Stock Performance due to Cross-Border Acquisition Announcements
‘A Sectoral Comparison with respect to Indian Firms’

Kavitha. L
Ph. D. Research Scholar, Department of International Business,
School of Management, Pondicherry University.

ABSTRACT

This study deals with analyzing the stock price behavior with respect to overseas acquisition announcements made by Indian firms. Twenty major Indian acquisitions are selected for analysis. Event study methodology is performed to measure fluctuations in stock performance due to acquisition announcements. The obtained results are discussed sector-wise and company-wise. The results suggest that, among the five sectors, food and beverages yielded highest cumulative returns followed by pharmaceutical and then metals and mining sector. Services sector incurred the highest negative returns. Reliance Industries, ONGC, TATA Power, Dr.Reddy’s Labs, TATA Chemicals, TATA Communications and Ranbaxy Laboratories are the firms that show positive increasing returns after acquisition announcement. Five years down the lane, among all the companies, Dr. Reddy’s Lab has experienced a hike in its share price thereby increasing the value of their shareholders.

Keywords: Cross-border acquisitions, Event study methodology, Stock price behavior

Introduction

The new liberalized policy (1991) of India welcomed international trade, foreign investment, tax reforms, privatization and initiation of inflation controlling measures. These changes and the liberal trade environment led India towards Cross–Border Mergers and Acquisitions (CBMA). Considering the trend of CBMA in India, starting with less than 5 cross border deals in the year 1991, it has improved to 225 sell out deals (cross border sales) and 130 buy out deals (cross border purchases) in 2014, which is nearly more than 20 times. According to the UNCTAD Report (2014), the value of buy out deals is more than the sell out deals except in the recession phases (2008 and 2011) and their values have increased after 2005 because of 100% Foreign Direct Investment (FDI) acceptance. In the last decade, the volumes of deals were highest in the year 2007 with 223 inbound and 220 outbound. After 2011, the inbound deals had started growing. The shift in focus from outbound to inbound is reasoned out by Grand Thornton in their 2011 deal tracker annual issue. According to the report, trend reversal is led by – “fears over the economic dynamics of the European region and its global impact; and growing domestic market making Indian targets a safer bet”. According to the DIPP Report (2015), the top most investors of foreign investment into India are Mauritius (35%) followed by Singapore (13%), and UK (9%); and the FDI inflows in top 3 sectors include (i) Service sector (17%), (ii) Construction - development (9%), and (iii) Telecommunication (7%). India has attained the fourth position in the current ranking of most favored destinations for investment by transnational corporations (World Investment Report, 2014).

According to Zephyr Merger and Acquisition Portal (2008), the top three host countries of India from 2000 – 2007 are (i) Canada (34%), (ii) USA (24%), (iii) European countries (12%); and the top three sectors with high FDI outflows from 2001 – 2007 include (i) Food and Beverages (19%), (ii) Chemicals (12%), and (iii) Computer Software and Telecom (10%). The choice of host countries has changed after 2008, as Indian companies didn’t want to invest in developed countries which were affected by the US credit crisis. According to UNCTAD (2009), CBMA buy out in developed countries fell by 33%. Economies of developing countries were indicated as the ones with the greatest investment potential. Therefore, in 2008 strategic investors dominated CBMA activities and India
being one among them made aggressive investment to make use of the opportunity. During the 2007 crisis, India had a favorable economic condition which encouraged the industries to go across border to utilize the opportunities that prevailed in the developed countries particularly USA and Europe prior to the crisis. Therefore, this study focuses on the major overseas investments (acquisitions) that took place during the crisis period. The selected acquisitions pertain to those industries that were the major contributors of FDI outflows. Out of which, around 20 deals of 5 major sectors such as Energy [(a) Reliance Industries acquiring Marcellus Shale; and (b) ONGC acquiring Imperial Energy (c) Suzlon Energy acquiring Hansen Transmissions; (d) TATA Power acquiring Kaltim Prima; and (e) GMR Infrastructure Ltd. acquiring IntraGen NV Power], Metals and Mining [(TATA Steel acquiring NatSteel and Corus) and Hindalco – Novelis Deal], Services [(a) WIPRO acquiring infocrossing; (b) HCL-AXON Deal; (c) TCS – CGSL Deal, (d) TATA Communication journey with Neotel, (e) Indian Hotels acquiring The Campton place], Food and Beverages [(a) United Spirits acquiring Whyte and Mackay, and (b) TATA Global Beverages acquiring Vitax and Grand], and Pharmaceutical [(a) Dr. Reddy’s Laboratory acquires Betapharm, (b) Ranbaxy acquires Terapia, (c) Jubliant – Draxis Deal, and (d) TATA Chemicals acquires General Chemicals] were selected for this study.

