Impacts of Mergers and Acquisitions Announcements on Stock Performances in

Technology Industry in U.S. Market

by

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Abstract

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This study is designed to determine if mergers and acquisitions (M&A) can create value for companies in U.S. technology industry.   The abnormal return around the announcement date and the significance of cumulative abnormal returns confirm that M&A has positive impact on stock performance of these companies. Also, this study runs a regression of standardized cumulative abnormal return on some factors that may influence the results to see which factors have influence and to examine to which degree they influence the results of M&A deals.   The conclusion is that size, liquidity, and profitability of the acquirer and type of the payment influence the result of M&A deals.

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Chapter 1

Introduction

According to Investopedia (2013), mergers and acquisitions (M&A) is a general term used to refer to the consolidation of companies. A merger occurs when two companies' combine together to form a new company and an acquisition is when one company buys another without forming a new company. There are several forms of M&A, namely, horizontal M&A, vertical M&A, diversified conglomerate M&A, congeneric M&A, hostile takeovers, corporate raiding, cross-border M&A, shareholder activism, private equity, and LBO (Gaughan, 2007). This paper will examine whether or not M&A announcements have any impact on acquirer's stock price and if so, whether they are value enhancing or value destroying activities. Also, the factors in the M&A activities that may affect the stock price patterns will be discussed. While M&A is still a puzzle in financial fields, whether it creates value for firms and the sources of synergies are under discussion in recent years. The objective of this paper is to explore this puzzle by using an event study so as to provide more general information and constructive suggestion for companies and investors.

This paper will focus on technology industry in the U.S. market. In the contemporary slow economy, companies are easier to buy market share than to grow organically. Therefore, in the technology industry where companies are maturing and

selling replacement products over new market innovations, there are more and more

M&A deals taking place especially in small - lower middle market and they boost the

development in turn.   Whether the M&A deals have positive or negative impact on

companies' stock performances is also influenced by many other factors such as the

type of payments, namely, cash or shares, liquidity and diluted earning per share of

the acquirer, announce enterprise value, deal size, etc.   Influences from these factors

will be taken into consideration.

It may be tempting for companies to implement an M&A deal so as to take

advantage of the announcement and improve the stock performance while trying to

create value for the companies.   Also, investors in stock market who are exposed to

the risks related to this kind of event news should be cautious as long as they do not

have insider information and only have access to public information and historical

data.   This study, therefore, is needed for both company side and investor side.

In the technology industry in the U.S. market, a large amount of M&A deals

show impacts on stock behaviors.   In order to explain the impact more explicitly

and to further explore the underlying sources, this study conducts an event study by

using single-factor model, cumulative abnormal return (CAR) method and several

dummy variables.   The analysis and results will provide a general view on this issue

to companies and investors to help them make clearer corporate and investment

plans.

The rest of the paper is organized as follows.　In Chapter 2, insights and findings from the existing literature on efficient market hypothesis (EMH) and the effect from M&A will be briefly reviewed.　In Chapter 3, the data and methodology used will be described in detail.　Chapter 4 describes the analysis and reports the results of the study.　Chapter 5 gives the conclusion and explores the limitations and recommendations.

Chapter 2

Literature Review

2.1 Efficient Market Hypothesis

To explore the impact of M&A on stock performance in US technology industry, researchers at first noticed the Efficient Market Hypothesis (EMH), which was introduced by Fama in the 1960s, for the reason that market efficiency influences the accuracy and speed that stock prices respond to the events. Butron (1989) defined that "a stock market is said to be efficient if it accurately reflects all relevant information in determining security prices". Stock prices in the market with weak form of EMH reflect all historical price information while those in the market with semi-strong form of EMH reflect not only information included in the historical prices but also publicly available information such as corporate news, balance sheets, stock splits, dividend increases, and so on. The strong form of EMH means all information, which even includes insider information, is fully reflected in stock prices. It has been asserted by Burton (1989) that although there may be pricing irregularities in different periods and fashion may affect markets, any abnormal return or excesses in other variables will be corrected eventually so that the U.S. stock market is still remarkably efficient. In addition, Tobias (2011) tests the semi-strong form of EMH by conducting an event study of the effects of dividend announcement on firm values. He finds significant relationship between abnormal stock returns and unexpected dividend announcements (Tobias, 2011). Thus, the

event study in this paper does have meaning and can be used to draw conclusions on the relationship between M&A events and stock performances.

2.2 Previous Studies on The Relationship Between M&A and Stock Performances

There are many recent studies using event study and empirical analysis to assess the possible impacts of M&A on firm value, corporate stock performance, and other aspects.   They can be categorized into the following types.   Firstly, M&A does have positive impacts as positive abnormal returns or improvements in performances in different factors have been observed.   Secondly, on the contrary, some negative abnormal returns may lead to the conclusion that M&A is a value destroying activity.   Thirdly, many factors in the M&A deals influence their impacts on firm value, stock returns or other performances.   These previous studies will be discussed in the subparts of this chapter.

