Chapter Two

LITERATURE REVIEW AND RESEARCH METHODOLOGY
2.1 Literature Review

The significance of mergers and acquisitions as strategy decisions impacting long term profitability and shareholder wealth has led to accumulation of substantial amount of literature on mergers and acquisitions. However, since mergers and acquisitions waves have been observed quiet early in developed countries, the studies are also largely available in the context of these countries. Thus, significant amount of accomplished empirical research work on mergers and acquisitions in countries like US, UK and other developed countries exists as of date.

There are two research approaches adopted in the literature for examining wealth creation effect of mergers and acquisitions. One approach is to use share price data to determine gains and losses to shareholders of acquirer and target firms in M&A deals. The second approach has been to use the accounting data to analyse long-run operating and financial performance of acquirers in a merger transaction. The studies falling under these two approaches can be broadly classified into Announcement period studies, Studies on long term performance of acquirers focusing on operating performance and Studies on long term share price performance. In this section we review studies for determining a general conclusion on impact of M&A on operating performance of companies as also shareholder wealth.
2.1.1 M&A and Announcement Period Returns

A large number of studies have focused on short term returns generated to shareholders surrounding the announcement period of the event. These studies essentially follow event study methodology. The application of this technique to study short term wealth creation process is based on ‘efficient market hypothesis’. Upon the announcement of a merger between two or more firms, the market ‘learns’ new information and adjusts to a new level, incorporating this new information [Rieck, O. (2002)]. This new information incorporated into stock prices reflect shareholders’ perception about impact of merger on the future profit stream from the merged entity. The stock returns on the days around the announcement that are solely due to the occurrence of the M&A announcement are called Cumulative Abnormal Returns and have been analysed by the researchers to identify wealth gains or losses to different groups of shareholders. A general conclusion of large number of studies in this context is that the target firms are the gainers while negative returns are observed in case of acquiring firm shareholders.

Dodd (1980) finds that shareholders of target firms earn large positive abnormal returns from announcement of merger proposals. These announcement period returns range from 13% at the announcement date of the offer to 33.96% average over the duration of the merger proposal i.e. 10 days before and 10 days after the announcement. On the other hand, shareholders of bidder firms experience negative abnormal returns of 7.22% and 5.50% over the duration of the proposals.
Asquith, P., Bruner, R., Mullins, D. (1983) studied 343 completed mergers in US during 1975-1983 to examine the effect of mergers on the wealth of bidding firms' shareholders. They conclude that the bidding firm gains significantly during the 21 days leading to the announcement of each of their first four merger bids. Bidders' abnormal returns are positively related to the relative size of the merger partners and the gains during the announcement period are larger for mergers which are successful. Further, the authors provide evidence that the returns to bidding firms are smaller for equity financed bids than for cash merger bids. Besides, the study concludes that the market's average response to a merger bid is always positive for target firms and it is significantly more positive when the offer is financed with cash rather than equity. The study of Asquith, et. al (1983) thus indicates that measuring market's reaction to a merger bid for a bidder firm not only measures the estimated present value of the merger investment decision but also the market's reaction to financing decision.

Asquith, P. (1983) investigated the effect of merger bids on stock returns using the sample of successful and unsuccessful merger bids between July 1962 and December 1976, where the target firms are listed in NYSE. Using the daily common stock returns for two years before the press date until one year after the outcome date, Paul concludes that the announcement of a merger bid increases the probability of merger. Further, both successful and unsuccessful target firms exhibit positive and significant average excess returns on the press day and the day before. The examination of the period from the press day to outcome day also suggests that the probability of merger changes during the interim period.
with new information. The cumulative excess returns rises for successful target firms during this period and falls for unsuccessful target firms. Besides the author concludes that most of the gains from merger go to stockholders of the target firms with the stockholders of the successful bidding firms earning little if any return.

Malatesta (1983) examined a matched sample of targets and their bidders in 30 successful mergers and finds a significant average increase of $32.4 million (t = 2.07) in their combined equity value in the month before and month of outcome announcement. The acquired (target) firms gained more than the acquirer forms. The target firms earned $18.6 million (t = 5.41) of the combined increase in the equity value while acquiring firms earned $13.8 million (t = 0.91).

Firth (1990) examines mergers and takeover activity in the UK, specifically, the impact of takeovers on shareholder returns and management benefits. The research shows that mergers and takeovers resulted in benefits to the acquired firms' shareholders and to the acquiring companies' managers but that losses were suffered by the acquiring companies' shareholders.

Datta, Pinches and Narayana (1992) based on 75 observations for bidders and 79 for targets referred in 41 earlier studies on wealth creation effects of mergers, find that the bidders on an average, gain nil or statistically insignificant gains from announcement of mergers while target firms' shareholders experience over 20% increase in value. The authors further prove that both bidders and targets
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lose in stock-financed transactions and conclude that of all the factors, mode of payment is the most significant explanatory factor in wealth gains for both bidders and targets. A modest evidence of the positive effect of non-conglomerate mergers on bidder's wealth is also available in this study.

Davidson, W., Cheng, L. (1997) using standard event methodology tested two important hypotheses – (i) the bid premium is larger for all cash acquisitions than for acquisitions settled by an exchange of common stock, all other things being equal. (ii) Abnormal returns of the target firms in the announcement period are a function of the bid premium and not the method of payment. They show that (without controlling for other variables) the announcement period abnormal returns for target receiving cash are significantly larger than returns on target for which stock is exchanged. However when relative size of payment and other variables are controlled for, the method of payment is unrelated to target firm abnormal returns. Thus it is concluded that a cash offer is not inherently more valuable than a share exchange that offers the equivalent amount of shares. Cash offers are the source of larger returns only because cash targets received larger payments from bidders.

Ocana, C., Pena, I., Robles, D. (1997) investigated the share price returns of target firms. Applying event study methodology to 71 targets and 32 bidders listed on Madrid Stock Market during the period 1990 to 1994 the authors computed average abnormal returns and cumulative average abnormal returns and concluded that the behavior of stock price during takeover in a small market

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(Spain) is quite similar to the pattern observed in the larger US and UK stock markets. Specifically they found that target shareholders gain significant abnormal returns, though there is some significant upturn in the two months before the bid.

Draper, P., Paudyal, K. (1999) examined the impact of takeover bid announcement on the returns, trading activities and trading costs of target and bidding firms. With sample of 581 target firms and 349 bidding firms between 1988 and 1996 and analyzing daily share prices, volume of trades, number of trades, order size and quoted bid-ask spreads the authors conclude that the shareholders of target companies benefit from the announcement of takeover bids. Within the 10 day period surrounding the announcement the cumulative excess returns available to the shareholders of target firms exceed 11%. In contrast the shareholders of a bidding firm suffer a loss of just under 1% during the same period. Benefits to the shareholders were also found to be dependent on method of payment. Prices of target (bidding) firms increase (decrease) most if the shareholders of the target firms are given an option to receive the payment in shares or in cash.

Cybo-Ottone, Murgia, M. (2000) studied the stock market valuation of mergers and acquisitions in the European banking industry. Based on a sample of very large deals observed from 1988 to 1997 they conclude that, on average, at the announcement time the size-adjusted combined performance of both the bidder and the target is statistically significant and economically relevant. The positive
gains in shareholder value are associated to the average domestic bank to bank M&A and to banking/insurance deals. On the other hand, the economic impact of cross-border deals and of bank product expansion in investment banking, albeit much publicized, is non-existent. Although the sample chosen shows a great deal of cross-sectional variation, the general results are mainly driven by the significant positive abnormal returns associated with the announcement of domestic bank to bank deals and by product diversification of banks into insurance. On the contrary, it is found that M&A with securities firms and concluded with foreign institutions did not gain a positive market’s expectation.

Floreani, A., Rigamonti, S. (2001) examined the stock market valuation of mergers in the insurance industry between 1996 and 2000 in Europe and in the US. Forming a sample of 56 deals in which the acquiring company is listed data reveal that insurance companies mergers enhance value for bidder shareholders. Over the event window (-20,+2) their abnormal return is 3.65%. The abnormal returns for acquiring firms are larger the greater the relative size of deal value. The authors also find that mergers occurring between insurance companies located in the same European country are not valued positively by the market, while cross-border deals appear to increase shareholder’s wealth. The analysis of a sub-sample of simultaneously listed bidders and targets reveals that the combined insurance companies experience significantly positive abnormal returns over the event window (-20,+2) shareholders gain 5.27% and consistent with previous findings, target shareholders substantially increase their wealth.
Penas, M., Unal, H. (2001) examined the impact of the merger announcements on monthly bond returns of acquiring and target-banks in a sample of 65 bank merger cases. They report that bondholders of bidder and target banks realize significant positive risk and maturity adjusted bond returns around the merger announcement month. In addition, the results show that the acquiring banks' credit spreads of the fixed-rate non-convertible bond issues decline significantly in 38 merger cases. The cross-sectional regression results provide evidence that the incremental size attained in the merger is a significant determinant of both the positive bond returns as well as the decline in credit spreads after controlling for factors such as diversification, leverage and asset quality changes. The study also report that the bond returns around the merger announcement and the post-merger decline in spreads are not monotonic with size. Mega-banks and smaller size banks do not show any significant announcement month bond returns or post-merger decline in spreads. In contrast, medium size banks experience significant bond returns and realize reduction in cost of funds.

