Impact of Domestic and Cross-Border Acquisitions on Acquirer Shareholders' Wealth: Empirical Evidence from Indian Corporate

Neelam Rani[1], Surendra S. Yadav[1] & P. K. Jain[1]

[1] Department of Management Studies, Indian Institute of Technology Delhi, India

Correspondence: Neelam Rani, Department of Management Studies, Indian Institute of Technology Delhi, Vishwakarma Bhawan, Shaheed Jit Singh Marg, Hauz Khas, New Delhi, 110016, India. Tel: 91-995-893-4508. E-mail: neelam.iitd@gmail.com

Abstract

The present paper compares the impact of domestic acquisitions and cross-border acquisitions on Indian acquirer shareholders' wealth during 2003-2008. A segregated analysis has also been conducted to measure the impact of stake/control acquired, based on a sample of acquisitions of 268 domestic and 255 target firms across border. Further, this paper also analyses the short-run performance of percentage of stake/control acquired in both type of acquisitions. The stake/control acquired is divided into two categories: (i) complete acquisition and (ii) partial/majority control acquisition. Event study methodology has been conducted to analyse the share price performance of Indian acquirers in short-term. The findings reveal that cross-border as well as domestic acquisitions enhance shareholders' wealth of the acquirer company on the announcement. The results indicate that cross-border acquisitions generate higher returns than domestic acquisitions. Nonetheless, the segregated analysis makes it evident that the shareholders of acquiring firms of complete cross-border acquisitions earn higher abnormal returns (significant at 5 per cent). The abnormal returns are higher (though statistically insignificant) for partial/majority control domestic acquisitions.

Keywords: cross-border acquisitions, event study, abnormal returns, short-term performance

1. Introduction

Mergers and acquisitions (in recent years) are increasingly getting accepted by Indian businesses as a critical strategy. The strategy of mergers and acquisitions may be adopted to access the market through an established brand, *inter-alia,* to reduce competition, to increase market share, to acquire competence or to reduce tax liabilities or to adjust accumulated losses of one entity against the profits of other entity. Cross-border acquisitions have noticed a substantial growth worldwide, with India being one of the major emerging market acquirer in the global market. The present paper aims to analyse the short-run performance of Indian acquiring firms and to explore the impact of percentage of stake acquired in domestic and cross-border acquisitions during 2003-2008. The control/stakes acquired are divided into two categories: (i) complete acquisition (acquisition of 100 per cent) and (ii) partial/majority control acquisition (acquisition of above 51 per cent but less than 100 per cent). Specifically, this study attempts to address the following three research questions:

- What is the share price performance of Indian acquiring firms in short-run for cross-border acquisitions and domestic acquisitions?
- What is the impact of the percentage of stake/control acquired on the short-run performance of the Indian acquiring firms in domestic as well as cross-border acquisitions?
- Is there any difference in the short-run performance of the Indian acquiring firms in cross-border acquisitions and domestic acquisitions?

The present paper aims to provide new evidence on the short-term performance of acquiring firms in India, for both domestic and cross-border acquisitions. This paper not only attempts to measure the returns to acquiring firm shareholders, but separately also for domestic and cross-border deals. The paper differs from previous studies on mergers and acquisitions in two important respects. Firstly, the study includes both cross-border acquisitions and domestic acquisitions, and second segregated analysis of acquiring of varying stakes (complete and partial) in both types of acquisitions.

The present paper uses event study to address the above research questions. The findings of this paper indicate

that the shareholders of acquirer Indian corporates involved in cross-border acquisitions experience significant positive abnormal return on the announcement day. The abnormal returns are also quite impressive of more than two per cent during the pre-event window as well as multi-days event window for the cross-border acquisitions. The returns for domestic acquisitions are also positive during the pre-event window as well as multi-days event window. The findings suggest that the positive abnormal returns don't sustain in post-event window period for the cross-border as well as domestic acquisitions.

Another revealing finding is that the acquirer earns positive abnormal returns in case of complete cross-border acquisitions. In marked contrast, the acquirer shareholders lose for complete domestic acquisitions.

Further, the acquirers experience higher return for partial/majority control domestic acquisitions. The advantages of acquiring complete control of a firm are due to assets owned and capacity to acquire complimentary assets. Cross-border acquisitions are characterized by high information asymmetry, in addition, cultural barriers-including difference in languages, political and economic systems appears to be the reasons behind the negative returns in partial/majority control cross-border acquisitions. The positive returns found on the announcement and during pre-event window are due to synergy hypothesis and the expectation of the Indian managers to realize synergies. This may be possibly due to the rationale that companies acquire another company for strategic motives such as to obtain economies of scale and scope, and utilize available resources and capabilities, thus creating more scope for synergies and value creation.

For better exposition, the paper is organized into six sections including this section. Section 2 reviews the previous empirical research work related to domestics and cross-border mergers and acquisitions and develop hypotheses. Data collection and sample selection related issues have been delineated in section 3. Section 4 explains the objectives of the present work and methodology used. The major findings are discussed in section 5 while concluding observations, limitations and future research directions are contained in section 6.

2. Literature Review and Hypotheses

Despite extensive literature on the value creation/destruction of mergers and acquisitions, the empirical evidence on returns to acquirer' shareholders does not converge to any conclusion. In other words, the previous studies in finance and business strategy indicate that wealth effects of shareholders of the acquiring firms are varied. While some studies report negative cumulative average abnormal returns, others document returns from zero or positive cumulative average abnormal returns.

Extant literature (Datta & Puia, 1995; Sirower, 1997; Corhay & Rad, 2000; Mulherin & Boone, 2000; Mitchell & Stafford, 2000; Walker, 2000; DeLong, 2001; Houston et al., 2001; Doukas et al., 2002; Goergen & Renneboog, 2004; Beitel et al., 2004) observe significant negative return in the range of one to five percent for varying windows specially prior to announcement to shareholders of the acquiring firms.

In marked contrast, many studies (Markides & Ittner,1994; Schwert, 1996; Cakici et al. 1996; Maquieira et al. 1998; Eckbo & Thorburn, 2000; Kohers & Kohers, 2000; Doukas et al. 2002; Kiymaz, 2003; Beitel et al., 2004) observe positive return. The studies find significant positive abnormal returns for acquiring firms (upto seven per cent) around the announcement. Bruner (2002) suggested in a review paper that these varied results make the conclusions regarding the acquirer firms' performance more difficult.

In case of domestic acquisitions, Moeller et al. (2003); Lowinski et al. (2004); Campa and Hernando (2004); and Conn et al. (2005) reveal positive cumulative average abnormal return for domestic acquisitions.

In marked contrast, Jarrell et al. (1988); Bradley et al. (1988); Jarrell & Poulsen (1989); Mulherin and Boone (2000); Andrade et al. (2001); Moeller et al. (2003); Bruner (2005) find no gains for acquirers in domestic acquisitions in US. Similarly, Pettway et al. (1990) reveal similar findings for domestic acquisitions in Japan and Franks and Harris (1989) in British.

As far as cross-border acquisitions, Markides and Ittner (1994) document positive return for a sample of US acquirer of 276 cross-border acquisitions during 1975 to 1988. Similarly, Eun et al. (1996) report that cross-border acquisitions increase wealth for target as well as acquiring firms for a paired sample of 103 US firms by cross-border acquirers during 1979-90. The study observes that Japanese firms acquire benefit from the R&D capabilities of the US target firms whereas UK acquirers experienced no wealth gains.

Markides and Oyon (1998) also observe wealth gains during 1975 to 1998 for US cross-border acquisitions. Likewise, Cakici et al. (1996); and Goergen and Renneboog (2004) document wealth enhancement in acquiring cross-border target firms for US acquirer firms, for event windows varying between ten days before and after the announcement date. Lowinski et al. (2004); Campa and Hernando (2004); Conn et al., (2005) also observe positive returns in cross-border acquisitions for shareholders of acquiring firms.