2.2.1 Positive Impacts From M&A

Hackbarth and Morellec (2008) develop a model to explore the dynamics of stock performances and firm-level betas in M&A.   They find there are positive abnormal announcement returns, which is consistent with empirical evidences (Hackbarth & Morellec, 2008).   After separating the sample into two groups, they observe that acquiring firm's beta has consistent patterns and that beta increases prior

to the M&A announcement but then decreases at the time of announcement when the acquirer's beta exceeds that of the target (Hackbarth & Morellec, 2008).   Also, Harris, Ozgen, and Ozcan (2000) use longitudinal data and non-parametric method to examine the impact of M&A on efficiency in hospitals.   They find that hospitals' organizational performance has been improved after M&A deals and that scale efficiency, rather than technical efficiency, plays a dominant role in improving hospitals' efficiency (Harris, Ozgen, & Ozcan, 2000).   Besides, Thomas J. Herd and Ryan McManus (2012) assert in their latest research that the success rates of M&A have increased and that almost the top half of successful M&A deals can create enough shareholders' value, no matter in which industry or region and in which economic cycle they take place.   All the previous studies above show that M&A deals are related to the improvement of the companies in post-M&A period.

2.2.2 Negative Impacts From M&A

Synergy from M&A is still a myth and has been doubted for years.   People wonder if M&A "pays" and how they work.   Bruner (2001) answers part of these questions by using four approaches, i.e. event studies, accounting studies, surveys of executives, and clinical studies, to measure M&A profitability and by reviewing scientific evidences published from 1970s to 1990s.   He uses specific benchmarks to measure performances and summarizes three possible outcomes, namely, M&A as value conserving, value creating, and value destroying activity (Bruner, 2001).   He

believes that many statistically significant abnormal returns mean nothing in economic materiality and previous published evidences do show that acquirers have worse returns than their non-acquiring counterparts after M&A deals (Bruner, 2001). Furthermore, Ravenscraft and Scherer (1989) draw a conclusion that the firms in manufacturing industry in U.S. market have obvious lower profitability after M&A deals with a sample taken from 1957 to 1977.   Therefore, M&A deals, in some cases, have negative impacts on firms' stock behaviour, efficiency, and other performances.

2.2.3 Sources of M&A stock price changes

In addition to the impacts of M&A on firm value and stock performance, some researchers explore deeper into the effects of different factors involved in the M&A deals.   Bouwman, Fuller, and Nain (2009) build a model to examine the effect of whether the acquirers buy target firms during high-valuation markets or during low-valuation markets.   They observe that acquirers who buy target firms during high-valuation markets have significantly higher short-term returns but lower abnormal returns in stock and lower operating profits in long run than those who buy target firms during low-valuation markets (Bouwman, Fuller, & Nain, 2009).

Herd and McManus (2012) explore many other factors such as deals' timing, industry, and size.   They find that deals' timing is very important while firm values

in some industries have been improved more than those in other industries (Herd &

McManus, 2012).   For example, deals in banking and capital market create much

more value than those in communications industry and energy industry (Herd &

McManus, 2012).   When considering size effect, they conclude that bigger deal

leads to larger return while smaller deals have better performances (Herd &

McManus, 2012).   Last but not least, they suggest that companies with clear focus

on growth are more likely to succeed in M&A (Herd & McManus, 2012).

Previous studies have many results showing the impact of M&A deals in

different industries in different markets and they also examine the effect from

various factors involved in M&A deals to see what are more important when

affecting the results.   In this paper, only the technology industry in U.S. market will

be taken into consideration.   To examine the factors influencing M&A results,

previous models help in building the model in this paper.   The outcome will in turn

be used to test whether the U.S. market is efficiency, which has been tested before by

a variety of approaches.

Chapter 3

Methodologies

3.1 Data Description

To analyze the relationship between M&A announcements and stock performances in the U.S. technology industry, this paper takes advantage of M&A announcements data from 1979 to 2006, stock prices data and daily index dataset from 2005 to 2006.   This period is before the 2007-2008 financial crisis so that the stock performance during that period is more stable and obeys the market rules. Stock performance after the financial crisis is sometimes irrational and difficult to analyze.   M&A announcements data is a dataset merged of SDC, COMPUSTAT and CRSP database of the acquirers, while stock price data and daily index data are from CRSP and CPMPUSTAT database respectively.   There are 9861 observations and 39 variables in the M&A announcement dataset indicating the announcement date, acquirer name, acquirer nation, acquirer SIC, acquisition technique, deal attitude, deal status, host current enterprise value at announcement, source of fund, and many other factors involved in the M&A cases.   Only finished M&A cases are discussed.   The table in Appendix A provides an overview of the M&A announcements data.   In the daily stock price and daily index datasets, there are 4549085 observations showing the company ID, company specific returns, daily value-weighted returns, which are the returns of index, and dates.   These datasets are categorized as pool data, which is a type of data that includes elements of both

time-series data and cross-section data and is accurate and more useful in empirical

analysis.