Komoto, K. (2002) found that among acquiring companies, in the banking, cement and marine transport industries, there was a positive divergence of approximately 10% at 40 days after the announcement. Another significant characteristic was that the two industries whose stock prices increase — banking and marine transport — show a positive divergence starting at 20 days prior to the announcement. Among acquired companies, a stock price divergence was not observed in banking until the merger was announced, but then a significant positive divergence occurred in reaction to the announcement, which gradually
continued to increase. On the other hand, in marine transport, the stock price plunged in reaction to the merger announcement, and then stabilized. The other industries showed positive and negative divergences of approximately 10% by the day of merger announcement, but the divergences subsequently disappeared by day 40. The results thus show that in reality stock prices can rise or fall significantly depending on the industry.

Billett, M., King, T., Mauer, D. (2003) examined the wealth effects of mergers and acquisitions on target and acquiring firm bondholders in the 1980s and 1990s. It is found that, below investment grade target bonds earn significantly positive announcement period returns. By contrast, acquiring firm bonds earn negative announcement period returns. Additionally, target bonds have significantly larger returns when the target’s rating is below the acquirer’s, when the combination is anticipated to decrease target risk or leverage, and when the target’s maturity is shorter than the acquirer’s.

Cummins and Weiss (2004) analyze the market value effects of mergers and acquisitions in the European insurance industry over the period 1990–2002. The results of the event-study analysis show that European M&As created small negative cumulative average abnormal returns for acquirers (generally less than 1%) across various windows surrounding the transaction date. Targets, however, realized substantial positive CAARs. Breaking down the transactions into cross-border and domestic (within country) transactions, they find that cross-border transactions were value-neutral for acquirers, whereas within-border transactions
led to a significant loss in value for acquirers. For targets, both cross-border and within-border transactions created significant value. The value creation tended to be higher for within-border transactions than for cross-border transactions. Overall, the results are somewhat conflicting with respect to the value of geographically diversifying versus geographically focusing mergers. Geographically diversifying mergers seem to have superior value-related effects for acquirers, but focusing mergers tend to create more value for targets.

Kiymaz, H. (2004) investigated the impact of mergers and acquisitions on US bidders and targets involved in cross-border mergers of financial institutions. Using the sample of 355 US targets and 391 US bidders involved in international M & A of financial institutions during the period of 1989-1999 he concluded that while US targets experience positive significant wealth gains, US bidders encounter insignificant wealth gains during merger announcements. There are also differences in wealth gains with respect to industry classification and to the regional location of foreign targets and bidders. The macroeconomic variables including foreign and US economic conditions, level of economic development of target country, exchange rate volatility along with the effectiveness of foreign government, relative size of participants and control of target largely explain the wealth gains to bidders and targets.

Rosa, R., Limmack, R., Supriadi, and Woodliff, D. (2004) studied 155 takeover bids for unlisted firms in Australia in order to investigate the response of share market to ownership structure when assessing the information content of
method of payment in takeovers. Using the event study method the authors test whether the signaling implication of the method of payment in takeover of private and public companies are different by comparing the share market reaction to cash and share bids made by listed companies for respectively private and public companies. A remarkable aspect of the results of the study is that acquiring firms earned significantly positive excess returns on announcement of bids for private targets but not for public targets. In respect of method of payments the authors conclude that the positive returns to acquirer in private bids are driven by the cash-based offers. Lower competition for private targets allows acquirers to capture more of the economic rent from takeover by offering cash bids rather than shares.

Choi, J. and Russell, J. (2004) investigate if the M&A transactions of construction firms make positive contributions to the performance of the firms and if in implementing M&A transactions, firms should seek related or unrelated diversifications. The research findings, which were drawn from an analysis of 171 construction M&A transactions, indicate that the performance of construction M&A was positive at an insignificant level, as measured by equity market returns. The market performance index, CAR, is employed to assess the level of success of construction M&A transactions. Research findings obtained from the various analyses indicate that the overall success of market performance was not significantly different from zero. In other words, shareholders of construction firms gained almost nothing around the M&A implementations. Therefore, the research findings of this study are consistent with previous research findings,
indicating that shareholders of acquiring firms, on average, break even. Whereas the relationship between the type of diversification strategy and performance indicates that while the related diversification strategy has been slightly favored by both theories and empirical research findings over unrelated diversification, no significant performance difference was observed between two diversification strategies.

Ruud, Vincent, Huib (2005) examined the wealth creation and redistribution theories of mergers and acquisitions using a Dutch sample in the period 1954 till 1997. The results shows that 52 % of the bidding companies have a positive share price reaction at the announcement of a merger or acquisition, while 82 % of the takeover targets show a positive share price performance. The Dutch data allow independent test of many issues addressed in studies of the UK and US mergers and takeovers. The research shows that returns for a bidding corporation are on average lower during a merger wave. 30% of the Dutch mergers were completed with the value of the target being overestimated or the bidding management overestimating itself. Furthermore, payment of the acquisition in cash in comparison to payment in shares provides better returns on average to both the shareholders of the bidding company and the takeover target.

Ismail, A. and Davidson, I. (2005) used event study methodology to examine the market reaction to 102 merger announcements in the European financial services industry between 1987 and 1999, and compare the results to the US
and available European studies. They report positive returns for targets in various event windows that are examined, while the returns to acquirers varied across the deal type and the various event windows. It is found that bank-to-bank deals are more value enhancing than cross-product deals (i.e. deals which diversify the scope of the banks operations into insurance, brokerage or securities services) and that merger deals earn higher returns than acquisition deals. The results also give some support to the view that in Europe the market reacts more positively to crossborder mergers than to national mergers, except in the (_1, 0) day event window where it appears that marriages based on gaining market power look more profitable than those based on geographical diversification. They also found that higher weighted average returns are generated for deals settled in a combination of cash, equity and loan notes as compared to cash deals, while equity settled deals generated the lowest return.

Friesen, M. (2005) presents empirical evidence on the shareholder value effects of the announcement of the horizontal merger between Air France and KLM, which led to the creation of Europe's leading airline group, between September 2003 and May 2004. Using an event study methodology, the stock price reactions of both, the involved parties and rival carriers, around the announcement day when the intention of the French and the Dutch flag carrier to merge became public as well as on the announcements during the following exchange offer period are analyzed. KLM as the target firm experienced significant positive abnormal returns whereas shareholders of Air France as the bidding firm earned little if anything.
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Lau, B., Proimos, A., and Wright, S. (2005) uses both accounting operating measures and share return measures to investigate the post-merger performance of 21 Australian mergers of publicly listed companies during the period 1999 to 2002. The results show that excess returns to the shareholders of the target firms are significantly greater than zero, measured over an event window of both one day and eleven days. There is weak evidence that the excess returns to the shareholders of the bidder firms are significantly less than zero, measured over an event window of one day only, with a differential effect according to the method of financing for the latter group.

Major Observations from Announcement Period Studies

Following are some of the important conclusions derived from announcement period studies:

(i) All the announcement period studies reviewed apply cumulative abnormal returns or cumulative excess returns methodology for the purpose of studying wealth creation effects of mergers and acquisitions.

(ii) Almost all the studies provide evidence that shareholders of acquirer or bidder firms do not gain any significant returns around announcement period. In fact, some studies provide evidence of negative abnormal returns for shareholders of acquirer firms. On the other hand shareholders of target firms have been found to earn statistically significant wealth gains. This is true even if proposed merger/acquisition bids have subsequently been unsuccessful.
(iii) The observed behaviour of stock prices during takeover in a small market is found to be quite similar to the pattern observed in the larger US and UK stock markets with positive returns for target firms and negative returns for acquirer firms.

(iv) Abnormal returns have been found to be negative or insignificant for stock financed mergers and acquisitions while positive and significant for cash financed transactions.

(v) The evidence of difference in positive abnormal returns for shareholders in domestic and cross-border mergers and acquisitions deals is at best mixed. Specifically, though, for mergers and acquisitions in Europe, the markets have reacted positively for cross-border deals rather than domestic deals.

(vi) The abnormal returns to shareholders of acquiring firms are found to be sensitive to deal size. Larger the deal sizes, larger have been the abnormal returns to shareholders of acquiring firms.

(vii) Acquiring firms earn significantly positive excess returns on announcement of bids for private targets but not for public targets.

(viii) Abnormal returns to shareholders of acquirer and target firms have also been found to be sensitive to industry type.

(ix) Negative abnormal returns to acquirers have also been observed in bond market. Here again, below investment grade target bonds have found to earn significantly positive announcement period returns.
2.1.2 M&A and Long Term Share Price Returns

Research in mergers and acquisitions is not confined to short period analysis. Several researchers have also extended the event study methodology for the purpose of studying long term implications of M&A on shareholder wealth creation. There are also a few studies available that apply a different methodology for the same research objective. The following section discusses some of the significant literature reviewed in the context of M&A and long term share price returns.

Malatesta, P. (1983) studied the net effect of the long-run sequence of events leading to merger and of merger per se on shareholder wealth. The appropriate measure of the wealth effect is shown to be the abnormal dollar return cumulated over time. Using this measure he finds that the long-run wealth effect of the event sequence culminating in merger was significantly negative for acquiring firms. For acquired firm the effect was negative but not significant. The evidence in the study also revealed that the measured abnormal rate of return to acquiring firms are sensitive to a slight variation in model specification and dependent on firm size with smaller firms earning significantly negative post-merger returns.

Schipper, K., Thompson, R. (1983) measured the impact of acquisition activity on firm value by differentiating between specific merger event and programs of acquisition activity. Applying event study methodology and computing CAR and Average Standardized Residuals (ASR) they conclude that there are positive
abnormal returns one year before announcement of mergers. By focusing on programs of acquisitions activity, as opposed to individual mergers, the authors examined the economic impact of certain legislations on merger activity and found that such regulatory changes had a significantly adverse impact on share values of acquiring firms which is consistent with the negative performance of acquiring firms found in the post-announcement period of studies of mergers and tender offers announcements in the 1960s in US.