Doukas and Travlos (1988) observe that US acquirers do not earn positive abnormal returns on the announcement of cross-border acquisitions. Similarly, Uddin and Boateng (2009) find no significant gains for UK cross-border acquisitions. Mathur et al. (1994) also document significant negative returns for UK acquiring firms. Basu and Chevrier (2011) suggest that a larger distance between the acquirer and the target is related to lower abnormal returns for the acquirer. In summary, the evidence on the wealth effects of cross-border acquisitions for acquiring shareholders is inconclusive.

Extant literature also delves into the comparison of implications of domestic versus cross border acquisitions for acquirers. Empirical work documents variation in the performance of domestic and cross-border acquisitions (Cakici et al. (1996); Goergen & Renneboog (2004); Aw & Chatterjee (2004); Campa & Hernando (2004); Lowinski et al. (2004); Moeller & Schlingemann (2005); Conn et al. (2005); Francis et al. (2008)).

Cakici et al. (1996) document cross-border acquirers (Japanese, British, Australian and Dutch) experience positive and significant abnormal returns for their acquisitions of US target firms. They compare the shareholder wealth gains for 195 cross-border acquirers for acquisitions of US target firms and 112 US acquirers for acquisitions of non-US target firms across borders during 1983-92. However, the study report that U.S. acquiring firms do not benefit from their acquisition of foreign targets over the same period. Francis et al. (2008) observe that cross-border as well as domestic acquisitions enhance wealth for US acquirers for a sample of 1491 cross-border and 7612 domestic acquisitions during 1990 to 2003. Moeller and Schlingemann (2005) provide empirical evidence for higher stock returns on domestic acquisitions relative to cross-border acquisitions of US acquirers for a sample of 4,430 acquisitions during 1985–1995. The study documents that global and industrial diversification are negatively associated with stock returns. Conn et al. (2005) also report a similar pattern in domestic vis-a-vis cross-border acquisitions announcement effects for UK acquirers during similar time period. Their findings report cross-border acquisitions create lower wealth relative to domestic acquisitions.

Campa and Hernando (2004) also document lower return for acquirers acquiring targets in different countries in Continental European. Goergen and Renneboog (2004) report similar results of higher short-term wealth gains for domestic acquisitions than cross-border acquisitions by Continental European acquiring firms. Eckbo and Thoburn (2000) also find better announcement returns for domestic firms relative to cross-border firms in Canada. Mangold and Lippok (2008) suggest that cross-border acquisitions generate significant negative returns while domestic acquisitions create value for shareholders of German acquirers. Aw and Chatterjee (2004) also establish similar conclusion of higher wealth effects for UK acquiring firms for domestically acquisitions in comparison to cross-border acquisitions. Lowinski et al. (2004) observe no difference in the returns of domestic and cross-border acquisitions to Swiss acquiring firms. They analyze the performance of 114 domestic and cross-border acquisitions by Swiss acquirers during the period from 1990 to 2001.

In marked contrast to the above empirical findings reporting higher returns to acquirers for domestic acquisitions relative to cross-border acquisitions, Kang (1993) observes higher gains for Japanese acquirers targeting acquisitions in US compared to domestic acquirers there.

In recent works, Zhu and Malhotra (2008); Gubbi et al. (2010); Barai and Mohanty (2010); Kohli and Mann (2011); Karels et al., (2011); Rani et al., (2011) observe positive returns for cross-border acquisitions by Indian acquirers. Recently, few studies have examined the performance of cross-border acquisitions for a sample form cross-section of countries. Kose et al., (2010); Zhu (2011); Zhu et al., (2011) document positive returns for the acquirers from emerging economies.

Singh et al. (2012) reveal evidence of a decrease in economic value added, return on capital employed and earnings per share in the years following the cross border mergers and acquisitions of Indian acquiring firms. Bertranda and Betschinger (2012) show that both domestic and cross-border acquisitions tend to reduce the performance of acquirers compared to non-acquiring firms. Investigating a sample of 600 Russian acquirers their results suggest that Russian acquirers suffer from the inability to leverage value due to low M&A experience and capability, especially when making international acquisitions.

Table 1 summarizes the findings of the above stated studies; it is evident that the results are varied despite similarities in the time frames used to analyse the short-term performance of domestic and cross-border acquisitions. Thus, a review of existing literature suggests that findings of empirical work related to comparison of the performance of the acquiring firm in cross-border acquisitions with those of domestic are still ambiguous.

Zhu et al. (2011) suggest that two major motivations, namely, the market for corporate control hypothesis and strategic market entry hypothesis compete for cross-border acquisitions. They suggest that the strategic market entry hypothesis dominate and serve the cross-border acquisitions extensively, while market for corporate control hypothesis motivates and is more relevant rationale for domestic partial acquisitions.

Strategic market entry hypothesis proposes that an acquisition is a speedy way of entering new markets in new countries. Acquiring an already established company is the fastest way to enter market across border. In the asset-seeking perspective, cross-border acquisitions are considered as a means to acquire strategic assets available with the target firms. Acquires plan to obtain access technology based superior resources and skills with the target firm that not available with the domestic firms in a particular product market. Asset-seeking hypothesis is related to acquirers' strategy to improve competitiveness as they grow. That is, how firms improve their capability. The acquirer gains access to patent-protected technologies, superior management, marketing skills and other resources and technologies by acquiring targets across border. Blonigen (1997) argues that cross-border acquisitions result into research and development synergies. Firm specific advantages would arise from the capacity to acquire, or the efficient coordination of, the complementary assets owned by the cross-border target firms. International acquisitions are way to acquire strategic assets-seeking in order to facilitate strategic and organizational transformation of the firms (Gubbi et al., 2010).

Table 1. Summary of studies analysing the Impact of domestic (D) versus cross-border (CB) acquisitions on acquirers' shareholders wealth

Author	Sample period	Acquirer country	Target country	Sample size	Major finding	Impact
Francis et al. (2008)	1990-2003	US	Domestic Cross-border	7692(D) 1491 (CB)	Domestic acquirers earn significant higher wealth gains than cross-border acquirers	Positive (D, CB)
Donohoe (2006)	1990-1998	UK, US, Canada, Australia, Japan and European Acquirer	UK	219	Domestic acquirers gain insignificantly higher returns than cross-border acquirers	Positive (D) Negative (CB)
Aw and Chatterjee (2004)	1990-1996	UK	Domestic Cross-border (US and Continental Europe)	79	Performance of UK acquirers is superior in domestic acquisitions compared to cross-border acquisitions Performance of UK acquirers is superior in acquisitions of US target compared to the target firms from Continental Europe	Negative (D, CB)
Conn et al. (2005)	1984-1998	UK	Domestic Cross-border	4,344	Cross-border acquisitions yield lesser wealth gains than domestic acquisitions	Positive (D, CB)
Campa and Hernando (2004)	1998-2000	European	Domestic Cross-border	262	Cross-border acquisitions create lesser wealth gains than domestic acquisitions	Positive (D, CB)
Eckbo and Thorburn (2000)	1964-1982	Canada, US	Domestic Cross-border	1,846	Domestic acquirers earn significant higher wealth gains than cross-border acquirers Returns are positive for domestic acquirer and negative for cross-border acquirer	Positive (D) Negative (CB)
Moeller and Schlingemann	1985-1995	Canada	Domestic Cross-border	4,430	Cross-border acquisitions yield lesser wealth gains than	Positive (D, CB)

(2005)					domestic acquisitions	
Tebourbi (2005)	1988-2002	Canada	Domestic Cross-border	462	Cross-border acquisitions generate superior returns than domestic acquisitions	Positive (D, CB)
Cummins and Weiss (2004)	1990-2002	European	Domestic Cross-border	256	Domestic acquisitions destroy wealth significantly	Negative (D)
					Cross-border acquisitions create substantial wealth gains	Positive (CB)
Goergen and Renneboog (2004)	1993-2000	European	Domestic Cross-border	142	Cross-border acquirers earn insignificantly higher wealth gains than domestic acquirers	Negative (D) Positive (CB)
Cakici et al. (1996)	1983-1992	Japanese, British, Australian, Dutch, Canadian acquirers of 195 US target firms	Cross-border	195	Non-US cross-border acquirers gain significantly higher wealth for their acquisitions of the US target firms	Positive (CB)
		US acquirer of 112 non-US target firms		112	US acquirers experience negative returns from their cross-border acquisitions	Negative (CB)
Lowinski et al. (2004)	1990-2001	Swiss	Domestic Cross-border	114	No difference in returns of cross-border acquisitions and domestic acquisitions	Positive (D, CB)
Mangold and Lippok(2008)	2000-2007	Germany	Domestic Cross-border	57	Cross-border acquisitions result in wealth destruction	Negative (CB)
					Domestic acquisitions generate positive wealth for shareholders	Positive (D)

Summing up, domestic partial acquisitions and cross-border partial acquisitions are motivated by different hypotheses. The acquiring firms obtain strategic resources that may not be available in their domestic market, by cross-border acquisitions, which improve their capabilities to be competitive. Cross-border acquisitions are thus likely to be more beneficial in comparison with domestic acquisitions, suggesting there are real benefits from international investment.

