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MERGERS & ACQUISITIONS IN BOMBAY STOCK EXCHANGE: TESTING FOR MARKET EFFICIENCY USING PANEL REGRESSION

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ABSTRACT

Mergers and Acquisitions (M&As) are the inorganic growth strategies which have become important in today's corporate world due to increase in competition and complexity. M&As are not only related to accounting measures of performance of firms but they also affect the wealth of the shareholders either positively or negatively. According to Hubris hypothesis given by Roll (1986), the merger and acquisition announcements result in a decrease in stock price of acquiring firm, leading to a fall in its value. On the other hand, Synergy Hypothesis states that the two firms merge to take advantage of economic gains that result from sharing of resources, resulting in increased returns to the shareholders of both firms. The purpose of this paper is to find out whether there is any difference in the stock price and returns before and after the announcement of merger and acquisition. To capture short run/immediate effect of M&A announcement on the stock price and shareholders return, this study has used Market Model to calculate abnormal returns and semi-log regression equations have been estimated to support the analysis. This paper is an attempt to investigate the efficiency of Indian stock market in the semi-strong form in the event of successful merger announcements. The finding from this research is that the Indian stock market is efficient in semi-strong form in the event of merger announcements.

KEYWORDS

M&A, abnormal return, event- study, announcement effect, market efficiency, semi- strong form.

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1.0 INTRODUCTION

Mergers and acquisitions are the most common routes taken by corporations for inorganic growth all over the world. In fact the last two decades have been known as the M&A waves. Mergers and Acquisitions take place when two or more companies are brought under the same effective control and are managed by the same group. It can be done in two ways: (i) acquisition of one business unit by another or, (ii) creation of a new company by complete consolidation of two or more units.

M&As have always been concerned with bringing benefits including operating efficiency, financial strength and an increase in profitability of the survived firm because of more gains, reduction in expenses, reduction in earnings volatility, achievement of economy of scale and scope and increased market power as well. Many research studies from the beginning of M&A have focused on approximately every aspect of firm affected by such events. These issues include firm profitability, efficiency, liquidity and share performance to some extent as well. But mostly studies- in developing countries like India, have focused on examining the operating performance of survived firm in context of profitability, solvency and efficiency etc. "This approach is not accurate in economic sense because data used is based on historical figures which more likely to ignore the current market value. Other drawback is that, changes in results could be due to factors other than M&A solely".

Since the main goal of a firm is to achieve the objective of shareholder's wealth maximization, we must evaluate the performance of bidding company in stock market as well. Moreover, the studies which have focused on the impact on firm value are not comprehensive in nature and results are neither consistent, nor able to generalize or to accept /reject the hubris (and synergy) hypotheses. Some studies have documented significant increase in abnormal returns of bidding companies after event, while others have given results consistent with hubris hypothesis. Therefore, there is a need to scrutinize it more.

Besides this, most studies in emerging economies have focused only on the long term impact on acquiring firms rather than analyzing the immediate effect of M&A announcement on shareholders' wealth. There is a need to examine the short run effect as well; such an approach helps us to capture the immediate stock market reaction which highlights the true benefits and real economic effect due to consolidation announcement. This can be done through technical analysis. Technical analysis is based on apparent trends in share prices and these trends are generated as short run phenomenon, not reflecting the long term fundamentals of the company. So in this paper, through event study, we are measuring only the immediate effect/ trend and not the fundamental value.

Further, by making use of panel data analysis, we have investigated the efficiency of Indian stock market in semi- strong form in case of merger announcements (i.e. publicly available information). In an efficient market, security prices fully reflect all available information. "Thus, an information regarding the prospect of the company will affect the stock price to react quickly, which makes it impossible for the investors to earn excess return or abnormal return". On the other hand, if market is not efficient, it will not be able to discount the event/ available information; therefore, there will be some kink in the price or return trend.

Thus through this paper, we intend to study the effect of M&A announcement on acquiring firm value in the short run and examine market efficiency. A sincere attempt has been made to capture the effect of M&A announcement on stock price and returns for the immediate time after the event has occurred. This exercise will provide useful information about the effects of M&A to the management and owners of business firms who are continuously searching for potential partners to implement mergers in future and to the investors of stock markets as well.

This paper is organized as follows: Section 2 discusses the objectives of study, Section 3 details the Literature Review, Section 4 presents the research hypotheses, Section 5 discusses the data and methodology, Section 6 presents the Empirical Analysis and Results, Section 7 contains Conclusions and, lastly References are given in Section 8.

II.0 OBJECTIVES OF THE STUDY

The main objectives of this study are to determine the impact of M&A announcements on the stock price and return of acquiring firms in the short run and to examine market efficiency for Indian Stock Market in the event of M&A announcement. To put it differently, the objectives are as follows:

1. To find out whether there is any difference in stock price before and after merger and acquisition announcement.
2. To find out whether there is any difference in log return in pre-announcement and post-announcement periods.
3. To analyze if the Indian stock market is efficient in semi-strong form in the event of merger and acquisition announcements using abnormal return.

III.0 LITERATURE REVIEW ON ANNOUNCEMENT EFFECT OF MERGERS AND ACQUISITIONS

Mergers and Acquisitions are important strategic decisions that affect the profitability and wealth of shareholders of the company. Researchers, especially in developed economies such as USA and UK have conducted numerous studies to answer the basic question: Do mergers and acquisitions create any value for the company and its shareholders? Studies focusing on the post-merger performance and value-creation effect of M&As usually follow either of the two general approaches: first is share price analysis- using data regarding share prices to identify gains and losses to shareholders of acquirer and target firms, and second is operating performance analysis- using accounting data to analyze long-run operating and financial performance of acquirers in a merger deal.

The studies falling under these two approaches can be further divided into three categories:

- Announcement Period studies,
- Studies focusing on long term share price performance and,
- Studies focusing on operating performance.

This section discusses some important announcement period studies conducted across the globe to draw a general conclusion on the impact of M&A announcements on the corporate performance as well as on the shareholders' wealth.

