“Testing Hubris Hypothesis for Mergers in Pakistan: Using Event Study Technique”

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Abstract

Hubris Hypothesis for mergers (Roll, 1986) is the benchmark for testing the effect of merger on the value of the firm. In this study the Hubris Hypothesis has been tested for mergers in Pakistan by using the event study technique (MacKinlay, 1997). 42 events of mergers in Pakistani Stock Market during the period 2000-2012 have been considered for study purpose. The study concludes that the Average Abnormal Returns (AAR) tend to be positive in pre-merger period and negative in post-merger period but the Hubris Hypothesis does not sustain as true for mergers in Pakistan.

Key words: Hubris Hypothesis, Mergers, Average Abnormal Returns, Event Study, Parametric and Non Parametric tests.

1. Introduction

Financial investors and financial analysts both are curious about the value of the firm especially when any corporate level event occurs. It was hard to answer what happens to the value of the firm when an corporate level event like merger occurs, until Fama (1970) gave the concept of Efficient Market Hypothesis. The benchmark technique of Event Study to test the Efficient Market Hypothesis (effect on value of the firm) was given by MacKinlay (1997). The event study technique is regarded as standard for evaluating the impact of an event on value of the firm (Brown & Warner, 1985; MacKinlay, 1997). Variety of corporate events have been studied like Acquisitions, issuing new stocks, and management change (Asquith & Mullins Jr, 1983; Brown & Warner, 1985). In this study the impact of merger on the value of the firm has been examined.

The Hubris Hypothesis of mergers is considered as a benchmark for evaluating the effect of merger on the value of the firm. It states that bidder firms' return is significantly positive in pre-Merger and Acquisition (M&A) period and it is significantly negative in post M&A period (Roll, 1986). Rational behind this hypothesis is that the acquiring firm is overvalued because of over confidence of stock holders of the bidder firm which creates the hike in prices more than what the real value is, and just after the merger, the market corrects itself and prices come to the intrinsic values of the merger for the acquirer. Graphical representation of Hubris Hypothesis

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has been given in Annexure Table B. For testing this hypothesis the standard event study technique with market and Capital Asset Pricing Model CAPM model (Brown & Warner, 1985; MacKinlay, 1997) has been used.

In Pakistan, mostly M&A have been studied with the reference to financial performance (Kemal, 2011; Kouser & Saba, 2011), very less work has been done on analyzing the value of the stock or stock holder's wealth, pre and post mergers using event study technique. In literature Mahmood, Aamir, Hussain, and Sohail (2011), Bashir, Sajid, and Sheikh (2011) and Rafique and Muhammad (2013) are the most prominent works, but they have conflicting results, which raises a question whether mergers make any instant impact on the value of the acquiring firm in Pakistan. Put differently, from investors' point of view what should be the immediate effect of merger on the shareholder of the acquiring firm?

Mergers and Acquisition are making the restructuring and modifications in financial dynamics of the corporate sector (Amel, Barnes, Panetta., & Salleo, 2004). Literature gives different views regarding the cause behind the M&A, for example Kenneth D. Jones and Critchfield (2005) argue that the poor economic conditions are the main reason behind M&A which make it hard to survive for the small firms. On the other hand, few researchers argue that the efficiency gain or synergy effect is the reason behind the M&A (Chronopoulos, Claudia Girardone, & Nankervis, 2012). M&A in Pakistani stock market is not having strong roots in terms of its history and depth as compared to other developed countries; like in USA. In USA the first business combination can be traced back in 1883 while in Pakistan the first merger occurred in 1995. The number and size of mergers in Pakistan is also smaller as compared to developed countries. Table 1 reports the yearly History of M&A in Pakistani stock market from 1995-2012.

The remaining paper is distributed in 4 sections. Section 2 discusses the research question and literature review, section 3 explains the methodology of study, section 4 presents the analysis and findings, while section 5 concludes the study.

2. Research Question and Literature:

2.1 Development of Research Question

As mentioned earlier, in Pakistan, mostly M&A have been studied with the reference of financial performance (Kemal, 2011; Kouser & Saba, 2011), limited work has been done on analyzing the value of the stock or stock holder's wealth, pre and post mergers using event study technique as defined by Brown and Warner (1985); Fama (1970); MacKinlay (1997).