2.1 Hypotheses

2.1.1 Performance of the Indian Acquiring Firms in Cross-Border and Domestic Acquisitions

The aim of the present study is to investigate whether these factors show similar effect in Indian context on returns to the acquiring shareholders in case of domestic and cross-border acquisitions or not. No previous event study has examined all these aspects in Indian context. On a priori basis, we hypothesize that cross-border acquisitions perform better than domestic acquisitions in short-term. This leads to the following hypothesis:

H1: The performance of acquirers of cross-border acquisitions is better than domestic acquisition.

2.1.2 Stake of Acquisition and Acquiring Firm Performance

Beamish and Banks (1987); Geringer and Hebert (1989); and Chari et al., (2010) suggests that the level of control is one of the factors in determining the success of acquisition. Extant literature reveals that acquiring majority control is beneficial to the shareholders both of acquiring and target firms. Chari et al. (2010) observe that the acquisition of majority control results into significant increases in the stock returns of the acquiring firm as well as of target firm in the emerging markets.

Acquirers obtain complete control over the resources of the target firm through 100 per cent acquisitions. Harrison et al., (2001) suggest that access to complementary resources is a major motive for acquisitions. The acquirers gain organizationally embedded resources of the target firm which otherwise are hard to obtain. Kiymaz (2004) suggests that the acquirer can reorganize the target firm according to its needs, if it has full control over the target. Butz (1994) argues that other shareholders can obstruct actions by the acquirer if the complete stake/control is not acquired. In addition, the integration of the cross-border target firms might be difficult due to cultural differences. Further, cultural differences might also lead to communication and coordination problems. Therefore, acquirers choose to acquire 100 per cent equity of the targets in order to avoid the hassles of managing co-ownership. Caves (1996) documents that only with majority control acquisitions, acquirers can fully reflect their underlying economic/management principles, strategic ability, and resource commitment during the course of entry and operations in cross-border acquisitions.

Chen (2008) argues that the acquisitions of complete control are driven mostly by acquisitions of capabilities. On the other hand, partial/majority control acquisitions are motivated by other strategic considerations. Acquirer can procure competitive assets from local firms, such as advanced technologies and well-established brands (Anand & Delios, 2002; Chen & Zeng, 2004). Strategic goals such as rapid entry into growing industries or capacity control in mature industries or consolidation of market power in concentrated sectors can be achieved by partial/ majority control acquisitions (Caves & Mehra, 1986; Hennart & Park, 1993).

A partial acquisition changes the ownership structure of target firm; it represents a unique form of corporate restructuring because it alters the form of control over the target's management. Meyer and Tran (2006) suggest that partial acquisitions often initiate a dynamic process leading to full control over local firms thus giving access to a wider range of resources. Recently in a disaggregated analysis of 398 complete acquisitions, Rani et al. (2012) observe that the acquirer earns 2.99 per cent cumulative average abnormal return (CAAR) in case the target firm is acquired as wholly-owned subsidiary (WOS). In contrast, the study reports that the acquirer shareholder loses almost five per cent CAAR (statistically significant at 1 percent) when the target firm is completely absorbed with the acquirer during the same period. The apparent controversy in the empirical literature regarding the stake of acquisitions leads to our second and third hypothesis:

H2. The short-term share performance of acquirers of complete cross-border acquisitions is better than the complete domestic acquisition.

H3. The short-term share performance of acquirers the partial/majority control cross-border acquisitions is better than the partial/majority control domestic acquisitions.

3. Data Collection and Sample Selection

The sample for this study is collected from Thomson SDC Platinum Mergers and Acquisitions Database. The sample consists of the announcements of mergers and acquisitions by Indian companies listed on Bombay stock exchange from January 2003 to December 2008. All deals that fulfil certain conditions have been included in the study. Mergers and acquisitions in the financial sector are excluded from the sample. This is because of the different nature of assets and liabilities of financial firms, and the different financial reporting of these companies. Acquisitions of minor stakes (that is less than 51 per cent) have been excluded from the sample. To avoid possible information contamination or the confounding effect, the firms that undertake any significant event such as announcements of dividends or ex-dates on any type of dividend (cash/ stock dividend) or bonus shares within twenty days prior and after the acquisition are excluded from the sample. There is no announcement of issuance of new shares by way of domestic or international offering in the form of Public Offer, follow-up of public offer Preferential Issue, American Depository Receipts (ADR), Foreign Currency Convertible Bonds (FCCB), and Global Depository Receipts (GDR), announcement of another merger or acquisition during the event window. There is no announcement of capital investment in a new project, credit rating and financial results during the event window. The firms must have daily price information available on the Bombay Stock Exchange or Capitaline database. The firms having non-synchronous trading have been eliminated from the sample. These filters reduce the dataset to 523 announcements comprising 255 cross-border and 268 domestic acquisitions (Table 2).

Table 2 contains the details of selection of final sample of mergers and acquisitions for the study.   Year-wise distribution and feature-wise distribution of the sample acquisitions are detailed in Table 3 and Table 4, respectively. Yearly distribution of acquisitions presented in Table 3 shows that the trend of both type of acquisitions has been increasing since year 2003 over the sample period with highest number of acquisitions reported in year 2007 for both. Feature-wise of distribution of acquisitions in Table 4 depicts that cash is used most frequently to finance both type of acquisitions. Contrary to the domestic acquisitions, stock payments are

rarely used for cross-border acquisitions.   Acquisitions of unlisted/private target firms are higher in comparison to the acquisitions of listed target firms. Table 5 reveals the characteristics of the final sample used in the study.

Table 2. Sample selection

Total number of announcements	5504
Less acquisitions excluded:	
Rumours and news of acquisitions withdrawn subsequently	2125
Minor acquisitions	1829
Acquisition of stake by promoters, inter-se transfer among associate companies and preferential allotments	68
Increase in stake and re-announcements for open offers	75
Acquisition by financial companies	165
Acquisition by unlisted companies and investor groups	85
Acquisition of business, assets, divisions and brands	71
Trading data not available	164
Confounding events	209
More than one type of acquisition in one announcements	47
Multiple acquisitions in one announcement	48
Formation of subsidiary, restructuring and reorganisation	55
Date could not be verified	40
Selected in sample (5504-4981)	523

Source: Thompson SDC Platinum data base for mergers and acquisitions.

Table 3. Year-wise distribution of cross-border and domestic acquisitions, 2003–2008

Year	Cross-border acquisitions	Domestic acquisitions	Total
2003	16	21	37
2004	17	21	38
2005	39	31	70
2006	54	67	121
2007	72	70	142
2008	57	58	115
Total	255	268	523

Table 4. Distribution of cross-border and domestic acquisitions according to features

Feature	Cross-border acquisitions	Domestic acquisitions	Total
Cash financed acquisitions	241	183	424
Stock financed acquisitions	4	81	85
Acquisitions with mixed financing	10	4	14
Acquisitions of private and unlisted firms	229	226	455
Acquisitions of listed firms	24	41	65
Acquisitions of Govt. public sector units	2	1	3
Acquisitions of partial/majority controlling stake	61	64	125
Acquisitions of complete stake	194	204	298

Table 5. Statistics related to two sets of disaggregated samples

Characteristics			Number
(I)	Cross-border acquisition		255
	Complete cross-border acquisition		194
	Partial/ majority control cross- border acquisition		61
(II)	Domestic acquisition		268
	Complete domestic acquisition		204
	Partial/ majority control domestic acquisition		64

4. Objectives and Methodology Used

4.1 Objectives

The major objective of the study is to examine whether the value creation for the shareholders of acquiring firm from cross-border mergers and acquisitions differ from domestic mergers and acquisitions. The paper focuses on the following issues:

- To compare abnormal returns to the acquirer shareholders of cross-border acquisitions and domestic acquisitions.