Cross Border Mergers and Acquisitions are made by the companies to gain the strategic benefits of other countries. Many key aspects have to be addressed when taking these strategic decisions to withstand competition in the global market. The synergy hypothesis explains that the reason for the acquisition is only when its value is rising, which means after the acquisition the value of the combined firm should be more than the value of the pre-merged individual firms (Bradley et al., 1988; Seth et al., 2000). Consequently, the managers of both acquirer and target firms propose to exploit shareholder wealth and would opt for integration only if the outcome is profitable for the shareholders of both (Berkovitch and Narayanan, 1993; Goergen and Renneboog, 2004). Thus, it becomes necessary to know the shareholder reaction to the acquisition announcements in order to predict the impact of acquisition on the value of the acquiring firm.

Considering the existing literature, only few studies have been done in India and also industry comparison was not highlighted. However, hardly few deals enhanced the shareholders value. Hence, this paper throws light on the stock market volatility due to the announcement of the acquisition. In accordance, the objective framed for this study is:

To examine the stock price behavior due to acquisition announcements of the selected Indian acquirers.

Review of Literature

The success and failure of CBMA transactions have immense importance and have vast outcomes for the firms and its stakeholders (Sudarsanam, 2003). Gregory and Mc Corriston (2005) analyzed the performance of pre and post acquisitions of UK cross border for short and long run with 343 deals took place between1984 to 1994, and used market model for five day and longer window but the short run had negative returns for EU and rest of the world except US. Ayoush (2011) examined the variation between domestic Merger and Acquisition announcements and CBMA announcements. The sample taken for the study was 585 domestic and CBMA transactions made by UK companies from 1996 to 2003. The study applied all the three benchmark methods in event study methodology. The results indicated that there were positive returns to the domestic and negative returns on CBMA transactions.

As per McWilliams and Siegel (1997) study on “An Event Study Methodology determines whether there is an ‘abnormal’ stock price effect associated with an unanticipated event. From this analysis the researcher can infer the significance of the event.” And Mitchell and Netter (1994) stated, “An Event Study Methodology is a statistical technique that estimates the stock price impact of
occurrences such as mergers, earnings announcements, and so forth. The basic notion is to disentangle the effects of two types of information on stock prices—information that is specific to the firm under question (e.g., dividend announcement) and information that is likely to affect stock prices market wide (e.g., change in interest rates).” In general the event study method analyzes the fluctuations in a company’s stock prices due to business news (Rao and Sreejith, 2013).

The non availability of data has made this event studies very difficult particularly in economic and finance and accounting related research work. The uniqueness of this method is that it helps to evaluate cumulatively over many firms if they are experienced a similar event at different time period to understand the abnormal returns caused by the firms specific events (Ahern, 2009).

The three well-accepted commonly used normal return calculation methods are: Mean, Market and Conditional Risk Adjusted Returns. Various studies have been conducted to prove which is the best method to calculate normal returns? On the other hand, researchers vary in their opinion on the robustness of the method. Brown and Warner (1980) concluded that Market Adjusted method is equal to the regression method.

Brown and Warner (1985) in their study stated that “Even if a researcher doing an event study has a strong comparative advantage at improving existing methods, a good use of his time is still in reading old issues of the Wall Street Journal to more accurately determine event dates”. They also highlighted the necessity in estimating event dates. It is essential as the results may be incorrect when uncertain events are considered. They declared that while using daily and accurate event dates, the statistical power of the event studies increase. On the other hand, Glascock et al (1987) cautioned flaw in results caused due to the leakage of information well before the event occurrence. Besides his warning, it was proved that the predictions based on accurate event dates were precise compared to studies using indistinct event dates.