ANNOUNCEMENT PERIOD STUDIES

Such studies follow event study methodology and consider the short term returns earned by the shareholders surrounding the announcement period of the event. Whenever there is an announcement regarding merger of two firms, the market adjusts rapidly to this information and this new information is incorporated into the share prices of firms. The returns generated by shareholders on the days around the announcement that are specifically due to the announcement of event are called Cumulative Abnormal Returns and have been studied by the researchers to determine the gains or losses to the shareholders. A large number of such studies conclude that the target firms earn positive returns while shareholders of acquiring firms experience loss of wealth. Some important studies are as follows:

TABLE A

AUTHOR(S) & YEAR	OBJECTIVE(S)	COUNTRY & PERIOD & METHODOLOGY	RESULTS
Dodd(1980)	To determine the impact of both accepted and rejected merger proposals on the wealth of shareholders.	US (1970-77) Market model Abnormal returns	Shareholders of target firms earn positive abnormal returns while bidder shareholders earn negative abnormal returns over the duration of proposal in case of both completed and canceled proposals.
Firth(1980)	To determine the impact of takeover on shareholders wealth and management benefits.	UK (1969-75) Market model Control group	Shareholders of acquired firms and managers of acquiring firms benefit while shareholders of acquiring firms suffer a loss of wealth.
Asquith et al. (1983)	To determine if mergers are value enhancing strategies for the shareholders of bidding firms.	US (1975-83) Excess returns Regression	Shareholders of bidding firms earn significant positive returns during the 21 days before the announcement of each of their first four merger bids. These abnormal returns are directly correlated with the relative size of the target firm's equity.
Datta, Pinches and Narayana (1992)	To determine how shareholders' wealth is influenced by factors such as number of bids (single vs. multiple), type of financing (cash vs. stock), and type of acquisition (conglomerate vs. non-conglomerate).	US (Meta-Analysis) Event study Multiple regression	Stockholders of acquiring firms on an average earn nil or statistically insignificant gains from the announcement of merger while stockholders of target firms experience positive abnormal returns of over 20%. Both acquirer and acquired firms lose in stock-financed transactions. Also, there is a positive effect of related or non-conglomerate mergers on wealth of acquiring firms' shareholders.
Davidson and Cheng (1997)	To test – (i) bid premium is greater for cash- financed acquisitions than stock-financed acquisitions, (ii) excess returns generated to the target firms in the announcement period depend upon the bid premium and not the method of payment.	US(1981-87) Market model Abnormal returns Cross sectional regression	Cash financed takeovers, are associated with larger bid premiums, these larger premiums are positively related to abnormal returns generated to target shareholders.
Ocana, Pena, and Robles (1997)	To examine the share price returns generated to the shareholders of target firms in Spain.	Spain(1990-94) Average abnormal returns (AARs) and Cumulative AARs	Target shareholders did not earn significant abnormal returns during first part of the year before the announcement period, but significant excess returns were experienced in the two months before the bid. Thus, small markets (Spain) respond in the same way as the larger US and UK stock markets.
Cybo-Ottone and Murgia (2000)	To analyze the impact of mergers in banking industry in Europe.	Europe (1988-97) Market model (AR and CAR) Bivariate & Multivariate Regression analysis	Significant increase in shareholder value in case of within-country acquisitions, deals involving two or more domestic banks and, banks with insurance companies. But M&A deals with securities firms or with cross-border institutions were not valued positively by the market.
Floreani and Rigamonti (2001)	To analyze the impact of mergers in Insurance industry in US and Europe.	Europe and US (1996-2000) Event study Abnormal returns	Mergers resulted in an increase in the wealth of shareholders of acquiring firms. Direct positive correlation between the abnormal returns for acquirers and the deal size. Significant increase in the shareholders' wealth in case of cross-border deals, while mergers concluded between insurance companies located in the same European country did not gain a positive market's expectation.
Billett, King, and Mauer (2003)	To determine the impact of mergers and acquisitions on the wealth of bondholders of target and acquiring firms.	US (1979-97) Monthly Abnormal bond returns	Bonds issued by the target firm earn significant positive announcement period returns of 1.09% while, bondholders of acquiring firm experience negative announcement period returns.
Choi & Russell (2004)	To examine the effect of M&A in the construction sector in U.S. on firms' performance and investigate factors that may affect post M&A performance.	US(1980-2002) Market adjusted model & CARs Multiple regression	Acquiring firms experience insignificant improved performance. No evidence was found that either acquisition time, method of payment, or target status impact the reported performance. Related diversifications performed slightly better than unrelated diversifications.
Cummins and Weiss (2004)	To examine the wealth effects of mergers and acquisitions in the European insurance industry.	Europe (1990-2002) Average abnormal returns & Cumulative average abnormal returns	Acquiring companies experienced negative cumulative average abnormal returns (generally less than 1%) but targets experienced significantly positive CAARs in the range of 12-15%. Geographically diversifying mergers tend to create more value for acquiring firms, and focusing mergers are more beneficial for target firms.
Rosa, Limmack, & Woodliff (2004)	To analyze the impact of method of payment (i.e. cash or issue of shares) in takeover of private and public companies.	Australia (1990-98) Event study Continuously compounded market excess returns	Shareholders of acquiring firms realized significantly positive abnormal returns on announcement of bids for private targets but not for public targets. These positive returns accrue to the acquiring firms in the takeovers in which payment to the target is made through cash, rather than shares.
Ismail and Davidson (2005)	To determine the response of stock market to M&A announcements and compare the results to the previous studies undertaken in Europe and US.	Europe (1987-99) Event study Abnormal returns Bivariate analysis	Target firms realized positive returns but the returns to acquiring firms varied across - the deal type and the various event windows. Specifically, merger deals were more value enhancing than acquisition deals and bank-to bank deals provided higher returns to the shareholders than cross-product deals. European market generally reacts more favorably to cross-border mergers than to domestic mergers.
Gersdorff and Bacon (2009)	To test the efficiency of the U.S stock market vis-a vis announcement of M&As.	US (2000- 07) Event study Paired sample t-test	US stock market is efficient in its semi-strong form vis- a –vis announcement of M&As. No significant difference between actual and expected returns showing that investors are not able to outperform the market.
Khan and Ikram (2012)	To determine the effect of merger announcement in banking industry in India on stock performance.	India (2003-09) Event study methodology, ARs, CARs	Indian stock market is efficient in its semi-strong form as both the historical and publically available information are disseminated in the stock prices and no investor is able to earn abnormal/excess return.