Table 1: M&A History in Pakistan

S.No	Year	No. of Mergers	Total Paid up Capital (million)
1	2012	01	132.75
2	2011	03	27,484.86
3	2010	04	1469.488
4	2009	04	1370.648
5	2008	04	7,161.60
6	2007	05	4956.294
7	2006	14	12661.87
8	2005	03	543.202
9	2004	39	8087.645
10	2003	08	1799.352
11	2002	16	3496.518
12	2001	07	3,890.95
13	2000	01	200.0
14	1999	02	295.807
15	1998	02	1005.636
16	1997	06	2733.061
17	1996	01	335.501
18	1995	01	240.052

Source: KSE official website.

Rafique and Muhammad (2013) made an attempt to test the hubris hypothesis for merger. In that paper the focus was only on the post-merger immediate effect on the value of the stock. Moreover, long run effect of merger on the value of the stock was also measured. The sample size was 12 cases of mergers. The market model was applied along with standard event study technique. The paper concludes that hypothesis sustains as true as value of the stock decline just after the mergers. Testing of only one dimension of Hubris Hypothesis (post-merger effect), small size of sample and the use of one market model for estimation leads to room for further quest in to the issue.

Mahmood et al. (2011) examined the effect of M&A on share price by testing the Hubris Hypothesis. They considered 8 merger cases during 2000-2002 as their sample size. They concluded that 5 out of 8 bidder companies' stock values have increased after merger, 2 companies were down and 1 company has shown no change. The conclusion was drawn on the basis of one month pre and one month post-merger stock values graphical presentation. That was a good effort on the emerging issue of

study but this study lacks the statistical analysis and more importantly the standard technique of event study analysis. So conclusion cannot be considered as good reference in the literature.

Bashir et al. (2011) tested Hubris Hypothesis by examining the forty five mergers in Karachi Stock Exchange (KSE). They used standard event study analysis technique along with Market Model. The study concluded that analysis was unable to accept the Hubris Hypothesis in Pakistan. This paper provides few new dimensions for future studies like the use of different models and tests under the basic event study analysis technique.

Deo (2012) tested the Hubris Hypothesis for M&A in Indian market. The sample consists of 22 mergers of banking and technology firms. Using the event study method they conclude that Hubris Hypothesis does not sustain for their study. The results are in contrast with most of the studies done in the developed countries for example Dodd (1980) and Bradley, Desai, and Kim (1983).

Anand and Jagandeep (2008) conducted a study by taking the banking sector of India as a sample, for testing the hubris hypothesis for merger using the sample size of 5 merger cases. The study concludes that there is a positive and significant effect of merger on the value of the acquirer firm's stock.

The above discussion indicates that there are contradictory results regarding the conclusion of hubris hypothesis. Possible reasons for such results can be the model selection, not consistent use of standard event study methodology and/or lack of statistical analysis. So the research questions for the study can be stated as:

RQ.1: Does Hubris Hypothesis of merger sustain in Pakistani Market.

RQ.2: Does the model selection in event study methodology leads to different conclusions for Hubris Hypothesis of merger.

2.2 Literature from Developed Countries

In the developed countries lot of work has been done but empirical findings are conflicting. For example, Firth (1991) conducted event study on mergers in UK during 1969 to 1975. The month of merger announcement has been taken as event window. The results reported that Cumulative Average Abnormal Returns (CAAR) was -.045% for the month of announcement but it was not mentioned that these results were statistically significant or not. Dodd (1980) studied 151 US mergers during 1990 to 1977. The event window selected for the study was 40 days before and after the event. The result of the study shows that the bidder firms Average Abnormal Returns (AAR)

were -0.23% at the zero or event date like the date on which event occur. Another dimension was explored by Bradley et al. (1983) who conducted the study on 90 unsuccessful bidders for mergers and examined the effect of bidding on the value of the firm during the event window. The data for the study was collected from 1962 to 1980. The 20 day event window was used for the study. The study concluded that the bidder have earned more than 2% just one day before the merger date and faced the losses of nearly 3% just after the merger date.