Gilbert, E., Lyn, E. (1990) tests for several hypotheses about the bidding firm’s stock returns during the merger announcement period and thirty six months surrounding the merger event. The hypotheses are that abnormal returns in the merger announcement month will be higher in friendly mergers than in hostile mergers, and abnormal returns during the pre-announcement period will be higher for friendly mergers than in hostile mergers and finally abnormal returns during the post-announcement period will be higher for hostile mergers than in friendly mergers. Using sample period of March 1975 to December 1978 and data on 68 mergers in US and employing CAR methodology the authors conclude that, hostile and friendly mergers are independent transactions with possible unique motivations and market impact. During the announcement month, the cumulative abnormal returns of friendly bidding firms exceed those of the hostile group indicating that there may be a difference in the acquisition costs between the two groups. The results also offer evidence that the superior stock performance before the takeover may be a motivating factor for the merger. There is evidence of significant and positive post announcement performance of Goa University
the hostile bidding firms which offer support that hostile mergers are perceived to be more likely to result in leaner and more profitable organizations. However, over the entire 24 month period post-announcement, no significant difference in the performance of two groups was found.

Agrawal, A., Jeffe, J. and Mandelker, G. (1992) examined nearly an exhaustive sample of mergers between NYSE acquirers and NYSE/AMEX targets over the period 1955 to 1987 with a view to evaluate long term performance of acquirers during post merger period. Their analysis of 937 mergers and 227 tender offers after adjusting for the size effects and applying CAAR methodology, indicate that shareholders earn significantly negative returns over long term post-merger. Specifically, the authors find shareholders of acquiring firms suffering a loss of 10.26% (t = -2.37) over a five year period post completion of acquisition. Even for 3 year period the CAAR, were found to be significant -7.38% (t = -2.72) for acquiring firms. The share price performance was nothing different for conglomerate and non-conglomerate mergers with both the types earning negative (-8.6% and -25.5%) CAARs over a five year period. The authors further conclude that the long-run post acquisition performance is worse for tender offers financed by equity rather than by cash.

Loderer and Martin (1992) control for size effects changes in the risk free rate and changes in systematic risk and find that, on average, acquiring firms do not underperform a control portfolio during the first 5 years following acquisition. They simply earn their required rate of return, no more or less. There was some
negative performance observed for the first 3 years, especially during the second and the third years after the acquisition.

Parkinson, C., Dobbins, R. (1993) investigated the returns to shareholders in 77 companies involved in fighting and defending a hostile bid. Using CAR methodology the authors concluded that target companies, which successfully defend a takeover bid substantially improve their economic performance in the period from 6 months to 24 months after the month of the bid. Interestingly, the study finds that significant gains obtained by shareholders in the target company around the time of the bid announcement are not lost after the failure of the bid. In apparent defiance of the efficient market hypothesis abnormal returns continue for the two years after the bid. Bidder companies achieve small, significant positive abnormal return only in the month preceding the month of the bid. In general they conclude that shareholders in target companies are the main beneficiaries of merger although bidder companies in failed bids also demonstrate some improvement in performance subsequent to a failed bid.

Sudarsanam, S. (1995) examined the valuation effects of large block acquisitions on target companies. For a sample of 228 UK listed companies in which block acquisitions of between 5% and 30% are made during 1985-92 and for several subsamples, Sudarsanam found that partial acquisitions are indeed value enhancing.
Sudarsanam, S., Holl, P., Salami, A. (1996) attempted to give an integrated explanation of the wealth experience of the bidder and target shareholder groups in terms of the synergy and agency factors while controlling for bid dynamics variables. Using data on 429 mergers in UK between 1980 and 1990 and employing event study methodology the authors conclude that financial synergy dominates operational synergy. Marriage between companies with a complementary fit in terms of liquidity slack and surplus investment opportunities is value creating for both groups of shareholders. However, when highly rated firms acquire less highly rated targets the acquiring firm shareholders experience wealth losses whereas target shareholders experience wealth gains. The evidence suggests that the ownership structure also impacts significantly on shareholder returns. Large shareholdings decrease these returns to both bidder and target shareholders whereas bidder toehold decreases the returns to target shareholders. As far as payment method is concerned they conclude that the equity offer generate smaller wealth gains for both bidders and targets than pure cash or hybrid offers.

Loughran and Vijh (1997) in a study of 947 acquisitions during 1970-1989 find that 5 years following the acquisition, on average, firms that complete stock mergers earn significantly negative excess returns of -25% whereas firms that complete cash tender offers earn significantly positive excess returns of 61.77%. Over the combined pre-acquisition and post-acquisition period, target shareholders who hold on the acquirer stock received as payment in stock mergers do not earn significantly positive excess returns.
Gregory, A. (1997) examines a comprehensive data set of large domestic takeovers by UK listed companies between 1984 and 1992. By using a series of models of abnormal returns, together with the Ibbotson (1975) 'Returns Across Time Series' model and a simple cross-sectional model of returns across all listed UK companies, the author provides evidence that the average abnormal return for up to two years post-acquisition is unambiguously and significantly negative. In particular, acquirers financing a takeover through equity, and single (as opposed to regular) acquirers exhibit significant negative performance. There is also some evidence to suggest that diversifying acquirers perform worse than non-diversifying acquirers and that recommended bids are associated with poorer subsequent under-performance by acquirers than are hostile bids.

Rau and Vermaelen (1998) explain the acquirers' performance in terms of three variables – the type of acquisition, i.e. merger or tender offer, the pre-bid valuation of the acquirer, i.e. glamour or value acquirer, and method of payment. They find that acquirers in mergers under-perform in the three years after the acquisition while in tender offers earn a small but statistically significant positive abnormal returns. However, the long run underperformance of acquirers in merger is not uniforms across firms. It is predominantly caused by the poor post-acquisition performance of low book to market “glamour” acquirers who perform much worse than other glamour stocks and earn significantly negative bias adjusted abnormal returns of -17% in mergers.
Slovin, M., Sushka, M. (1998) examined the parentsubsidiary mergers transactions that do not entail arm's length bargaining or a change in control. The sample of parentsubsidiary merger in the study included 105 subsidiaries and 101 parents while third party buyout sample included 38 parents and 38 subsidiaries from US. Analyzing the share price response of subsidiaries and parents at announcements of parentsubsidiary mergers and comparing the results to conventional mergers as well as to thirdparty buyouts of majoritycontrolled subsidiaries they find positive gains to subsidiaries in parentsubsidiary mergers that are at least as large as returns to targets in conventional mergers. They conclude that parentsubsidiary mergers are value enhancing for both subsidiary and parent shareholders and the value of the combined enterprise is greater than the sum of the preannouncement values of the separate entities. They also find that buyouts of subsidiaries by third parties generate positive returns for minority shareholders that are not significantly different from minority returns in parentsubsidiary mergers. However there are greater gains to parents from third party buyouts compared to parentsubsidiary mergers.

Rau, R., Vermaelen, T. (1998) examined the longterm performance (over the three years following the date of completion of the merger) of bidding firms in mergers and tender offers, with bids announced and completed between January 1980 and December 1991. The full sample comprised of 3169 mergers and 348 tender offers from US. The authors find that acquirers in mergers underperform in the three years after the acquisition while acquirers in tender...
offers earn a small but statistically significant positive abnormal return. However, the long-term underperformance of acquiring firms in mergers is not uniform across firms. It is predominantly caused by the poor post-acquisition performance of low book-to-market glamour acquirers who perform much worse than other glamour stocks and earn significant negative bias-adjusted abnormal returns of −17% in mergers. Specifically, in contrast to value bidders, glamour bidders in both 100% cash-financed and 100% equity-financed mergers significantly underperform after the merger.

Barnes, P. (1998) used data on 755 UK mergers between the beginning of 1987 and the end of 1993 to examine why bidders do badly in mergers. Barnes, P. (1998) concludes that the bidder stockholders do not experience wealth gains from unrelated industry bids and if they do these are less than for related merger bids.

Powell, R. (2001) examined the question whether abnormal returns can be earned from a strategy of investing in firms predicted by a statistical model to be potential takeover targets. Using binomial logit model to estimate the probability of takeover for a firm from the population of firms for the period 1986 to 1995 the authors selected 471 targets. Further employing Buy and Hold abnormal Returns they conclude that developing statistical models to predict takeover targets is unlikely to result in a profitable investment strategy.
DeLong, G. (2003) used cross sectional analysis to examine 54 bank mergers announced between 1991 and 1995 to identify factors influencing performance post merger, test focus versus diversification hypothesis in bank mergers, understand the market reaction to the announcement of bank mergers and analyse long-term performance of bank mergers. He concluded that although the market reacts positively upon announcement of mergers that focus activities, geography and partners earnings streams, focusing mergers do not necessarily improve long-term performance. Only one factor—similar earnings streams—enhances long term performance.

