72%	102	28%	361	89%
Source: Compiled from CMIE Prowess Database						
Note: Explanation for these terms are given in subsequent sections						

Each acquirer and target company belongs to specific industry. Thus, each company is affected by rules and regulations of the industry to which it belongs. Economic factors also affect a specific industry. Therefore, different past studies have used suitable control sample that is completely different from the experimental sample to examine the post M&A performance to know whether the firm performance is because of M&A and isolate the influence of industry and economic factors. Adjusting the effects of the external environment makes M&A performance analysis meaningful (Bild, et al., 2002); (Ramaswamy&Waegelein, 2003); (Ramakrishnan, 2008). As per these studies, the pre M&A and post M&A performance are measured taking control firms and each measure are adjusted for industry adjusted performance. So control firms are selected for each industry based on two criteria (a) manufacturing companies that have not gone for any M&A deals during the sample period (b) financial data are available for the sample period. Table 5 shows the number of companies in each control group for traditional ratios.

Table 5 Sample of Control Firms for Industry Average Performance

Industry	Years								
	2000	2001	2002	2003	2004	2005	2006	2007	2008
Chemical	180	202	215	222	219	232	289	277	43
Diversified	6	6	7	7	7	7	9	8	3
Food and Beverage	114	126	151	167	171	181	203	189	25
Machinery	107	109	118	122	132	133	167	156	29
Metal and Metal Products	94	106	126	136	141	145	177	173	24
Miscellaneous Manufacturing	55	65	72	75	75	80	91	85	8
Non Metallic MineralProducts	41	43	48	47	48	47	51	43	7
Textiles	161	155	161	162	154	173	195	182	32
Transport	36	39	51	60	62	71	83	78	4
Source: Compiled from CMIE Prowess Database									

After that, based on the availability of financial data for the sample period, data were collected in relation to M&A year.

4.2.Financial Measures of Performance: Financial Ratios & Index Score

In the light of the research objectives of the study, variables and their definitions are adopted from existing literature. All the financial ratios are computed with the help of data collected from CMIE Prowess. Financial measures used in the study are discussed below in detail:

Various studies have used traditional parameters to examine the post M&A performance (Ooghe&Balcaen, 2000); (Mantravadi& Reddy, 2007); (Kumar &Rajib, 2007); (Vanitha&Selvam, 2007); (Kumar & Bansal, 2008); (Kumar, 2009); (Saboo&Gopi, 2009). The different traditional financial parameters used for the study and the definitions of variables are listed in Table 6.

Table 6 Definition of Variables

Financial Parameters	Variables	Definitions
Liquidity	Current Ratio (CR)	Current Assets/ Current Liabilities
	Quick Ratio (QR)	Quick Assets/ Current Liabilities
Profitability	Return on Capital employed (ROCE)	Profit Before Interest and Tax/Average Capital Employed
	Return on Net Worth (RONW)	Profit after Tax/ Average Net Worth
	Return on Assets (ROA)	Profit after Tax/ Total Assets
	Net Profit Margin (NPM)	Profit after Tax /Sales
Leverage	Interest Coverage Ratio (ICR)	Interest/Profit Before Interest and Tax
	Total Debt Ratio (TDR)	Total Debt to Total Assets
Efficiency	Asset Turnover Ratio (ATR)	Sales/ Average Total Assets
	Sales to Fixed Assets (SFA)	Sales/ Average Fixed Assets
Source: Collected from various existing literature		

The ratios are not collected directly from the data source. Rather data for acquiring firm and target firms are collected separately and then each value is combined for pre and post M&A period separately and then the ratios are calculated (Healy, et al., 1992); (Ramakrishnan, 2008). After that, financial ratios are normalised because the sample of 407 firms consist of acquiring and target from different industries in the manufacturing sector, and the data span over a longer period of time i.e. 1992-2011. The time period might be affected by different economic conditions. The sizes of companies also differ significantly. All the financial performance parameters are adjusted for the control groups.