3.2 Research Rationale and Models

The rationale for this event study is to build up event windows and

corresponding estimation windows to analyze the performance of the target variable

in the event windows.   The first step is to process all the dataset and merge the

M&A dataset, daily stock price dataset, and daily index dataset together at various

levels and create estimation windows and event windows for each M&A deal.   In

this paper, short-horizon estimation windows are from day -60 to -31 and

long-horizon estimation windows are from day -180 to -31 if the announcement dates

are set as day 0.   Short-horizon event windows are from day -5 to +5 while

long-horizon event windows are from day -2 to +60.   The following two figures

illustrate the estimation and event windows in short-term and long-term analysis

respectively.

Figure 3.1

    Estimation window   Event window

|----------------------------------|------------------------|-------------|-------------|

t=-60   t=-31   t=-5   t=0   t=+5

                                                 Event

Figure 3.2

<pre>
              Estimation window   Event window

|--|----------------|-----|------------------|
t=-180   t=-31   t=0 t=+2   t=+60

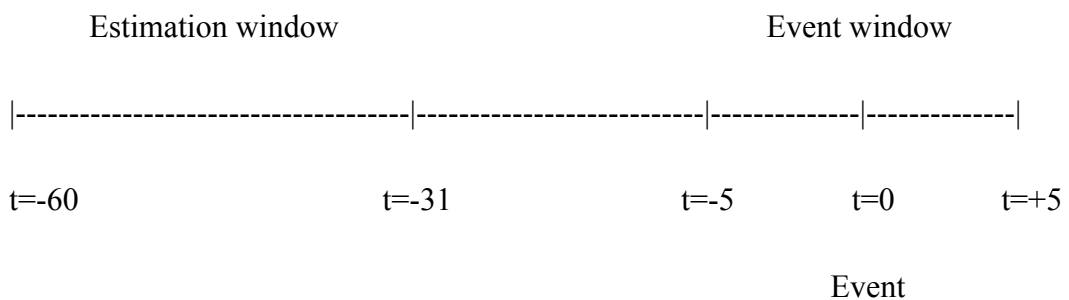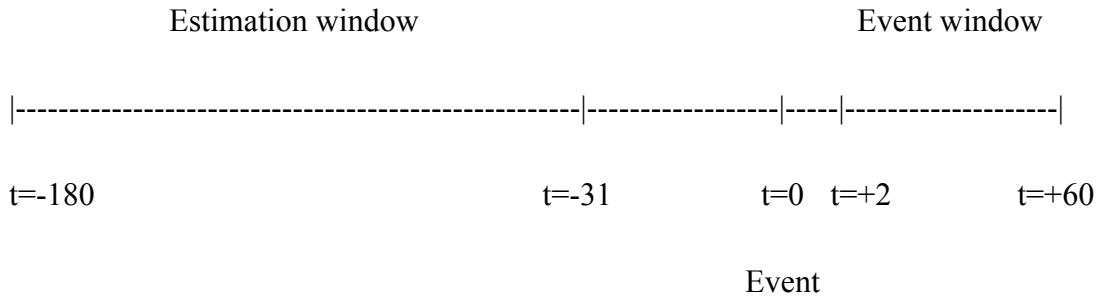   Event
</pre>

Secondly, this paper uses the daily return of the company's stock price and

the market index in the estimation windows to predict the normal return in the event

windows by using the regression of market model.   The market model is a

single-factor model widely used in event study.

$$R_{i,t} = \alpha + \beta R_{m,t} + \varepsilon_{i,t} \qquad \text{(Equation 3.1)}$$

where $R_{i,t}$ is firm return and $R_{m,t}$ is value weighted return (index).

Estimation windows are set prior to the M&A event so that the return

predicted from the stock performance within this period is not affected by the M&A

event and is thus treated as conditional expectation of normal return in which the

condition is the returns in estimation windows and the prediction is based on market

model regression.   The returns observed in the event window are treated as actual

returns.   Abnormal returns are generated by subtracting conditional expectation of

normal returns from actual returns.   Cumulative abnormal return is the sum of all

the abnormal return in an event window.   Average cumulative abnormal return is

the average value of the cumulative abnormal returns in all event windows.

$$AR = R_{EW} - E(NR|R_{i,t}) \qquad \text{(Equation 3.2)}$$

where AR is abnormal return, R_{EW} is actual return in the event window, and

$E(NR|R_{i,t})$ is conditional expectation of normal return predicted from market model

(Equation 3.1) in the estimation window.

$$CAR_j = \sum_t AR_{j,t} \qquad \text{(Equation 3.3)}$$

where CAR_j is cumulative abnormal return of event j.

$$ACAR = \frac{\sum_j CAR_j}{j} \qquad \text{(Equation 3.4)}$$

where $ACAR$ is average cumulative abnormal return.