Sudarsanam and Mahate (2003) examined several issues in mergers with a comprehensive list of all successful UK takeovers completed between 1983 and 1995. Particularly they examined (i) long-run and short-run performance of acquirers using a variety of benchmark models; (ii) the relative performance of acquirers based on their pre-bid financial status as either glamour or value acquirers using both the PE ratio and market to book value ratio as proxies; (iii) the interaction between the pre-bid financial status of acquirers and the method of payment; (iv) whether payment method dominates the pre-bid status of the acquirer or vice-versa in determining the post-acquisition shareholder wealth outcome. Using PER and Market to Book-Value ratios and BHAR they find that acquirer’s experience BHARs in the region of −1.4% at the time of the bid announcement and an average of −15%, across the various benchmark models, over a three year post acquisition period. In the bid announcement period the stock market investors do not seem to extrapolate the pre-bid performance of
acquirers but they appear to start revisiting their judgement as they receive more information. Over a three-year post acquisition period value acquirers outperform glamour acquirers. The authors also provide some evidence that glamour firms are more likely to use equity financing than cash. Value acquirers are more likely to use cash. There is also some evidence of an interaction between the pre-bid financial status of the acquirer and the method of payment on the long-run post-acquisition returns. Glamour acquirers offering equity seriously underperform than those offering cash.

Markelevich, A. (2004) studied all completed mergers of US public companies between 1981 and 1999 to examine long run performance of firms based on merger motives. Long-term abnormal stock returns are calculated based on the market adjusted model using an equally weighted index for the entire sample. The model is estimated over 24 months prior to the announcement of the acquisition. Cumulative abnormal returns (CAR) are calculated for the acquirer as monthly returns for the three years following the acquisition. The mean and median LTCARs (Long Term Cumulative Abnormal Returns) for the first year, the first two years, and the first are found to be negative and significantly different from zero. Moreover, the author finds that LTCAR becomes more negative as time progresses. This indicates that on average, the acquisitions are not in the interest of long-term shareholders of acquirer firm. The author further concludes that agency-motivated acquisitions reduce post-acquisition long term performance. On the other hand, synergy-motivated acquisitions tend to
increase post-acquisition long term performance only in the first year following acquisition.

**Wiggenhorn, J. and Madura, J. (2004)** show that acquisitions by newly public firms elicit a positive and significant market response and that newly public firms are not penalized when financing acquisitions with stock in the manner that other public firms are. They find that acquisitions by newly public firms are more favorable when the target is private, when the pre-acquisition sentiment is favorable, and when firm is not already heavily involved in integrating other businesses. The announcement effects are also more favorable when the acquisitions are relatively small. For the entire sample, the buy-and-hold returns are not significant. However, when the sample is partitioned by motive of the acquisition, the acquisitions motivated by economies of scale exhibit positive and significant buy-and-hold returns, while the acquisitions motivated by economies of scope exhibit negative (but not significant) returns.

**Dash (2004)** examines the economic consequences of mergers on the shareholders of acquiring firm. He applies event study methodology to assess the extent of value creation by mergers. The results indicate that on an average mergers lead to value destruction, irrespective of their pattern over a long period of time and the destruction is relatively greater in case of unrelated mergers. He draws a contradictory conclusions to the popular belief of merger as a mean of corporate salvation and declares it as a myth.
Ley, P. (2005) determines whether South African firms engaging in M&A activity generate persistent monthly positive abnormal returns in the 36-months after the announcement of an event. The sample consisted of 299 M&A transactions (announced between January 1989 and August 1998) of firms listed in the industrial sector of the JSE. They conclude that shareholders should not be long-term investors in M&A active firms. The CTAR (Calendar Time Abnormal Returns) results indicate that there were more negative abnormal return trends for a portfolio of M&A active firms. The CAR results indicate that in order to maximize their returns investors should sell their shares in M&A active firms after seven months from the announcement of an event. Even value firms, which generated a positive 36-month CAR only were found to have a positive CAR in the first year.

Moeller, Schlingemann and Stultz (2005) analyzed the performance of acquiring firms through the two major merger waves in US during the period 1980 to 2001. Using a large database of 12,023 acquisitions, they find that over the period 1998 through 2001 shareholders in bidder firms lost $240 billion. They also find that even when the target shareholders benefits were taken into account the net effects were still negative $134 billion. They opine that target shareholders gain at the expense of acquiring firm's shareholders.

Sharma, M. (2010) examine M&A in US banking industry involving the formation of mega banks. Using a convenience sample of 20 quarterly time points in the event window from 2 years prior to the merger through 2½ years after the
merger, including the announcement date and the date of completion for each of the merger, the author provides evidence that none of the 5 mergers studied created any value to shareholder rs. The accounting methodology adopted in the study with Return on Equity, Operating cash flow analysis, however, indicated that value creation did happen in 3 out of 5 merger cases.

Major Observations from Long Term Share Price Performance Studies

(i) The literature provides the evidence that largely the mergers and acquisitions do not create significant wealth gains to shareholders of acquirer firms in the long run.

(ii) The measured abnormal rate of return to acquiring firms is dependent on firm size with smaller firms earning significantly negative post-merger returns.

(iii) Regulatory changes had a significantly adverse impact on share values of acquiring firms.

(iv) There is evidence of significant and positive post announcement performance of the hostile bidding firms over friendly takeovers which offer support that hostile mergers are perceived to be more likely to result in leaner and more profitable organizations. However, over the long period post-announcement, no significant difference in the performance of two groups was found.

(v) The long run share price performance for conglomerate and non-conglomerate mergers was found to be negative. The long-run post
acquisition performance is found to be worse for tender offers financed by equity rather than by cash.

(vi) Shareholders in target companies are the main beneficiaries of merger although bidder companies in failed bids also demonstrate some improvement in performance subsequent to a failed bid.

(vii) Mergers between companies with a complementary fit in terms of liquidity slack and surplus investment opportunities is value creating for both groups of shareholders. However, when highly rated firms acquire less highly rated targets the acquiring firm shareholders experience wealth losses whereas target shareholders experience wealth gains.

(viii) The average abnormal return for up to two years post-acquisition is unambiguously and significantly negative for acquirers. In particular, acquirers financing a takeover through equity, and single (as opposed to regular) acquirers exhibit significant negative performance. There is also some evidence to suggest that diversifying acquirers perform worse than non-diversifying acquirers.

(ix) Acquirers in mergers under-perform in the three years after the acquisition while in tender offers earn a small but statistically significant positive abnormal returns. However, the long run underperformance of acquirers in merger is not uniform across firms. It is predominantly caused by the poor post-acquisition performance of low book to market “glamour” acquirers who perform much worse than other glamour stocks.

(x) Bidder shareholders do not experience wealth gains from unrelated industry bids and if they do these are less than for related merger bids.
(xi) Agency-motivated acquisitions reduce post-acquisition long term performance while synergy-motivated acquisitions tend to increase post-acquisition long term performance only in the first year following acquisition.

(xii) The acquisitions motivated by economies of scale exhibit positive and significant buy-and-hold returns, while the acquisitions motivated by economies of scope exhibit negative (but not significant) returns.

2.1.3 Studies on Operating Performance

Studies based on accounting measures such as financial ratios and financial statements data have attempted to identify significant improvements in various financial parameters of profitability, cash flow situation, solvency and operational and financial synergies, over a long time period. A general conclusion of several of these studies is that M&A are non-value creating for shareholders.

Ravenscraft and Scherer (1989) tested the hypothesis that other things being constant, if mergers result in economies of scale, the post merger profits should be higher than the pre-merger profits and/or their industry averages. They studied 2,732 lines of business for the years 1975-77 and did not find any improvement in post merger improvement in performance of acquirers. In fact, with no control for the merger accounting methods (purchase vs pooling), there was a significant negative impact of 13.34 per cent on the post-merger profitability.
Healy, Palepu and Ruback (1992) attempted not only to study whether mergers improve performance but also if they do, then what are the sources of such economic gains. With a sample of 50 largest mergers of public industrial firms in the US, completed between 1979 and mid-1984, Healy, et. al. applied cash flow measure to study post merger performance. Pre-tax operating cash flow return on assets were used to measure the improvements in operating performance. The aggregate industry-adjusted pre-merger and post-merger performance measures were calculated, five years prior to and subsequent to the merger, and then these two were compared to study the change in post-merger performance. The firm-specific, economy, and industry factors that might influence post-merger performance, were thus controlled for. An increase in the post-merger operating cash flow returns vis-à-vis the firms' industries was observed. The increase was 2.8 per cent per year, after controlling for the pre-merger performance. The improvements in operating cash flows after merger were found to be due to enhancement of asset productivity post-merger. Healy, et. al. stated that the economic gains from a takeover “are most likely to be detected when the target firm is large.” Given these findings, it is important to analyse mergers in India which are normally small in deal value.

Cornette and Tehranian (1992) applied Healy, et. al. (1992) methodology to study post merger performance of 30 large banks in US where acquisitions took place between 1982 and 1987. The pre-merger performance was computed for years -1 to -3 before merger and +1 to +3 after the merger. The authors finds the mean annual industry-adjusted cash flow returns before the merger was -0.2%
for the entire sample and 1% post merger. This means that, before the merger, the sample banks underperformed as compared to their industry by 0.2 per cent, but outperformed by 1 per cent post-merger. There was a significant (at the 1% level) increase of 1.2 per cent in performance post-merger as compared to before the merger. This study pertained specifically to the US banking industry and hence its results may not be generalizable across other industries.

In fact both the studies [Healy, et. al. (1992) and Cornette and Tehranian (1992)] are difficult to generalize for all the sectors and all the merger events given the fact that they both focused on only large size mergers and acquisitions.

McGuckin, R., Nguyen, S., Reznek, A. (1995) examine the effect of acquisitions on productivity performance of acquiring firms using the conventional regression analysis and a method of productivity decomposition. The empirical work uses both plant- and firm level data on the entire population of U.S. food manufacturing firms that operated continuously during 1977-87. The authors find that (1) acquisitions had a significant, positive effect on acquiring firms' productivity growth, but this effect becomes insignificant when only firm-level data on multi-unit firms are included in the regressions; and (2) the decomposition results show that while the productivity contribution of the external component (acquired plants) is positive, the contribution of the internal component (existing plants) is negative; the two components offset each other leaving productivity of multi-unit acquiring firms virtually unchanged after acquisitions. These results suggest that assessing the impact of acquisitions on
the structure and performance of firms requires a careful look at the individual components (i.e., plants) of the firms, particularly for large multi-unit firms.