From the literatures on M&A, it is found that there are studies on the performance evaluation of companies involved in mergers and acquisitions. Studies have been made in different countries like USA, UK, Malaysia, Pakistan, Greece, Nigeria, Philippines and India. Performance has been evaluated for companies various sectors like manufacturing (Pharmaceuticals & Healthcare, Chemicals, Electrical Equipment, textiles) and the financial sector (like banking, software). From the literature, it is observed that various financial ratios are used to examine the impact of M&A. Essentially the studies measure the impact in terms of increase or decrease in particular financial ratio in post M&A period compared to pre M&A period. However it is possible to get mixed results. i.e. as per some criteria of performance, the impact can be positive and as per some criteria the impact can be negative. Thus, the challenge is to develop a scientific approach that would deal with the multiple financial ratios. A composite score is used to provide more stable measures of the underlying abilities of ratios (Anglim, 2009). In this study multiple performance metrics are used and compared between the pre and

post M&A period. In addition to this a composite score is developed for the pre and post M&A period separately by taking into account different financial ratios.

Though principle component analysis is not used in creating index score in M&A related studies but it has been used in different other socio economic fields of research (Vyas &Kumaranayake, 2006). This study aims to fill the existing gap in literature involving post M&A performance in manufacturing sector using a single index score. Principal Components Analysis is used to find out the Index score. Principal component analysis helps in reducing the financial ratios into a single index of financial performance.These ratios cover different aspects of financial performance viz. liquidity, profitability, solvency and efficiency. The variables chosen for the creating the index score are current ratio, return on capital employed, return on net worth, interest coverage ratio, return on assets, asset turnover ratio, sales to fixed asset turnover, net profit margin ratio.

Principal components analysis is based on the correlation matrix of the variables involved. PCA is done for pre and post M&A period separately. The index score is found for each sample firm by taking the values of first principal component (PC1). The first principal component is chosen since it has highest eigenvalue. Hence, statistically significant.The table 7 shows the eigen value analysis of the correlation matrix of the principal component analysis used in the study:

Table 7 Eigen Value Analysis of the Correlation Matrix

Component	Pre M&A Period			Component	Post M&A Period		
	Eigen value	Proportion	Cumulative		Eigen value	Proportion	Cumulative
1	4.2	0.53	0.53	1	4.32	0.54	0.54
2	1.33	0.17	0.69	2	1.1	0.14	0.68
3	0.89	0.11	0.8	3	1.02	0.13	0.81
4	0.51	0.06	0.87	4	0.71	0.09	0.89
5	0.38	0.05	0.91	5	0.32	0.04	0.94
6	0.28	0.04	0.95	6	0.29	0.04	0.97
7	0.25	0.03	0.98	7	0.15	0.02	0.99
8	0.16	0.02	1	8	0.08	0.01	1

There are as many components extracted during a principal component analysis as there are variables that are used. In this study, eight variables are used, so there are eight components. The components that are actually relevant and extracted by principal component analysis are those have Eigenvalue greater than one. In the pre M&A period, the first component account that for the most variance and have the highest eigenvalue of 4.20, and the next component have Eigenvalue of 1.33, that account for as much of the left over variance, as it can, and so on. In the post M&A period, for first three components, eigenvalues are greater than 1.

The Table 8 shows the eigen vectors (component loadings) of the variables used in the study:

Table 8 Eigen Vectors (Component Loadings)

Variable	PC1	Variable	PC1
CR_{pre123}	-0.18	$CR_{post123}$	-0.05
$ROCE_{pre123}$	0.39	$ROCE_{post123}$	0.45

Variable	PC1	Variable	PC1
RONW$_{pre123}$	0.4	RONW$_{post123}$	0.35
ICR$_{pre123}$	0.39	ICR$_{post123}$	0.36
ROA$_{pre123}$	0.44	ROA$_{post123}$	0.44
ATR$_{pre123}$	0.23	ATR$_{post123}$	0.28
SFA$_{pre123}$	0.32	SFA$_{post123}$	0.34
NPM$_{pre123}$	0.38	NPM$_{post123}$	0.40

Table 4.8 shows the component loadings. The values of PC1 for each variable is taken and multiplied with individual ratios for all the 407 sample firms and then the index values were found pre and post M&A period separately.