There results may vary based on the length of event windows (Pinches and Singleton, 1978; Glascock et al., 1987). Pinches and Singleton (1978) in their study selected an event window for 30 days prior to credit rating announcement along with post announcement of 12 days. Griffin and Sanvincente (1982) analyzed the impact of the rating announcement by selecting 11 days before and one day after the event. On the contrary, Houlthausen and Leftwich (1986) considered longer windows in their study. They took 300 days prior and 60 days post the event to analyze abnormal returns. Glascock et al (1987) proposed 90 days prior and post the event in their study. Vassalou and Xing (2003) studied 36 days window of before and after the event. Most of the earlier studies used larger windows like weekly, monthly returns and concluded that the larger event windows are ineffective for small samples. (Brown and Warner, 1985; Bessembinder et al., 2009).

Research Methodology

Event study method is used to study stock price effect for short-term to acquisition completion announcements. As abnormal returns are averaged for each event day across firms (where t=0 is the announcement day) and Cumulative Abnormal Returns (CARs) are computed for the window of interest by summing average abnormal returns for the window (Hassan et al., 2007). The fundamental assumption of this method indicates that the market responds instantly for the information and announcements. Therefore the stock prices reflect the effects on events like Merger and Acquisition (MacKinley, 1997; Yesilyurt, 2012). “Event Studies” were generally used to assess the impact of economic events on the value of the firms. It is used to develop trading strategies in the securities market; theoretically, they are significant in understanding the level of market efficiency (Fernando and Guneratne, 2009). It can be used further to evaluate the impact of policies framed by the companies on firm value one of which is the announcement or completion of a takeover (Agrawal and Mandelker, 1990; Lys and Vincent, 1995; Gregory, 1997; Bruner, 1999). The event study is an
important tool in the financial economist's toolkit that can be traced back to the 1930s. Fama, Fisher, Jensen and Roll (1969) popularized the market model and others started adopting later (Sorokina et al., 2013).

In this study, Market model (MacKinley, 1997) is used to determine the reaction of share price to acquisition completion announcements.

\[
R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}
\]

Where: \(R_{it}\) = the return on the stock \(i\) on day \(t\), \(\alpha_i\) = the intercept term, \(\beta_i\) = the systematic risk of stock \(i\), \(R_{mt}\) = the return on the market on day \(t\), \(\epsilon_{it}\) = the error term in the model.

The abnormal return generated by the stock is utilized as the means to measure the response to acquisition announcements while it is computed using the estimated \(\alpha\) and \(\beta\) terms and the actual return on the market for that particular day.

\[
E(R_{it}) = \hat{\alpha}_i + \hat{\beta}_i R_{mt}
\]

Where: \(E(R_{it})\) = expected return on stock \(i\) on day \(t\), \(\hat{\alpha}_i\) = estimated constant return, \(\hat{\beta}_i\) = estimated variable return.

Then, the abnormal returns are calculated in respect of each event as follows.

\[
AR_{it} = R_{it} - E(R_{it})
\]

Where: \(AR_{it}\) = abnormal return on stock \(i\) on day \(t\), \(R_{it}\) = actual return on acquiring company stock \(i\) on day \(t\), \(E(R_{it})\) = expected return on acquiring company stock \(i\) on day \(t\).

The Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR) is computed as follows.

\[
AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it} \quad \quad \quad CAAR_t = \sum_{t=1}^{T} AAR_t
\]

In order to carry out an event study “the event” and “investigation window” should be determined. The event defined for this study is the announcement of acquisition completion. Comprising the event date, investigation window of this study spreads to either side of the event date. Accordingly, the investigation window ranges from \(t_{-30}\) to \(t_{+30}\) (event window of 61 days). The event window captures the impact of the event (MacKinley, 1997) but the length of the estimation period and the window vary according to the study. In this study, the investigation window comprises of 61 days and 5 event windows, which were sorted as follows: \(-W1 = (t_{-1}, t_{0}, t_{+1}); W2 = (t_{-2}, t_{-1}, t_{0}, t_{+1}, t_{+2}); W3 = (t_{-5}, ..., t_{0}, ... , t_{+5}); W4 = (t_{-10}, ..., t_{0}, ..., t_{+10}); W5 = (t_{-30}, ..., t_{0}, ..., t_{+30})\)