Mcdougall, G. (1995) analyze the impact of mergers and acquisitions on corporate decisions and corporate performance. The analysis is based on mergers between mid-1985 and end of 1987. Some of the important findings of the research are:

- Corporations that have been taken over by foreign interests increase their capital investment and their R&D spending.
- However, short-term profitability is not positively affected by foreign takeovers. In fact, the profit to sales ratio declines sharply immediately after takeovers by foreigners. The profit to equity ratio behaves in the same way.
- High levels of R&D spending seem to be associated with high profitability. In other words, a high level of investment in the production and use of new technologies is causing the profitability of firms to increase.
- Firms appear to undertake capital investment in tandem with R&D spending, implying complementarity between the two inputs in the production process.
- There exist economies of scale in the R&D activity sphere. This means that as the firm is growing in size, the relative amount of R&D spending it needs to do declines.
- The behaviour of corporations taken over by foreign interests differs significantly from corporations taken over by Canadian interests. The
latter seems to show an increase in short-term profitability and, at best, no change in investment in physical capital or research and development.

Ali and Gupta (1999) examine the potential motives and effects of corporate takeovers that occurred in Malaysia during the period 1980 through 1993 and find that the acquirer firms have achieved larger size at the expense of reduced profit both for themselves and the acquired firms. Bidder firms in Malaysia in general, have lower profitability, higher risks and leverage vis-à-vis the control bidder firms.

Tsung-Ming and Hoshino (2000) attempted to find out whether value was created in Taiwanese mergers through tapping of economies of scale. Their sample consisted of 20 firms that acquired other firms between 1987 and 1992. Both stock market-based and accounting-based measures were used to assess shareholder wealth gains and improvements in corporate performance post-merger. Accounting measures were used to determine the profitability, financial health, and growth of the acquirers post-merger. Profitability was assessed using ROA and ROE. The financial health was measured using financial leverage, liquidity, and operating expenses. Growth was measured as the sales growth. The pre- and post-acquisition adjusted values were compared to arrive at the performance of the merged firm. They found no profitability improvements post merger for the acquirers. In fact, there was deterioration in some profitability indicators. There was no significant difference in the pre- and post-merger values for leverage and debt equity while the current ratio fell significantly in the
first year after the merger while not being significantly different in the later years. The acquirers significantly underperformed on even the measure of sales growth post-merger.

Cosh, A., Guest, P. (2001) examined the long-run pre- and post-takeover performance of hostile takeovers in the U.K. from 1985-96. Employing Account study methodology Cosh and Guest examined the pre- and post-takeover profit returns of bidders and targets, relative to control firms matched on industry and size and conclude of no evidence that bidders in hostile takeovers experience higher pre-takeover profits than non-merging firms. The median annual profit returns for years –3 to –1 earned by bidders in hostile takeover do not differ significantly from those of control firms. In the post takeover period there is clear evidence that the performance of combined firms improves following hostile takeover. Profitability is enhanced, announcement share returns are positive and long run share returns are found to be not significantly negative. On the other hand the study concludes that the friendly takeovers do not improve performance in the post takeover period and result in significantly negative share returns in the long run period following the takeover. Examining the relation between post takeover performance and target pre takeover performance no evidence could be found that in hostile takeover the post takeover profit performance of the combined firm is negatively related to the pre takeover profit performance of the target.
Pawaskar (2001) studied 36 mergers that had taken place in India between 1992 and 1995. Using accrual measures of accounting spread over three years before and after the merger, the study found that the profitability of the merged firms was impacted negatively due to the merger, i.e., corporate performance did not improve significantly post-merger.

Divesh Sharma, Jonathan Ho (2002) investigated whether corporate acquisitions create synergies reflected in corporate operating performance measures. For a sample of 36 Australian acquisitions occurring between 1986 and 1991 and using matched firms to control for industry and economy-wide factors the study found that on the basis of four accrual (Return on Assets, Return on Equity, Profit Margin and EPS) and four cash flow performance measures (RoA, Return on Sales, RoE, Number of Ordinary Shares), corporate acquisitions did not lead to significant post-acquisition improvements in corporate operating performance. The study also found that the type of acquisition (conglomerate versus non-conglomerate) and the form of acquisition financing (cash, share or a combination) do not significantly influence post-acquisition performance. Similarly, the size of the acquisition and the payment of a premium do not influence post-acquisition performance.

Komoto, K. (2002) examined whether business results improve by mergers. The authors analyze several mergers among listed companies in the early 1990s whose post-merger business results were available for five years. Specifically, from paper and pulp, chemical and cement industries. Focusing on two
indicators of management efficiency: return on assets, which looks at earnings, and equity ratio, which gauges financial condition, they found that mergers produced no significant effects on business performance.

Kaur, S. (2002) compared the pre and post-takeover performance for a sample of 20 acquiring companies during 1997-2000, using a set of eight financial ratios, during a 3-year period before and after merger, using t-test. The study concluded that both profitability and efficiency of targeted companies declined in post-takeover period, but the change in post-takeover performance was statistically not significant.

Barragato, C. and Markelevich, A. (2003) use the corporate acquisition setting to examine earnings quality during the post acquisition period. They define earnings quality as an earnings stream more closely associated with future cash flows from operations. They further use the stock market's reaction at the acquisition announcement to infer merger motives and hypothesize that synergy-motivated acquisitions will produce higher quality earnings than agency-motivated acquisitions. The findings are consistent with this prediction and support the view that managers who pursue synergy or agency-motivated acquisitions do not face the same economic environment and incentive schemes. The results are also consistent with the notion that incentives for earnings management are greater following agency-motivated acquisitions when compared to those of synergy-motivated acquisitions. They conjecture that these differences originate from those accounting-based contracts that are likely
impacted by reported post-acquisition balance sheet and income statement amounts.

Kruse, Park and Suzuki (2003) examined the long-term operating performance of Japanese companies using a sample of 56 mergers of manufacturing firms in the period 1969 to 1997. By examining the cash-flow performance in the five-year period following mergers, the study found evidence of improvements in operating performance, and also that the pre- and post-merger performance was highly correlated. The study concluded that control firm adjusted long-term operating performance following mergers in case of Japanese firms was positive but insignificant and there was a high correlation between pre- and post-merger performance.

Kruse, T., Park, Park, K., and Suzuki, K. (2004) examined the long-term operating performance following 56 mergers of manufacturing firms traded on the Tokyo Stock Exchange in the period 1969 to 1997. In particular, the study focuses on the effect of diversification, the existence of preexisting relationships, and the changes in employment surrounding the mergers. They find evidence of improvements in operating performance for the entire sample, and that the pre- and post-merger performance is highly correlated. Moreover, the long-term performance is significantly greater following mergers of firms operating in different industries. This superior performance is especially marked among diversifying firms that acquire their sales affiliates and among those that increase employment. The results suggest that one key motivation of consolidation is to
benefit from diversification. Finally, existing relationships among merging firms and mergers involving distressed targets are not related to post-merger performance.

Markelvich, A. (2004) analysed all completed mergers of US public companies between 1981 and 1999. Applying accounting study methodology of Healy, et. al. (1992) the author calculates industry adjusted operating cash flow from 5 year before the acquisition to 5 years after the acquisition. The author finds that adjusted operating performance shows a decrease in performance approaching the year of merger (from 1.73% to 0.51%) and an increase in performance in the year following the merger (from 0.51% to 2.15%). The author also finds synergy-motivated acquisitions significantly outperforming agency-motivated acquisitions in terms of operating performance. Further, the results of some of the measures of operating performance indicate that synergy-motivated acquisitions increase performance following the merger while agency-motivated acquisitions decrease their performance following the merger.

Rahman and Limmack (2004) examined evidence for improvement in operating performance in Malaysian acquisitions. With sample of 94 listed acquirers and 115 target companies involved in acquisitions over the period 1988 through 1998 and analysing components of operating cash flow, the authors find that improvement in post acquisition performance are driven by an increase in asset productivity and the higher levels of operating cash flow generated per unit of sales.
LITERATURE REVIEW AND RESEARCH METHODOLOGY

Beena (2004) analysed the pre and post-merger performance of a sample of 115 acquiring firms in the manufacturing sector in India, between 1995-2000, using a set of financial ratios and t-test. The study could not find any evidence of improvement in the financial ratios during the post-merger period, as compared to the pre-Merger period, for the acquiring firms.

Gerard T. Olson, Michael S. Pagano (2005) examined long-term operating and stock performance of mergers of publicly traded bank holding companies during 1987-1997 period. They find that the acquiring bank's estimated sustainable growth rate prior to the acquisition, as well as post-acquisition changes in this growth rate, and the bank's dividend payout ratio are economically significant determinants of the merged bank's abnormal stock return performance over the three years following the merger. In particular, improving a bank's sustainable growth rate from one standard deviation below the sample mean to one standard deviation above the mean, an increase of 18%, can increase a merged bank's cumulative 3-year buy-and-hold abnormal return by an average of 138.1%. This result is sufficiently large to enable the average bank merger to significantly outperform relevant stock market benchmarks over a 3-year post-merger period. This finding is robust even after controlling for differences in state banking regulations over the sample period, differences in the relative size and market share of the acquirer and target banks, managerial and blockholder ownership variables, and the possible endogeneity of the bank's sustainable growth rate.
Lau, B., Proimos, A., and Wright, S. (2005) uses both accounting operating measures and share return measures to investigate the post-merger performance of 21 Australian mergers of publicly listed companies during the period 1999 to 2002. They use three years of data before and after the merger event to test operating performance of merging firms. With respect to operating performance, there is only parametric evidence that mergers increase ROA, inventory turnover and leverage. These tests also show limited evidence that equity financed mergers reduce the profitability and some cash flow measures of the merged firms, compared to other financing arrangements.