For bidder company the results are different in two different set of data in US, for example Lang, Stulz, and Walkling (1989) studied the US mergers to investigate the effect of merger on the value of the bidder firm. Total 87 firms were studied for this purpose from 1968 to 1986. The event window selected was 5 days pre and 5 days after event. The empirical results concluded that there was significantly negative impact on the bidder in post-merger period. Whereas Smith and Kim (1994) have studied the US stock mergers of nearly 180 mergers from the time period of 1980 to 1986. To trace the impact of merger on stock the window of 5 days was used and the results concluded that just one day before the event of merger the bidder firms stocks were significantly down with nearly 0.23%. Holl and Kyriazis (1997) have examined the bidder firm's stock reaction on mergers. The sample of 178 firms has been used in the study used 10 years merger data starting from 1979. Significantly Negative CAAR results were reported in post-merger period.

Other than US mergers studies the UK, Canada and European mergers have been studied and different results were found. For example in UK more than 1500 mergers have been studied by Higson and Elliott (1998) in order to trace the impact of mergers on acquirer and the target firm. The results show that there are insignificant gains for both the bidder and the acquirer. Whereas Campa and Hernando (2004) studied the 262 European Mergers during the period from 1998 to 2000. The event window of 30 days has been taken. The acquirer significantly negative returns up to 2% have been observed near the merger data. The case of Canada is also having different result as Benae Amar and Andrac (2006) examined 138 mergers. Short event window of one day has been formulated sensing the impact of merger on the value of the firm. The results shows that the acquiring firms earn 1.6% the study have used the market model for calculation of abnormal returns.

Despite the fact that some studies were failed to upheld the hubris hypothesis, on the basis of results of majority of studies it can be concluded that in developed countries the Hubris Hypothesis sustain. As per literature we can say that mostly Hubris Hypothesis confirmed as sustain in developed countries whereas in Pakistan very less work has been done on this topic and work need improvement like use the models for calculating the abnormal returns and testing the hypothesis.

Following are the Hypotheses for this research which are based on the literature, 1st two of them are addressing the Hubris Hypothesis and 3rd one is developed for explain the differences of conclusion for testing the hypothesis.

H1: The value of bidder firm increases just before the merger.

H2: The Value of the Bidder Firm decrease Just after the merger.

H3: Different models lead to different conclusion for Hubris Hypothesis Testing.

3. Population and Sample, Variables and Model:

3.1 Population & Sample

In Pakistan total numbers of mergers are 122 from 1995 to 2013. Due to data availability constraint the mergers from 2000 onwards have been considered. This study has considered both financial and non-financial firms mergers, however since open ended mutual funds are not traded at stock market therefore mutual fund have been dropped.

Upon the examination of financial and non-financial mergers cases we found that there are 34 cases of financial institutions and 16 cases of nonfinancial institutions, in which the companies were demerged/remerged or delisted from the stock market, so were not sustained for data analysis. There are 12 cases of mergers in which the target firm have acquired more than one company on the same date. Final we were

Table 2: An over view of M&A in Pakistan (2000-2013)

Types	No. of M&A
Mutual Funds	30
Financial Institutions	48
Non-Financial Institutions	44
Total	122

Source: KSE official website

left with 42 merger cases.

Table 3: Sample of M&A for the Study (2000-2013)

Types	Total	Excluded	Included	Merger on Same Day (Dropped)	Reason for Exclusion
Mutual Funds	30	30	-	-	Nature of Data is different
Financial Institutions	48	34	13	01	Companies delisted or Remerged. Not sustained for data analysis
Non-Financial Institutions	44	16	17	11	Companies delisted or Remerged. Not sustained for data analysis
Total	122	80	30	12	

Source: KSE official website

For the study the data of dates of mergers were taken from the official data portal of KSE. The data of stock market and companies share prices was also collected from the KSE and business recorder website. The six months Treasury Bills rate have been used as the proxy for risk free rate and collected from the statistical bulletins of State Bank of Pakistan. The data for the stock market return and the individual company returns were collected for 120 days pre-merger period and 10 days event window has been selected as defined by MacKinlay (1997) complete conceptual frame work of event study is given in Annexure Table A.