The next step is to test the significance of $ACAR$ to see whether the

efficient market hypothesis holds.   If the $ACAR$ is statistically significant and does

show economic meanings, then the market is at least semi-strong efficient form and

the result can help imply the correlations and do the following analysis.   Here,

linear regression of CAR with only constant coefficient is used to test whether the

cumulative abnormal return exist.   Also, the following t-value of average

cumulative abnormal return is an indicator of the significance of $ACAR$.

$$t = \frac{ACAR}{\frac{\sigma_{ACAR}}{\sqrt{N}}} \qquad \text{(Equation 3.5)}$$

where the σ_{ACAR} is the standard deviation of $ACAR$.

The next step is to plot the graph of AR to illustrate the impacts on stock

behaviour in the event window. From the graph of AR, whether the M&A is value enhancing or value destroying in this industry and how the impacts of M&A take place can be observed. Also, the effects of M&A on periods of different lengths are examined by setting short-term event windows and long-term event windows.

Thirdly, this paper standardizes cumulative abnormal return and then regresses it on the factors that may affect the $SCAR$ to examine to which degree the changes of these factors can explain the changes of $SCAR$ and how they influence the effects of M&A announcements on stock performance. The significance, sign, and magnitude of the slope coefficients of regressors can be used to express the impact pattern in this analysis. The model of regression on different factors is as follows.

$$SCAR = \frac{CAR}{SD} \qquad \text{(Equation 3.6)}$$

where *SD* is standard deviation of *CAR* and *SCAR* is standardized cumulative abnormal return.

$$Z = \frac{1}{\sqrt{N}} \sum_i^N SCAR_i \qquad \text{(Equation 3.7)}$$

where N is the number of observations and Z is the Z-value in normal distribution for looking at how many standard deviations' length the observation is away from the mean.

$$SCAR = \beta_1 \times EPS + \beta_2 \times deal\_size + \beta_3 \times CR + \beta_4 \times announce\_e\_value$$
$$+ D\_cash + D\_shares + D\_cash\_shares + \varepsilon$$

(Equation 3.8)

EPS: Diluted earning per share of acquirer

deal_size: Size of the acquisition deal (in thousand)

CR: Current ratio of the acquirer

announce_e_value: Announce enterprise value of the acquirer

*D*_cash, *D*_shares, *D*_cash_shares: Dummy variables denoting the type of the deals:

*D*_cash=1 if deals are in cash, *D*_cash =0 otherwise;

*D*_shares=1 if deals are in paid in shares, *D*_shares=0 otherwise;

*D*_cash_shares=1 if deals are paid in cash and shares, *D*_cash_shares=0 otherwise.

Event study is a statistical method frequently used to measure the impact of a specific event on a firm and it relies on the efficiency of market. There are many models that can be used to predict the conditional expectation of normal returns, such as market model, CAPM and Fama and French three-factor model. Here market model is used for the reason that it takes both market trend and company's risk into consideration. Also, CAPM applies under many restrictions so that its validity is questionable. Fama and French three-factor model is not used here for the sake of complexity. In the latter regression, dummy variables and financial statement variables such as ratios and values denoting different status of both acquirers and targets are introduced so that different factors involved in the M&A deals are taken into account.

Chapter 4

Analysis of Results

4.1 Overview

This section is going to analyze and explain the results of the event study

and the model of factors.   The study and model are run under STATA 11 and the

code for the event study is done with the help from Dr. Mohammad M. Rahaman.

There are so many kinds of tests to check the significance of abnormal returns and

average cumulative abnormal returns but only t-test is used for the sake of simplicity

and that the implication from t-test are powerful and useful.

4.2 Result of Event Study

The existence of abnormal return can be checked by testing the significance

after setting different estimation windows and event windows.   From the table

below, we observe the probability of ($|T|>|t|$) is 0.0036 when the null hypothesis is

mean of abnormal return equals zero while the alternative hypothesis is that the mean

of abnormal return is not zero, which means the abnormal return is statistically

significant at a 95% significance level as the p-value is less than 0.05.   Therefore,

the existence of abnormal return has been tested.   The number of observation is

3245, which is much larger than 30, so that normal distribution stands and the results

from this dataset have statistical meanings.

Table 4.1

```
. ttest AB==0

One-sample t test

Variable |      Obs        Mean     Std. Err.    Std. Dev.    [95% Conf. Interval]

      AB |     3245     .001934     .0006645     .0378508     .0006312      .0032368

    mean = mean(AB)                                              t =     2.9107
Ho: mean = 0                                    degrees of freedom =       3244

    Ha: mean < 0                 Ha: mean != 0                 Ha: mean > 0
 Pr(T < t) = 0.9982       Pr(ITI > Itl) = 0.0036         Pr(T > t) = 0.0018
```

Besides, the short-term impact in shown in the following figure.   From this

figure we observe that the abnormal return soars on the announcement date and falls

a little back on the next day, then goes back to the ordinary level after some

fluctuations.   The market reacts rapidly and accurately to the M&A news.

