M&A Announcements and Their Effect on Return to Shareholders:

An Event Study

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Abstract

This study examines a sample of M&A announcements in the Asia-Pacific region during the time period of May 2013 – September 2013 to identify the post-facto effect of M&A announcements on the stock prices of the target and the bidding firms. The study has used the event study methodology where the Cumulative Average Abnormal Returns (CAAR) of the target and bidder firm's stock prices in different event windows have been analyzed. A paired sample analysis has also been conducted by comparing the pre-announcement and post-announcement returns of the target and bidder firms' stock prices in the event window of ±2 days. Across all the event windows, target firm's stock price yields positive CAAR that is significantly different from zero. Unlike the target firms, bidder firms do not show statistically significant CAAR across all the event windows. The target firms depict that the post announcement returns are significantly greater than the pre-announcement returns, indicative of the immediate market reaction to the information disclosure.

Keywords: Event Study Methodology, Constant Mean Return (Market-adjusted), Cumulative Average Abnormal Returns, Efficient Market Hypothesis, Event window, Asia-Pacific Region

1. Introduction

The need for constant change in today's dynamic business environment propels the companies to look for expansion by acquisition or merging with other companies. This quest for change drives the companies to look for mergers and acquisitions opportunities that they can leverage to create value at a cost that is substantially less than the actual value created. These opportunities are rare and difficult to find, and once found then the creation of value from them is even more difficult. The difficulty can be attributed to the differences in companies involved – i.e. bidder and target – in terms of culture, operations and management ideology. Finding a perfect match is not possible, however even a close match can generate returns in proportion to the expectations. It is this expectation of high returns to investment that have led to increase in the number of merger and acquisition transactions over the years.

Companies view M&A with an expectation of creating value through better efficiency, reduction of costs through economies of scale, larger product offerings and other synergies. Large M&A affect the industry, the local economy and in certain cases even the global economy. The extent to which M&A affect the economy has been a subject of various empirical studies and always closely monitored by the government to ensure that a competitive market environment is not damaged by any merger or acquisition.

In the aftermath of the global crisis of 2008, companies that were able to successfully handle the crisis are faced with a dilemma of restructuring to ensure that they maintain their competitiveness. M&A provide an attractive avenue for the restructuring, however companies need to consider the actual costs, effects and probability of success in M&A before reaching their final decision.

The effects of M&A are so profound that it directly affects the prices of common stocks of both the bidder and target. Each is affected in a different manner and in a varying magnitudes depending on the perception value generated for it amongst the stockholders. Empirical studies from research in most of the markets indicate that in M&A announcement, the target firms earn a significant abnormal return (Franks, Harris & Titman 1991, Dodd & Ruback

1977, Jensen & Ruback 1983), as compared to the bidding firms that yield insignificantly different from zero returns (Campa & Hernando 2004, Jensen & Ruback1983).

In the past decade or so, the Asia Pacific region has experienced significant growth in M&A activity. The number of deals in this reason has jumped from about 2091 deals in 2000 to about 6939 deals in 2011 (Vazirani 2012). Moreover, it is suggested that inward M&A have played an integral role in the growth and development of these economies and hence are expected to continue on these activities increasingly to match up with the developed economies (Liu, Shu & Sinclair 2009). The motivation of this study is, hence, to understand the impact of merger and acquisition (M&A) announcement on security prices of the target and bidding firms in the Asia-Pacific markets.

The structure of the research is in the following pattern. The next section comprises of evidence from similar studies from various other markets. Subsequently the paper describes the research objectives and the methodology applied to the data of the M&A activity in the Asia-Pacific market. Further the results obtained through the application of the said methodology, are critically analyzed to determine if the transaction announcement creates abnormal returns to the target or the bidding firm. Also, the sections expands its horizon on explaining the Efficient Market Hypothesis (EMH) associated with the research. Finally the paper is concluded with appropriate interpretations.

2. Empirical Evidence

A merger or an acquisition can be defined as a combination of two firms where the bidder usually pays a premium depending upon the synergies involved (Gersdorff & Bacon 2009). Economic disturbances give firms with excess cash reserves the leverage to buy out other firms at cheap prices. Large economic disturbances give rise to merger waves, where a series of huge number of mergers are observed over a period of time (Papadatos 2011). Six such merger waves have been observed in the past with the first one in 1893 and the latest on in 2002, leading to monopolizations and establishment of multi-national corporations (McCarthy 2013).

Empirical evidence from research in other markets depict typical findings of significant positive abnormal returns to the shareholders of the target firms and insignificantly negative returns to shareholders of bidder firms around the M&A announcement period (Campa & Hernando 2004). Returns in these markets are influenced by several factors that include the method of payment (stock, cash or mix), bidder's asset base, type of merger (horizontal, vertical or conglomerate) and the kind of acquisition (domestic or cross border).