4.3. Basic Specifications for the Study

For the purpose of study, certain assumptions and specifications are made below:

- Log of total assets is taken as the proxy for the size of the companies.
- The median of the total assets of the acquirer company in the acquisition year is taken into consideration for segregating the acquirer into large and small companies.
- Size of acquirer for linear regression is the log of total assets prior to one year of M&A.
- Relative Size is a dummy variable equal to 1 if target firm is smaller than acquirer and otherwise equal to 0.
- For the relative size of the companies (size of the acquirer to size of the target) the total assets of the acquirer are compared with the total assets of the target prior to the acquisition year.
- Type of industry is classified as per the CMIE Prowess database classification. Industry relatedness is a dummy variable with a value equal to 1 to for deals where acquirer and target belong to same or related industry and 0 otherwise.
- Method of payment is a dummy variable denoted as 1 representing cash and 0 if the mode of payment is stock.
- Experience is a dummy variable with value 1 representing the prior M&A experience of acquirer and 0 otherwise.

4.4. Tools and Techniques: Empirical Model Specification using Linear Regression

There are various studies that have adopted a regression technique for M&A performance related issues. Earlier studies in USA, observedthe factors affecting the operating performance of companies after merger(Healy, et al., 1992); (Ramaswamy, 2003). In India, past studies has been conducted to find out the factors affecting corporate acquisitions compared to industry performance in the post M&A period such as offer size, relatedness and bidder leverage (Ghosh, 2001); (Pawaskar, 2001) (Sharma & Ho, 2002); (Ramakrishnan, 2008). The factors affecting post merger operating performance of Malaysian companies (Rahman &Limmack, 2004). Such analysis is conducted to understand subsequent actions taken by managers(Krishnan et al, 2007).(Muia,2011)explored the determinants of growth of firms through mergers and acquisitions in Kenya. (Carsten& Teresa, 2009) used Multiple Regression Analysisexamine the factors affecting post-acquisition performance. (Kamaly, 2007) also found out the determinants of the aggregate mergers and acquisitions (M&A) activity directed to developing countries.

So, based on earlier studies on Merger and Acquisitions that have used linear regression, this study is carried out using linear regression. The equation for the linear regression is

$$Y_i = \beta_1 X_1 + \beta_2 X_2 + \cdots + \beta_8 X_8 + vi$$

The dependent variable is: Y_1 = Rate of post index score

The independent variables are:
X_1 = M&A Experience;
X_2 = Industry Relatedness;
X_3 = Size of Acquirer;
X_4 = Type of Deal;
X_5 = Pre M&A Quick Ratio
X_6 = Pre M&A Return on Capital Employed;
X_7 = Pre M&A Total Debt Ratio;
X_8 = Pre M&A Pre M&A Interest coverage ratio;
υ_i = Random Disturbance Term

   In case where regression is carried out for merger and acquisition separately, the type of deal variable is dropped from the model. In case of acquisition method of payment is added while it is not taken for merger. Quick ratio is a stringent measure of liquidity than current assets. Hence, this is preferred in the model than current ratio. Return on capital employed takes care of only equityshareholders. Although total debt ratio and interest coverage ratio measure solvency and are related to each other, lower debt ratio does not mean companies are more solvent, because the ability to pay interest as measured by interest coverage ratio can be low. So both the measures are taken for solvency parameter for the model.
   Multiple regression analysis is done based on 407 M&A deals. Since companies adopt either a merger or an acquisition as an investment decision at one time, the regression model is thus applied in three categories (a) mergers and acquisition (b) acquisition (c) mergers. In various models, it has further been analysed based on three more steps (a) taking both success and failure cases (b) only success cases (c) only failure cases. The sample companies were classified into two categories viz. successful or unsuccessful. The cases where the index score in post M&A period is higher than the pre M&A period were classified as successful and rest as unsuccessful. Variables having more than 0.5 corelation are excluded. Dummy variables M&A experience and type of deal are also incorporated in the model.

