A Study Of The Stock Market's Reaction To Announcements Of Acquisitions By Mid Cap Indian IT Companies

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ABSTRACT

This paper analyses the stock market's reactions to announcements of acquisitions in the Indian mid cap IT sector by using the event window method in the framework of the semi- strong form of efficient markets. This paper looks into the question - that does the stock market react irrationally to announcements of acquisitions in the mid cap IT sector, as result of which, there could be abnormal returns for the investors . Mid cap stocks are not efficiency priced all around the world, and a number of papers have supported this statement. The traditional notion of efficient markets described in the academic finance literature is quite strong ,and probably, is unrealistic. Irregularities may well exist in the market and even persist for periods of time, and the markets, at times, can be influenced by fads and fashions. For the present study, the researcher used a five-year period that is from 2005 to 2010 to select the sample for this study.

Keywords : EMH, IT Mid Cap Companies, Investor Behaviour, Stock Market, Acquisitions

INTRODUCTION

This paper examines the stock market's reactions to the announcements of acquisitions in the Indian mid cap IT sector by using the event window method in the framework of the semi -strong form of efficient markets. This paper examines a simple question - that does the stock market react irrationally to announcements of acquisitions in the mid cap IT sector, as a result of which, there could be abnormal returns for investors and offers possible explanations for the same. However, since 2002, no significant research studies have been undertaken to study the stock market's reactions to announcements of acquisitions in the Indian context. Acquisitions have been used as a means of growth by the Indian IT companies, hence, it is important to study the reaction of the stock markets to the announcements of acquisitions.

THEORETICAL FRAMEWORK AND THE ANOMALY IN IT

Semi Strong Form of Efficiency states that current market prices not only reflect all information content of historical prices, but also reflect all the information which are publicly available about the companies being studied. If markets are efficient in this sense, then an analysis of balance sheets, income statements, announcements of dividend changes or stock splits, mergers or any other public information about individual companies (the technique of fundamental analysis) will not yield abnormal economic profits.

From the review of papers, the founder of Efficient Market Theory, Fama himself said that there could be abnormal returns in all forms of EMH, and several papers have supported this claim. This anomaly clearly shows that the irrational behavior in stock markets cannot be explained in the paradigm of rational stock markets.

❖ **Supporting Papers For This Anomaly :** The researcher found a paper on the same issue in the western context, and the findings are as follows. The pre - announcement date run-up in target firms' stock prices have been well documented. For example, Dodd (1980) estimated that stockholders of acquired firms experienced an average abnormal stock price increase of 6.59 percent over the 9-day period beginning 10 days before and ending 2 days before the merger proposal announcement. Similarly, Keown and Pinkerton (1981), who examined abnormal returns over an interval beginning 60 days before a public announcement, observed that cumulative average residual becomes positive 25 trading days before the announcement date of a corporate acquisition and that roughly half of the total price adjustment occurs before the announcement date. Likewise, Sanders and Zdanowicz Asquith (1983) observed positive average abnormal stock price activity 20 days before the public announcement date of a merger bid. They found that in the 10 days preceding a merger announcement, the abnormal stock price increase of the target firms was approximately 5 percent. Finally, Dennis and McConnell (1986) found a statistically significant cumulative average

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market-adjusted target firm stock price increase of 8.11 percent over the period from day one through day two preceding the public announcement date (Sanders, Jr. and Zdanowicz, 1992).

The researcher found similar papers in the Indian context. While takeovers or change in control have been infrequently taking place in India; it is only after the SEBI Regulations of 1997 that the conditions for making an open offer were clearly specified. Between April 1997 and April 2001, 268 open offers had been made. Despite a large number of open offers, only 16 of these open offers entailed an outlay of ₹ 10 crore (slightly less than US $2.5 million). The remaining ones were related to firms which were small and their stocks were fairly illiquid. Any meaningful study on the impact of change in control of a firm on gains for shareholders or shareholders' returns requires that the stock is frequently traded and is liquid during the period of the study; a condition unlikely to be met during the period under study as stocks of only relatively medium and large firms have been liquid enough. The study was restricted only for open offers of above ₹ 10 crore. This paper found that there were 18% positive abnormal returns to stocks during the window event (Pandey, 2001).