Where: \(W1, W2, W3, W4, and W5\) are the event windows and \(t_0\) identifies the acquisition completion announcement day. To calculate the model, daily share (closing) prices of the companies and the index is collected from Capitaline Database and Yahoo Finance for a period of 61 days equally spread to either side of the event date. BSE SENSEX is the index selected, because it is the standard index used in various studies, half of the acquirers are listed in the index, and their market value is more than half of the total index capitalization.

In this study, one sample t-test is adopted to find significant change in Average Abnormal Returns (AAR) and Cumulative Average Abnormal Returns (CAAR) in the event windows. One sample t-test is a statistical procedure often performed for testing the mean value of a distribution. To find out the significant change in AAR and CAAR in the event windows before and after the acquisition announcements, paired t-test is applied. A paired t-test is used to “compare two population means where you have two samples in which observations in one sample can be paired with observations in the other sample”. MS EXCEL 2007 and SPSS 20.0 are the softwares used to calculate and present the results graphically.
Analysis and Empirical Results

The market model results are obtained and represented graphically and interpreted sector-wise and company-wise separately. In the graphs, day 0 indicates the event day and the trend is spread over 30 days before and after the event day across the X-axis, and the difference in returns is measured in percentage across the Y-axis.

(i) Sector-wise Returns

The sector-wise average abnormal returns is projected in figure 1 and the interpretations suggest that; the energy sector, with the announcement, the returns have become positive immediately with an increase of 2% and declined to its previous fluctuation status after 2 days from announcement. The trend in metals and mining sector which was negative till the announcement has reversed the trend with the event and became positive 2 days post acquisition. Service sector experienced a negative return immediately after the event upto 1% and turned positive only after 5th day after the event and has been mostly negative throughout the investigation window. Food and beverages yielded returns of 2% from the previous day and reached a highest return of 5% post event. But the returns dropped sharply after the 2nd day. Among all the sectors, pharmaceutical sector had a sharp rise of 6% immediately post announcement but declined immediately within the 2nd day. Thus, except the service sector the other four experienced a positive trend immediately post-announcement but later all the sectors experienced minor fluctuations.

Sector-wise Cumulative Abnormal Returns in figure 2 given below explains that there is an increase in the cumulative returns in metals and mining, food and beverages and pharmaceutical sector post announcement of acquisition. Service and Energy sector experience a stable and negative trend. Among the five sectors, food and beverages yielded highest cumulative returns followed by pharmaceutical and then metals and mining sector. Services sector incurred the highest negative returns.
The results based on one sample t-test given in Annexure A explain that the food and beverages sector experienced a significant change in AAR throughout the investigation window. Except the energy sector, all the other sectors experienced a significant change in their CAAR’s in 2nd, 3rd, 4th, and 5th windows; but the energy sector experiences a significant change in CAAR throughout the investigation window. The pervious statement implies that there is significant change in the cumulative returns uniformly for all sectors before and after 2days from announcement. The results further describe the significant changes in AAR sector-wise during the investigation window. Except the metals and mining sector, other sectors did not experience any significant change in their returns throughout the investigation window. Metals and mining sector shows significant change in its AAR only in the 3rd and 5th window prior to the event and did not experience any change post event. The significant changes in CAAR sector-wise during the investigation window implies that all the sectors have experienced significant change in 3rd, 4th, and 5th windows in both the time periods, and there is significant change in CAAR before and after 5days from the event day for all sectors. The results in Annexure B describes that there is no significant change in average abnormal returns, but there is an increment in cumulative average abnormal returns in the sectors post announcement. In food and beverages and pharmaceutical sector, there is significant positive increase in the cumulative returns only after 5 days when compared to 5 days before announcement of acquisition. In the energy sector there is a significant decrease in the cumulative returns after 10 days from announcement compared to pre announcement period. Metals and mining sector experienced an increase after the event compared to its counterpart for the 30 day window. Services sector experienced increase in 4th window and decrease in the 5th window compared to the pre event period. Thus all the sectors experience significant change in their CAAR post announcement compared to pre announcement when 30 day event window is considered.