Past research indicates that cash acquisitions generated higher positive abnormal returns than stock offers, due to the tax-exemption in capital gains earned (Huang & Walking 1987). Further, research conducted on overnight and daytime announcements shows that an overnight acquisition announcement where a cash transaction is involved tends to earn significantly positive abnormal returns and it does not hold true for daytime announcements (Chen, Chou, & Lee 2011). A research conducted by Wansley, Lane & Yang (1983) indicated a higher return for the targets with cash transactions as compared to those involved in stock transactions. The type of merger horizontal, vertical or conglomerate affects the reaction of market on the day of announcement (Papadatos 2011).

The impact of announcement can be significantly different if the different window periods are chosen for calculating abnormal returns (Andrade, Mitchell, & Stafford 2001,Swaminathan, Murshed, & Hulland 2008, Aintablian & Roberts 2005, Scholtens & Wit 2004, Athanasoglou, Asimakopoulos, & Georgiou 2005, Pandey 2001). Even the indices used for analysis can affect the results (Scholtens & Wit, 2004). In fact, the mode of payment may also affect the returns generated for the shareholders of target and bidding firms (Singh & Kohli 2005). There are many studies with conflicting conclusions. An analysis of US companies between 1963-86 resulted in significant abnormal returns for the target firm's shareholders in the event period of -20 to +10 days (Jarrell & Poulsen 1989). Chakraborty (2010) reported negative returns whereas Franks, Harris & Titman (1991) and Swanstrom (2006) showed positive returns for the target firm's shareholders. A study by Rosen (2006) indicated that when the markets for mergers are *hot* (large number of mergers), the bidding firms earn high returns in the short run, whereas in the long run their returns are reversed. These long run results were estimated to be even worse than the short run results in the cold merger markets (Rosen 2006). Studies in several Asian markets including India, China, Hong Kong and Japan produced either small positive or negative returns for the bidding firm shareholders that were considered insignificant (Rani, Yadav, & Jain 2013, Anand & Singh 2005).

3. Objectives and Research methodology

The primary objective of this study is to understand, identify and measure if M&A announcement creates any abnormal returns to the shareholder's of the target firms and the bidder firms in the Asia-Pacific markets. Study of literature points out the lack of empirical studies in the said area for the geography and time period under purview.

The study is based on 37 Mergers and Acquisition announcements in the Asia Pacific Market during May 2013 to September 2013. The study analyses the reaction of the stock prices of the firms involved in the selected M&A announcements during different event windows, i.e. ±2 days, ±5 days, ±7 days and ±10 days. The study also attempts to analyze if the abnormal returns (if any) generated by the announcements are statistically significant or not. Event study methodology (Corrado 2010) has been employed to measure the amount of abnormal returns (positive or negative) due to M&A announcements. The study attempts to reflect on the informational value of an M&A announcement by calculating abnormal returns, if any. The underlying assumption of this methodology is the efficiency in markets and the means by which the information is processed is unbiased in nature (Fama, Fisher, Jensen, & Roll 1969).

Following is a detailed procedure for the event study methodology adopted in this research:

M&A announcement is the event considered for this study. Event period or event window is defined as the time interval chosen for the study where 0 is the announcement date. Usually for the study of M&A announcements the window chosen is few days before and after the announcement. As per the Efficient Market Hypothesis (EMH) the announcement should incorporate the changes in the stock prices on the announcement date itself, but since these kinds of studies try to analyze the violation of efficient market hypothesis (Peterson, 1989), the pre-event and post-event period has been considered. The pre-event period is considered to estimate any leakages of information and analyze the effects of the same. The post-event period is considered to estimate any delay in the reach of the information being disseminated (Peterson 1989).

The data of the M&A announcements in the period May 2013 – September 2013 of the publicly traded, target and bidding firms, in the Asia-Pacific market available on S&P Capital IQ and Yahoo Finance (Refer to **Appendix 1** for the list of M&A announcements used for the research). For each firm involved in the M&A announcement, an appropriate broad market index has been selected as a benchmark to reflect the market movements (Refer **Appendix 2** for further details). Data of few indices has been acquired from the respective exchange's website like Gre Tai Market Index, etc.

The final sample consists of 37 M&A announcement selected where both the bidder and the target are publicly traded in the Asia-Pacific region. This was achieved by selecting all M&A announcements till September 2013 and filtering only those announcements in which both the target and the bidder were publically traded in any of the markets in Asia Pacific region. This led to 43 announcements being selected. Some of these announcements were such that sufficient data was not available, like those from Kazakhstan and Luxembourg, and thus were excluded from the study. Thus, the sample size boiled down to 37 announcements. The central limit theorem suggests if distribution that has a large sample size (n>30) then the distribution is assumed to be a normal distribution. The data of the announcement dates, security prices of the target firms involved in the M&A announcement in the event window period (i.e. from –t to +t) and the prices of the market indices were recorded and analyzed.

3.1 Normal and abnormal return measurement

The abnormal return is calculated using the difference between the actual returns and expected returns of the firms. Abnormal return of a security i,

$$AR_{i,t} = R_{i,t} - E[R_{i,t}] \tag{1}$$

Where, $R_{i,t}$ is the actual return and $E[R_{i,t}]$ is the expected or normal return(Duso, Gugler, & Yurtoglu, 2010).