- To examine the abnormal return for disaggregated sample on the basis of percentage of stake acquired (partial/majority control, complete) for cross-border acquisitions and domestic acquisitions.

4.2 Methodology

The event study methodology has been employed to measure the short-term stock price performance to the announcements of acquisitions as outlined in the Appendix. Average abnormal returns (AAR), Cumulative average abnormal return (CAAR) to shareholders as the measure of acquisition performance have been used. In addition, Precision weighted cumulative average abnormal return (PWCAAR) has also been calculated. To test the significance of abnormal returns two parametric test (Patell's test (T_P^*), Standardized cross-sectional test (T_{BMP})) and two non-parametric test (Generalized sign test (T_S) and Rank test (T_R)) have been conducted (Note 1).

4.3 Empirical Results

Average abnormal returns on the announcement day and cumulative average abnormal returns (CAARs) for various event windows have been analyzed for cross-border acquisitions and domestic acquisitions. In addition, the abnormal returns have been compared for sub-samples segregated on the basis of percentage of stake (partial/majority control, complete).

4.4 Cross-Border Acquisitions and Domestic Acquisitions

Table 6 reports the abnormal returns to the acquirer shareholders on the announcement day and various event windows for cross-border acquisitions and domestic acquisitions. It contains average abnormal return, cumulative average abnormal return, precision-weighted average abnormal return, and median abnormal return. Additionally, it presents proportion of positive and negative average abnormal return. Moreover, it provides the results of various tests conducted to measure statistical significance for average abnormal returns and cumulative average abnormal returns.

Panel A of the Table reveals that acquirer shareholders earn average abnormal return of 1.60 per cent (significant at 1 per cent) on the announcement day for cross-border acquisitions. The value of precision-weighted average abnormal returns and median abnormal returns are 1.50 and 1.02 per cent respectively. Moreover, the proportion of stocks having positive return on the announcement day is more than 66 per cent. The proportion of stocks having positive return is significant at 1 per cent. Table 6 also indicates that the acquirer shareholders experience CAAR of 2.74 per cent during event windows of eleven days (-5, +5) and 2.71 per cent five days (-2, +2). CAAR during 19 days pre-event window (-20, -2) is 2.26 per cent. CAAR during the around the announcement is 2.25 per cent and 2.06 per cent for event windows of two days (-1, 0) and three days (-1, +1) respectively. All these results are significant at 1 per cent.

One notable finding is that the positive CAAR along with impressive Precision –Weighted CAAR sustain for longer event windows of twenty one days (-10, +10) and forty one days (-20,+20).

But acquisitions reduce wealth significantly during post-event window of 19 days (+2, +20). The negative

abnormal returns are 2.71 per cent (significant at 1 per cent).

Panel B of Table 6 presents the returns to acquirer of domestic acquisitions. The returns are lower for all event windows in the case of domestic acquisitions. However, acquirers experience loss during 19 days post-event window (+2, +20) in both types of acquisitions but the loss is higher in the case of domestic acquisitions.

Fig. 1 exhibits the trend of cumulative average abnormal returns of cross-border and domestic acquisitions for (-20, +20) including both pre-event window and post-event window. It is clear from the graph of CAAR that cross-border acquisitions enhance wealth over entire 41 days (-20, +20) period, whereas domestic acquisitions generate lower wealth and start falling in comparison to cross-border acquisitions.

Independent t-test has been conducted to measure the difference between mean CAR of cross-border acquisition and mean CAR of domestic acquisitions; the results are tabulated in Table 7.

It is apparent that mean difference is positive for all the windows. However, the difference is insignificant. These results provide some support to the hypothesis that returns to acquirer shareholder of the cross-border acquisitions is higher than the domestic and acquisitions.

Table 6. Abnormal returns to the shareholders of acquiring firms (cross-border acquisition and domestic acquisition) on the announcement day and during multi-days event windows, 2003-2008

Event Window	Abnormal Return			Positive: Negative	Parametric tests		Non-parametric tests	
	Average	Precision-weighted average	Median		T_P*	T_{BMP}	T_S	T_R
Panel A: Cross-border acquisitions (N=255)								
Abnormal returns on announcement day								
AD	1.60%	1.50%	1.02%	169:86	9.902**	6.277**	6.717**	7.306**
Cumulative abnormal returns during varied multi-days event windows								
(-20,-2)	2.26%	2.07%	1.48%	142:113	3.028**	2.596**	3.320**	2.618**
(-1,0)	2.06%	1.84%	1.19%	174:81	8.542**	5.902**	7.346**	6.553**
(-1,+1)	2.25%	1.98%	1.72%	160:95	7.470**	5.397**	5.585**	5.695**
(-2,+2)	2.71%	2.32%	1.59%	163:92	6.772**	5.501**	5.962**	5.499**
(-5,+5)	2.74%	2.35%	1.86%	149:106	4.565**	4.174**	4.201**	3.813**
(-10,+10)	1.96%	1.88%	1.04%	141:114	2.585**	2.354**	3.195**	1.599
(-20,+20)	1.79%	2.06%	1.10%	135:120	1.936*	1.795*	2.440**	1.460
(+2,+20)	-2.71%	-1.99%	-2.67%	97:158	-2.930**	-2.719**	-2.340**	-2.736**
Panel B: Domestic acquisitions (N=268)								
Abnormal returns on announcement day								
AD	1.03%	0.99%	0.50%	151:116	5.348**	4.155**	3.759**	4.717**
Cumulative abnormal returns during varied multi-days event windows								
(-20,-2)	1.56%	1.15%	0.63%	139:129	1.363	1.259	2.224*	1.824*
(-1,0)	1.28%	1.02%	0.48%	147:121	3.861**	3.429**	3.206**	3.560**
(-1,+1)	1.36%	1.13%	0.43%	147:121	3.494**	2.996**	3.206**	3.345**
(-2,+2)	1.58%	1.26%	1.06%	148:120	3.032**	2.788**	3.329**	2.674**
(-5,+5)	0.91%	0.71%	-0.44%	128:140	1.14	1.129	0.873	0.899
(-10,+10)	0.06%	0.02%	-1.50%	122:146	0.011	0.01	0.137	0.223
(-20,+20)	-0.54%	-0.56%	-2.43%	118:150	-0.444	-0.402	-0.354	0.256
(+2,+20)	-3.47%	-2.83%	-3.91%	99:168	-3.391**	-3.082**	-2.636**	-2.778**

AD=Announcement day   N=Number of observations.

* and **Denote significance at 5 and 1% levels, respectively.