3.2 Variables

3.2.1. Returns

The stock and market returns are used for data analysis. The formulas are as under

$$R_i = \frac{ClosingStockPrices_t - ClosingstockPrices_{t-1}}{ClosingStockPrices_{t-1}} \quad (1)$$

$$R_i = \text{Log} \left(\frac{ClosingStockPrices_t}{ClosingStockPrices_{t-1}} \right) \quad (1.1)$$

Where R_i is the daily return of the individual stock
 t is current day and $t-1$ is the previous day.

$$R_m = \frac{Stock\ Market\ Index_t - Stock\ Market\ Index_{t-1}}{Stock\ Market\ Index_{t-1}} \quad (2)$$

$$R_{it} = \text{Log} \left(\frac{\text{Stock Market Index}_t}{\text{Stock Market Index}_{t-1}} \right) \quad (2.1)$$

Where R_{it} is the daily return of the KSE-100 Index

Stock Market Index_t is the current Index value

Stock Market Index_{t-1} is the previous day Index value.

3.2.2. Expected Returns

For the calculation of expected return we have used two different models in this study: market return model and CAPM model (MacKinlay, 1997). These models were used by Brown and Warner (1985) the calculations are as under.

$$(E)R_i = \alpha_i + \beta_i R_m + \epsilon_0 \quad (3)$$

Here $E(R_i)$ is the estimated return R_m is the risk of the market. α_i & β_i are the parameters of the OLS regression.

The CAPM model is as follows:

$$(E)R_i = R_i - \{R_f + \beta_i * (R_M - R_f)\} \quad (4)$$

Here the $E(R_i)$ is estimated returns R_i the return of the i^{th} company R_f is the risk free rate here t bill rate of SBP has been used as risk free rate.

3.2.3. Abnormal Returns

Abnormal returns have been calculated as the difference of actual returns minus estimated returns as used by Brown and Warner (1985); MacKinlay (1997) in even study methodology.

$$AR = (A)R - (E)R \quad (5)$$

Where (A)R is the actual return and E(R) is the estimated return where the E(R) has been obtained from equation 3 and 4. The use of AR formula with the use of equation 4 is called as The Jensen model and used by Jensen (1968).

The cumulative abnormal return is the sum of individual firms' returns.

$$CAAR = \sum_{i=0}^n AR_i \quad (6)$$

3.3 Statistical Model Description

Following is an overview of the statistical analysis.

In this study the stock price reaction to the merger has been tested by using different statistical test. As return calculation in eq. 1, 1.1 and 2, 2.1 uses two different types of formula in first set of equations the simple returns and second is log returns have been calculated just to check the pattern of normality in AR data. For this purpose Jarque-Bera test has been used the formula is as under.

$$JB = \frac{n}{6} (s^2 + \frac{1}{4}(K - 3)^2) \quad (7)$$

$$S = \frac{\mu_3}{\delta_3} = \frac{\frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^3}{(\frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2)^{3/2}} \quad (7.1)$$

$$K = \frac{\mu_4}{\delta_4} = \frac{\frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^4}{(\frac{1}{n} \sum_{i=1}^n (x_i - \bar{x})^2)^2} \quad (7.2)$$

Where n is the number of observations (or degrees of freedom in general); S is the sample skewness, and K is the sample kurtosis:

$$t = \frac{AAR}{\sigma(AAR)} \quad (8)$$

Where,

AAR = Average Abnormal Return

$\delta(\text{AAR})$ = Standard Error of Average Abnormal Return

The Standard Error formula is

$$\text{S.E} = \frac{\sigma}{\sqrt{n}} \quad (8.1)$$

Wilcoxon Signed Rank test statistics is given by

$$Z = \frac{w - \frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}} \quad (9)$$

Where w has mean

$$\mu_w = \frac{n(n+1)}{4} \quad (10)$$

w has standard deviation

$$\sigma_w = \frac{n(n+1)(2n+1)}{24} \quad (10.1)$$

4. Analysis and Findings

In the Table 4 the descriptive statistics of Average Abnormal Returns (AAR), AAR_LOG and AAR_CAPM has been given. The three different models used for Abnormal Returns calculation gives different descriptive data like the value of mean is 4.4 with the normal return formula, 0.000 with the log formula and -.000 with AAR_CAPM. The AAR and AAR_LOG are having positive mean value where AAR_CAPM is the value of abnormal returns calculated by using CAPM model which is a dynamic economic model. So it can be concluded that the AAR from market model are positive where CAPM model gives the negative values which is because the risk free rate has been considered while calculating expected returns.