Different methods have been suggested to calculate abnormal returns viz; Constant Mean Return Model (mean adjusted), Market Model, Capital Asset Pricing Model (Mackinlay 1997), and Constant Mean Return Model (Market-adjusted) (Peterson 1989)

This study has used Constant Mean Return Model (Market-adjusted), where abnormal returns on each day in the event window are calculated.

$$AR_{i,t} = R_{i,t} - X_i \tag{2}$$

Where, AR_{it} is the abnormal return on the stock i, on day t

R_{it} is the return on a particular equity stock i, on particular day t and,

X_i is the average return on the market index that is assumed to be constant over the event window.

A market index can appropriately measure the benchmark returns that are considered to be the "normal" return expected by an investor at a particular point of time in the market. To measure any sort of "abnormal" returns we

subtract the "normal market return" of a broadly traded market index from the stock's (target or bidding firms) return.

This study used the constant mean return (market adjusted) model since the constant mean return (mean-adjusted) model does not reflect the fair and constant normal returns of the firms involved in the M&A announcement in the estimation period as against the market index returns in the market adjusted model. Hence there is bias in the abnormal returns calculated by the mean-adjusted model. The CAAR of the target and the bidding firms have been tested using the following hypothesis:

H0: Announcements do not affect shareholder value of the firms involved in the M&A announcement, (CAAR = 0, i.e. abnormal returns are not significant)

H1: Announcements affect shareholder value of the firms involved in the M&A announcement, (CAAR ≠ 0, i.e. abnormal returns are significant)

This is similar to what was used in earlier studies way back in 1984 by Brown & Warner (1984).

This hypothesis has been tested for bidding and target firms, separately, and for each of the event windows, viz;±2 days, ±5 days, ±7 days and ±10 days. Then, above hypothesis were tested by using t values at At 1%, 5% and 10% level of significance. A two-tailed test has been applied to test the significance of the CAAR produced by the target and the bidding firms.

The significant returns could be on both the sides of the mean, a two-tailed test. The t-statistics for this research at 1%, 5% and 10% level of significance, with 36 degrees of freedom (df = n−1, where n=37) are as follows.

Table 1. Critical values for a t-test with df = 36

Level of Significance	Critical Values
10%	±1.688
5%	±2.028
1%	±2.719

Hypothesis testing has also been conducted on the target firms' and bidder firms' pre-announcement CAAR and post-announcement CAAR for the ±2 days event window, to understand the leakage of private information prior to the announcements in the Asia-Pacific market. A paired sample analysis is conducted to test the same for which the hypotheses test is stated below:

H_0: Post-announcement CAAR ≤ Pre-announcement CAAR

H_1: Post-announcement CAAR > Pre-announcement CAAR

If the null hypothesis is accepted, the hypothesis indicates leakage of insider information in the market leading to shareholders acting on the stocks before the official public announcements and earning higher CAAR prior to the announcement. Rejection of null hypothesis indicates that the investors act upon the information after it is officially available to the public.

4. Analyses and Discussion

4.1 Bidding Firms

The hypothesis test results in failing to reject the null hypothesis, which indicates that the cumulative average abnormal returns are statistically insignificantly different from zero at all levels of significance. This indicates that there in no informational value created for the shareholders of the bidding firm as they do not earn any sort of abnormal returns as a result of the M&A announcement.

The below table indicates the p-values generated for different time windows. P-values indicate the level of significance where the null hypothesis starts to get rejected. They are significantly high, i.e. around 32.8% on an average of all event windows and thus probability of accepting the null hypothesis (announcements do not affect shareholder value) is till this very high value. Hence, the statistics that is run at 1%, 5% and 10% level of significance fails to reject the null hypothesis, indicating that the M&A announcements do not create significant value to the bidding firms' shareholders.

Table 2. T-test results for the bidding firms

	Cumulative Average Abnormal Returns (CAAR)	t-statistic	P-value	Is the CAAR statistically significant?*
±2 days	1.2%	0.929	0.359	No
±5 days	1.7%	0.946	0.351	No
±7 days	2.3%	1.132	0.265	No
±10 days	2.5%	0.968	0.340	No

*at 1%, 5% and 10% level of significance

The other way of determining the value created through this hypothesis testing is to look at the t-statistic values. The t-statistic for all the event windows lay in the acceptance region of the normal distribution graph and hence the null hypothesis is accepted. The below graph indicates the same (at 5% level of significance). If the t-test statistic lies in the shaded portion the null hypothesis is rejected, otherwise it is accepted.