Table 7. T-test for difference between mean CAR of acquirers of cross-border acquisitions and domestic acquisitions

Event Window	Mean CAR (%) of acquirers for cross-border acquisitions (N=255)	Mean CAR (%) of acquirers for domestic acquisitions (N=268)	Mean Difference	T Value	p-value
AD	0.016	0.010	0.006	1.58	0.115
(-20,-2)	0.023	0.016	0.007	0.52	0.605
(-1,0)	0.021	0.013	0.008	1.59	0.112
(-1,+1)	0.023	0.014	0.009	1.44	0.149
(-2,+2)	0.027	0.020	0.011	1.56	0.119
(-5,+5)	0.030	0.010	0.020	1.9	0.058
(-10,+10)	0.020	0.001	0.019	1.36	0.174
(-20,+20)	0.018	-0.005	0.023	1.15	0.249
(+2,+20)	-0.027	-0.035	0.008	0.57	0.566
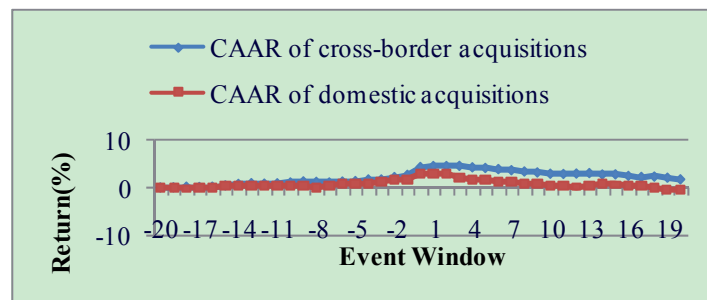
Figure 1. CAAR of cross-border acquisitions and domestic acquisitions over event window (-20, +20)

4.5 Stak–Wise Cross-Border Acquisitions and Domestic Acquisitions

Table 8 presents the abnormal returns to the acquirer shareholders of complete cross-border acquisitions and domestic acquisitions .The Table shows that the acquirer shareholders of cross-border acquisitions earn 1.56 per cent average abnormal return on the announcement day; the returns are lower at 0.78 per cent for complete domestic acquisitions.

The most revealing finding is that the acquirer shareholders earn 3.45 per cent, 3.36 per cent and 3.27 per cent during event windows of 41days (-20, +20), 11days (-5, +5) and 5 days (-2, +2) respectively in the case of complete cross-border acquisitions. The CAAR during the 19 days pre-event window (-20,-2) is 2.94 per cent; moreover, the returns are significant.

In marked contrast, lower positive CAAR has been observed during the smaller event window of 2 days (0, +1), 3 days (-1, +1) and 5 days (-2, +2) for compete domestic acquisitions.

Independent t-test has been conducted to measure the difference between mean CAR of complete cross-border acquisitions and mean CAR of complete domestic acquisitions. The results are tabulated in Table 9. The results show that mean difference is positive during all event windows. The t-statistics shows that difference is also significant at 5 per cent level for event window of 2 days (p-value = 0.013 < 0.05), 3 days (p-value = 0.016< 0.05), 5 days (p-value = 0.026< 0.05), 11 days (p-value = 0.016< 0.05), 21 days (p-value = 0.039< 0.05) and 41 days (p-value = 0.038< 0.05).

These results strongly support hypothesis 2 that the shareholder wealth effect of complete cross-border acquisitions is higher than the complete domestic acquisitions. The trend of CAAR during (-20, +20) days (portrayed in Fig. 2) corroborates the conclusion that the acquirer shareholders experience higher gains in the case of complete cross-border acquisitions than the complete domestic acquisition.

In marked contrast to the above findings, Panel D of Table 8 shows that the acquirer shareholders earn higher returns for partial/majority control domestic acquisitions. The average abnormal return is 1.84 per cent for the complete domestic acquisition on the announcement day. During three days event window, the CAAR is 2.83

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per cent and precision-weighted CAAR is 2.13 per cent; these results are statistically significant. From Panel C of Table 8, it is apparent that the acquirer shareholders earn lower returns in the case of partial/majority control cross-border acquisitions.

Independent t-test has been conducted to measure the difference between mean CAR of partial/majority control cross-border acquisitions and partial/majority control domestic acquisitions; the results are tabulated in Table 10. Negative mean difference has been noted between the returns; however, the difference is not significant. This does not lend any support for the hypothesis 3. In fact, the results show that acquirers of partial/majority control of domestic acquisitions earn higher returns.

The trend of CAAR during (-20, +20) days (portrayed in Figure. 3) also support the conclusion that the partial/majority control domestic acquisitions generate higher shareholders return.

Table 8. Abnormal returns to the shareholders of acquiring firms (cross-border acquisitions and domestic acquisitions) based on percentage of stake acquired on the announcement day and during multi-days event windows, 2003–2008

Event Window	Abnormal Return			Positive: Negative	Parametric tests		Non-parametric tests	
	Average	Precision-weighted average	Median		T_P^*	T_{BMP}	T_S	T_R
Panel A: Complete cross-border acquisitions (N=194)								
Abnormal returns on announcement day								
AD	1.56%	1.42%	1.11%	130:64	8.218**	5.147**	5.994**	6.487**
Cumulative abnormal returns during varied multi-days event windows								
(-20,-2)	2.94%	2.46%	1.23%	104:90	3.136**	2.635**	2.246*	2.418**
(-1,0)	2.23%	1.92%	1.42%	138:56	7.799**	5.276**	7.148**	6.329**
(-1,+1)	2.54%	2.16%	1.84%	128:66	7.144**	5.056**	5.706**	5.760**
(-2,+2)	3.27%	2.75%	1.65%	126:68	7.018**	5.659**	5.418**	5.531**
(-5,+5)	3.36%	2.78%	2.05%	114:80	4.736**	4.222**	3.688**	3.560**
(-10,+10)	2.66%	2.34%	1.21%	108:86	2.820**	2.602**	2.823**	1.134
(-20,+20)	3.45%	3.30%	1.47%	103:91	2.732**	2.493**	2.102*	1.447
(+2,+20)	-2.03%	-1.32%	-2.60%	74:120	-1.714*	-1.650*	-2.078*	-2.581**
Panel B: Complete domestic acquisitions (N=204)								
Abnormal returns on announcement day								
AD	0.78%	0.81%	0.47%	111:92	3.879**	3.037**	2.694**	3.568**
Cumulative abnormal returns during varied multi-days event windows								
(-20,-2)	1.83%	1.46%	1.40%	108:96	1.532	1.391	2.201*	2.144*
(-1,0)	0.90%	0.76%	0.39%	110:94	2.530**	2.303*	2.483**	2.532**
(-1,+1)	0.90%	0.83%	0.27%	109:95	2.276*	1.969*	2.342**	2.420**
(-2,+2)	1.48%	1.19%	1.13%	115:89	2.560**	2.416**	3.186**	2.453**
(-5,+5)	0.65%	0.69%	-0.40%	98:106	0.984	0.965	0.795	0.839
(-10,+10)	-0.68%	-0.46%	-1.84%	91:113	-0.459	-0.395	-0.19	-0.208
(-20,+20)	-1.40%	-0.95%	-3.05%	86:118	-0.665	-0.589	-0.893	0.179
(+2,+20)	-4.16%	-3.24%	-3.91%	70:133	-3.436**	-3.070**	-3.088**	-2.843**
Panel C: Partial/majority control cross-border acquisitions (N=61)								
Abnormal returns on announcement day								
AD	1.74%	1.77%	0.97%	39:22	5.591**	3.667**	3.043**	4.017**
Cumulative abnormal returns during varied multi-days event windows								
(-20,-2)	0.08%	0.79%	2.07%	38:23	0.598	0.549	2.785**	1.278
(-1,0)	1.51%	1.60%	0.60%	36:25	3.557**	2.629**	2.270*	2.710**
(-1,+1)	1.32%	1.40%	0.51%	32:29	2.533**	1.966*	1.24	1.900*
(-2,+2)	0.92%	0.93%	1.52%	37:24	1.330	1.131	2.528**	1.888*
(-5,+5)	0.78%	0.92%	1.70%	35:26	0.888	0.898	2.013*	1.793*
(-10,+10)	-0.27%	0.39%	0.95%	33:28	0.257	0.225	1.497	1.383
(-20,+20)	-4.87%	-4.16%	-3.81%	23:38	-2.932**	-2.487**	-1.079	-1.24
(+2,+20)	-3.47%	-1.98%	0.64%	32:29	-0.914	-0.921	1.24	0.54