Figure 4.1
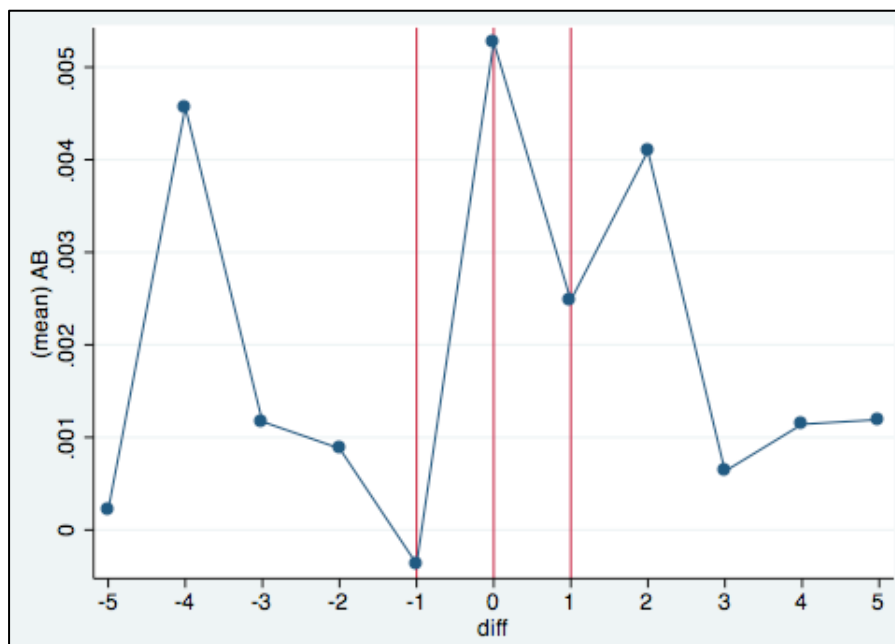
The summary of the linear regression on CAR is as follows. The coefficient of the constants is the mean of CAR. The p-value 0.002, which is less than 0.05, indicates that the CAR is statistically significant at 95% significance level.

Table 4.2

```
Linear regression                              Number of obs =      295
                                               F(  0,   294) =     0.00
                                               Prob > F       =       .
                                               R-squared      =  0.0000
                                               Root MSE       =  .11588

                        Robust
 CAR_eachyr      Coef.   Std. Err.     t    P>|t|    [95% Conf. Interval]

     _cons    .0212743   .0067467   3.15   0.002    .0079962    .0345523
```

This can also be done by the following summary. Here the standard deviation is different from the one in the above table. The above statistical results are from a robust linear regression, which eliminates the effect from multicollinearity. After the effect from multicollinearity is eliminated, the standard deviation decreases.

Table 4.3

```
  Variable        Obs        Mean    Std. Dev.        Min         Max

CAR_eachyr      12095    .0212743    .1156873   -.5228186    1.069458
```

The next result is from bootstrapping. This paper bootstraps cumulative abnormal return to see if there is any difference in return one-day before and one-day after the event date. The number of replication is 1000. The result shows that the difference is statistically significant as the p-value is less than 0.05.

Table 4.4

```
Bootstrap results                              Number of obs    =      295
                                               Replications     =     1000

     command:  bootcumret
     boottest: r(cumret)


             Observed   Bootstrap                          Normal-based
               Coef.    Std. Err.     z     P>|z|      [95% Conf. Interval]

  boottest    .0212743   .006698    3.18   0.001      .0081465      .034402
```

After looking at the short-term abnormal return pattern, the paper takes another event study to look at the performance in long-term. The estimation windows are much earlier and the event windows are after the event and appear wider, designed to examine the impact from a long-term view. From Figure 4.2 we do not observe obvious effect pattern so that the effect from an M&A announcement is just a short-term factor and places no significant changes in stock performances after the M&A deals in U.S. technology industry.