IV.0 RESEARCH HYPOTHESES

This section details the hypotheses formed for the purpose of testing market efficiency of entire Indian Stock Market in event of M&A announcements, by using trends in stock price, log return and abnormal return of four sample acquiring companies listed on Bombay Stock Exchange Sensex. So the various hypotheses framed on the basis of research objectives are as follows:

- H₁₀: There is no significant difference in stock price before and after merger announcement.
- H₁₁: There is significant difference in stock price before and after merger announcement.
- H₂₀: There is no significant difference in log return in pre – announcement period and post announcement period.
- H₂₁: There is significant difference in log return in pre – announcement period and post announcement period.
- H₃₀: The Indian stock market is not efficient in semi-strong form in the event of M&A announcements in terms of abnormal return.
- H₃₁: The Indian stock market is efficient in semi-strong form in the event of M&A announcements in terms of abnormal return.

V.0 DATA AND METHODOLOGY

This section describes the data used for analysis and the various steps forming part of the methodology undertaken for examining the data.

V.1 Data

We have used daily adjusted closing stock prices of the sample acquirer companies and BSE SENSEX historical prices to calculate the abnormal return around the merger announcement date from the year 2012 to 2014. Stock prices of sample companies and BSE Sensex prices have been obtained from yahoo finance website (<http://finance.yahoo.com>). The dates of formal announcements of acquisitions to be made by sample companies have been obtained from BSE website. In this study, we have studied four cases of acquisitions made by Indian firms. They have been chosen through the following criteria:

- a. The stock price and index price are available in yahoo finance.
- b. The index price and stock price of each firm are available for the duration of the event study, which is from (-)180 to (+)20 days.
- c. The stock is actively traded.

Thus we have dropped thinly traded stocks from our sample and have included only the stocks with high volume of trading. Since we intend to check the efficiency of Indian Stock Market with respect to M&A announcements, it is better to consider only actively traded stocks listed at BSE Sensex. This is so because BSE Sensex comprises of well-established, actively traded and financially sound companies, and hence it can be considered as a representative of Indian Stock Market.

Based on the above criteria, Table 1 consists of the companies that have been chosen for analysis.

TABLE 1: LIST OF SAMPLE COMPANIES

NO.	ACQUIRING COMPANY	TARGET COMPANY	ANNOUNCEMENT DATE
1.	SUN PHARMACEUTICALS	RANBAXY INC.	07.04.2014
2.	ASIAN PAINTS	ESS ESS BATHROOM PRODUCTS	29.05.2014
3.	JINDAL STEEL	CIC MINING CORP.	25.07.2012
4.	THOMAS COOK INDIA	STERLING INDIA RESORTS	10.02.2014

V.2 Event Study Methodology

To analyze the impact of merger and acquisition announcements on the wealth of shareholders of acquiring company, event study method is being used. This study uses this method because it can directly measure the capital gain earned by shareholders resulting from any event of merger and acquisition.

Event study is an empirical research technique that can see the effect of a particular event on a firm’s stock price. Event study uses abnormal return over the event window to test for market efficiency. An abnormal return, which implies the difference between actual return and expected return will be positive or negative - depends on the information if the market is not efficient. In an efficient market, it is not possible to find abnormal returns because it is impossible for investors to earn excess return. There are many approaches to find abnormal return. In this paper, we have used statistical model of market model. The steps of conducting event study are as follows:

1. The first step is to define the event and the event window. The event in this research is announcements of successful merger and acquisition. Announcements of successful mergers are categorized as positive news which will make the stock prices to increase after the announcement. The event window in our study is 20 days prior and after the announcement day (-20 to +20). The day of official announcement of acquisition is known as the event day, denoted as 0. Since market model is used, there is a need to establish estimation window as well. Figure 1 depicts the timeline of event window which uses day (-)180 to (-)21 as the estimation window.

ESTIMATION WINDOW	EVENT WINDOW		
-180	-20	0	20

2. Gather the daily closing adjusted historical prices of stocks and BSE SENSEX from yahoo finance and calculate the daily stock log return (R) and daily market log return (R_m). The returns of each stock along the estimation and event window is calculated using the formula below:

$$R_{it} = \ln\left(\frac{P_{it}}{P_{it-1}}\right) = \ln(P_{it}) - \ln(P_{it-1})$$

Where R_{it} is the log return of stock i at day t, and P_{it} and P_{it-1} is the closing adjusted price of stock i at day t and the closing adjusted price of stock i at day t-1 respectively.

Then calculate the market return using BSE SENSEX daily price. The corresponding market return is also calculated along the estimation and event window using the formula:

$$R_{mt} = \ln\left(\frac{P_{mt}}{P_{mt-1}}\right) = \ln(P_{mt}) - \ln(P_{mt-1})$$

Where R_{mt} is the market log return at day t, P_{mt} and P_{mt-1} is the closing price of market index at day t and the closing price of market index at day t-1 respectively.

Reason for using Logarithmic Returns:

The empirical studies have found that simple return of financial asset exhibit limited liability, which is contrary to the normal distribution. Limited liability means that the largest loss an investor can make is his total investment; so that the smallest net return achievable is (-)1 or (-) 100%. Since the normal distribution stretches from (-)∞ to (+)∞ and this lower bound of (-)1 violates this property of normality, the log return takes care of this drawback. In addition to this, the multi-period log return, can have some useful economic interpretations. Because of these reasons, this study makes use of the logarithmic return and not the simple return.

3. A regression analysis is conducted using the actual daily log return of each stock (R) as dependent variable and the corresponding daily market log return (R_m) of BSE SENSEX as independent variable over the estimation window (180 days prior to the event window) to obtain the intercept - alpha and slope - beta for each stock separately. Table 2 shows alpha and beta that are used for each stock.

TABLE 2: ALPHA AND BETA FOR EACH STOCK

ACQUIRING COMPANY/ STOCK	ALPHA	BETA
SUN PHARMACEUTICALS	0.0004	0.656
ASIAN PAINTS	0.001	0.943
JINDAL STEEL	(-)0.001	1.411
THOMAS COOK INDIA	0.002	0.608

4. Calculate the expected return of each stock for each day during the event window (day -20 to +20) using the formula:

$R_{it} = f(R_{mt})$ (FUNCTIONAL FORM OF EQUATION)

$R_{it} = \alpha_i + \beta_i \cdot R_{mt} + U_t$ (ESTIMATING EQUATION)

$\hat{R}_{it} = \hat{\alpha}_i + \hat{\beta}_i \cdot R_{mt}$ (ESTIMATED EQUATION AS PER MARKET MODEL APPROACH)

Where \hat{R}_{it} is the expected return on stock i at time t, R_{mt} is the corresponding market return i.e. BSE SENSEX, $\hat{\alpha}_i$ and $\hat{\beta}_i$ are OLS parameters estimated through regression equation.