Martynova, Oosting and Renneboog (2007) investigated the long-term profitability of corporate takeovers in Europe, and found that both acquiring and target companies significantly outperformed the median peers in their industry prior to the takeovers, but the profitability of the combined firm decreased significantly following the takeover. However, the decrease became insignificant after controlling for the performance of the control sample of peer companies.

Vanitha. S and Selvam. M (2007) analyzed the pre and post merger performance of Indian manufacturing sector during 2000-2002 by using a sample of 17 companies. For financial performance analysis, ratio analysis were used along with statistical measures such as mean, standard deviation and 't' test. They found that the overall financial performance of merged companies in respect of 13 variables were not significantly different from the expectations.
Mantravadi, P. and Reddy, V. (2008) study the impact of mergers on the operating performance of acquiring corporate in different periods in India, after the announcement of industrial reforms, by examining some pre- and post-merger financial ratios, with chosen sample firms, and all mergers involving public limited and traded companies of nation between 1991 and 2003. The study results suggested that there are minor variations in terms of impact on operating performance following mergers in different intervals of time in India. It also indicated that for mergers between the same groups of companies in India, there has been deterioration in performance and returns on investment.

Mishra, P., and Chandra, T. (2010) examine 52 listed drugs and pharmaceutical companies in India over a period from 2000-01 to 2007-08. Using panel data econometrics with M&A as one of the independent variable in regression analysis, the author finds that M&A do not have any statistically significant influence on profitability of Indian pharmaceutical firms.

Some of the studies on mergers and acquisitions applying accounting data have even attempted to characterize the merging firms. Akhigbe, Madura, and Whyte (2004) for instance design an empirical model to determine the prior probability of a bank becoming an acquisition target. They find that the probability of a bank being acquired is higher for banks that are larger, have a lower return on assets, a higher capital level, more non-performing loans, higher runup in price, a lower market-to-book multiple, a higher core deposit ratio, and a higher loan concentration. They also examine whether the full gains to target
banks are conditioned on the probability of being acquired. They find that the
gains to target banks in the one year pre announcement period are more
pronounced for banks that exhibit high-logit probability characteristics. The gains
are large and significant in the short-term announcement period, but not
significantly related to the logit probabilities among banks. Their results suggest
that the share price adjustment for the characteristics that make some banks
more appealing targets appears to be completed in the pre-announcement
period. Thus, they conclude that studies that estimate the gains to targets using
only the announcement period are underestimating the gains.

**Major Observations from Operating Performance Studies**

(i) With no control for the merger accounting methods (purchase vs pooling),
there was a significant negative impact observed on the post-merger
profitability of acquirer companies.

(ii) The increase in industry adjusted operating cash flows is reported by
some studies. The improvements in operating cash flows after merger
were found to be due to enhancement of asset productivity post-merger.

(iii) The economic gains from a takeover are most likely to be detected when
the target firm is large.

(iv) Acquisitions in US food manufacturing sector had a significant, positive
effect on acquiring firms' productivity growth, but this effect becomes
insignificant when only firm-level data on multi-unit firms are included in
the regressions. Further, post acquisitions, while the productivity
collection of the external component (acquired plants) is positive, the
contribution of the internal component (existing plants) is negative; the two components offset each other leaving productivity of multi-unit acquiring firms virtually unchanged after acquisitions.

(v) For Canadian firms, short-term profitability was found to be not positively affected by foreign takeovers.

(vi) Malaysian acquirer firms have found to have achieved larger size at the expense of reduced profit both for themselves and the acquired firms. Bidder firms in Malaysia in general, have lower profitability, higher risks and leverage vis-à-vis the control bidder firms.

(vii) Acquirers in Taiwan found no profitability improvements post merger for and in fact, there was deterioration in some profitability indicators. No significant difference in the pre- and post-merger values for leverage and debt equity was observed while the current ratio fell significantly in the first year after the merger. The acquirers significantly underperformed on even the measure of sales growth post-merger.

(viii) In the post takeover period for UK firms there is clear evidence that the performance of combined firms improves following hostile takeover.

(ix) For Australian firm, the type of acquisition (conglomerate versus non-conglomerate) and the form of acquisition financing (cash, share or a combination) do not significantly influence post-acquisition performance. Similarly, the size of the acquisition and the payment of a premium do not influence post-acquisition performance.

(x) For Japanese acquirers, control firm adjusted long-term operating performance following mergers in case of Japanese firms was found to be
positive but insignificant and there was a high correlation between pre-
and post-merger performance.

(xii) Synergy-motivated acquisitions significantly outperforming agency-
motivated acquisitions in terms of operating performance.

(xiii) Equity financed mergers reduce the profitability and some cash flow
measures of the merged firms, compared to other financing
arrangements.

(xiii) There are minor variations across industrial sectors in terms of impact on
operating performance following mergers in different intervals of time in
India. It also indicated that for mergers between the same groups of
companies in India, there has been deterioration in performance and
returns on investment.

(xiv) M&A do not have any statistically significant influence on profitability of
Indian pharmaceutical firms.

It can be safely concluded that Mergers and Acquisitions are one of the
most researched areas within the finance domain. Empirical work has been
undertaken in several developed countries largely focusing on wealth creation
effect of mergers and acquisitions. Though M&As basically aim at enhancing
shareholder value, the result of several empirical studies reveal they have
consistently benefited shareholders of target firms while shareholders of acquirer
firms have either failed to gain any significant positive returns or have earned
negative returns during post-merger period. The profitability of acquirers has also
marred after mergers and acquisitions. Within these broad findings, however, there does exist a certain amount of research gap which is outlined as under:

(i) M&As have been extensively researched largely in developed countries such as US and UK. In fact several researchers have examined mergers in similar period in these countries by adopting different methodology or different research objective. The literature on performance analysis of M&A is scant in developing countries like India.

(ii) Most merger studies in Indian context have adopted either a case study approach or have focussed on very limited sample size. Not many studies in Indian context have focussed on most recent period. Given the fact that M&As have increased in India significantly in recent years, limited evidence is available on their performance. This is also on account of the fact that empirical work in this area requires allowing for reasonable time period post merger for examining the operating and financial implications of M&As.

(iii) Several studies in developed countries as well as developing countries like India have focussed on aggregate analysis of mergers. A very limited amount of literature is available providing evidence on impact of M&As on share price, operating and financial performance of firms across various industrial sectors.

(iv) While established methodology of event study have been extensively used in M&A studies in developed countries, very limited literature is available that is exploiting the advantages of this methodology in Indian context.
2.2 Problem of the Study

Mergers and Acquisitions have increased significantly in India with firms acquiring companies domestically as well as globally. The phenomenon of M&A is seen across various industrial sectors of the Indian economy. Mergers and Acquisitions is a strategic business decision and the acquiring firm and its shareholders are the important beneficiaries of this decision. The strategy literature commonly argues that M&As are one of the mechanisms by which firms gain access to new resources and, via resource redeployment, increase revenues and reduce cost. The potential economic benefits of M&As are changes that increase value that would not have been made in the absence of a change in control. These changes in control are potentially most valuable when they lead in the re-deployment of assets or restructurings, providing new operating plans and business strategies. Or, simply all of these could only provide a possible improvement in free cash flow. Through the strategy of M&A thus, the acquiring firm intends to improve its long term operating and financial performance. The major focus is on improving long term profitability of firms, improve the efficiency of utilization of existing and acquired assets and make the acquirer firm more stable in the long run to address competitive forces and command sizeable market share. An assessment of M&A strategy therefore has to be in the light of these perceived benefits. With heightened M&A activity in India, the present study therefore aims at examining the long term operating and financial performance of acquirer firms in India in order to evaluate the efficacy of their M&A strategy.
Further, a significant amount of literature on evaluation of M&A strategy has relied on evidence from aggregate sample. However, there could exist some differences in the impact of M&A on operating and financial performance of acquirers from different industrial sectors. Every industrial sector has its own cost structure and revenue generating potential. Mergers may thus bring about positive or negative alterations of differing magnitude in the cost and revenue matrix of these industrial sectors. An evaluation of acquirers accounting for these sectoral differences is thus imperative. The present study therefore aims to fill this gap in the literature on M&A in Indian context.

Any long term strategy requiring commitment of organizational resources needs to ultimately provide significant benefits to shareholders. Investors also hope to make significant long term gains by investing in acquirers expected synergic benefits. However, as observed from the literature review, the global evidence with respect to mergers is not favourable to the acquirer firms' shareholders. M&As are found to be creating wealth for target firm's shareholders but have been generally found to have negative or insignificantly positive effect on wealth of acquirer firms' shareholders. This study therefore aims at evaluating the performance of M&A in Indian context from the shareholders' viewpoint and examines implications of M&A on short term and long term share price performance of acquirer firms. The research also aims at bringing out sectoral differences in shareholder wealth creation, if any, across select industrial sectors.
2.3 Importance of the study

With heightened M&A activity in India coupled with global evidence of M&A destroying the shareholder value it becomes imperative to evaluate the impact of this inorganic strategy on long term performance of Indian corporates. While some studies have already been done in Indian context, most of them followed a case study approach and lacked specific industry perspective. The present study attempts to give an aggregate picture of impact of M&A on corporate performance and also examines impact of M&A deals sectorwise. Largest M&A deals in recent times have been in the financial services industry and minimal literature is available on impact of M&A in this industry. This study evaluates the operating performance of firms even in financial industry excluding the bank to bank mergers which have not been the focus of earlier studies. The study is useful for corporate planners and strategists to evaluate the M&A strategy and introspect the reasons for its success or failure. It contributes significantly to existing literature on M&A by analysing sectoral differences of impact of M&A on acquirer firms operating and financial performance.