Normal Distribution Graphs of the T-test Result

±2 days

±5 days

±7 days

±10 days
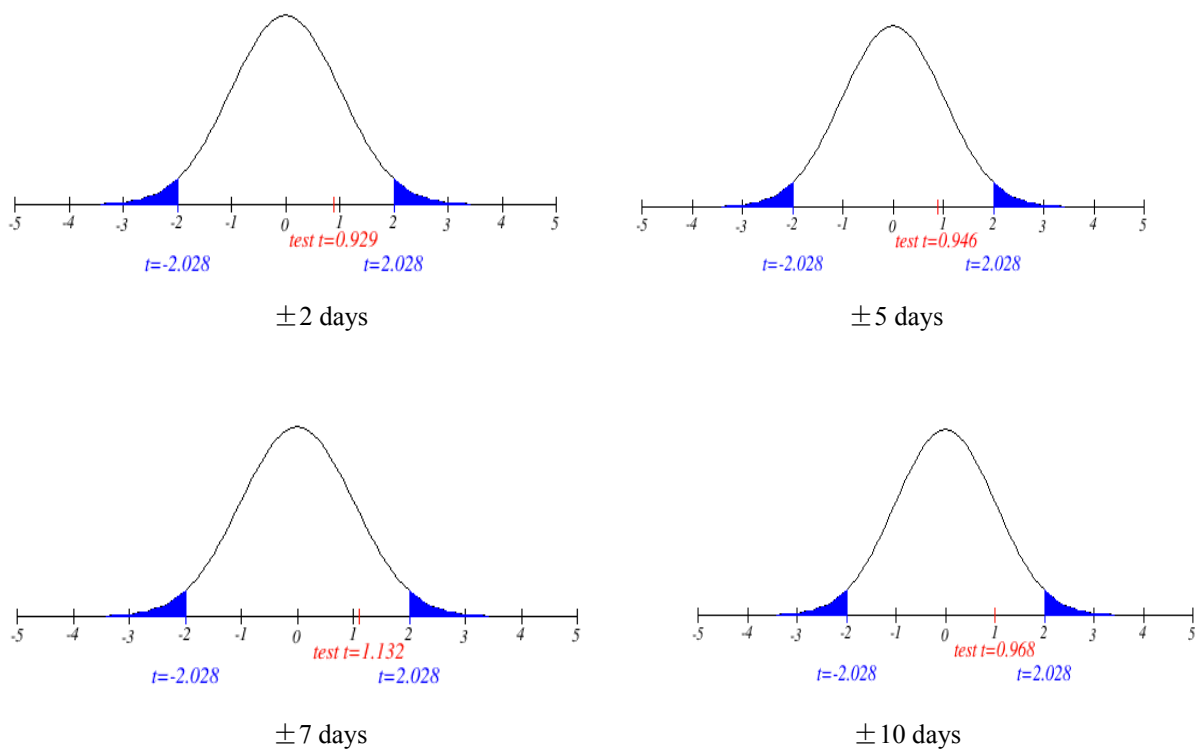
This result is in line with the findings of the earlier studies including, (Swaminathan, Murshed, & Hulland 2008, Papadatos 2011, Franks, Harris, & Titman 1991, Chakraborty 2010) and in contrast with researches like, (Wong, Cheung, & Mun 2009, Rosen 2006, Aintablian & Roberts 2005).

There is a common notion in the market about the high risk involved for the bidding firm arising from an acquisition without extensive due diligence that could lead to humongous losses. This may be one of the reasons that the shareholders feel a sense of skepticism about the growth of the merged entity and hence an announcement does not yield positive returns for the bidding firms' shareholders.

Across event windows: The p-value of the bidding firms depicts a higher value when the event window is shorter (0.36 for an event window of ±2 days) as compared to longer windows (0.27 for an event window of ±7 days). This indicates that in the short periods, the CAAR is highly insignificant than in slightly longer periods. This further suggests that the stock prices may show small positive abnormal returns over longer periods, but immediately after the event there are no significant returns from the bidding firm's shareholders. It is difficult to draw any consistent conclusion because the p-value rises to 0.34 for the 11 days event period (±10 days).

From the table of the bidding firms, we can infer that the CAAR of the bidding firms shows a small positive abnormal return in the range of 1.2% - 2.5% across all event windows, but as seen in the hypothesis test this return is not statistically significant and could be driven by outliers. These outliers could yield a positive return due to a positive market perception about the merger's success or difference in the deal offering or the type of merger that the market believes will grow successfully in the future.

Bidder firms' ±2 day event window: The high p-value of 0.386 indicates that we fail to reject the null hypothesis at 1%, 5% and 10% level of significance. This indicates that the post-announcement returns (CAAR) are less than or equal to pre-announcement returns (CAAR) by a mean difference of 0.6%, further suggesting that the announcement does not create any sort of abnormal returns to the bidder firm's shareholders. Since the pre-announcement returns in the event window of ±2 days is greater by a marginal difference, there might be a low probability of presence of any sort of insider information on which the market reacts to before the occurrence of the event.

Table 3. Bidder firms' ±2 day event window

Paired-sample analysis for Pre-announcement minus Post-announcement period CAAR	
Summary measures for Pre-announcement minus Post-announcement period CAAR	
Sample size	37
Sample mean	-0.006
Sample standard deviation	0.122
Test of mean>=0 versus one-tailed alternative	
Hypothesized mean	0.000
Sample mean	-0.006
Std error of mean	0.020
Std error of mean	36
t-test statistic	-0.292
p-value	0.386

4.2 Target Firms

The analysis pertaining to the target firms indicate existence of statistically significant CAAR across all the event windows. The p-values are low and the t-statistic lies in the rejection region and thus the null hypothesis is rejected, indicating that the target firms' shareholder earn abnormal returns due to the announcement of an M&A. The target firms in an M&A announcement create a significant amount of valuable information to the respective shareholders.