In Figure 1 the results of Jarque Bera (JB) tests have been displayed. The JB test, tests the following hypothesis:

H_0 : Data is Normally distributed.

H_1 : Data is not normally distributed.

So here the value of JB Stats is 4.19 with the probability of 0.122 with the significance level of 5% which leads to the conclusion that we cannot reject the Null

Table 4: Descriptive Analysis

	AAR	AAR_LOG	AAR__CAPM__
Mean	4.470	0.000	-0.000
Median	4.448	0.000	-0.001
Maximum	10.517	0.037	0.035
Minimum	-1.857	-0.035	-0.035
Std. Dev.	3.006	0.014	0.014
Skewness	0.043	0.095	-0.032
Kurtosis	2.156	2.879	2.713

hypothesis at 0.05 level of significance. But it is non-normal at the significance level of 13% so for being at the safe side we have applied the non-parametric Wilcoxon Test on this data set.

Figure 1: JB Test for AAR

In Figure 2 the results of JB tests for AAR_LOG has been displayed. As here the value of JB Stats is 0.29 with the probability of 0.86 with the significance level of 5% which leads to the conclusion that we cannot reject the Null hypothesis at 5 percent level of significance. Even at 10% and 15% therefore, only parametric test can be used.

In Figure 3 displays results of the JB test for AAR_CAPM. In the data of Average abnormal returns we have Jarque-Bera test value 0.50 with the P value of 0.77. Since P Value is greater than 0.05 so we cannot reject the null hypothesis. This indicates that the sample is normally distributed therefore parametric test should be applied.

In the Table 4 the values of Average Abnormal Returns (AAR) and Cumulative Average Returns (Amel et al.) in the +10 and -10 event window have been tabulated. No specific trend can be traced out from pre and post event window as the AAR have mixed positive and negative values in post and pre event window but on the day

of merger the AAR and the CAR for both the models is negative like -0.01% and 0.03% . So we can say that there are negative returns on the day of merger whereas CAR is negative in the complete pre and post windows for both the models.

Figure 2: JB Test for AAR_LOG

Figure 3: JB Test for AAR_CAPM

Table 4: Results for AAR(CAPM) &AAR_Log

Day Relevant to Event	AAR (CAPM)	T statistics	AAR_log	T statistics
-10	0.014	0.196	0.020	0.105
-9	0.001	0.017	-0.004	-0.020
-8	0.004	0.057	-0.003	-0.016
-7	0.001	0.017	-0.011	-0.054
-6	0.017	0.236	-0.000	-0.004
-5	-0.013	-0.174	-0.029	-0.150
-4	0.000	0.003	-0.001	-0.006

-3	0.0159	0.210	0.011	0.057
-2	-0.009	-0.128	-0.030	-0.153
-1	-0.001	-0.015	-0.020	-0.105
0	-0.010	-0.145	-0.036	-0.183
1	0.007	0.101	0.022	0.116
2	0.016	0.220	0.015	0.076
3	0.009	0.131	0.0307	0.1561
4	-0.001	-0.024	-0.004	-0.021
5	0.000	0.008	-0.001	-0.007
6	-0.003	-0.045	-0.003	-0.018
7	-0.006	-0.087	-0.007	-0.038
8	0.016	0.216	0.014	0.073
9	-0.021	-0.289	-0.023	-0.120
10	-0.010	0.137	-0.046	-0.237

In Table 5 the AAR & CAR have been compared with 3 different models. The results are almost the same as on the date of merger the AAR are negative ranging 0.01% to 0.03% for different models. A positive trend of AAR in pre-merger window can be traced in the following table as only 3 out of 10 values of AAR in pre-merger period are negative for first two models and almost same trend in 3rd model which shows the pattern of increase in the firm value in pre-merger period. Whereas, in post-merger date 6 out of 10 values are negative which means firm values decrease in post-merger dates. But these trends are not statistically significant.