5. DISCUSSION OF RESULTS

   Performance =f (Type of Deal, M&A Experience, Industry Relatedness, Size of Acquirer, QR_{pre123}, $ROCE_{pre123}$, TDR_{pre123}, ICR_{pre123}). Based on this equation, the results of the linear multiple regressions are discussed below:

Table9 Linear Regression Estimates for Post M&A performance using Index Score

Variables	Coefficient (Success Cases)	Coefficient (Failure Cases)	Coefficient (Both Success &Failure Cases)
const	0.26 (2.30**)	-0.34 (-3.41***)	0.08 (0.73)
1. Type of Deal	0.02 (0.32)	-0.09 (-1.56)	-0.07 (-1.15)
2. M&A Experience	-0.09 (-1.52)	0.04 (0.67)	-0.06 (-1.11)
3. Industry Relatedness	0.07 (0.95)	0.09 (1.43)	0.10 (1.56)

4. Size of Acquirer	0.03 (1.76*)	-0.01 (-0.97)	-0.02 (-1.03)
5. QR_{pre123}	-0.17 (-1.87*)	-0.37 (-3.99***)	-0.31 (-3.54***)
6. $ROCE_{pre123}$	0.57 (4.89***)	0.63 (5.58***)	0.36 (3.30***)
7. TDR_{pre123}	0.02 (0.17)	-0.14 (-1.20)	-0.03 (-0.23)
8. ICR_{pre123}	1.25 (8.79***)	1.09 (7.32***)	1.14 (8.10***)
Number of observations	192	215	407
Mean dependent var	0.37	-0.24	0.05
Sum squared residual	30.52	30.71	118.83
F Test	$F_{(8, 183)}= 37.36$	$F_{(8, 206)}= 36.76$	$F_{(8, 398)}= 30.84$
P-value(F)	0.00	0.00	0.00
Log-likelihood	-95.87	-95.86	-326.98
S.E. of regression	0.41	0.39	0.55
S.D. dependent var	0.65	0.59	0.69
R-squared	0.62	0.59	0.38
Adjusted R-squared	0.60	0.57	0.37
Schwarz criterion	239.05;	240.05	708.03
Akaike criterion	209.73	209.72	671.95
Hannan-Quinn	221.61	221.98	686.23

Note: ***, **, * represent statistical significance at the 1 %, 5 % and 10 % levels respectively. The figure in the bracket represents the t statistics values.

Table 9 shows the regression analysis result of post M&A performance in terms of index score. Using the OLS technique in the regression analysis framework for 192 successful companies in case of both merger and acquisition cases, it is found that the pre M&A size of the acquirer, pre M&A quick ratio, pre M&A return on capital employed, pre M&A interest coverage ratio are important factors influencing the success of post merger enhancement of index score. In this case size is positively related to post M&A performance. It is found that the large size acquirer can do well in the post M&A period because it can obtain benefits from product and factor market and thereby reducing the overall cost of operations. It indicates larger acquirer have higher growth potential in terms of the combined index score. The larger acquirer has greater opportunities to growth faster through mergers and acquisitions by getting better access to financial resources from financial institutions, showing that quantity effect is favourable for larger firms. Size probably shows the market power of acquirer. The results of size aspect are consistent with the earlier findings (Kakani, et al., 2001).