The p-value indicates the probability level of accepting the null hypothesis. The p-values of 0.001 indicate that the null hypothesis is being rejected from the levels as low as 0.1% of significance level. Hence, it shows that at 1%, 5% and 10% level of significance the null hypothesis is rejected indicating that announcement do create shareholder value for the target firms' shareholders. Unlike for the bidding firms, where the result of the hypothesis testing across all event windows and all levels of significance is the same, there is an exception in the results of the target firms returns in the event window ±2 days. The p-value is slightly higher than 1% that indicates that the null hypothesis is accepted at 1% level of significance.

Table 4. T-test results for the target firms

	Cumulative Abnormal (CAAR)	Average Returns	t-statistic	P-value	Is the CAAR statistically significant?
±2 days	9.5%		2.617	0.013	Yes*
±5 days	10%		3.728	0.001	Yes**
±7 days	16.1%		4.415	0.000	Yes**
±10 days	14.6%		3.830	0.000	Yes**

*at 5% and 10% level of significance; **at 1%, 5% and 10% level of significance

Also, looking at the t-test statistic, it is clear that all the t-test statistic result lie in the rejection region, indicating that the null hypothesis is rejected. Below are the graphs of the same at 5% level of significance for all event windows. If the t-test statistic lies in the shaded portion the null hypothesis is rejected, otherwise it is accepted.

Normal Distribution Graphs of the T-test Result
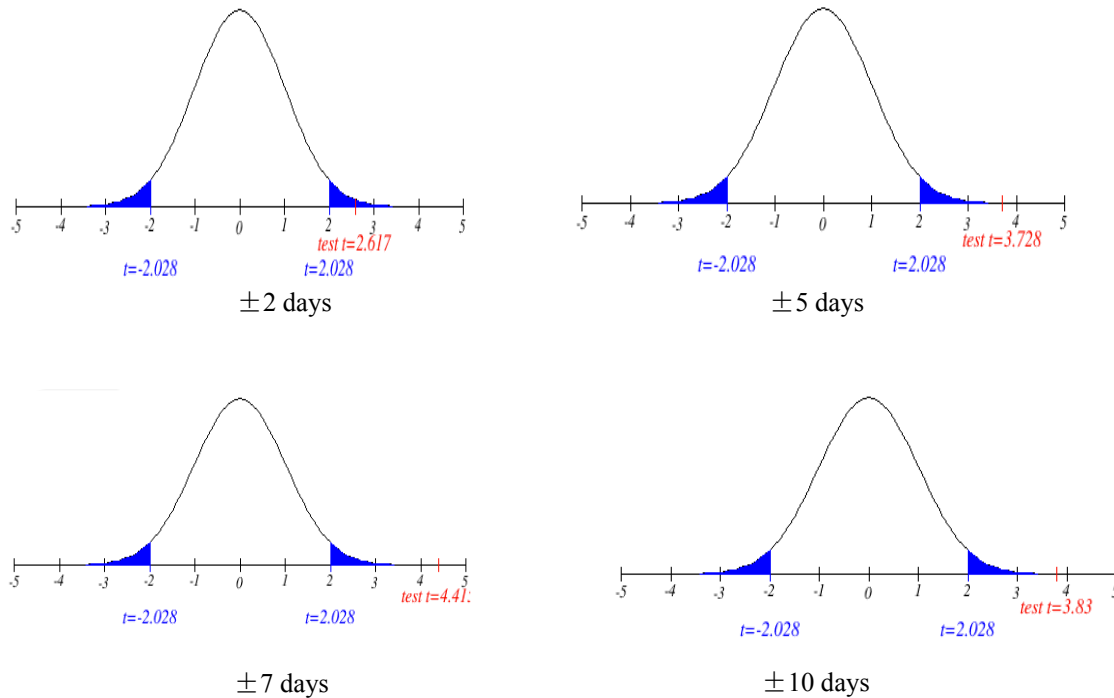
This result of the target firms is in line with almost all the researchers including,(Athanasoglou, Asimakopoulos, & Georgiou 2005, Huang & Walking 1987, Jarrell & Poulsen 1989, Singh & Kohli 2005, Scholtens & Wit 2004), as against (Wong, Cheung, & Mun 2009) whose research resulted in negative abnormal returns in the different markets.

Investors are aware about the high amount of premiums paid to the target firm if the deal is closed. This leads to high returns to the target firm's shareholders if the merger is underwritten. Thus, an announcement generally attracts investors to buy the shares of the target firm in hopes of earning higher returns in the future.

Across event windows: The p-values decrease with the larger event windows, signifying a greater significance for larger event windows. This implies that the returns calculated over larger event windows are more significant than returns over shorter windows. Though the returns to the target firm's shareholders are highly significant in every event window, the research suggests that the larger event window returns are most visible and prominent (Pandey 2001).