Figure 4.2
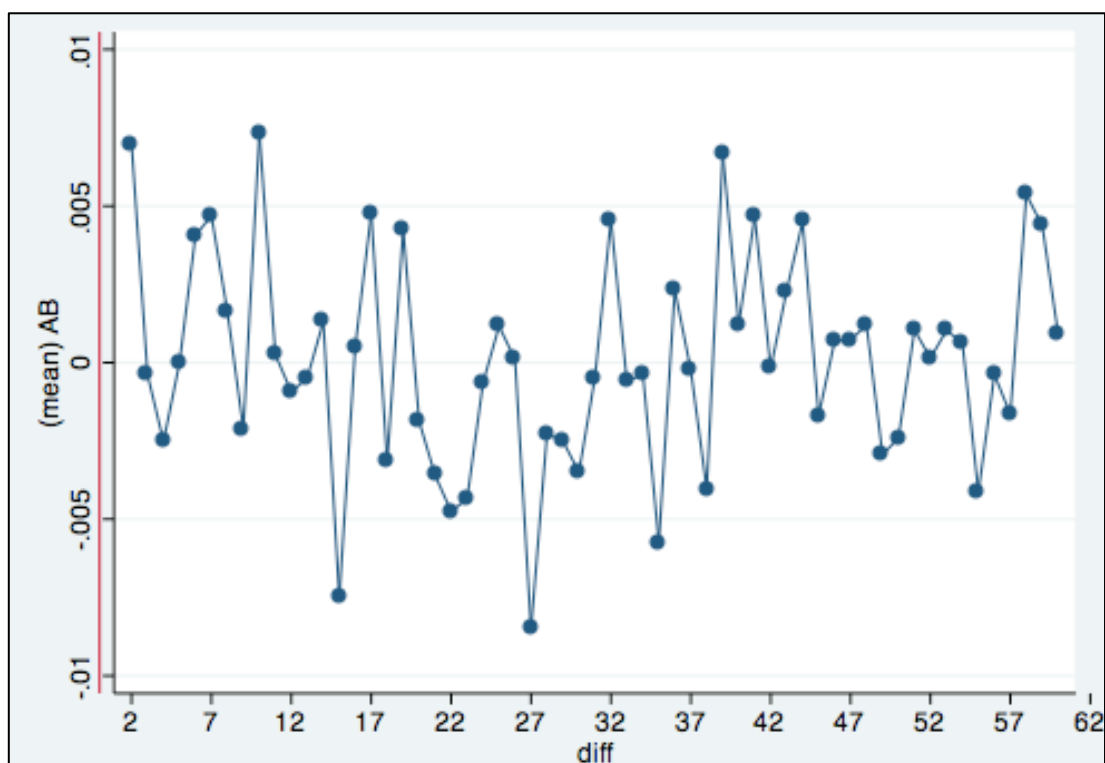
4.3 Result of Factor Analysis

After standardizing the cumulative abnormal return, this paper regresses it

on the factors that may affect the standardized cumulative abnormal return (SCAR)

to examine to which degree the changes of these factors can explain the changes of

SCAR and how they influence the effects of M&A announcements on stock

performance.   In order to efficiently collect information of the factors such as

liquidity ratio, diluted EPS, enterprise value, and deal size, this paper picks up

companies randomly by setting some criteria and collects information for only the

companies that satisfy these criteria.   The criteria are as follows.   Firstly, current

enterprise value and other data needed should not be null in the dataset.   Secondly,

the acquirers' nation should also be U.S.   Thirdly, only successful deals are used.

Fourthly, deal attitude should be friendly.   Other factors are not used for the sake of

the convenience of collecting data.   After all the above criteria, only 39 companies

are left.   However, these 39 companies can still be used to have this factor analysis

since the dataset satisfies the minimal observation requirement of normal distribution,

which is 30.   Evidence from statistics tells that dataset with more than 30

observations shows a trend of normal distribution.   The company list is in Appendix

B.

        After collecting the data of liquidity ratio, diluted EPS, enterprise value, and

deal size from yahoo finance and website of Edgar, U.S. Securities and Exchange

Commission (SEC), the paper uses STATA to create corresponding dummy

variables and runs the regression mentioned in Chapter 3.   The regression result is

shown in Table 4.5.   It is important to mention that there is no constant coefficient

because there are three dummy variables for three different types of payment instead

of two and no constant coefficient is necessary to avoid the dummy variable trap.

At first, we read the result from the R-squared and the corresponding F-test.   The

R-squared here is 0.7417, which is relatively high, and its F-test shows that its

p-value is equal to 0.0027, which is less than 0.05, implying that the R-squared is

statistically significant at 95% significance level.

The next step is to read the coefficients of different regressors.   Coefficient of diluted EPS indicates that whenever diluted EPS increases 1 unit, the standardized cumulative abnormal return will fall by 0.231307 units but this change is not significant as its p-value is greater than 0.05.   Coefficient of deal size tells that whenever the deal size rises by 1 unit, the SCAR will drop by 5.63*e-09 units, which are significant, the change is so small and ignorable though.   Acquirer's current ratio, which is generated by dividing current asset over current liability, is negatively correlated to the SCAR and the impact is significant.   By comparing the coefficients of dummy variables for cash payment, shares payment, and cash and shares payment, the paper judges that the difference among them is not very obvious.   Only the cash payment has a p-value less than 0.05.   Therefore, the impact from different types of payment is not that important.   The last is announce enterprise value, which is influencing the SCAR in an insignificant level with a very little positive coefficient.

Result from this factor analysis tells that the impacts from deal size, current ratio, and cash payment are significant while those from diluted EPS, shares payment, cash and shares payment, and announce enterprise value are insignificant.   Also, from the statistically significant coefficients, the paper tells that impact of cash payment is positive while impacts of deal size and acquirer's liquidity is negative. However, we should keep in mind that this result is from a small sample in U.S. technology industry and the companies used here have some characteristics in

common.   Other dataset may show different outcomes.