(ii) Company - Wise Returns

Charts in figure 3 given below explain company - wise abnormal returns. Reliance Industries, ONGC, TATA Power, GMR Infrastructure, TATA Steel (Corus), Hindalco Ind., WIPRO, Dr. Reddy’s Labs, TCS, TATA Chemicals, TATA Communications and Ranbaxy Laboratories incurred immediate positive returns with the acquisition announcement. TATA Steel (Natsteel), TATA Global Beverages, Suzlon Energy, and HCL yielded negative returns. Indian Hotels saw a sharp rise post announcement but the returns started declining the 2nd day. United Spirits also saw a sharp rise post announcement but the returns became stable there on. Jubliant Lifescience experienced stable returns post announcement. Though some companies experience a positive trend immediately post-announcement but later the returns are subject to minor fluctuations.

Figure 4 explains the company-wise cumulative abnormal returns. After comparing the pre and post share price reaction due to acquisition announcement, the results indicate that among the 20 acquiring firms; Reliance Industries, ONGC, TATA Power, Dr. Reddy’s Labs, TATA Chemicals, TATA Communications and Ranbaxy Laboratories show positive increasing cumulative returns after announcement. TATA Steel (Natsteel), Hindalco Ind., TCS, Indian Hotels, Wipro, United Spirits, TATA Global Beverages have increasing cumulative returns post announcement. Jubliant Lifescience didn’t show any significant change in cumulative returns during the investigation window. GMR Infrastructure, Suzlon Energy, TATA Steel (Corus) and HCL experience decrease in cumulative returns post announcement.
Figure 5. Company-wise Abnormal Returns
Summary of Findings

- Sector-wise abnormal returns indicate that except for the service sector, the other four sectors experience a positive trend immediately post-announcement but later all the sectors experience minor fluctuations. There is an increase in the cumulative returns in metals and mining, food and beverages and pharmaceutical sector post announcement of acquisition. Service and Energy sector experience stable and negative trend. Among the five sectors, food and beverages yielded highest cumulative returns followed by pharmaceutical and then metals and mining sector. Services sector incurred the highest negative returns.

- Company-wise analysis explains that, Reliance Industries, ONGC, TATA Power, GMR Infrastructure, TATA Steel (Corus), Hindalco Ind., WIPRO, Dr. Reddy’s Labs, TCS, TATA Chemicals, TATA Communications and Ranbaxy Laboratories incurred immediate positive returns with the acquisition announcement. TATA Steel (Natsteel), TATA Global Beverages, Suzlon Energy, and HCL yielded negative returns. Indian Hotels saw a sharp rise post
announcement but the returns started declining the 2nd day. United Spirits also saw a sharp rise post announcement but the returns became stable there on. Jubliant Lifescience experienced stable returns post announcement. Company-wise cumulative returns reveals that Reliance Industries, ONGC, TATA Power, Dr.Reddy’s Labs, TATA Chemicals, TATA Communications and Ranbaxy Laboratories show positive increasing returns after announcement. TATA Steel (Natsteel), Hindalco Ind., TCS, Indian Hotels, WIPRO, United Spirits, TATA Global Beverages have increasing returns post announcement. Jubliant Lifescience didn’t show any significant change in returns during the investigation window. GMR Infrastructure, Suzlon Energy, TATA Steel (Corus) and HCL experience decrease in returns post announcement.

Limitations of the Study
- The non availability of data base regarding the number of deals (acquisitions) completed and confidentiality of information by the companies were major constraints of the study.
- The results are confined only to the selected companies, sectors and time period. Thus a generalized view about the cross-border acquisitions cannot be made.