From the table of the CAAR of the target firms below, we can infer that the CAAR increases with the length of the event window, suggesting that over longer periods an M&A announcement fetches higher CAAR. Since a merger is regarded to be beneficial for the target firm in the long run due to the efficiencies brought by the acquirers, the target firm's shareholders are expected to reap the benefits that are foreseen in the future (Peter 2011).

Target firms' ±2 day event window: Further considering the abnormal returns during pre-announcement and post-announcement period, the p-value is 0.041 and the t-statistic for the same is -1.793, indicating that the null hypothesis is rejected at 5% level of significance. This concludes that the Post-announcement CAAR is greater than Pre-announcement CAAR by mean difference of 6.9%. The semi-strong form efficient market hypothesis states that the stock prices react to the information in the present and there is an immediate reaction to the information disclosure. This emerges very clearly from the hypothesis that was tested on the event window of ±2 days.

Table 5. Target firms' ±2 day event window

Paired-sample analysis for Pre-announcement minus Post-announcement period CAAR	
Summary measures for Pre-announcement minus Post-announcement period CAAR	
Sample size	37
Sample mean	-0.069
Sample standard deviation	0.233
Test of mean>=0 versus one-tailed alternative	
Hypothesized mean	0.000
Sample mean	-0.069
Std error of mean	0.038
Degrees of freedom	36
t-test statistic	-1.793
p-value	0.041

5. Limitations and Conclusion

The research analyzes the effect of M&A announcement on prices of securities for both target and bidder firms. The research focuses on 37 announcements by publicly traded bidder and target firms in the Asia-Pacific region during the time period from May 2013 to September 2013.

The analyses were carried out using the event study methodology, using event windows of 2,5,7 and 10 days before and after the announcement date. The abnormal returns and cumulative average abnormal returns (CAAR) were calculated using the constant mean return (market-adjusted) model and then hypothesis testing was performed over the CAAR of the sample to identify if the CAAR is statistically significant.

The hypothesis test was run over the CAAR of the target and the bidding firm over 4 different event windows. The CAAR of the target firms over the 4 event windows are statistically significant and increase with the length of the event windows. Also, with increasing length of the event window, the lower p-value suggests that the CAAR is more statistically significant than at relatively shorter event windows.

The results of the study indicate that CAAR of bidding firms across different event windows are not statistically significant, signifying thereby that they do not create any abnormal returns as a result of the M&A announcement. Though the CAAR value shows a small positive abnormal return, outliers seem to drive the CAAR values. The p-value is lower with increasing length of the event windows, suggesting that over long-term the CAAR is less statistically insignificant than over short-term.

The pre-announcement and post-announcement average abnormal returns of 37 target and bidding firms were also tested for their significance. A paired sample analysis was conducted for the same and the result leads us to determine the form of efficiency prevailing in the market. The target firms' results showed that the post-announcement returns were greater than the pre-announcement returns by a mean difference of 6.9%, indicating that the investors act upon the announcement. The bidding firms' analysis shows that the pre-announcement returns are higher than the post announcement returns, thus it could be indicating a strong form of efficiency where there is a small possibility of insider trading. Since there is only a marginal difference of mean of 0.6%, we cannot signify this as a strong form of efficiency.

Some of the data was not available for particular mergers in the sample and thus these could not be considered. For example a merger in Kazakhstan did not have the data available for historical prices of Kazakhstan index (KZKAK).

If a merger is announced on a weekend, then no data would be available on those dates. Due to this we had to take a date that was actually two days later than the merger announcement date thus leading to discrepancy in the data collected.

At some dates in the event window either the stock data or the index data were not available. This led us to deleting those dates, as we could not calculate abnormal returns by using the partial information available.

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Appendices

Appendix 1

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Firms Involved in the M&A Announcement