Panel D: Partial/majority control domestic acquisition (N=64)							
Abnormal returns on announcement day							
AD	1.84%	1.60%	0.88%	40:24	4.014**	3.059**	2.883**	3.152**
Cumulative abnormal returns during varied multi-days event windows							
(-20,-2)	0.67%	0.11%	-0.71%	31:33	0.054	0.053	0.62	-0.146
(-1,0)	2.48%	1.91%	1.22%	37:27	3.384**	2.824**	2.129*	2.669**
(-1,+1)	2.83%	2.13%	1.20%	38:26	3.087**	2.592**	2.380**	2.433**
(-2,+2)	1.92%	1.47%	0.47%	33:31	1.635	1.384	1.123	1.017
(-5,+5)	1.75%	0.78%	-0.57%	30:34	0.576	0.585	0.368	0.314
(-10,+10)	2.42%	1.63%	-0.84%	31:33	0.843	0.881	0.62	0.816
(-20,+20)	2.22%	0.78%	-0.16%	32:32	0.279	0.272	0.871	0.193
(+2,+20)	-1.29%	-1.46%	-3.60%	29:35	-0.807	-0.776	0.117	-0.538

Table 9. T-test for difference between mean CAR of complete cross-border acquisitions and domestic acquisitions

Event Window	Mean CAR for complete cross-border acquisition (N=194)	Mean CAR for complete domestic acquisition (N=204)	Mean Difference	T Value	p-value
AD	0.016	0.008	0.008	1.950	0.052
(-20,-2)	0.029	0.018	0.011	0.710	0.479
(-1,0)	0.022	0.009	0.013	2.49*	0.013
(-1,+1)	0.025	0.009	0.016	2.42*	0.016
(-2,+2)	0.033	0.015	0.018	2.23*	0.026
(-5,+5)	0.034	0.006	0.027	2.41*	0.016
(-10,+10)	0.027	-0.007	0.033	2.07*	0.039
(-20,+20)	0.035	-0.014	0.049	2.08*	0.038
(+2,+20)	-0.020	-0.042	0.021	1.390	0.164

N=Number of observations;* Denotes significance at .05 level.

Table 10. T-test for difference between mean CAR of partial/majority control cross-border acquisitions and domestic acquisition

| Event Window	Mean CAR for partial cross-border acquisition (N=61)	Mean CAR for partial domestic acquisition (N=64)	Mean Difference	T Value	p-value
AD	0.017	0.018	-0.001	-0.120	0.908
(-20,-2)	0.001	0.007	-0.006	-0.220	0.827
(-1,0)	0.015	0.025	-0.010	-0.870	0.385
(-1,+1)	0.013	0.028	-0.015	-1.110	0.271
(-2,+2)	0.009	0.019	-0.010	-0.630	0.527
(-5,+5)	0.008	0.018	-0.010	-0.520	0.606
(-10,+10)	-0.003	0.024	-0.027	-0.980	0.327
(-20,+20)	-0.035	0.022	-0.057	-1.430	0.155
(+2,+20)	-0.049	-0.013	-0.036	-1.370	0.173

N=Number of observations.
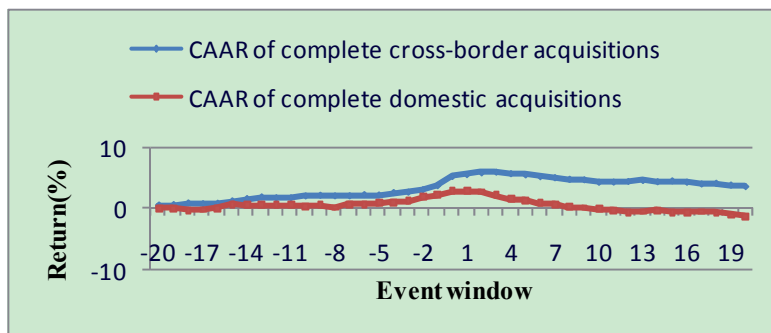
Figure 2. CAAR of complete cross-border acquisitions and domestic acquisitions over event window (-20, +20)
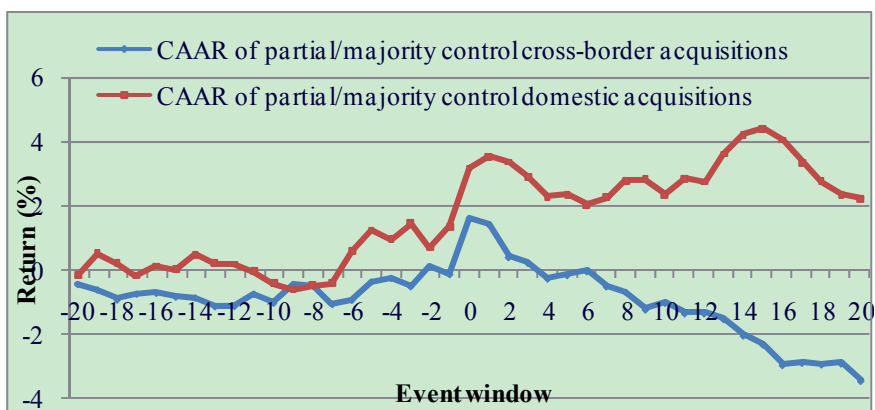

Figure 3. CAAR of partial/majority control cross-border acquisitions and domestic acquisitions over event window (-20, +20)

5. Concluding Observations, Limitations and Future Research Directions

This paper analyses the stock price performance of Indian acquirer companies in the short-term. The sample consists of 255 cross-border acquisitions and 268 domestic acquisitions during the period 2003 to 2008. The results indicate that the shareholders of acquirer Indian corporates involved in cross-border acquisitions experience positive abnormal return of 1.56 percent (significant at 1 per cent) on the announcement day. The abnormal returns are also quite impressive of more than two per cent during the pre- event window as well as multi- days event window of 2 days (-1, 0), 3 days (-1, +1), 5 days (-2, +2) and 11 days (-5, +5) for the cross-border acquisitions; moreover, they are significant at 1 per cent. The cumulative average abnormal returns are also positive for longer event windows of 21 days (-10, +10) days and 41 days (-20, +20) days. The returns for domestic acquisitions is also positive during the pre-event window as well as multi- days event window of 2 days (-1, 0), 3 days (-1, +1), 5 days (-2, +2).

The findings suggest that the positive abnormal returns don't sustain in post-event window period for the cross-border as well as domestic acquisitions.

The notable finding of disaggregated analysis is that the acquirer earns almost three and a half percent CAAR (significant at 1 per cent) for even 41 days longer event window (-20, +20) in case of complete cross-border acquisitions. In marked contrast, the acquirer shareholders lose almost one and a half per cent for complete domestic acquisitions.

Another notable finding of the study is that the acquirers experience higher return for partial/majority control domestic acquisitions. The returns are more than two per cent during the multi- days event window of 2 days (-1, 0), 3 days (-1, +1) as well as longer event windows of 21 days (-10, +10) and 41 days (-20, +20). In marked contrast, the acquirers suffer losses (negative returns) for partial/majority control cross-border acquisitions. The advantages of acquiring complete control of a firm are due to assets owned and capacity to acquire

complimentary assets. Cross-border acquisitions are characterized by high information asymmetry, in addition, cultural barriers- including difference in languages, political and economic systems appears to be the reasons behind the negative returns in partial/majority control cross-border acquisitions. Lack of requisite voting power (Note 2) to pass a special resolution, less autonomy and difficulty in integration process post-acquisitions also seems to be a factor for negative market reaction in case of partial/ majority control cross-border acquisitions. Spencer et al. (2001) and Zhu et al. (2011) also find that long-term performance of partial acquired firms is highly dependent on corporate control characteristics of the target and the acquiring firms. Aybar and Ficici (2009) also find support for the positive impact of the stake pursued in the acquisition of cross-border target firm.

The positive returns found on the announcement and during pre-event window are due to synergy hypothesis and the expectation of the Indian managers to realize synergies. This may be possibly due to the rationale that companies acquire another company for strategic motives such as to obtain economies of scale and scope, and utilize available resources and capabilities, thus creating more scope for synergies and value creation.