Table 4.5

Source	SS	df	MS		Number of obs =	39
					F(7, 32) =	5.74
Model	4.25201036	7	.607430052		Prob > F =	0.0027
Residual	1.48042517	32	.105744655		R-squared =	0.7417
					Adj R-squared =	0.6126
Total	5.73243553	39	.272973121		Root MSE =	.32518

scar	Coef.	Std. Err.	t	P>ltl	[95% Conf. Interval]	
EPS	-.231307	.2050846	-1.13	0.278	-.6711697	.2085557
deal_size	-5.63e-09	1.67e-09	3.37	0.005	2.05e-09	9.22e-09
CR	-.2000529	.0484013	-4.13	0.001	-.3038633	-.0962425
D_cash	.5646386	.1910758	2.96	0.010	.1548218	.9744554
D_shares	.4403655	.2467474	1.78	0.096	-.0888552	.9695861
D_cash_sha~s	.4720522	.2323247	2.03	0.062	-.0262347	.970339
ann~_e_value	6.21e-07	.0000228	-0.03	0.979	-.0000495	.0000483

Chapter 5

Conclusion

The purpose of this paper is to examine the relationship between M&A announcements and stock performance in U.S. technology industry by conducting an event study.   Also, the impacts from companies' liquidity, enterprise value, type of payment, and deal size are tested in a newly built model.   The first event study is done on all M&A deals in this industry during 2005-2006.   The second factor analysis is done on 39 companies that satisfy some criteria.

The outputs of STATA show the following results:

1. Abnormal return and cumulative abnormal return in short-term are statistically significant.

2. Stock performs well on announcement date and falls back to ordinary level afterwards.

3. There is significant difference in return one-day before and one-day after the event date in the short-term event window.

4. In long-term, there is no obvious change.

5. The impacts of diluted earning per share, shares payment, cash and shares payment, and announce enterprise value on standardized cumulative abnormal return are insignificant, while those of deal size, acquirer's liquidity, and cash payment are.

6. Deal size and acquirer's liquidity have negative impact on SCAR while cash payment has positive impact.

The results above show that this specific market is efficient since market reacts to information rapidly and accurately.   Therefore, abnormal return exists only the announcement day but disappears in long run.   Investors cannot intentionally earn abnormal return all the time.   All in all, M&A is a value enhancing activity for companies in U.S. technology industry.   In addition, M&A outcomes are influenced by many factors, which may jointly affect the stock behaviour in both short-term and long-term.

References

Bouwman, C., Fuller, K., & Nain, A. (2009 February). *Market Valuation and*

    Acquisition Quality: Empirical Evidence. Retrieved from http://www.jstor

    .org/stable/30226002

Burton, G. (1989, March 10.). *Is the Stock Market Efficient?* Retrievend from

    http://www.jstor.org/stable/1703677

Cheng, A. (2013, February 25). *Retailers expect strong M&A wave to continue: After*

    the biggest year for deals in the last five, 2013 seen strong too. Retrieved

    from http://www.marketwatch.com/story/retailers-expect-strong-ma-wave

    -to-continue-2013-02-25

Gaughan, P. (2007, February 02). Mergers, Acquisitions, and Corporate

    Restructurings, Fourth Edition. *Chapter 2: History of Mergers* (pp. 29-68).

    Retrieved from http://my.safaribooksonline.com/book/hr-organizational

    -management/9780471705642

Hackbarth, D., & Morellec, E. (2008, June.). *Stock Returns in Mergers and*

    Acquisitions. Retrieved from http://www.jstor.org/stable/25094471

Harris, J., Ozgen, H., & Ozcan, Y. (2000, July). *Do Mergers Enhance the*

    Performance of Hospital Efficiency? Retrieved from http://www.jstor

    .org/stable/253961

Herd, T., & McManus, R. (2012). *Who says M&A doesn't create value?* Retrieved

    from http://www.accenture.com/us-en/outlook/Pages/outlook-journal-2012

-mergers-acquisitions-create-value.aspx

Mergers And Acquisitions - M&A. (2013). In *Investopedia*. Retrieved from

http://www.investopedia.com/terms/m/mergersandacquisitions.asp

Ravenscraft, D., & Scherer, F. (1987). Life after takeovers. *Journal of Industrial*

Economics, 36, 147-156.

Tobias, M. (2011). *Dividend Announcement and Firm Value: A Test of Semi Strong*

form of Efficiency at the Nairobi Stock Exchange. Retrieved from

http://web.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=3c660f2b-f1d4-4

36c-814b-68a8995f1c30%40sessionmgr10&vid=2&hid=19

Appendix A

Table: Summary of variables in merged dataset

obs: 9,861   vars: 39   size: 4,348,701 (99.2% of memory free)

This is merged dataset of SDC, COMPUSTAT and CRSP of the acquirers.