5. Then, the Abnormal Return is calculated as:

$$AR_{it} = R_{it} - \hat{R}_{it}$$

Where R_{it} is the actual log return on stock i at time t.

6. Further, we have used semi-log regression equations to test the effect of time and nature of industry on closing adjusted stock prices and actual returns. We have tried to find out in what time phase these dependent variables are significant. The time phases are namely pre- announcement and post- announcement. The functional form of semi-log regression equation used (with log price as dependent variable) is as follows:

Log Price = f (D₁, T, D₁T, ID)

Log Price = $\beta_0 + \beta_1 D_1 + \beta_2 T + \beta_3 (D_1 T) + \beta_4 ID$

Where,

β_0 = Intercept for Pre-announcement period

$\beta_0 + \beta_1$ = Intercept for Post-announcement period (provided β_1 is significant)

β_2 = Growth rate of price for Pre-announcement period

$\beta_2 + \beta_3$ = Growth rate of price for Post-announcement period (provided β_3 is significant)

D₁ (EVENT DUMMY) = 1, If announcement period is post announcement, otherwise 0

T = Time Period (1 for day (-)20, 2 for day (-)19 41 for day 20)

β_4 = Coefficient for Industry Dummy

ID (INDUSTRY DUMMY) = 0, If industry is manufacturing, otherwise 1

So in this model, the intercepts and slopes vary with the time period- pre and post announcement. β_1 i.e. differential intercept coefficient gives the difference in intercepts between pre and post announcement period and β_3 i.e. differential slope coefficient gives the difference in slopes between the two periods.

Similarly, we have estimated semi log regression equation for Returns. The functional form of equation is as follows:

Log Return = f (D₁, T, D₁T, ID, AR, D₁AR)

Log Return = $\beta_0 + \beta_1 D_1 + \beta_2 T + \beta_3 (D_1 T) + \beta_4 ID + \beta_5 AR + \beta_6 (D_1 AR)$

Where,

β_0 = Intercept for Pre-announcement period

$\beta_0 + \beta_1$ = Intercept for Post-announcement period (provided β_1 is significant)

β_2 = Growth rate of stock return for Pre-announcement period

$\beta_2 + \beta_3$ = Growth rate of return for Post-announcement period (provided β_3 is significant)

D₁ (EVENT DUMMY) = 1, If announcement period is post announcement, otherwise 0

T = Time Period (1 for day (-)20, 2 for day (-)19 41 for day 20)

β_4 = Coefficient for Industry Dummy

ID (INDUSTRY DUMMY) = 0, If industry is manufacturing, otherwise 1

β_5 = Coefficient for Abnormal Return in pre- acquisition period

$\beta_5 + \beta_6$ = Coefficient for Abnormal Return in post- acquisition period (provided β_6 is significant).

7. Thus, using the data for four sample companies, we have formed two regression equations for each company individually- one for price and second for returns as dependent variables. In such regression equations, we have ignored ID (Industry Dummy) variable as we are concerned with making conclusions regarding individual companies and not for the market as a whole. Also, we have compared the predicted stock price (and predicted return) obtained through regression, with the actual stock price (and actual return) during the event window by drawing line charts for the same. Such an analysis helps us to understand M&A activity undertaken by sample companies in a better way.

8. However, with such an analysis we cannot make any conclusion about Indian stock market trends and behavior i.e. is the market efficient, are investors able to exploit market, what is abnormal return and change in abnormal return- all such questions cannot be answered through analyzing data for sample companies individually. Therefore, we have pooled the data for sample companies, making it panel data and used fixed effects model. Then we have tried to observe the behavior of market, is market able to absorb news, does it lead to further abnormal return or abnormal returns are ironed out etc. ...All this will tell us about nature of Indian stock market with sample of the four companies that we have chosen for study.

9. With respect to above points, an important feature of our methodology that needs a mention is the use of generic dates. In our study, main independent variable is time (T) but M&A event for our sample acquiring companies have taken place at different points of time. Hence instead of taking the specific dates on which these events have taken place for individual acquiring companies, we have considered generic dates (i.e. time variable (T) ranging from 1 for day (-)20, 2 for day (-)19to 41 for day 20 in event window), making it possible for us to pool the data and apply panel regression.

VI.0 EMPIRICAL ANALYSIS AND RESULTS

This section details the results of panel regression as well as the conclusions drawn from analysis of each individual sample acquiring company.

VI.1 PANEL DATA ANALYSIS

This section contains the results of panel regression using Log Price and Log Return as dependent variable one by one.

TABLE 3: PANEL REGRESSION: LOG PRICE

SUMMARYOUTPUT					
Regression Statistics					
Multiple R	0.985708943				
R Square	0.971622121				
Adjusted R Square	0.970908212				
Standard Error	0.140184181				
Observations	164				
ANOVA					
	Df	SS	MS	F	Significance F
Regression	4	106.9824642	26.74562	1360.989	8.042E-122
Residual	159	3.124605136	0.019652		
Total	163	110.1070693			
	Coefficients	Standard Error	t Stat	P-value	
Intercept	6.248119797	0.032340644	193.1971	1.6E-190	
D ₁	-0.04415725	0.092640087	-0.47665	0.634263	
T	-0.00155831	0.002525944	-0.61692	0.538168	
D ₁ T	0.001912893	0.003710554	0.515528	0.6069	
ID	-1.86507796	0.025279964	-73.7769	6.7E-125	

The analysis shows us that the coefficient of industry dummy is negative and statistically significant at 5% level, this means that the share prices of service industry are lower than those of manufacturing industry. But, as such the M&A event does not have any significant impact on share price because post- acquisition, the share price falls but the fall is not statistically significant at 5% level and also it is very marginal (4.41 of a percent).