❖ **Major Anomalies In The Theory :** The EMH became controversial, especially after the detection of certain anomalies in the capital markets. Some of the main anomalies that have been identified are as follows:

❖ **The Weather :** Few would argue that sunshine puts people in a good mood. People in good mood make more optimistic choices and judgments. Saunders (1993) showed that the New York Stock Exchange index tends to be negative when it is cloudy. More recently, Hirshleifer and Shumway (2001) analyzed the data for 26 countries from 1982-1997 and found that stock market returns were positively correlated with sunshine in almost all the countries studied. Interestingly, they found that snow and rain have no predictive power!

❖ **Standard & Poor's (S&P) Index Effect:** Harris and Gurel (1986) and Shleifer (1986) found a surprising increase in share prices (up to 3 percent) on the announcement of a stock's inclusion into the S&P 500 index. Since in an efficient market only information should change prices, the positive stock price reaction appears to be contrary to the EMH because there is no new information about the firm other than its inclusion in the index.

❖ **Over/Under Reaction of Stock Prices To Earnings Announcements:** There is substantial documented evidence on both over and under-reaction to earnings announcements. DeBondt and Thaler (1985, 1987) presented evidence that is consistent with stock prices overreacting to current changes in earnings. They reported positive (negative) estimated abnormal stock returns for portfolios that previously generated inferior (superior) stock prices and earning performance. This could be construed as the prior period stock price behavior overreacting to earnings developments (Bernard, 1993). Such interpretation had been challenged by Zarowin (1989), but was supported by DeBondt and Thaler (1990). Bernard (1993) provided evidence that is consistent with the initial reaction being too small, and being completed over a period of at least six months. Ou and Penman (1989) also argued that the market underutilizes financial statement information. Bernard (1993) further noted that such anomalies are not due to research design flaws, inappropriate adjustment for risk, or transaction costs. Thus, the evidence suggests that information is not impounded in prices instantaneously as the EMH would predict.

❖ **Indian Anomalies :** A few studies to test the Indian stock markets for various forms of efficiency have been reported. Sharma and Kennedy (1979), Rao and Mukerjee, Gupta and Obaidullah (1990) and others empirically tested the weak form of EMH for the Indian stock markets and provided supporting evidence that they are efficient in the weak sense. In another empirical study to test the semi-strong form of EMH, Obaidullah (1990) examined the adjustment of stock prices to announcements of half-yearly earnings by companies. The study provided evidence that stock price adjustment to the 'event' of half-yearly earnings announcement is slow. The study considered the 'event' of bonus issue announcement.

Raja (2010) reported as to why there were abnormal returns on the announcement of the bonus issue in an efficient market. The paper reported that the Indian capital markets for the IT sector, in general, were efficient, but not perfectly efficient to the announcement of the bonus issue. This informational inefficiency can be used by the investors for making abnormal returns at any point of the announcement period.

Why there are abnormal returns on the announcement of stock splits in the IT sector as documented by Raja, Sudhahar and Selvam (2009) showed the fact that the security prices reacted to the announcement of stock splits. The reaction took place for a very few days surrounding day 0, and for the remaining days, it was extended up to +15. Thus, one can conclude from the forgoing discussion that the Indian stock markets with respect to IT companies in general

are efficient, but are not perfectly efficient to the announcement of stock split. This can be used by the investors for making abnormal returns at any point during the announcement period.

❖ **Possible Explanations For This Anomaly :** These phenomena have been rightly referred to as anomalies because they cannot be explained within the existing paradigm of EMH. It clearly suggests that information alone is not moving the prices. These anomalies have led researchers to question the EMH and to investigate alternate modes of theorizing market behavior (Roll, 1984). The psychology literature describes a myriad of behavioral biases that can potentially explain almost any observed deviations from the Efficient - Market Hypothesis. However, the most prominent anomalies can be explained by what is called the "Investor Overconfidence". Many economists would agree that their notion of rationality should not be taken too literally. First, this notion implicitly assumes that individuals have an unlimited ability to both observe and process information. In reality, of course, individuals have limited processing ability and hence use vague, ad-hoc rules to translate the information they receive into estimates of cash flows and company valuations. For example, investors may not be able to incorporate the news about the antitrust proceedings against Microsoft Corporation into concrete views about the future competitiveness of the industry and how this future will, in turn, affect Microsoft's future cash flows. In reality, investors do much of their analysis based on "hunches" or "feelings," which can easily be influenced by behavioral biases resulting from investor overconfidence, which in reality, should be minimal. In contrast, to value a company whose value probably depends on future growth options and intangible assets, such as Amazon.com or Microsoft Corporation, an investor must rely on much more subjective information. For such companies, the overconfidence-related mispricing effects should be stronger than for stable companies (Daniel and Titman, 1999).