Further, it is also important from the viewpoint of investors who speculate superior earnings from such transactions and therefore invest for short term and long term gains. The present study is among the few attempts in the area of M&A that applies event study methodology on aggregate data of firms across sectors for the purpose of analysing the effects of wealth gains.
2.4 Objectives of the Study

1. To examine the trends in M&A in India
2. To examine the effect of M&A announcement on share prices of acquirers
3. To examine whether M&A increase aggregate wealth of shareholders
   3.1. To examine pre-merger and post-merger operating and financial performance of firms in M&A deals
   3.2. To examine the impact of M&A on long-term share price performance during post-merger period

2.5 Research Methodology

2.5.1 Period of Study:

The study covers M&A in India during the period from financial year 1995-1996 through 2005-2006. The study period is divided as pre-merger and post-merger period for each case of M&A depending upon the year of merger for each M&A deal. Pre-merger as well as post-merger period comprises of 3 years each. The year in which merger/acquisition has taken place is excluded from the study so as to allow for post-merger adjustments and integration issues.

2.5.2 Sample Design

The study basically follows judgemental sampling. The sample for the study primarily includes mergers by public limited companies listed on BSE, during the
period of study. Only domestic mergers are included in the study. The details of sample selection procedure is explained as under:

(i) The initial sample size included 321 acquirer firms identified from CMIE Prowess database for which year and date of merger could be obtained. The year and date of merger were collected from various sources like CMIE Prowess database and websites of national dailies like Financial Express, Business Standard, Hindu Businessline etc.

(ii) The initial sample was reduced to exclude conglomerate mergers since the study focuses on sectoral analysis of M&A besides aggregate analysis of impact of M&A on acquirer firms.

(iii) Companies in the sample were further screened to ensure that they had not engaged in further mergers and acquisitions within 3 years before and after the merger under study. This is necessary since the inclusion of acquirers with multiple mergers during pre and post merger period would create the problem of isolating the impact of single merger on performance of acquirer firm.

(iv) Merger cases where 3 years of data was not available for pre-merger period and post-merger period were removed from the study sample.

(v) Merger cases which were out of the study period were excluded.

(vi) The final sample size after accounting for all the above screening criteria thus reduced to total of 70 acquirers.

(vii) For the purpose of sectoral analysis of M&A cases, the above 70 acquirer firms were further classified as those belonging to manufacturing sector...
and financial services sector. The final sample size includes 50 acquirers from manufacturing sector and 20 from financial services sector. The 50 acquirers from manufacturing sector were further categorized based on industrial sectors under study following CMIE industry classification. The final sample of 50 acquirers thus include 15 acquirer firms from Chemical sector, 10 from Textile sector, 10 from Drugs and Pharmaceuticals and 11 from Food and Beverage sector. The remaining 4 acquirers are classified as miscellaneous category. However, the study does not focus on any specific analysis of acquirers in miscellaneous category.

2.5.3 Data Variables and Data Sources

The data variables required for the study and their respective sources are discussed below:

(i) Volume and value data of Mergers and Acquisitions

An important objective of the study is to examine the trends in mergers and acquisitions in India. For this purpose, the statistical data on number of M&A during the period from 1995-96 to 2006-07 has been collected. For this purpose, multiple sources of data had to be used since there is no single official database on M&A in India which gives a complete picture of mergers and acquisitions in India during the study period. Accordingly, for the period from 1995-96 through 1999-2000, the database on M&A prepared by Rabi Narayan Kar (2006) is used. The author has compiled this database from multiple sources including Centre for Monitoring Indian Economy (CMIE), Department of Company Affairs (DCA)
and Securities and Exchange Board of India (SEBI) sources for listed companies. For the period from 2000-01 to 2006-07, the established sources including CMIE Business Beacon and CMIE M&A database are used.

(ii) **Deal dates and merger announcement dates**

Deal dates and merger announcement dates are important for the purpose of classifying the merger period into pre merger period and post merger period and studying the announcement effect of mergers. The data on deal dates and announcements is obtained from multiple sources including CMIE Prowess database, CMIE Business Beacon Database (Online source) and various financial dailies.

(iii) **Share Prices of Acquirer Firms**

For the purpose of empirical analysis of shareholder wealth creation on short term and long term basis, the study applies daily and weekly share prices of acquirers. Besides, the data on BSE Sensex and sectoral share market indices is used in the event study methodology. The required data on share prices has been collected from BSE Daily Official List Price and Volume Data CD and CMIE Prowess database. The BSE Sensex and values for sectoral share market indices for Chemical, Textile, Drugs and Pharmaceuticals, Food and Beverage and Financial Services Sectors have been collected from CMIE Prowess database.
(iv) **Financial Statements and Accounting Ratios**

For the purpose of examining impact of M&A on long term operating and financial performance of acquirers the various accounting ratios have been used as data variables along with specific financial variables from financial statements of acquirer firms. The required financial statements of acquirer firms along with accounting ratios have been obtained from Capitaline Database and CMIE Prowess Database.

### 2.5.4 Methodology

(i) **Methodology for studying announcement period returns of M&A**

Research on wealth creation has been largely undertaken using Event Study methodology. The methodology of Event Study attributed to Fama, Fisher, Jensen and Roll (1969) has been very widely used in studying the announcement effect of mergers and acquisitions worldwide [see for instance Eckbo (1983), Asquith (1983), Malatesta (1983)]. Event study is a statistical method used to gauge the impact of a corporate event, such as stock split, earnings announcements, dividend or bonus announcements and mergers and acquisitions announcements. It has become a standard method of measuring security price reaction to such announcements or events. In practice, event studies have been used for two major reasons [Binder, J. (1998)]: (a) to test the null hypothesis that the market efficiently incorporates information and (b) under the maintained hypothesis of market efficiency, at least with respect to publicly available information, to examine the impact of some event on the wealth of
firm's security holders. The event study methodology assesses whether specific events create abnormal returns for shareholders of firms. It is based on efficient market hypothesis and thus assumes that a firm's stock market value perfectly reflects its value and future profit stream. This approach is based on the proposition that in an efficient market, the immediate wealth effect reflects the capital market's overall unbiased assessment of the present value of the future benefits of the merger or acquisition [Datta, Pinches and Narayanan, (1992)].

Essentially, the event study analyses the stock return (based on price changes) of acquirer firms or target firms or both relative to a portfolio of stocks representing the market. Upon the announcement of a merger between two or more firms, the market 'learns' new information and adjusts to a new level, incorporating this new information [Rieck, O. (2002)]. This new information incorporated into stock prices reflect shareholders' perception about impact of merger on the future profit stream from the merged entity. Differences in returns of acquiring firm or target firm relative to market returns are usually calculated over a period ranging from one day to many days or weeks leading up to and following the “event” of the merger announcement. In making the calculations, the investigators seek to determine whether the announcement of the merger causes the stock return of acquirer or target firm to perform differently than the general market returns for stocks. The stock returns on the days around the announcement that are solely due to the occurrence of the M&A announcement are called Cumulative Abnormal Returns. The event study methodology has been found to be consistent and valid when attempting to quantify any event [Wooldrige and Snow (1990)].
Applying the well established methodology of event study, we divide the total period of analysis in respect of each acquirer into two major time periods viz. 'Estimation Window' and 'Event Windows' as depicted in the figure below:

<table>
<thead>
<tr>
<th>Estimation Window</th>
<th>Event Window</th>
</tr>
</thead>
<tbody>
<tr>
<td>[(t-20)-180]</td>
<td>(t-20)</td>
</tr>
<tr>
<td></td>
<td>(t)</td>
</tr>
<tr>
<td></td>
<td>(t+20)</td>
</tr>
</tbody>
</table>

The event window covers period surrounding the announcement of merger. The date of announcement of merger is termed as 't' day. Period before 't' day is called as pre-announcement period while period after 't' day is called as post-announcement period. Studies examining wealth creation effect of mergers have typically employed short announcement periods around announcement date. This is due to the fact that though merger negotiations usually take place in secrecy, the information tends to leak out and market starts speculating about potential benefits of mergers to acquirer and target firms. The market's expectations, however, are almost fully formed by the announcement date of the merger or acquisition with wealth effects being insignificant around the consummation date [Asquith (1983), Dodd (1980)]. This is also consistent with the efficient market hypothesis as well as empirical evidence [Datta, Pinches and Narayana (1992)]. We therefore construct short period event windows to study wealth effects with announcement data as the base. Three event windows are selected in pre-announcement period viz. t-5 (5 days before announcement date), t-10 (10 days before announcement date) and t-20 (20 days before
announcement date). Similarly, three event windows are selected for post-announcement period viz. t+5 (5 days after announcement date), t+10 (10 days after announcement date) and t+20 (20 days after announcement date). Additionally, three around announcement date windows are constructed which include (t-20, t+20), (t-10, t+10) and (t-5, t+5).