Taking a look at coefficient for time, we can notice that growth rate of share price for the pre- acquisition period is (-)0.15 of a percent but this fall in share price in pre-acquisition period is not statistically significant. However, after the event, there is a slight revival in share prices; in actual terms as compared to pre-acquisition period, the revival after the event is 0.34 of a percent, but again this increase is not statistically significant at 5% level.

Thus, we can conclude that the Indian Stock market is efficient in semi- strong form because from the sample under study, the analysis shows that the trend of stock prices is actually falling in pre-acquisition period, but the combined effect is that post-event, the growth rate of prices starts rising; as a result net effect is 0.34 of a percent increase in growth rate. But because this change in share prices is very low in magnitude and is not significant in terms of p-value, we can only conclude that the market is efficient and it is discounting the event; the information of event is being absorbed completely in the market. Moreover, because the growth rate of prices has reversed from being negative in pre-acquisition period to positive in post-acquisition period, it can be said that the M&A event has been treated as a good news by the investors.

TABLE 4: PANEL REGRESSION: LOG RETURN

SUMMARYOUTPUT					
Regression Statistics					
Multiple R	0.929170621				
R Square	0.863358043				
Adjusted R Square	0.858136057				
Standard Error	0.008024626				
Observations	164				
ANOVA					
	Df	SS	MS	F	Significance F
Regression	6	0.0638787	0.010646	165.3314	3.33115E-65
Residual	157	0.010109955	6.44E-05		
Total	163	0.073988654			
	Coefficients	Standard Error	t Stat	P-value	
Intercept	0.003047177	0.00186699	1.632133	0.104656	
ABNORMAL RETURN	1.080134548	0.041983755	25.72744	3.45E-58	
D ₁	-0.00157923	0.005336651	-0.29592	0.767681	
T	-0.00015885	0.000145063	-1.09505	0.275173	
D ₁ T	0.00020482	0.000213066	0.961294	0.337882	
ID	0.000446023	0.001449745	0.307656	0.758752	
D ₁ AR	-0.16530244	0.065996792	-2.5047	0.013276	

The analysis shows that coefficients for all variables except Abnormal Return are not statistically significant at 5% level. Starting with the intercept, we can notice that the log return was positive in pre-acquisition period but it has become negative after the event. However, this change is not statistically significant at 5% level. Taking a look at coefficient for time, we can notice that growth rate of returns for the pre- acquisition period is (-)0.015 of a percent but this falling trend in returns in pre-acquisition period is extremely small and not statistically significant. Therefore, it can be said that the return series is leveled. However, after the event, there is a slight revival in returns; in actual terms as compared to pre-acquisition period, the rise after the event is 0.035 of a percent, but again this rise is miniscule and not statistically significant at 5% level. So, return after event as such, is not increasing.

The coefficient for industry dummy is positive and extremely small (0.044 of a percent), favoring service industry but again it is not statistically significant. But very surprisingly before event, abnormal return is positive and statistically significant at 5% level and, after event also it is still significant but it has fallen significantly by 16.53%. Thus, before event, AR was strong and significant but after the event, AR has fallen significantly. This means that there was anticipation of the event in market prior to the event, and after event, there has been complete absorption of news in the market due to which AR has fallen after the event. In other words, prior to the event, investors in market were exploiting information which was only anticipated and was not being absorbed in market and by using such information, they were able to earn extra-normal returns and hence out-perform the market in pre-acquisition period.

VI.2 INDIVIDUAL COMPANY ANALYSIS

This section describes the results obtained from the analysis of stock price and return data of each sample acquiring company individually.

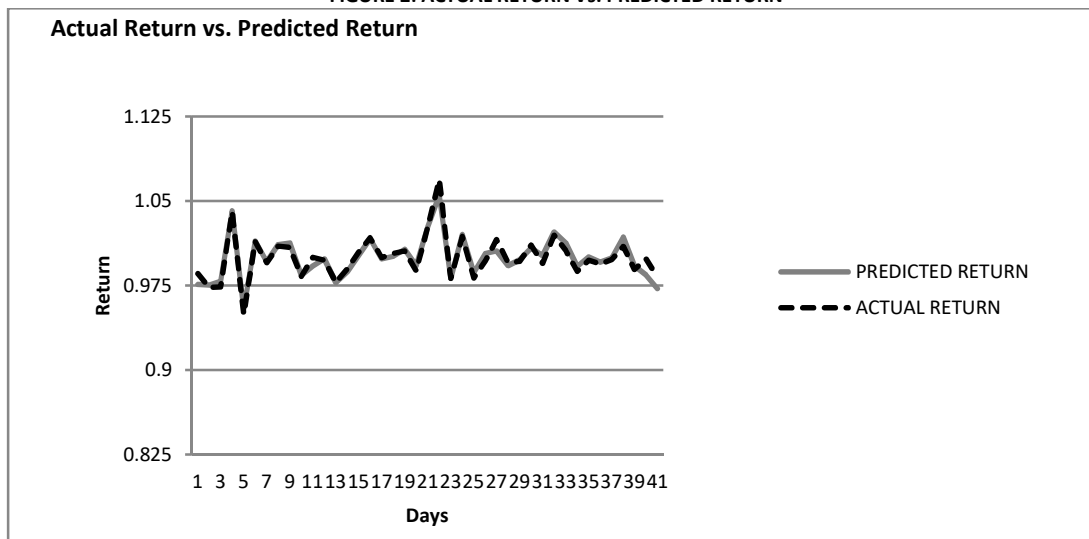
VI.2.1 SUN- PHARMACEUTICALS

FIGURE 1: ACTUAL PRICE Vs. PREDICTED PRICE



The stock price of Sun Pharmaceuticals shows a clear trend. Prior to the announcement of acquisition by company, the stock prices have been showing a falling trend. On the announcement day, there has been a strong revival in stock prices. Thereafter, the stock price has been increasing but at decreasing rate.