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Sr No	Announcement date	Target	Bidder
1	Sep-4-2013	Marukyo Corporation (FKSE:9866)	Nishi-Nippon Railroad Co., Ltd. (TSE:9031)
2	Sep-3-2013	The Trust Company Limited (ASX:TRU)	IOOF Holdings Limited (ASX:IFL)
3	Sep-3-2013	Thu Duc Wasuco J.S.C. (HOSE:TDW)	Refrigeration Electrical Engineering Corporation (HOSE:REE)
4	Aug-23-2013	Invictus Gold Limited (ASX:IVG)	Impact Minerals Limited (ASX:IPT)
5	Aug-19-2013	Tysan Holdings Ltd. (SEHK:687)	The Blackstone Group L.P. (NYSE:BX)
6	Sep-2-2013	China Minzhong Food Corporation Limited (SGX:K2N)	PT Indofood Sukses Makmur Tbk (JKSE:INDF)
7	Aug-12-2013	Royal Electric Co.,Ltd. (JASDAQ:6593)	Odawara Engineering Company Limited (JASDAQ:6149)
8	Jul-30-2013	China Gas Holdings Limited (SEHK:384)	Beijing Enterprises Holdings Ltd. (SEHK:392)
9	Jul-30-2013	Clough Limited (ASX:CLO)	Murray & Roberts Holdings Ltd. (JSE:MUR)
10	Jul-29-2013	DWANGO Co., Ltd. (TSE:3715)	Nippon Telegraph and Telephone Corporation (TSE:9432); Nippon Television Network Corporation
11	Jul-23-2013	NexG Co. Ltd. (KOSE:A081970)	Hansol Inticube Co., Ltd. (KOSE:A070590)
			Solacia Corp. (KOSE:A070300)
12	Sep-4-2013	Stemlife Berhad (KLSE:STEMLFE)	Cordlife Group Limited (SGX:P8A)
13	Jul-20-2013	Kalindee Rail Nirman (Engineers) Limited (BSE:522259)	Texmaco Rail & Engineering Ltd (BSE:533326)
14	Jul-15-2013	Australian Power and Gas Company Limited (ASX:APK)	AGL Energy Limited (ASX:AGK)
15	Jul-15-2013	Breakaway Resources Ltd. (ASX:BRW)	Minotaur Exploration Limited (ASX:MEP)
16	Jul-15-2013	Bull Will Co., Ltd. (GTSM:6259)	Serial System Ltd. (SGX:S69)
17	Jul-16-2013	Yume no Machi Souzou Iinkai Co., Ltd. (JASDAQ:2484)	Japan Best Rescue System Co.,Ltd. (TSE:2453)
18	Jul-16-2013	Envestra Limited (ASX:ENV)	APA Group (ASX:APA)
19	Jul-11-2013	KAMA Co.,Ltd. (SHSE:900953)	Weichai Power Co. Ltd (SEHK:2338)
20	Jul-12-2013	Kumpulan Europlus Bhd (KLSE:KEURO)	MWE Holdings Bhd (KLSE:MWE)
21	Jul-10-2013	RHG Limited (ASX:RHG)	Cadence Capital Limited (ASX:CDM)
22	Jul-8-2013	Yancoal Australia Ltd (ASX:YAL)	Yanzhou Coal Mining Co. Limited (SEHK:1171)

23	Jul-5-2013	PT. Global Mediacom Tbk. (JKSE:BMTR)	PT MNC Investama Tbk (JKSE:BHIT)
24	Jul-3-2013	UBprecision Co. Ltd. (KOSE:A053810)	HB Technology CO.,LTD. (KOSE:A078150)
25	Jul-2-2013	Argosy Minerals Limited (ASX:AGY)	Baru Resources Limited (ASX:BAC)
26	Jun-30-2013	Clough Limited (ASX:CLO)	BT Investment Management Limited (ASX:BTT)
27	Jun-24-2013	PT Indomobil Sukses Internasional Tbk (JKSE:IMAS)	Gallant Venture Ltd (SGX:5IG)
28	Jun-24-2013	Asia Precision Public Company Limited (SET:APCS)	Ua Withya Public Company Limited (SET:UWC)
29	Jun-24-2013	Food Junction Holdings Ltd. (SGX:529)	Auric Pacific Group Limited (SGX:A23)
30	Jun-20-2013	Xceed Resources Limited (ASX:XCD)	Keaton Energy Holdings Limited (JSE:KEH)
31	Jun-18-2013	Pakfood Public Company Limited (SET:PPC)	Thai Union Frozen Products Public Company Limited (SET:TUF)
32	Jun-18-2013	Yashili International Holdings Limited (SEHK:1230)	China Mengniu Dairy Co. Limited (SEHK:2319)
33	Jun-13-2013	Simplex Holdings Inc. (TSE:4340)	KARITA & Company Inc.; The Carlyle Group LP (NasdaqGS:CG)
34	Jun-12-2013	Yamada Green Resources Limited (SGX:MC7)	Global Yellow Pages Limited (SGX:Y07)
35	Jun-5-2013	Parkson Holdings Berhad (KLSE:PARKSON)	Lion Industries Corporation Berhad (KLSE:LIONIND)
36	Jun-5-2013	United Fiber System Limited (SGX:P30)	PT Golden Energy Mines Tbk (JKSE:GEMS)
37	May-7-2013	APAC Resources Limited (SEHK:1104)	Shanghai Xinpeng Industry Co.,Ltd. (SZSE:002328)

Appendix 2

List of market indices

Region	Stock Exchange (SE)	Market index
Japan	Fukuoka SE	Nikkei 225 (^N225)
Japan	Tokyo SE	Nikkei 225 (^N225)
Australia	Australian Stock Exchange	All ordinaries index (XAO)
Hong kong	Hong Kong SE	Hang Seng Index (^HSI)
US	New York SE	NYSE Composite
US	JASDAQ	JASDAQ Index
Johhanesburg	Johhanesburg SE	FTSE/JSE All Share Index
Korea	Korean SE	KOSPI Composite Index (^KS11)
India	Bombay SE	BSE Sensex
Taiwan	Gre Tai Securities Market	GTSM Index
China	Shanghai SE	^SHSEC - Shanghai SE Composite
Malaysia	Kuala Lampur SE	Malaysia KLSE Composite Index
Indonesia	Jakarta SE	Composite Index (^JKSE)
Thailand	SE of Thailand	SET Index
Singapore	Singapore Exchange	Straits Times Index (^STI)
India	NASDAQ	Nasdaq Composite Index
Vietnam	Ho Chi Minh SE	Vietnam VN-Index