Once event windows are identified, the Abnormal Returns are computed in respect of each acquirer firm during these event windows. Abnormal return is the difference between expected return and actual return on acquirer firm's stock during an event window. Thus,

\[ AR_{it} = R_{it} - E(R_{it}) \]  \hspace{1cm} \text{Eq. (1)}

Where, \( AR_{it} \) is the abnormal returns on acquirer i's stock at time t in the event window, \( R_{it} \) is the actual returns on acquirer i's stock and \( E(R_{it}) \) is its expected returns. For the purpose of computing expected returns \( E(R_{it}) \) the market model [applied in Dodd and Ruback (1977), Firth (1980), Malatesta (1983)] depicting a linear relationship between acquirer's stock return and the market returns is used. Thus,

\[ E(R_{it}) = \alpha_i + \beta_i R_{mt} \]  \hspace{1cm} \text{Eq. (2)}

Where \( R_{mt} \) is the return on market index (BSE Sensex in this study) during the estimation window period and \( \alpha_i \) and \( \beta_i \) are the firm specific coefficients. The alpha (\( \alpha_i \)) and beta (\( \beta_i \)) components in the above model are computed by regressing market returns on stock returns during 'Estimation Window'. Estimation window comprises of time period of 180 days prior to t-20. The
estimation window period is thus a 'clean period' so selected to avoid including stock returns in regression model that are contaminated with merger news.

The abnormal returns so computed in Eq.(1) above are then used to compute Cumulative Abnormal Returns as under:

$$\text{CAR}_i(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} \hat{AR}_i$$  \hspace{1cm} \text{Eq.(3)}

Where, \( \text{CAR}_i \) is the Cumulative Abnormal Returns on acquirer i stock for event window \((\tau_1, \tau_2)\) surrounding the announcement date, and \( \hat{AR}_i \) is the abnormal returns on stock i.

Finally, Average Cumulative Abnormal Returns are computed from the above as under:

$$\overline{\text{CAR}}(\tau_1, \tau_2) = \frac{1}{N} \sum_{i=1}^{N} \text{CAR}_i(\tau_1, \tau_2)$$  \hspace{1cm} \text{Eq.(4)}

Where \( N \) is the total number of acquirer firms in the sample.

(ii) Methodology for examining impact of M&A on operating and financial performance of acquirer firms

In order to examine the impact of M&A on operating and financial performance of acquirer we apply the Accounting Ratio methodology used in several of the studies reviewed [for instance Beena (2000), Pawaskar (2001), Pazarskis, Vogiatzogloy and Christodoulou (2006), Vanitha and Selvam (2007)]. Financial ratios are widely used for modelling purposes both by practitioners and researchers, as their analysis is one of the most valuable tools for the decision...
making of many interested parties. We implement those financial ratios in this study which in our view could cover and examine the whole activities of acquirer firm during pre-merger and post-merger period. Several of the financial ratios we have selected have been applied in earlier studies in the context of mergers and acquisitions [for example Ali and Gupta (1999), Pawaskar (2001), Sharma and Ho (2002), Pazarskis, Vogiatzogloy and Christodoulou (2006), Vanitha and Selvam (2007)]. Broadly we categorize these financial ratios into Profitability Ratios, Solvency/Liquidity Ratios and Efficiency and Asset Utilization Ratio. The specific financial ratios analysed for the purpose of this study are presented in Table below:

**Table 2.1: Classification of Financial Ratios Selected for the Study**

*Panel A: For Acquirers in Manufacturing Sector*

<table>
<thead>
<tr>
<th>Category</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profitability Ratios</td>
<td>PBDIT Margin</td>
</tr>
<tr>
<td></td>
<td>PBIT Margin</td>
</tr>
<tr>
<td></td>
<td>Net Profit Margin</td>
</tr>
<tr>
<td></td>
<td>Return on Capital Employed (ROCE)</td>
</tr>
<tr>
<td></td>
<td>Return on Net Worth (RONW)</td>
</tr>
<tr>
<td>Solvency/ Liquidity Ratios</td>
<td>Debt-Equity Ratio</td>
</tr>
<tr>
<td></td>
<td>Current Ratio</td>
</tr>
<tr>
<td>Efficiency and Asset Utilization Ratios</td>
<td>Fixed Asset Turnover Ratio</td>
</tr>
<tr>
<td></td>
<td>Inventory Turnover Ratio</td>
</tr>
<tr>
<td></td>
<td>Operating Return on Assets</td>
</tr>
</tbody>
</table>
**Panel B: For Acquirers in Financial Services Sector**

<table>
<thead>
<tr>
<th>Banking Acquirers</th>
<th>Non-Banking Acquirers</th>
</tr>
</thead>
<tbody>
<tr>
<td>OETI – Operating Expenses to Total Income</td>
<td>PAT – Profit After Tax Margin</td>
</tr>
<tr>
<td>IITF – Interest Income to Total Funds</td>
<td>RONW – Return on Networth</td>
</tr>
<tr>
<td>NITF – Net Interest Income to Total Funds</td>
<td>DE – Debt Equity Ratio</td>
</tr>
<tr>
<td>OETF – Operating Expenses to Total Funds</td>
<td>CR – Current Ratio</td>
</tr>
<tr>
<td>NPTF – Net Profit to Total Funds</td>
<td>ASTO – Asset Turnover Ratio</td>
</tr>
<tr>
<td>RONW – Return on Networth</td>
<td></td>
</tr>
</tbody>
</table>

* Ratios are selected based on literature reviewed for M&A in financial services sector

The profitability ratios gauge the acquirer’s operating success over a given period of time; solvency ratios determine the ability of acquirer firm to meet short term and long term financial commitments; and efficiency and asset utilization ratios indicate the extent to which the acquirer has been able to improve the efficiency post merger in utilizing its assets particularly given the fact that the assets increase significantly post merger and inability to bring about increased usage of these assets would imply non-realization of synergy benefits.

The above financial ratios have been collected for the sample acquirer firms for their respective pre-merger and post-merger periods. The principal statistical technique applied on these financial ratios is the “Paired t Test” which again is the well established methodology used in similar studies [for example Pawaskar (2001), Vanitha and Selvam (2007)]. The pre-merger (three years prior to merger) and post-merger (three years after the merger) averages of above financial ratios are compared, and tested for differences, using paired “t”
test for two samples. The observations of each pair of firms in the sample are not independent, since the merging firm retains its identity before and after merger. Therefore "paired two-sample t-test for means" was considered appropriate to measure merger induced operating performance changes. Year of completion of merger was excluded from estimation. For the years prior to a merger, the operating ratios of the acquiring firm alone are considered. Post the merger, the operating ratios for the combined firm were used for analysis. The data analysis is performed using SPSS 14.0.

Further, a comparison of following specific items of financial statements of acquirers has been undertaken for pre-merger and post-merger period:

- Net sales
- Cost of production
- Net working capital
- Profit after tax
- Operating profit
- Cash flow from operating activities
- Total assets
- Rate of growth of net sales
- Rate of growth of net profit
- Market capitalisation
(iii) **Methodology for examining impact of M&A on long term share price performance of acquirers**

The long term effect of M&A on share prices of acquirers is studied using Buy and Hold Abnormal Returns (BHAR) methodology. BHAR methodology has been employed in several of the studies focusing on long term wealth creation effect of mergers and acquisitions [for instance, Loughran and Vijh (1997), Barber and Lyon (1997), Sudarsanam and Mahate (2003), Soongswang (2006)]. The BHAR essentially indicates the excess returns over the industry average that an investor buying the shares of the acquiring firm will be enjoying if he made the purchases those shares after merger. Barber and Lyon (1997) and Mitchell and Stafford (2000) argue that the BHAR is the appropriate estimator because it "precisely measures investor experience" and capture the risk preferences and the investment goals of the investors. They believed this was an important feature of the model as the investors' views towards the acquirer and the benchmark companies depended crucially on such goals and their preferences. With respect to long term wealth creation effect of mergers, our focus is on actual post-merger performance on the shares of acquirers rather than "announcement effect". We therefore construct our windows for event study analysis beginning from the week of the effective date of the merger rather than the announcement date. Three different event windows have been defined for the purpose of examining long term wealth creation effect of mergers with length of 1 year, 2 year and 3 year holding period during post merger period. The BHAR over the relevant event window is then computed by following the standard model given below:

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Where, $BHAR_i$ is buy and hold abnormal returns for sample acquirer firm, $R_{i,t}$ are the raw weekly returns on share prices of acquirer firms for period $t$, $R_{benchmark,t}$ is the weekly returns on benchmark index for period $t$. Eq.(5) essentially implies that the cumulative returns on share of acquiring company are computed by compounding the weekly returns on the acquiring company’s returns during the selected event window or holding period. The benchmark index selected for the purpose of computation of BHAR are the CMIE sectoral indices relevant to a given acquirer in the sample. The selection of sectoral indices is more appropriate as the long term abnormal returns are computed in comparison to industry average returns.

Finally, the average buy and hold returns across the portfolio of acquirer companies in a given sector during a holding period $T$ is computed as:

$$BHAR_T = \frac{1}{N} \sum_{i=1}^{N} BHAR_{i,T}$$

Eq.(6)

Where $N$ is the total number of acquirer companies in the sample.

To test the null hypothesis that mean CAR or BHAR are equal to zero for sample of $N$ firms, the following tests are employed:

$$t_{CAR} = \frac{CAR_{it} - \mu}{\sigma(CAR_{it})/\sqrt{n}}$$

or

$$t_{BHAR} = \frac{BHAR_{it} - \mu}{\sigma(BHAR_{it})/\sqrt{n}}$$