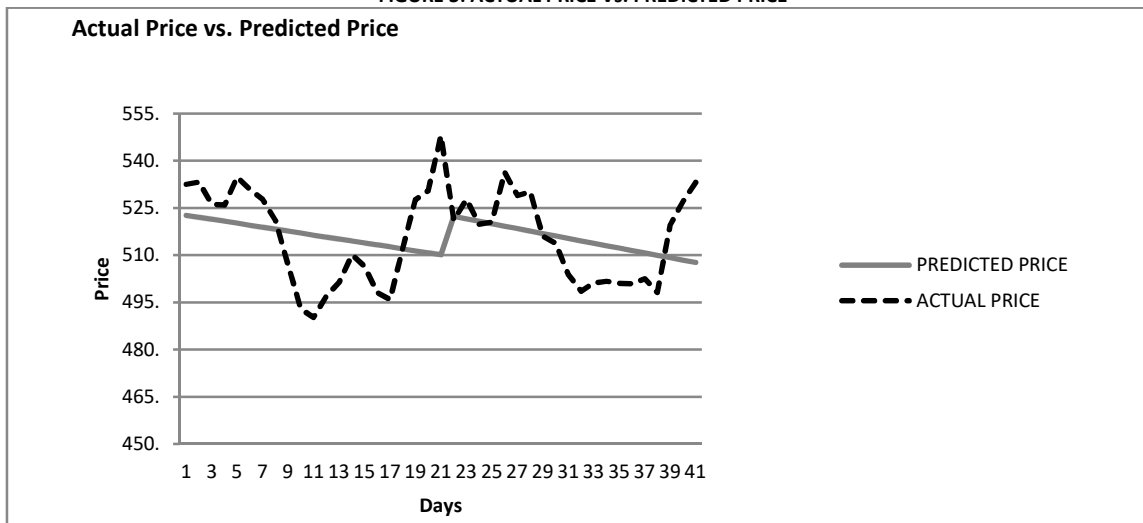
FIGURE 2: ACTUAL RETURN Vs. PREDICTED RETURN



The return generated by Sun Pharmaceuticals shows a mixed trend. Prior to the announcement of acquisition by company, the return has been showing a mixed pattern. On the announcement day, there has been an increase in return. Thereafter, again the return is not showing any consistent pattern.

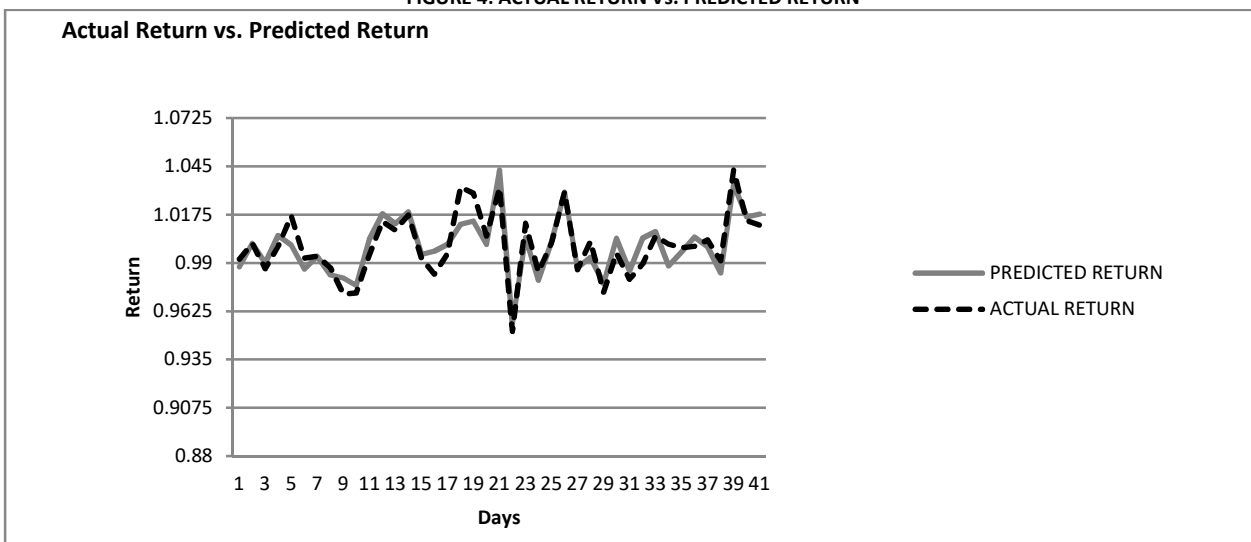
VI.2.2 ASIAN PAINTS

FIGURE 3: ACTUAL PRICE Vs. PREDICTED PRICE



The stock price of Asian Paints shows a clear trend. Prior to the announcement of acquisition by company, the stock price has been showing a falling trend. On the announcement day, there has been a strong revival in stock price. However, after announcement again stock price has been falling.

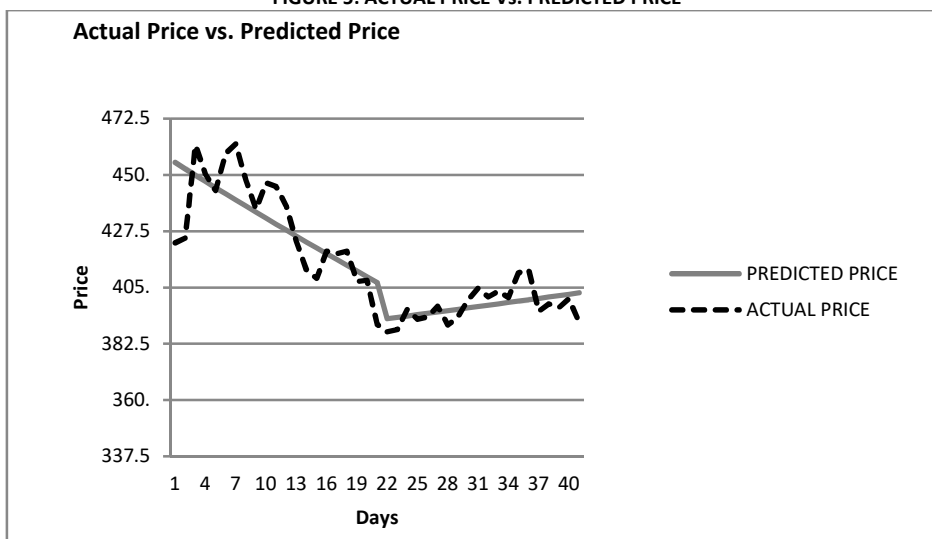
FIGURE 4: ACTUAL RETURN Vs. PREDICTED RETURN



The return generated by Asian Paints shows a mixed trend. Prior to the announcement of acquisition by company, the return has been showing a mixed pattern. On the announcement day, there has been an increase in return. Immediately after announcement, the return has decreased sharply. Thereafter, again the return is not showing any consistent pattern.