Conclusion and Recommendations
The sector-wise comparison reveals that, among the five sectors, food and beverages yielded highest cumulative returns followed by pharmaceutical and then metals and mining sector. Services sector incurred the highest negative returns. Reliance Industries, ONGC, TATA Power, Dr.Reddy’s Labs, TATA Chemicals, TATA Communications and Ranbaxy Laboratories are the firms that show positive increasing returns after acquisition announcement. The size of the parent company and its footage in their respective industry is an important criterion for a company to withstand the flaws in their international acquisitions as well as cope up with the changes in the global environment. TATA Group being the biggest multinational conglomerate was able to survive the after effects of the subprime crisis in spite of making its biggest acquisitions during the crisis period. A company must also be self sufficient before taking up strategic acquisitions. United Spirits though was the largest spirits company globally by volume, due to high debt had to sell their company to Diageo. Even the giants in the industry had incurred losses after acquisition, which suggests that the acquiring company must be efficient enough to perform even when growth becomes reverse in the economy as well as in the business cycle. Detailed analyses of the target countries major economic indicators are essential to take better decisions.

REFERENCES


**Thesis & Dissertations**


**Book**


**Reports**

DIPP Report –2015

Grand Thornton ‘Deal Tracker Annual Issue’- 2011

UNCTAD Report –2009 and 2014

World Investment Report – 2014
### ANNEXURE

**Annexure A: Sector-wise Results Based on One Sample t-test**

<table>
<thead>
<tr>
<th>Window</th>
<th>Energy</th>
<th>Metals &amp; Mining</th>
<th>Services</th>
<th>Food &amp; Beverages</th>
<th>Pharmaceutical</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t</td>
<td>p</td>
<td>t</td>
<td>p</td>
<td>t</td>
</tr>
<tr>
<td>W11</td>
<td>-.56</td>
<td>.630</td>
<td>-.95</td>
<td>.411</td>
<td>1.37</td>
</tr>
<tr>
<td>W21</td>
<td>-.03</td>
<td>.973</td>
<td>-.35</td>
<td>.737</td>
<td>.73</td>
</tr>
<tr>
<td>W31</td>
<td>-.37</td>
<td>.718</td>
<td>.42</td>
<td>.678</td>
<td>-.07</td>
</tr>
<tr>
<td>W41</td>
<td>-.35</td>
<td>.724</td>
<td>-.29</td>
<td>.768</td>
<td>.22</td>
</tr>
<tr>
<td>W51</td>
<td>-.06</td>
<td>.952</td>
<td>1.58</td>
<td>.118</td>
<td>-1.16</td>
</tr>
<tr>
<td>W12</td>
<td>-8.28</td>
<td>.014*</td>
<td>2.90</td>
<td>.062</td>
<td>-2.99</td>
</tr>
<tr>
<td>W22</td>
<td>-5.14</td>
<td>.007*</td>
<td>4.74</td>
<td>.005*</td>
<td>-4.87</td>
</tr>
<tr>
<td>W32</td>
<td>-5.87</td>
<td>.000*</td>
<td>10.24</td>
<td>.000*</td>
<td>-10.38</td>
</tr>
<tr>
<td>W42</td>
<td>-8.63</td>
<td>.000*</td>
<td>18.01</td>
<td>.000*</td>
<td>-18.40</td>
</tr>
<tr>
<td>W52</td>
<td>-9.45</td>
<td>.000*</td>
<td>20.05</td>
<td>.000*</td>
<td>-17.38</td>
</tr>
<tr>
<td>W11Pre</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
<td>.500</td>
<td>1.00</td>
</tr>
<tr>
<td>W11Post</td>
<td>-</td>
<td>-</td>
<td>-.100</td>
<td>.500</td>
<td>1.00</td>
</tr>
<tr>
<td>W21Pre</td>
<td>-1.55</td>
<td>.365</td>
<td>1.53</td>
<td>.266</td>
<td>0.52</td>
</tr>
<tr>
<td>W21Post</td>
<td>7.03</td>
<td>.090</td>
<td>-1.86</td>
<td>.203</td>
<td>0.34</td>
</tr>
<tr>
<td>W31Pre</td>
<td>-7.6</td>
<td>.489</td>
<td>3.13</td>
<td>.026*</td>
<td>0.05</td>
</tr>
<tr>
<td>W31Post</td>
<td>.60</td>
<td>.583</td>
<td>-.14</td>
<td>.897</td>
<td>-0.95</td>
</tr>
<tr>
<td>W41Pre</td>
<td>.24</td>
<td>.819</td>
<td>1.52</td>
<td>.160</td>
<td>-0.08</td>
</tr>
<tr>
<td>W41Post</td>
<td>-.29</td>
<td>.781</td>
<td>-1.48</td>
<td>.170</td>
<td>0.39</td>
</tr>
<tr>
<td>W51Pre</td>
<td>-.85</td>
<td>.400</td>
<td>3.57</td>
<td>.001*</td>
<td>-1.95</td>
</tr>
<tr>
<td>W51Post</td>
<td>.50</td>
<td>.618</td>
<td>.25</td>
<td>.804</td>
<td>0.24</td>
</tr>
<tr>
<td>W12Pre</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
<td>.500</td>
<td>-1.00</td>
</tr>
<tr>
<td>W12Post</td>
<td>-</td>
<td>-</td>
<td>1.00</td>
<td>.500</td>
<td>-1.00</td>
</tr>
<tr>
<td>W22Pre</td>
<td>-3.37</td>
<td>.184</td>
<td>2.00</td>
<td>.184</td>
<td>-1.97</td>
</tr>
<tr>
<td>W22Post</td>
<td>-2.78</td>
<td>.220</td>
<td>2.00</td>
<td>.184</td>
<td>-2.00</td>
</tr>
<tr>
<td>W32Pre</td>
<td>-2.80</td>
<td>.049*</td>
<td>4.73</td>
<td>.005*</td>
<td>-4.90</td>
</tr>
<tr>
<td>W32Post</td>
<td>-8.92</td>
<td>.001*</td>
<td>4.97</td>
<td>.004*</td>
<td>-4.97</td>
</tr>
<tr>
<td>W42Pre</td>
<td>-6.22</td>
<td>.000*</td>
<td>9.11</td>
<td>.000*</td>
<td>-9.45</td>
</tr>
<tr>
<td>W42Post</td>
<td>-8.55</td>
<td>.000*</td>
<td>9.52</td>
<td>.000*</td>
<td>-9.58</td>
</tr>
<tr>
<td>W52Pre</td>
<td>-6.18</td>
<td>.000*</td>
<td>10.82</td>
<td>.000*</td>
<td>-7.88</td>
</tr>
<tr>
<td>W52Post</td>
<td>-8.01</td>
<td>.000*</td>
<td>21.04</td>
<td>.000*</td>
<td>-27.22</td>
</tr>
</tbody>
</table>