Rational to many, the word suggested an outdated psychology, lightning-fast calculation, hedonistic motivation, and other presumably unrealistic behavior. As economic theory became more clearly and precisely formulated, controversy over the meaning of the assumptions diminished greatly, and now everyone more or less agrees that rational behavior simply implies consistent maximization of a well-ordered function, such as a utility or profit function. However, strong and even violent differences developed at a different level. Critics claimed that households and firms do not maximize, at least not consistently, that preferences are not well ordered, and that the theory is not useful in explaining behavior. Some theorists have replied that economic theory is valid only as a broad tendency, not in each specific instance; some noted that the "proof of the pudding is in the eating," and argued that this theory gives useful predictions even though decisions do not "seem" to be rational; still others claimed that only rational behavior has much chance of surviving a very harsh competitive world. However, these theorems are also shown to be consistent with an extremely wide class of irrational behavior, a defense of them is not necessarily a defense of individual rational behavior. Indeed, perhaps that economic theory is much more compatible with irrational behavior than had been previously suspected. Although economists have typically been interested in the reactions of large markets to changes in different variables, economic theory has been developed for the individual firm and household with market responses obtained simply by blowing up, so to speak, the response of a typical unit. Confusion resulted because comments and analysis were directed away from the market and towards the individual, or away from the economist's main interests. Those arguing that rationality is only a broad tendency, or that only a few units need to behave rationally in order for the markets to do so, were well aware of the difference between market and individual levels of analysis. Unfortunately, however, one can equally well argue that irrationality is only a broad tendency, or that only a few units need to behave irrationally in order for the markets to do so. An argument supporting rationality at the market level must imply that rational unit responses would tend to outweigh irrational ones, clearly distinguish between the market and individual levels and produces such an argument implying rationality at the market level (Becker, 1962).

RESEARCH METHODOLOGY

❖ **Basic Method :** To check whether the Indian stock markets react irrationally to announcements of acquisitions in the Indian mid cap IT companies, and the researcher used the event window method to capture abnormal returns in the acquirer's stock (if any) to announcements of acquisitions ,therefore, acting irrationally.

❖ **Sampling :** The researcher used a five-year period from 2005 to 2010 to select the sample for this study. The Sample (from the sample frame) for this study was based on the following yardsticks :

❖ The acquirer should be listed on the BSE before an acquisition process in order to acquire the required data (Daily returns).

❖ The market cap of the acquirer should be above five hundred crore rupees and below seven hundred crore rupees to fall into the class of mid cap companies in the sector.

❖ The acquirer should have acquired more than or equal to fifty percent of the stake in a target firm to have any impact on the stock price of an acquirer.

❖ The money value of the deal should be above ten million dollars to have any impact on the stock prices of an acquirer. The researcher chose the value of ten million dollars because the average commencement capital of these companies is ten million dollars. There are above fifteen active traded IT mid cap stocks on the BSE. The researcher selected the highest deal among the acquirer's deals to have an impact on the stock prices of an acquirer. After filtering the sample frame from the CMIE database, the researcher found that thirteen deals met the yardsticks. However, only ten deals met all the data requirements such as size of the deals and percentage of shares to be acquired, and some IT mid cap Indian companies did not disclose the amount to be paid. Hence, out of the 13 deals done by mid cap IT companies, only ten deals met all the yardsticks to be included in the sample for this study.

❖ The researcher used a ten day window before and after the announcement to study the market reaction to the announcement of the acquisition.

Table 1: Sample Mid Cap IT Companies Used For The study

Target Name	Acquirer Name	% of shares acquired	% owned after transaction	% sought after transaction	Value ($mi/bl)
Regulus Group LLC	3i Infotech Ltd.			100	80
Sparta Consulting	KPIT Cummins Infosystems Ltd.	100	100	100	38
Laser Soft Infosystems Ltd.	Polaris Software Lab Ltd.	100	100	100	11.304
Room Solutions Ltd.	NIIT Technologies Ltd.	51	51	51	46.443
Aztecsoft	Mindtree		50	50	90
FocusFrame Inc.	Hexaware Technologies		100	100	34.44
DecisionOne	Glodyne Technoserve Ltd.		100	100	104
Learning.com	Educomp Solutions Ltd.		51		24.5
Systems Task Group Intl. Ltd.	Mastek Ltd.	100	100	100	20
Brainhunter Inc.	Zylog Systems Ltd.		100	100	41.2
Source: CMIE, 2011					