Table 5: AAR Vs CAR

DAY RELEVNT TO EVENT	AAR (CAPM)	CAR (CAPM)	AAR_log	CAR_log	AAR	CAAR
-10	0.014	-0.082	0.015	0.032	0.020	0.009
-9	0.001	-0.080	0.001	0.034	-0.004	0.005
-8	0.004	-0.076	0.004	0.038	-0.003	0.002
-7	0.001	-0.075	0.001	0.039	-0.011	-0.008
-6	0.017	-0.057	0.018	0.057	-0.000	-0.009
-5	-0.013	-0.070	-0.012	0.044	-0.029	-0.039
-4	0.000	-0.070	0.000	0.045	-0.001	-0.040
-3	0.015	-0.054	0.015	0.060	0.011	-0.029
-2	-0.009	-0.064	-0.009	0.051	-0.030	-0.059
-1	-0.001	-0.065	-0.001	0.049	-0.020	-0.080

0	-0.010	-0.076	-0.011	0.038	-0.036	-0.116
1	0.007	-0.068	0.007	0.046	-0.022	-0.139
2	-0.016	-0.085	-0.016	0.029	0.015	-0.124
3	0.009	-0.075	0.009	0.039	0.030	-0.093
4	-0.001	-0.077	-0.001	0.037	-0.004	-0.097
5	0.000	-0.076	0.000	0.038	-0.001	-0.099
6	-0.003	-0.080	-0.003	0.034	-0.003	-0.102
7	-0.006	-0.086	-0.006	0.028	-0.007	-0.110
8	0.0163	-0.070	0.016	0.044	0.014	-0.096
9	-0.021	-0.092	-0.021	0.022	-0.023	-0.119
10	-0.010	-0.102	-0.010	0.012	-0.046	-0.166

For the first model we have used the non-parametric test. The results are same for the other two models as no significant pattern can be traced out from any of the 10 different windows.

Table 6: Wilcoxon Rank Sum Test

Window for Analysis	Z	Sig.
t ₊ 10 - t ₋ 10	-0.560	0.575
t ₊ 9 - t ₋ 9	-1.243	0.213
t ₊ 8 - t ₋ 8	-0.980	0.326
t ₊ 7 - t ₋ 7	-0.507	0.612
t ₊ 6 - t ₋ 6	-0.104	0.916
t ₊ 5 - t ₋ 5	-0.134	0.892
t ₊ 4 - t ₋ 4	-0.365	0.715
t ₊ 3 - t ₋ 3	0.000	1.000
t ₊ 2 - t ₋ 2	-0.447	0.654

As per analysis we can conclude that we are unable to reject any of our Null hypotheses like no significant effect of merger in short run can be traced in pre and post mergers window. Moreover, we have seen that the use of different models for event study derives same conclusion.

5. Conclusion and Recommendations

On the basis of empirical findings it can be concluded that the value of acquiring firms have positive trends in pre-merger window whereas the negative trends in

post-merger window, but these trends were not statistically significant to prove the Hubris Hypothesis. So we can conclude that Hubris Hypothesis does not sustain in KSE listed companies mergers. In addition to that it is concluded that different models and tests leads to the same results as no sensitivity of measures can be traced. Mergers finding is similar to the findings of Bashir et al. (2011) and Deo (2012). One of the reason that hubris hypothesis does not sustain here is that the mergers are still a new phenomenon for Pakistani Stock Market in terms of number and volume. As Higson and Elliott (1998) have studied almost 1500 merger or in some countries even hundreds of mergers occurred in just couple of years (Campa & Hernando, 2004) whereas, in Pakistan the number of total mergers is still less than 200 mark. As this research is also a part of pioneer set of researches in said context so future researches can be done by testing the Hubris Hypothesis for different sectors explicitly and the effect of mode of payment on merging firms' value can be examined.

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Annexure

Figure: A

Figure: B