Table 9 also shows the regression analysis result of unsuccessful companies of both M&A cases in terms of index score. Regression analysis by means of OLS technique using 215 M&A failure observations, it is found that pre M&A quick ratio, pre M&A return on capital employed, pre M&A interest coverage ratio have stronger relationship with the post M&A index score of failure companies.

Table 9 also shows the regression analysis result of both merger and acquisition successful or unsuccessful companies in terms of index score. Dependent variable: post M&A composite index score The OLS technique taking 407 observations and using the post M&A index score as the dependent variable found that, the determinants of M&A success and failure are the pre M&A return on capital employed, pre M&A total interest coverage ratio and pre M&A quick ratio.

Table 10Linear Regression Estimates for Post Acquisition Performance using Index Score

Variables	Coefficient
const	-0.10 (-0.78)
1. M&A Experience	-0.01 (-0.10)
2. Industry Relatedness	0.12 (1.03)
3. Size of Acquirer	0.16 (0.97)
4. Method of Payment	-0.01 (-0.08)
5. QR_{pre123}	-0.21 (-1.20)
6. $ROCE_{pre123}$	0.00 (-0.02)
7. TDR_{pre123}	0.40 (1.77*)
8. ICR_{pre123}	1.61 (5.55***)
Mean dependent variable	-0.09
Sum squared residual	36.14
$F_{(8, 108)}$	7.59
P-value(F)	0.00
Log-likelihood	-97.29
S.D. dependent variable	0.70
S.E. of regression	0.58
R-squared	0.36
Adjusted R-squared	0.31
Schwarz criterion	237.43
Akaike criterion	212.57
Hannan-Quinn	222.67
Note: ***, ** and, * represent statistical significance at the 1 %, 5 % and 10 % levels respectively. The figure in the bracket represents the t statistics values.	

Table 10 shows the regression analysis result of acquisition involved companies in terms of index score. Using the OLS technique for 117 observations of acquisition samples, the results show that pre acquisition solvency position is an influential factor for post acquisition performance in terms of index score. For the investment decision like acquisition, the method of payment is not significant factor as indicated from the results. Thus, investment decision for an acquirer (acquisition) and mode of payment (cash or stock) are not interdependent in nature. It hardly matters for acquirers in Indian manufacturing sector, whether they finance a particular deal through cash or stock, for the post M&A better performance.

Table 10 Linear Regression Estimates for Post Merger Performance using Index Score

Variables	Coefficient
const	0.01 (0.10)
1. M&A Experience	-0.06 (-0.92)
2. Industry Relatedness	0.11 (1.49)
3. Size of Acquirer	-0.03 (-0.53)
4. QR_{pre123}	-0.31 (-3.06***)
5. $ROCE_{pre123}$	0.48 (3.89***)
6. TDR_{pre123}	-0.27 (-1.81*)
7. ICR_{pre123}	0.95 (5.58***)
Mean dependent variable	0.11
Sum squared residual	79.80
F(7, 282)	26.81
P-value(F)	0.00
Log-likelihood	-224.40
S.D. dependent variable	0.68
S.E. of regression	0.53

Variables	Coefficient
R-squared	0.40
Adjusted R-squared	0.38
Schwarz criterion	494.15
Akaike criterion	464.79
Hannan-Quinn	476.55
Note: ***, ** and, * represent statistical significance at the 1 %, 5 % and 10 % levels respectively. The figure in the bracket represents the t statistics values.	

Table 10 shows the regression analysis result of merger involved companies in terms of index score. Using OLS technique for 290 observations, it is found that post merger index score is strongly influenced by pre merger quick ratio, pre merger return on capital employed, pre merger total debt ratio, pre M&A interest coverage ratio. Companies with less liquidity and less debt prior to merger, do well in the post merger period. While companies with better return on capital employed and interest coverage ratio in the pre M&A period perform well in the post merger period.