❖ **Tools :** The daily returns were calculated for both individual securities as well as the Market Index :

$$\text{Returns it} = pt - pt-1 \div pt - 1 * 100$$

Ri, t = Returns on Security i on time t ;
Pt = Price of the security at time t ;
Pt-1 = Price of the security at time t-1.

$$\text{AR} = \text{Daily Returns Of Individual Stock} - \text{Daily Returns Of BSE IT Index}$$

Where, AR is abnormal returns.

$$\text{SRV} = AR^2 \div V(AR)$$

Where,
SRV i, t = Security Returns Variability of security i in time t ;
AR2 i,t = Abnormal returns on security i on day t ;
V (AR) = Variance of Abnormal Returns during the announcement period Abnormal Returns (AR).

$$\text{Average Abnormal Returns} : \quad AAR = ARti \div n$$

Where N is the number of acquisitions.

Average Security Returns Variability : ASRV= SRVti ÷ n

Cumulative Abnormal Returns (CAR) : CAR = $\sum_{T}^{K}$ AAR

Where,

$CAAR_k$ = Cumulative Average Abnormal Returns for the kth period. Hereafter, it is referred to as CAR;

AAR_t = Average Abnormal Returns of sample acquisitions at time t.

❖ **T-Test :** The significance of reaction in security prices ($ASRV_t$) is tested by using the T- statistics as follows :

$$T_{stat} = ASRV_T \times \sqrt{\frac{N}{S}}$$

Where,

n is the number of quarters in the sample and s is the Standard Deviation of abnormal returns. The significance of the AAR_t is tested by using the t-test as follows:

$$T_{stat} = AAR_T \times \sqrt{\frac{N}{S}}$$

❖ **Objectives of The Study**

1) To analyze whether the stock markets react irrationally to announcements of acquisitions in IT mid cap stocks.

2) To test the semi strong form of market efficiency with respect to the announcement of acquisitions in IT mid cap stocks.

3) To analyze whether the stock market provides an opportunity to make abnormal profits during the announcement period.

❖ **Limitations of the Study :** The following are the limitations of the present study :

1) The present study is confined to only one event announcement.

2) This study is restricted to the IT industry only.

3) All the limitations of the tools used are applicable to this study.

DATA ANALYSIS AND INTERPRETATION

❖ **Analysis :** The analysis has been done in the following way to empirically test the informational efficiency of the Indian capital markets with special reference to the shares of selected IT Companies.

a) Analysis of Average Security Returns Variability (ASRV or SRV);

b) Analysis of Average Abnormal Returns (AAR);

c) Analysis of Cumulative Average Abnormal Returns (CAAR).

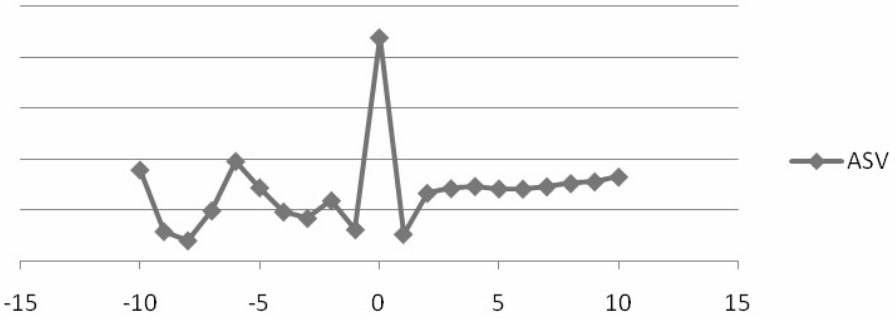
It can be inferred from the Table 2 and Figure 1 that the average of Security Returns Variability for the entire period was 1.3669 and the highest ASV during the entire period was 4.3749, which was on the event day, and this suggests that the markets reacted irrationally to the announcement of the acquisition, but the day after the event day, the ASV was 0.5146. The average ASV between these two days was 1.2160, which neared the entire average of ASV for the entire period. It appears that the markets quickly react to the announcements of acquisitions and the markets acted irrationally on the event day. This provided a perfect chance to the investors to make abnormal profits between these two days. Before the event period, starting from -10 day to -1 day, the ASV was just 1.0665, but after the event period, starting from +1 day to +10 day, the ASC was 1.3662. The pre announcement period ASV starting from -10 day to -1 day was 1.0655; the highest ASV during the same time was on the -6 day (1.9461) and the lowest ASV was on the -8 day (0.3894).In the post announcement period, starting from +1 day to +10 day, the ASV was 1.3362, which is nearly the same as the pre announcement period and the lowest ASV during the former period was on the +1 day (0.5146) and the highest ASV was on the +10 day (1.6398). This shows the disorderly nature of IT mid cap stocks.