Appendix 3

Target Firms

Event Window: Two days before and after the announcement (total of 5 days)

Results for one-sample analysis for Target_two	
Summary measures	
Sample size	37
Sample mean	0.095
Sample standard deviation	0.222
Confidence interval for mean	
Confidence level	95.0%
Sample mean	0.095
Std error of mean	0.036
Degrees of freedom	36
Lower limit	0.021
Upper limit	0.169
Test of mean=0 versus two-tailed alternative	
Hypothesized mean	0.000
Sample mean	0.095
Std error of mean	0.036
Degrees of freedom	36
t-test statistic	2.617
p-value	0.013

Event Window: Five days before and after the announcement (total of 11 days)

Results for one-sample analysis for Target_five	
Summary measures	
Sample size	37
Sample mean	0.100
Sample standard deviation	0.163
Confidence interval for mean	
Confidence level	95.0%
Sample mean	0.100
Std error of mean	0.027
Degrees of freedom	36
Lower limit	0.045
Upper limit	0.154
Test of mean=0 versus two-tailed alternative	
Hypothesized mean	0.000
Sample mean	0.100
Std error of mean	0.027
Degrees of freedom	36
t-test statistic	3.728
p-value	0.001

Event Window: Seven days before and after the announcement (total of 15 days)

Results for one-sample analysis for Target_Seven	
Summary measures	
Sample size	37
Sample mean	0.161
Sample standard deviation	0.222
Confidence interval for mean	
Confidence level	95.0%
Sample mean	0.161
Std error of mean	0.037
Degrees of freedom	36
Lower limit	0.087
Upper limit	0.236
Test of mean=0 versus two-tailed alternative	
Hypothesized mean	0.000
Sample mean	0.161
Std error of mean	0.037
Degrees of freedom	36
t-test statistic	4.415
p-value	0.000

Event Window: Ten days before and after the announcement (total of 21 days)

Results for one-sample analysis for Target_ten	
Summary measures	
Sample size	37
Sample mean	0.146
Sample standard deviation	0.232
Confidence interval for mean	
Confidence level	95.0%
Sample mean	0.146
Std error of mean	0.038
Degrees of freedom	36
Lower limit	0.069
Upper limit	0.224
Test of mean=0 versus two-tailed alternative	
Hypothesized mean	0.000
Sample mean	0.146
Std error of mean	0.038
Degrees of freedom	36
t-test statistic	3.830
p-value	0.000

Bidder Firms

Event Window: Two days before and after the announcement (total of 5 days)

Results for one-sample analysis for Bidder_two	
Summary measures	
Sample size	37
Sample mean	0.012
Sample standard deviation	0.078
Confidence interval for mean	
Confidence level	95.0%
Sample mean	0.012
Std error of mean	0.013
Degrees of freedom	36
Lower limit	-0.014
Upper limit	0.038
Test of mean=0 versus two-tailed alternative	
Hypothesized mean	0.000
Sample mean	0.012
Std error of mean	0.013
Degrees of freedom	36
t-test statistic	0.929
p-value	0.359

Event Window: Five days before and after the announcement (total of 11 days)

Results for one-sample analysis for Bidder_five	
Summary measures	
Sample size	37
Sample mean	0.017
Sample standard deviation	0.108
Confidence interval for mean	
Confidence level	95.0%
Sample mean	0.017
Std error of mean	0.018
Degrees of freedom	36
Lower limit	-0.019
Upper limit	0.053
Test of mean=0 versus two-tailed alternative	
Hypothesized mean	0.000
Sample mean	0.017
Std error of mean	0.018
Degrees of freedom	36
t-test statistic	0.946
p-value	0.351

Event Window: Seven days before and after the announcement (total of 15 days)

Results for one-sample analysis for Bidder_seven	
Summary measures	
Sample size	37
Sample mean	0.023
Sample standard deviation	0.125
Confidence interval for mean	
Confidence level	95.0%
Sample mean	0.023
Std error of mean	0.020
Degrees of freedom	36
Lower limit	-0.018
Upper limit	0.065
Test of mean=0 versus two-tailed alternative	
Hypothesized mean	0.000
Sample mean	0.023
Std error of mean	0.020
Degrees of freedom	36
t-test statistic	1.132
p-value	0.265

Event Window: Ten days before and after the announcement (total of 21 days)

Results for one-sample analysis for Bidder_ten	
Summary measures	
Sample size	37
Sample mean	0.025
Sample standard deviation	0.157
Confidence interval for mean	
Confidence level	95.0%
Sample mean	0.025
Std error of mean	0.026
Degrees of freedom	36
Lower limit	-0.027
Upper limit	0.077
Test of mean=0 versus two-tailed alternative	
Hypothesized mean	0.000
Sample mean	0.025
Std error of mean	0.026
Degrees of freedom	36
t-test statistic	0.968
p-value	0.340