**Note:** * Symbol indicates that the values are statistically significant.
Annexure B: Sector-wise Results Based on Paired t-test

| Pairs           | Energy | Metals & Mining | Services | Food & Beverages | Pharmaceutical |
|-----------------|--------|-----------------|----------|------------------|----------------*
|                 | t      | p               | t        | p               | t              | p           |
| W11Pre-W11Post  | -      | -               | 1.00     | .500            | 1.00           | .500        |
| W21Pre-W21Post  | 3.04   | .202            | 1.63     | .243            | .41            | .719        |
| W31Pre-W31Post  | 1.47   | .215            | 1.89     | .116            | .22            | .833        |
| W41Pre-W41Post  | .39    | .705            | 1.96     | .078            | -.29           | .776        |
| W51Pre-W51Post  | -.76   | .450            | 1.67     | .105            | -.144          | .159        |
| W12Pre-W12Post  | -      | -               | 1.00     | .500            | -1.00          | .500        |
| W22Pre-W22Post  | -.04   | .973            | 1.92     | .194            | -1.23          | .343        |
| W32Pre-W32Post  | 2.21   | .092            | 1.47     | .200            | -2.30          | .070        |
| W42Pre-W42Post  | 3.13   | .012*↓          | 1.29     | .223            | -2.37          | .039*↑      |
| W52Pre-W52Post  | 3.07   | .005*↓          | 6.87     | .000*↑          | 4.41           | .000*↓      |

Note: * Symbol indicates that the values are statistically significant. ↑ indicates increase and ↓ indicates decrease in post announcement period.