After analyzing the data, we accept that stock markets react irrationally to the announcements of acquisitions in IT mid cap stocks.

Table 2: Average Security Returns Variability (ASRV)		
Days	**ASV**	**T - Test**
-10	1.778407	1.014692
-9	0.570946	-0.54837
-8	0.389365	-1.15685
-7	0.976928	-0.04476
-6	1.946083	1.721019
-5	1.429564	0.775273
-4	0.954989	-0.0846
-3	0.828601	-0.30044
-2	1.174316	0.351222
-1	0.606138	-0.85346
0	4.374922	5.20953
1	0.514636	-0.99519
2	1.319554	0.459455
3	1.412573	0.492282
4	1.456138	2.040623
5	1.407143	0.910616
6	1.404901	0.534429
7	1.449892	0.779123
8	1.512021	1.040837
9	1.545792	0.867809
10	1.639757	0.813324
Source : Author's Research		

Period	**ASV**
From -10 day to +10 day	1.366317
From -10 day to -1 day	1.065534
From -10 day to day 0	1.366387
From day 0 to +1 day	1.21596
From +1 day to +10 day	1.366241
Source : Table 2	

Figure 1 : Average Security Returns Variability



Source : Table 2

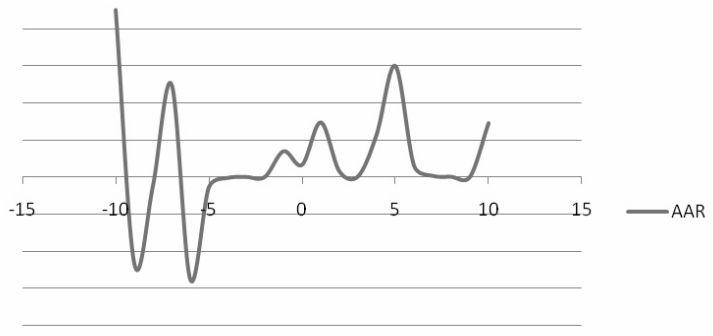
It is clear from the Table 3 and Figure 2 that the average of abnormal returns for the event window was 0.2362, and the highest AAR was on the -10 day (2.2503) and the lowest AAR was on the – 6 day (-1.3809). This also depicts the disorderly nature of Indian mid cap IT stocks .The pre announcement period AAR starting from -10 day to -1 day was 0.1019, and the highest AAR was on the -10 day (2.2503) and the lowest AAR was on the - 6 day (-1.3809).
Hence, it can be inferred that in such a scenario, the investors can make an abnormal profit of 0.8694 percent (even before the event day).
The average of abnormal returns between day 0 to +1 day was 0.1691 and the lowest AAR was on day 0 (0.16407) and the highest AAR was on +1 day (0.7350). The range of AAR between these days shows that the Indian IT mid cap stocks reacted irrationally, so the investors could make abnormal profits during the same period. These reactions took place a few days around the event day, as the average AAR from +1 day to +3 day was 0.2719 and the lowest AAR during this period was on the +3 day (0.0073) and the highest AAR was on +2 day (0.0735). This gave the investors a good chance to make an abnormal profit of 0.0661 during this period.
The post announcement period AAR starting from day 0 to +10 day was 0.3583, which is higher than the pre

Table 3: Average Abnormal Returns

Days	AAR	T- Test
-10	2.250306	2.093011
-9	-1.17003	-2.77352
-8	-0.117	-2.11616
-7	1.244361	0.47411
-6	-1.3809	-4.33109
-5	-0.13809	-2.05401
-4	-0.01381	-1.90538
-3	-0.00138	-1.75527
-2	-0.00014	-2.01514
-1	0.345907	-1.41735
0	0.16407	-1.29034
1	0.734955	-0.54345
2	0.073495	-1.33213
3	0.00735	-1.18443
4	0.575562	-1.89881
5	1.494879	1.106847
6	0.149488	-1.12259
7	0.014949	-1.70591
8	0.001495	-2.02976
9	0.000149	-1.58976
10	0.725294	-0.34923
Source : Google Finance,BSE		