6. SUMMARY AND CONCLUSION

This study is based on the hypothesis that performance of manufacturing companies in India is influenced by simultaneous impact of number of factors. Accordingly, this study analyses the relationship between post M&A performance and various factors affecting the same. From the regressions results using index score as dependent variable (as a measure of post M&A performance), it is found that the determinants of M&A success and failure are the pre M&A return on capital employed, pre M&A total interest coverage ratio and pre M&A quick ratio. The pre M&A return on capital employed influence favourably the post M&A performance of firms in term of index score. This factor has been significant in both almost all cases. Return on capital employed influence the post M&A performance of firms. The increase in profitability depends on enhanced monopoly power and increase in efficiency. Similarly, any decrease in profitability is explained by the managerial theory of the firm. It considers that the managers pursue corporate growth at the cost of some current profits (Marris, 1964) in (Pawaskar, 2001).As shown in results index score as the explanation for post M&A performance. One factor, namely, pre M&A quick ratio was significantly related to the regressions in all categories. Its direction of influence is consistent with the theoretical justification that firm's liquidity is one of the important aspects of firm's financial health to meet its current short term obligation. This finding prove that acquirer either go for merger or acquisitions will worse off if it does not enough liquidity for the new M&A environment. The explanatory power of the regression as expressed by R^2 and adjusted R^2.is not very high. Lower explanatory power of the regression results, indicates that the financial factors taken together do not explain fully the post M&A performance. However the result is consistent with other M&A studies (Datta, et al., 1992); (Kakani, et al., 2001).

7. CONTRIBUTIONS OF THE STUDY

This paper contributes to the academic research in M&A in many ways. It addresses the post M&A performance of manufacturing companies in India with recent M&A deals. To the best of our knowledge, limitedstudies have focused on M&A deals in Indian cases. The main

contribution of this paper lies in developing a index of different financial parameters for comparing pre and post M&A performance. It complements previous studies on Indian M&A research that focused only on financial performance parameters separately. Furthermore, while most studies focused on determinants of M&A, the current research is unique as it finds out the factors impacting success as well as the failure of mergers and acquisitions.

8. MANAGERIAL IMPLICATIONS

Performance implications of mergers and acquisitions are of considerable interest for managers of acquirer and target firms. Hence, in this article, an analysis is done for post M&A performance. The results from various models are consistent with the available empirical evidence from literature. In addition, the model also provides some new insights into the dynamics of performance of Indian M&A cases. First, the results strongly suggest that it is the companies that went for merger that benefit more than companies that went for acquisitions. More importantly, the findings highlight that managers considering mergers and acquisition strategy should be sensitive to the many factors that are related to post M&A performance. These include type of deal, quick ratio (liquidity), total debt ratio (solvency) and interest coverage ratio (solvency), return on capital employed (profitability). More specifically acquiring firms can maximize the post M&A performance by looking into the pre M&A liquidity and solvency situation of both the acquirer and target firms. Moreover, merger should be preferred than acquisitions wherever possible. This finding is consistent with the Mastracchio&Zunitch (2002) and Ireri (2011). Managers may not have control over all variables but can have partial or complete control over some variables. Controlling them would create a favourable situation for post M&A performance.

9. LIMITATIONS AND SCOPE FOR FUTURE RESEARCH

In the absence of a compelling financial justification for the post M&A performance of mergers as well as acquisitions, there is a need to look at non-financial factors to explain the post merger and acquisition behavior of Indian manufacturing companies.The present study has focused on limited financial and non-financial variables of M&A as independent variables which might not sufficiently indicate the post M&A performance. There is also a need for more satisfactory explanations of how and why acquirers actually undertake mergers and acquisitions. Again it is often difficult to account for all relevant factors within a single model, a large number of observations are necessary to shed light on various aspects of M&A. The study has focused on companies only in the manufacturing sector in India.It would be interesting to consider M&A in manufacturing sector in other Asiancountries and compare the results by evaluating performance through index score. Hopefully, these limitations wouldbring new research ideas among researchers for extending such work.

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