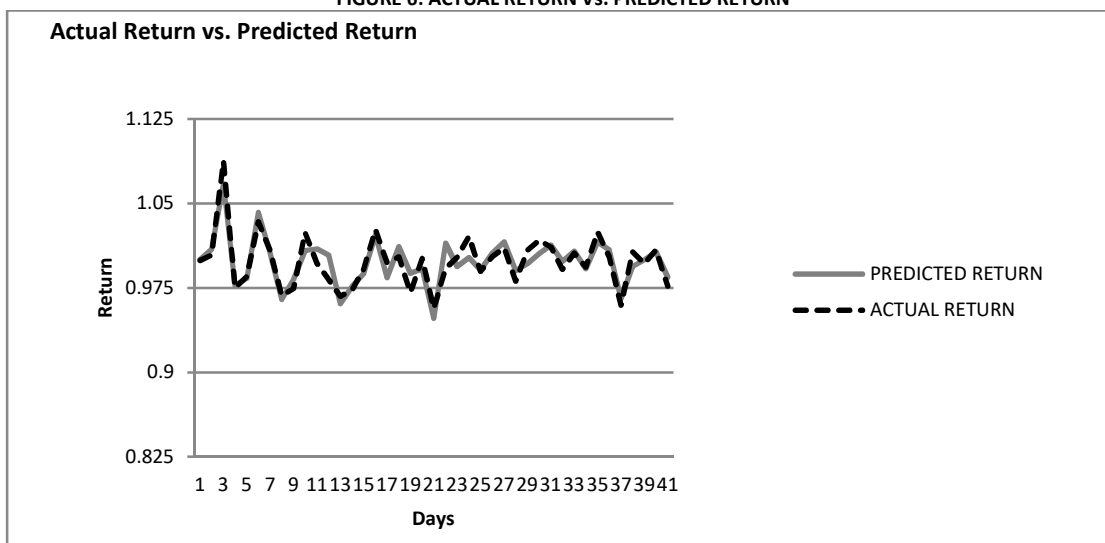
VI.2.3 JINDAL STEEL

FIGURE 5: ACTUAL PRICE Vs. PREDICTED PRICE



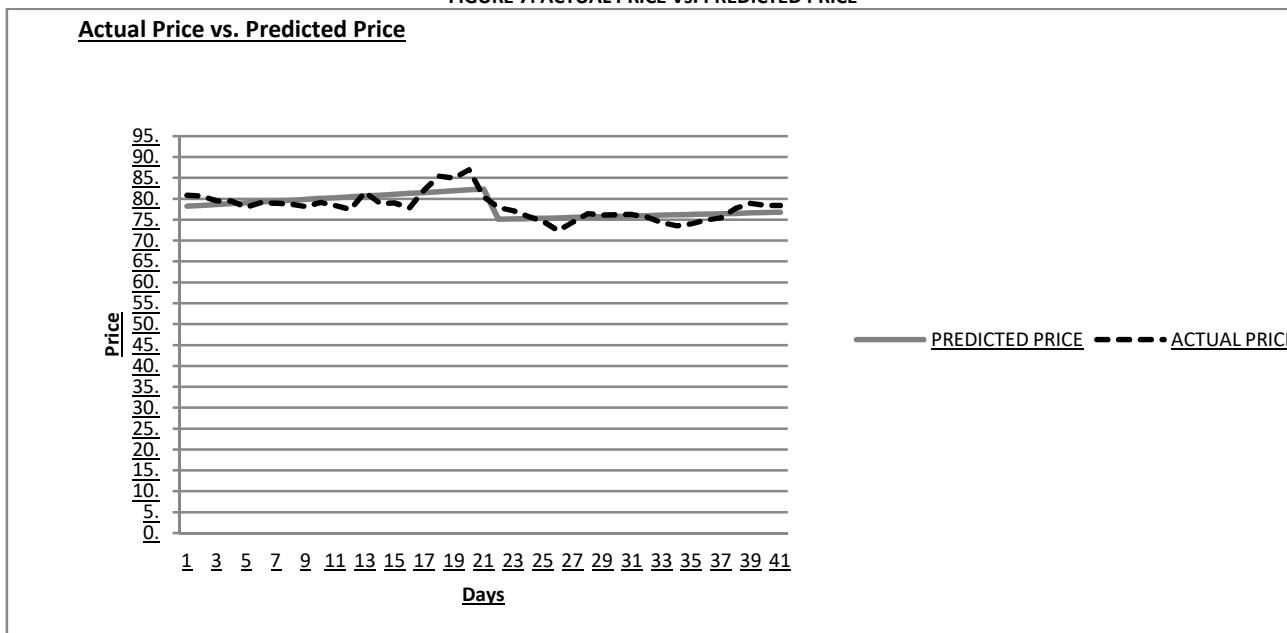
The stock price of Jindal Steel shows a clear trend. Prior to the announcement of acquisition by company, the stock price has been showing a falling trend. On the announcement day, there has been a decrease in stock price, which is continuing on day next to announcement day. Thereafter, again stock price has been increasing.