Period	AAR
From -10 day to +10 day	0.236234
From -10 day to -1 day	0.101923
From day 0 to +1 day	0.169078
From day 0 to +10 day	0.358335
Source: Table 3	

Figure 2 : Average Abnormal Returns



Source : Table 3

announcement period. The highest AAR was on the +5 day (1.4949) and the lowest AAR was on the +9 day (0.0001). During this period, the investors could make an abnormal profit of 1.4948. Hence, the stock markets provided an opportunity to the investors to make abnormal profits during the announcement period. Therefore, we have to reject the EMH in the semi -strong form with respect to the announcement of acquisitions in IT mid cap stocks because the stock market provided an opportunity to the investors to make abnormal profits.

It can be inferred from the Table 4 and Figure 3 that the CAAR for the entire period was 1.768811, and the highest CAAR was on the + 10 day (3.7691).

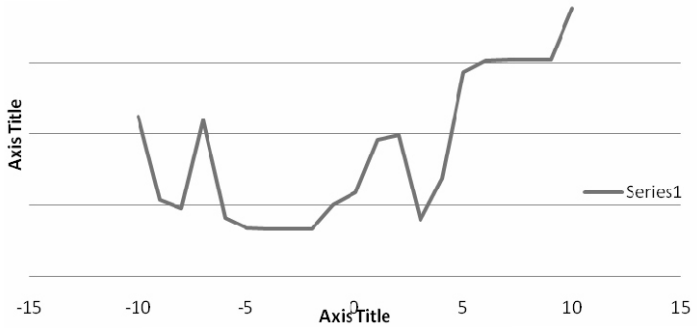
The lowest CAAR was on the – 3 day (0.6733). This range has proved that the stock market reacted irrationally to announcements of acquisitions of IT mid cap stocks.

Table 4 : Cumulative Average Abnormal Returns (CAAR)

Days	CAAR
-10	2.250306
-9	1.080275
-8	0.963272
-7	2.207634
-6	0.826736
-5	0.688646
-4	0.674837
-3	0.673456
-2	0.673318
-1	1.019225
0	1.183295
1	1.91825
2	1.991745
3	0.807315
4	1.382877
5	2.877756
6	3.027244
7	3.042193
8	3.043688
9	3.043838
10	3.769132
Source : Author's Research	

Period	CAAR
From -10 day to +10 day	1.768811
From -10 day to -1 day	1.791329
From day 0 to +1 day	2.675735
From day 0 to +10 day	4.347889
Source : Table 4	

Figure 3 : Cumulative Average Abnormal Returns



Source : Table 4

The pre- announcement period CAAR starting from -10 day to -1 day was 1.7913, and the highest CAAR was on the -7 day (2.2076) and the lowest CAAR was on the -2 day (0.6733).

Between the event day and after the event day, the CAAR was 2.675735, which is higher than the CAAR for the entire period. The lowest CAAR during these two days was 1.1833 on the event day, and the highest CAAR during the same period was on the day after the event day (1.9182). The post announcement period CAAR starting from +1 day to +10 day was 4.3979 higher than the pre- announcement period, and the highest CAAR during this period was on the + 10 day (3.7691), and the lowest CAAR was on the +3 day (0.8073).

This reaction took place a few days around the event day - mainly on + 1 day, +2 day and this ended on the +3 day.

The pre -announcement run up CAAR was 1.7913, and the post - announcement run up CAAR was 4.3479. This shows that the stock markets gave abnormal returns to the investors.

CONCLUDING REMARKS AND SCOPE FOR FUTURE RESEARCH

From the above analysis, it is clear that semi -strong form of EMH looks good on paper, but does not work in the Indian mid cap IT stocks with respect to announcements of acquisitions. The reason behind it being that announcements provide an opportunity to the investors to make abnormal profits. This constitutes an anomaly, which cannot be explained by the current theories of rational markets. Such a development is consistent with Kuhn's (1970) route for progress in knowledge. As he stated : *"Discovery commences with the awareness of an anomaly, i.e., with the recognition that nature has somehow violated the paradigm induced expectations..."* [Kuhn, 52].

By using this study, other researchers can work upon developing new theories by taking behavioral factors of stock markets to explain the stock market's behavior.

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