Variable name	Storage type	Display format	Variable label
date_announce	float	%dd_m_CY	Date Announced
acq_name	str77	%77s	Acquirer Full Name
acq_nation	str28	%28s	Acq. Nation
acq_sic	int	%10.0g	Acquirer primary SIC code deom SDC
acquisition_t~e	str29	%29s	Acquisition Technique
tar_bankrupt	str3	%9s	Target Bankrupt
block_purchage	str3	%9s	Block Purchases
deal_attitude	str9	%9s	Attitude
deal_status	str14	%14s	Status
announce_ente~e	str12	%12s	Host Curr. Enterprise Value at Announcement
effective_ent~e	str11	%11s	Host Curr. Enterprise Value Based on Effective Date (mil)
current_enter~e	str12	%12s	Host Curr. Enterprise Value (mil)
finance_borro_g	str3	%9s	Source of Fund– Borrowing
finance_bridg~n	str3	%9s	Source of Funds– Bridge Loan
finance_commo~k	str3	%9s	Source of Funds– CommonStock Issue
finance_debti~e	str3	%9s	Source of Funds– Debt Issue
finance_forei~d	str3	%9s	Foreign Provider of Funds
finance_corpf~d	str3	%9s	Source of Funds- Corp. Funds

finance_junkb~d	str3	%9s	Source of Funds– Junk Bond Issue
finance_lineo~t	str3	%9s	Source of Funds– Line of Credit
finance_mezza~e	str1	%9s	Source of Funds– Mezz. Fin
finance_prefe~k	str3	%9s	Source of Funds– Preferred Stock Issue
finance_right~e	str1	%9s	Source of Funds– Rights Issue
percent_acqui~d	float	%9.0g	% of Shares Acq.
percent_sought	float	%9.0g	% sought
percent_own_f~y	float	%9.0g	% Owned After Transaction
tar_name	str77	%77s	Target Name
tar_nation	str29	%29s	Target Nation
tar_sic	int	%10.0g	Target Primary Numeric SIC from SDC
acq_gvkey	long	%12.0g	GVKEY
acq_comp_sic	int	%8.0g	COMPUSTAT 4-digit SIC
acq_comp_name	str28	%28s	CONAME
tar_gvkey	long	%12.0g	GVKEY
tar_comp_sic	int	%8.0g	COMPUSTAT 4-digit SIC
tar_comp_name	str28	%28s	CONAME
acq_permno	long	%12.0g	NPERMNO
tar_permno	long	%12.0g	NPERMNO
acq_cumulativ~r	float	%9.0g	Cumulative abnormal return
tar_cumulativ~r	float	%9.0g	

Sorted by: date_announce

Appendix B

Table: Company List

#	Acquirer company name	Target company name
1	AEROFLEX INC	IFR SYSTEMS INC
2	LEVEL 3 COMMUNICATIONS INC	SOFTWARE SPECTRUM INC
3	OPENTV CORP	ACTV INC
4	BORLAND SOFTWARE CORP	STARBASE CORP
5	PROGRESS SOFTWARE CORP	EXCELON CORP
6	MICROSOFT CORP	VICINITY CORP
7	SATENET INC	CYLINK CORP
8	GILEAD SCIENCES INC	TRIANGLE PHARMACEUTICALS INC
9	INTL BUSINESS MACHINES CORP	RATIONAL SOFTWARE CORP
10	YAHOO INC	INKTOMI CORP
11	AUTOMATIC DATA PRECESSING	PROBUSINESS SERVICES INC
12	FIRST DATA CORP	CONCORD EFS INC
13	ZORAN CORP	OAK TECHNOLOGY INC
14	HYPERION SOLUTIONS CORP	BRIO SOFTWARE INC
15	NCO GROUP INC	NCO PORTFOLIO MANAGEMENT INC
16	SAFENET INC	RAINBOW TECHNOLOGIES INC
17	SYMANTEC CORP	ON TECHNOLOGY CORP
18	CONEXANT SYSTEMS INC	GLOBESPANVIRATA INC
19	QUOVADX INC	ROGUE WAVE SOFTWARE INC
20	SUNGARD DATA SUSTEMS INC	SYSTEMS & COMPUTER TECH CORP
21	GENZYME CORP	ILEX ONCOLOGY INC
22	CTS CORP	SMTEK INTERNATIONAL INC

23	SYMANTEC CORP	VERITAS SOFTWARE CORP
24	AFFILIATED COMP SVCS –CL A	SUPERIOR CUNSULTANT HLDGS CP
25	BLACK BOX CORP	NORSTAN INC
26	MCDATA CORP –CL A	COMPUTER NETWORK TECH CORP
27	VERIZON COMMUNICATIONS INC	MCI INC
28	ADOBE SUSTEMS INC	MACROMEDIA INC
29	INTEGRATED DEVICE TECH INC	INTEGRATED CIRCUIT SUSTEMS
30	SYBASE INC	EXTENDED SUSTEMS INC
31	ORACLE CORP	SIEBEL SYSTEMS INC
32	SYMANTEC CORP	BINDVIEW DEVELOPMENT CORP
33	SABA SOFTWARE INC	CENTRA SOFTWARE INC
34	SPRINT NEXTEL CORP	NEXTEL PARTNERS INC
35	MICROSEMI CORP	ACVANCED POWER TECHNOL INC
36	SPRINT MEXTEL CORP	ALAMOSA HOLDINGS INC
37	ELECTRONIC ARTS INC	JAMDAT MOBILE INC
38	AMGEN INC	ABGENIX INC
39	INTL BUSINESS MACHINES CORP	MICROMUSE INC