The acquiring companies adopt the strategies of mergers and acquisitions provide an opportunity to judiciously combine and effectively utilize intangible resources of both the companies on a broader scale. Favorable regulations and policies in post liberalization phase have helped Indian firms to expand and develop their acquisition capabilities over time. The market responds positively if the acquisition is considered a source of synergy and value-adding to the existing product portfolio of the acquiring company. Indian firms use cross-border acquisitions for strategic assets-seeking in order to facilitate strategic and organizational transformation of the firms; Moreover, access to developed markets for products, resources and capabilities enable Indian firms to leapfrog to the global league and thus create greater value than what could be achieved by acquiring a domestic firm (Gubbi et al., 2010). The acquirer also takes advantage of local knowledge, distribution channels, management experience, a qualified labor force, and an established brand name (reputation). Gaining entry by acquiring a stake in a particular market does not add additional capacity, in addition to being fast.

Further, over the years Indian firms, especially, in technology intensive industries like pharmaceutical sector and information technology had established their base as low cost product or service providers on mass scale. The cross-border acquisitions complement the acquiring firms with necessary technological, management expertise and international customer base to compete in overseas markets.

Based on findings, the management may prefer for complete acquisition of cross-border target firm. Further, it is suggested that corporates should acquire partial/majority control of domestic target firms as a subsidiary and are advised to absorb it with its own operations later on. Rani et al. (2010, 2012) also observe this implication during a survey.

The initial findings of the study reveals that cross-border acquisitions may be considered as an option to strengthen the competitiveness of Indian firms as the effects of these announcements appear to be a good indicator of longer-term success.

Above all, on a methodological level, the present study has demonstrated use of the four major significance tests to check the significance of average abnormal returns and cumulative average abnormal returns. The use of four main test-statistics for assessing significance levels of average abnormal return and cumulative average abnormal return has proved to be useful, since these test-statistics take into account effects due to event-induced variance and offers, therefore, an alternative evaluation of significance.

This paper is limited to looking at the short-term performance of acquiring firms. However the understanding of long-term performance can be done separately. Further, a study on dynamic process of partial and majority control acquisitions leading to ultimate control behavior will add useful insights to the understanding of mergers and acquisitions.

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Appendix

Event study methodology in the finance literature has become a standard tool in evaluating the stock price reaction to a specific event (McWilliams & Siegel, 1997). The following steps comprise the mechanics of event study:

The first step in the event study methodology is to define the event as the date on which the acquisition is first

announced to the public. Day 0 is defined as the day the announcement first appears in any newspaper. For this purpose of the study, the announcement day has been defined as the day when the Stock Exchange is informed about the board approval of the merger and acquisition deal. The day 0 has been defined as the board approval date as it facilitates the verification of a clean window from the archives of Bombay Stock Exchange. The most critical assumption of event study methodology is that there is no confounding event during the event window.

The estimation period is defined as the period prior to the occurrence of the event. It is imperative for the estimation window and event window not to overlap. This ensures that estimates of the normal return model are not influenced by the event –related returns. Estimation window of 255 (-290, -36) days has been considered in the study.

The event period surrounds the date of the announcement of acquisition during which the stock market response to the announcement is investigated. In order to account for early share price reactions (induced by the anticipation of stock market of an upcoming announcement before and potentially slow information processing after the event) the cumulative abnormal returns over alternate windows are considered. Fama et al. (1969) suggest that event date may be uncertain. Therefore, it is desired to consider abnormal return which might appear before and after the defined date. This interval is known as event window. The abnormal returns over varying windows, namely, (-20,-2), (-1, +1), (-1, 0), (-2, +2), (-5, +5) (-10, +10), (-20, +20), (+2, +20) have been observed to capture the leakage effect. The dates are verified (manually) to ascertain the clean period data. It has been checked (manually) that there is no contamination of information and confounding event during the event window. Long-run event windows have not been examined in the study due to two reasons; first, using a long event window severely reduces the power of the test statistic and lead to false inferences (Brown and Warner, (1980, 1985); McWilliams and Siegel, 1997). Second problem is the difficulty of controlling for confounding events. Also, long-event windows increase the likelihood of contemporaneous and inter-temporal correlations of residuals resulting in significant underestimates of standard errors (Salinger, 1992).

Stock returns move in response to several firm or market-specific factors. The key issue in event studies is what portion of the price movement is actually caused by the event of interest. In other words, it is required to extract the impact of the one particular event on stock returns. This leads to the concept of abnormal returns. The abnormal return of the jth stock (AR_{jt}) is obtained by subtracting the normal or expected returns in absence of the event $E(R_{jt})$, from the actual return in the event period, (R_{jt}) as per following equation (1).

$$AR_{jt} = R_{jt} - E\left(R_{jt}\right) \tag{1}$$

The market model approach relates the return of a security to the return of the market portfolio as per the market model equation (2).

$$R_{jt} = \alpha_j + \beta_j R_{mt} + \varepsilon_{jt} \quad, \text{where t= -290, . . ., -36} \tag{2}$$

where αj is a constant term for the jth stock, βj is the market beta of the jth stock, Rmt is the market returns, and εjt is an error term.

The parameters of the model are estimated by using the time-series data from the estimation period that precedes each individual announcement. The parameters estimated from the market model are then used in the calculation of abnormal returns for each day in the event window. The estimated parameters are then matched with the actual returns in the event period. The daily excess return i.e. abnormal return of firm j for the day t (AR_{jt}) is estimated from actual returns during the event period and the estimated coefficients from the estimation period as specified in equation (3):

$$AR_{jt} = R_{jt} - \left(\hat{\alpha} + \hat{\beta} R_{mt}\right), \text{ where } \text{t= -20, . . ., +20} \tag{3}$$

The average abnormal return (AARt) is calculated as per the equation (4).

$$AAR_t = \frac{1}{N} \sum_{j=1}^{N} AR_{jt} \tag{4}$$

where N is the number of firms.

The cumulative abnormal return for a given security is simply the sum of daily abnormal returns over the event window. Over an interval of two or more trading days beginning with day T1 and ending with day T2, the cumulative average abnormal return (CAAR) is

$$C\,A\,AR_{T_1,T_2} = \frac{1}{N} \sum_{j=1}^{N} \sum_{t=T_1}^{T_2} AR_{jt} \tag{5}$$

The study also calculates precision–weighted cumulative average abnormal returns (PWCAAR). The precision-weighted average is calculated using the relative weights of each stock. The precision-weighted return weight each stock in inverse proportion to its standard deviation as specified in equation (6):

$$PWCAAR_{T_1,T_2} = \sum_{J=1}^{N} \sum_{t=T_1}^{T_2} \omega_j A R_{jt} \tag{6}$$

where

$$\omega_j = \frac{\left(\sum_{t=T_1}^{T_2} \delta_{AR_{jt}}^2 \right)^{-\frac{1}{2}}}{\sum_{i=1}^{N} \left(\sum_{t=T_1}^{T_2} \delta_{AR_{jt}}^2 \right)^{-\frac{1}{2}}}$$

where

$$\delta_{AR_{jt}}^2 = \frac{\sum_{k=T_{D_b}}^{T_{D_e}} (A R_{jk})^2}{D_j - 2} \left[1 + \frac{1}{D_j} + \frac{(R_{mt} - \overline{R}_m)^2}{\sum_{k=T_{D_b}}^{T_{D_e}} (R_{mk} - \overline{R}_m)} \right]$$

Dj is the number of non-missing trading day returns in the D-day interval T_{D_b} through T_{D_e} used to estimate the parameter of the firm j. Rmt is the return on the market index on day t, $\overline{R}_m$ is the mean market return over estimation period (Cowan, 2007).

Statistical significance of event returns

Following two widely used parametric and two non -parametric test statistics as recommended in the literature (Campbell et al., 2010; Corrado and Truong, 2008).

Parametric tests

Patell's test (1976) corrected by Mikkelson and Partch (1988) and Standardized cross-sectional test (Boehmer et al., 1991).