FIGURE 6: ACTUAL RETURN Vs. PREDICTED RETURN



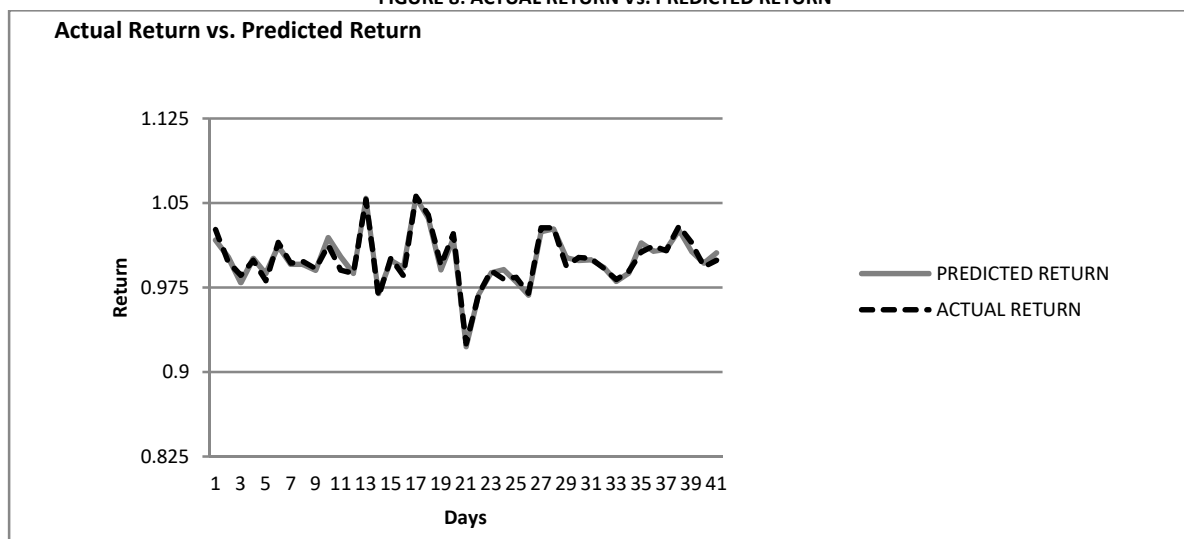
The return generated by Jindal Steel shows a mixed trend. Prior to the announcement of acquisition by company, the return has been showing no consistent pattern. On the announcement day, there has been a decrease in return. Thereafter, again the return is showing a mixed pattern.

FIGURE 7: ACTUAL PRICE Vs. PREDICTED PRICE



The stock price of Thomas Cook shows a clear trend. Prior to the announcement of acquisition by company, the stock price has been showing an increasing trend. On the announcement day, there has been a strong fall in stock price. Thereafter, again stock price has started increasing but at a miniscule rate.

FIGURE 8: ACTUAL RETURN Vs. PREDICTED RETURN



The return generated by Thomas Cook shows a mixed trend. Prior to the announcement of acquisition by company, the return has been showing no consistent pattern. On the announcement day, there has been a decrease in return. Thereafter, again the return is showing a mixed pattern.

As seen for all four sample acquiring companies, the predicted values of stock price (and return) come closer to the actual values, the points on the dotted line fall closer around the black line. Because the actual stock price (and actual return) is very close to predicted stock price (and predicted return) in case of our four sample companies, we can say that share price and return generated by these four sample companies have not changed significantly after their respective M&A event. Moreover, the investors of none of these four companies have been able to outperform the market by investing in their respective companies.

VII.0 CONCLUSION

The main goal of a firm is to maximize the wealth of its shareholders. In this light, an important issue in the area of corporate restructuring is to determine the effect of M&A on the wealth of shareholders of the company.

In past many researchers have tried to address this issue by using event study methodology and have documented that the shareholders of acquiring firm suffer due to the announcement of M&A by their company. However, a large no. of such studies have been carried out only in developed countries so the results cannot be inferred directly without being investigated in developing economies.

This study has taken a sample of four acquiring companies listed on Bombay Stock Exchange, which made acquisition announcement during the period 2012-14. We have chosen stocks listed on BSE Sensex because through this study we intend to test the market efficiency of Indian Stock Market in event of M&A announcement. Such an objective can be well accomplished through study of companies listed on BSE Sensex because Sensex comprises of actively traded and financially sound companies and hence it can be taken as a representative of Indian Stock Market.

To capture short run/immediate effect of M&A announcement on the stock price and shareholders return, this study has used Market Model to calculate abnormal returns and involves estimation of semi-log regression equations to test the effect of time and nature of industry on closing adjusted stock price and actual returns. We have tried to find out in what time phase these dependent variables are significant. The two time phases being pre- announcement and post- announcement periods.

The analysis shows that the trend of stock prices and log returns is actually falling in pre-acquisition period, but the combined effect is that post-event, the growth rates of prices and returns start rising. But because these changes in share prices and returns are very low in magnitude and are not significant in terms of p-value, we can conclude that Indian stock market is efficient in semi-strong form in the case of M&A announcements. This implies that the news/ information resulting

from the event of announcement of merger are fully discounted by the market. Thus, we fail to reject our null hypotheses 1 and 2, and hence we can conclude that there is no significant difference in stock price (and log return) in pre – announcement and post announcement periods. Accordingly, we fail to make any generalized conclusion about operation of hubris and synergy hypotheses in the market for corporate control in India.

Also, we have seen that before event, AR was strong and significant but after the event, AR has fallen significantly. This means that there was anticipation of the event in market prior to the event, and after event, there has been complete absorption of news in the market due to which AR has fallen after the event. In other words, prior to the event, investors in market were exploiting information which was only anticipated and was not being absorbed in market and by using such information, they were able to earn extra-normal returns and hence out-perform the market in pre-acquisition period. Thus, we can reject null hypothesis 3 and conclude that the Indian stock market is efficient in semi-strong form in event of M&A announcement in terms of abnormal return.

However, we have considered only 4 cases of M&As and have studied the stock prices and log returns of acquiring firms (bidding firms) only and not of target (acquired firms) due to data unavailability. There is a need to study a larger sample and explore in future, the results for the acquired firm where merger and acquisition are not for the 100% ownership.

Also, since M&A events for our four sample acquiring companies have taken place at different points of time, so instead of taking the specific dates on which these events have taken place, we have considered generic dates. Thus although we have not taken actual dates, we have used generic dates for our independent variable time, making it possible for us to pool the data and apply panel regression.

Thus, a plethora of literature is available on M&As, studying the impact of such activities on the wealth of shareholders of acquiring companies. But what makes our study different from all such studies is the use of panel data analysis and log returns. While earlier studies have analyzed stock prices and cumulative abnormal returns to make a conclusion about M&A events, our study is different in the sense that we are using stock prices, log returns and abnormal returns to conclude about market efficiency of Indian Stock Market through use of panel regression.

The management of firms can use this information regarding the impact of M&A announcement while deciding about/ carrying out these corporate restructuring activities. Since takeovers do not necessarily increase the shareholders' wealth, therefore the decision needs much scrutinization before entering in any M&A, because the main aim of a firm is to increase shareholders' wealth. On the other hand, investors and other stakeholders, particularly in India, may get an idea of the impact of M&A announcement on their wealth and can act accordingly.

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