Non-parametric tests

Generalized Sign test (Cowan, 1992) and;

Rank Test (Corrado, 1989);

Patell's test

Patell (1976) calculates a test statistic where the event period abnormal returns are standardized by the standard deviation of the estimation period abnormal returns. The literature also refers to the Patell test as a standardized abnormal return test or a test assuming cross-sectional independence. The standardised abnormal return of security j for day t (SARjt) is defined as abnormal returns of security j divided by its estimated variance $\sigma_{AR_{jt}}$ as in equation (7)

$$SAR_{jt} = \frac{A R_{jt}}{\delta_{AR_{jt}}} \cdot \tag{7}$$

where $\displaystyle \delta_{AR_{jt}}^2 = \frac{\sum_{k=T_{D_b}}^{T_{D_e}} (A R_{jk})^2}{D_j - 2} \left[1 + \frac{1}{D_j} + \frac{(R_{mt} - \overline{R}_m)^2}{\sum_{k=T_{D_b}}^{T_{D_e}} (R_{mk} - \overline{R}_m)} \right]$

Under the null hypothesis, each SARjt follows a Student's t distribution with Dj-2 degrees of freedom. Total standardized abnormal return (TSAR) has been obtained by summing SARjt across the sample:

$$T\,SAR_{t} = \sum_{j=1}^{N} SAR_{jt}.$$ (8)

The expected value of $TSAR_t$ is zero. The variance of $TSAR_t$ is

$$Q_t = \sum_{j=1}^{N} \frac{D_j - 2}{D_j - 4}$$ (9)

The test statistic for the null hypothesis that $CAAR_{T_1,T_2} = 0$ **is given in equation (10). This test statistic is denoted as T_P :**

$$T_P = \frac{1}{\sqrt{N}} \sum_{j=1}^{N} Z_{T_1,T_2}^{j}$$ (10)

where

$$Z_{T_1,T_2}^{j} = \frac{1}{\sqrt{Q_{T_1,T_2}^{j}}} \sum_{t=T_1}^{T_2} SAR_{jt} \quad \text{and}$$

$$Q_{T_1,T_2}^{j} = (T_2 - T_1 + 1)\frac{D_j - 2}{D_j - 4}$$

under cross-sectional independence of the Z_{T_1,T_2}^{j} and other assumptions the Z_{T_1,T_2} follows the standard

normal distribution under the null hypothesis.

Mikkelson and Partch (1988) corrected test statistic for the null hypothesis that CAAR =0 is given in equation (11). This test statistic is denoted as TP*:

$$T_P^{*} = N^{-\frac{1}{2}} \sum_{j=1}^{N} \frac{CAR_{T_{1j},T_{2j}}}{\delta_{CAR_{T_{1j},T_{2j}}}}$$ (11)

where

$$\delta^2{}_{CAR_{T_1,T_2}} = \frac{\sum_{k=T_{D_b}}^{T_{D_e}} AR_{jk}^2}{D_j - 2} \left\{ L_j \left[1 + \frac{L_j}{D_j} + \frac{\left(\sum_{t=T_1}^{T_2} R_{mt} - L_j \overline{R}_m \right)^2}{\sum_{k=1}^{D_j} \left(R_{mk} - \overline{R}_m \right)^2} \right] \right\}$$

where L is the length of the event period in trading days, L=T2-T1+1. Dj is the number of non-missing trading day returns in the D-day interval T_{D_b} through T_{D_e} used to estimate the parameter of the firm j.

Standardized cross-sectional test

The "standardized cross-sectional test" developed by (Boehmer et al., 1991) incorporates the information from both estimation and the event period. For day t in the event period, the test statistic is given in equation (12). This test statistic is denoted by TBMP:

$$T_{BMP} = \frac{TSAR_t}{N^{\frac{1}{2}}(\delta_{SAR_t})}$$ (12)

Where

$$\delta^2{}_{SAR_t} = \frac{1}{N-1} \sum_{i=1}^{N} \left(SAR_{it} - \frac{1}{N} \sum_{j=1}^{N} SAR_{jt} \right)^2$$

Define the standardized cumulative abnormal return for stock j as in equation (13):

$$SCAR_{T_{1j},T_{2j}} = \left(\frac{CAR_{T_{1j},T_{2j}}}{\delta_{CAR_{T_{1j},T_{2j}}}} \right)$$ (13)

Then the standardized cross-sectional test (TBMP) for the null hypothesis that CAAR=0 is

$$T_{BMP} = \frac{\sum_{i=1}^{N} SCAR_{T_{1j}, T_{2j}}}{N^{\frac{1}{2}} \left(\delta_{SCAR_{(r_{1j}, r_{2j})}} \right)} \tag{14}$$

where

$$\delta^2_{SCAR_{(r_{1j}, r_{2j})}} = \frac{1}{N-1} \sum_{i=1}^{N} \left(SCAR_{T_{1i}, T_{2i}} - \frac{1}{N} \sum_{j=1}^{N} SCAR_{T_{1j}, T_{2j}} \right)^2$$

The standardized cross-sectional test is robust to event- induced variance.

Generalized Sign test (TS).

The sign test (Cowan, 1992) is a simple binomial test to ascertain whether the frequency of positive abnormal residuals equals 50 per cent or not. The generalized sign test is a refined version of this test by allowing the null hypothesis having positive abnormal residuals to be different from 0.5.

The generalized sign test examines whether the number of stocks with positive cumulative abnormal returns in the event window exceeds the number expected in the absence of abnormal performance or not. The number expected is based on the proportion of positive abnormal returns in the 255 day estimation period,

$$\hat{p} = \frac{1}{n} \sum_{j=1}^{n} \frac{1}{255} \sum_{t=1}^{255} S_{jt} \tag{15}$$

where

$$S_{jt} = \begin{cases} 1 & if \quad AR_{jt} > 0 \\ 0 & otherwise \end{cases}$$

The sign test statistics is calculated as specified in equation (16). The generalised sign test statistic has been denoted as TS. The TS statistic has an approximate unit normal distribution with parameter $\hat{p}$:

$$T_S = \frac{w - n\hat{p}}{\sqrt{n\hat{p}(1 - \hat{p})}} \tag{16}$$

Where w is the number of stocks in the event window for which the cumulative abnormal return is positive.

Rank Test (T_R)

The rank test (Corrado, 1989) procedure considers the combined estimation period and event period as a single set of returns, and assigns a rank based on return to each daily for each firm. The rank statistic has been denoted as TR. For day zero, the test statistic is specified in equation (17):

$$T_R = \left[\left(\frac{1}{N} \sum_{j=1}^{N} k_{j0} \right) - \tilde{k} \right] \Big/ s_k \tag{17}$$

where kj0 is the rank of security-event j's day zero abnormal return in security-event j's combined 255-day estimation period and 19-day event period (in the case of (+2,+20) time series, k is the expected rank defined below, and sk is the time-series standard deviation of the sample mean abnormal return ranks.

Each security-event's non-missing returns have been ranked with the lowest rank being one. Ej represents the number of non-missing returns of security j in the event period; if there is no missing return, Ej =E=post –pre +1 and D= length of estimation window. The mean rank across the combined estimation and event period is

$$\tilde{k} = \frac{D + E + 1}{2}$$

The rank test statistic for the null hypothesis relating to the event window (T1, T2) is given in (equation 18):

$$T_R = (T_2 - T_1 + 1)^{\frac{1}{2}} \left\{ \frac{\overline{K}_{T_1 T_2} - \tilde{K}}{\left[\sum_{t=1}^{D+E} \left(\overline{K}_t - \tilde{k} \right)^2 \Big/ D + E \right]^{\frac{1}{2}}} \right\},$$

where

$\overline{K}_{T_1 T_2} = \dfrac{1}{T_2 - T_1 + 1} \sum_{t=T_1}^{T_2} \dfrac{1}{n} \sum_{j=1}^{n} K_{jt}$ is the average rank across the n securities and $T_2 - T_1 + 1$ days of the

event window and $\overline{K}_t = (1/n) \sum_{j=1}^{n} K_{jt}$ is the average rank across n securities on day t of the D+E day combined

estimation and event period.

Notes

Note 1. See APPENDIX for a comprehensive discussion of the test statistics.

Note 2. A special resolution is passed (to be passed with 2/3rd of majority) to change the name of a company, alterations to the memorandum or articles of association, or a reduction of capital of the company, etc. A special resolution requires 75 per cent shareholders of a company present or by appointment of a proxy to vote in favour at a general meeting of the company to alter a company's constitution.

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