# **Evaluation and Wealth Effects of Merger and Acquisition Announcements on the US Utility Industry**

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#### **Abstract**

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**Utility Industry** 

by

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The purpose of this paper is evaluate the relationship between mergers and acquisitions and the post and pre acquisition performance of some utility firms in the United States. Based on the result of the analysis, we evaluate whether it is good or bad performance for the market reaction. A sample of 50 M&A cases is randomly chosen from Bloomberg for this study. These M&A occurred between January 2010 and August 2013.

We employ Cumulative Abnormal Return (CAR) and the Market Model to analyze the sample to determine whether or not M&A can create value for utility industry in the U.S.

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#### Chapter 1

#### Introduction

In this paper, we attempt to provide answers to the following issue: Will M&A destroy or create value for the utility industry in the United States? If yes, how much value could be generated for target firms?

#### 1.1Main Idea of Merger and Acquisition (M&A)

Merger implies the following the combination of two or more commercial companies to form a single company. Acquisition is the act of contracting or assuming or acquiring possession of something. What are the differences between merger and acquisition? Merger refers to an enterprise to take various forms for receiving the property rights of other enterprises. However, acquisition refers to an enterprise formed through the purchase of shares of listed companies and the companies.

Mergers and acquisitions have several phases. Boland (1970) classified the M&A phases into two steps, the pre-merger and post-merger. Farley and Schwallie (1982) suggested M&A phases should include the integration of the strategic plan, intelligent screening, evaluation of targets through creativity, analysis, understanding value and price, anticipating the post-acquisition phase, and efficient implementation. Schweiger and Weber (1989) argued that the M&A's phases include pre-merger and implementation. Salus (1989) believed that the M&A phases include pre-merger,

merger and post-merger. Kazemek and Grauman (1989) mentioned that M&A process involve assessment, joint planning, issue analysis, structure selection, securing approvals, final planning, and implementation. Parenteau and Weston (2003) claimed that strategic planning, candidate screening, due diligence, deal execution, and the ultimate integration phase related to M&A.

There are three forms of payment associated with M&A's, namely cash payment, securities payment and tangible assets payment for the target firms. Each method has its advantages and disadvantages. Paying by cash might cause the companies' cash liquidity to deteriorate. Paying by securities might cause the old shareholders' ownership diluted. And paying by tangible assets could lead the parent companies' leverage increased. Moreover, in a stock transaction process, stock shares increase only in the new firm. Due to different motivations, acquiring companies should focus on different transactions to choose their targets more wisely in order to maximizing the benefit. For example, the acquiring firms will always choose the potential value increased firms, which implied that they had chosen the asset transaction.

Mergers and acquisitions are often connected with a business or competitive strategy, for instance, entering a new product or market segment, or changing the basis of competition. As can be seen that M&A motives include as follows:

- (1) M&A motives can develop or enlarge the product line, or complement the products or service of the acquiring company, which leads to investment in product differentiation.
- (2) M&A motives can increase market power. The acquiring firms have more power to decide the price of products. Also, it can increase barriers of entry into the industry.
- (3) M&A motives can increase market share. In this way, the acquiring firms become more competitive.

M&A belongs to corporate strategic terms. The strategy could be a relative one of remaining within the same or related industries or branching into other industries. Three strategies can describe these as follows:

Firstly, it is the Vertical Merger. Vertical mergers refers to a merger between two companies in different industries, producing different products or services. For instance, a firm grows vertically in the value chain from extracting raw materials to manufacturing to retailing. Most often the logic behind is to improve the merger coordination effect through the integration of enterprises.

Secondly, Horizontal Merger, it refers to the merger happens between two companies in the same industry. A horizontal merger is a business integration and it is normally a rival offering the same goods or services. The horizontal merger indicated acquiring firms to obtain a synergy

effect, which is the impact of its co-operation between organizations results when the performance of a combined unit is larger than what it would have been without any type of collaboration. Which in another words, one plus one is greater than two.

Thirdly, Conglomerate Merger, which refers a merger between enterprises that are included in different and unrelated business activities that are completely unrelated. Here there are two examples of enterprise group merger: pure enterprise group merger and mix enterprise group merger. Pure enterprise group mergers includes companies that have much in common, and mixed enterprise group mergers includes the companies that are looking for product extension or market expansion.

#### 1.2 US utility industry

#### 1.2.1 Overview of U.S. Utility industry

The modern electric utility industry started in the 1880s and expanded rapidly in the 1890s. From 1901 to 1932, growing economies of scale accelerate growth and consolidation in the electric utility industry, as well as the beginnings of State and Federal regulation. Both residential and commercial end use of electricity grew precipitate from 1941 to 1945. In 1949, the Federal Government authorized Tennessee Valley Authority (TVA) to create thermal-electric power plants for commercial electricity sale. 1950 to 1970 was a time of substantially uninterrupted prosperity for the electric utility industry. Demand for electricity grew fast, consistently, and predictably, while electricity prices keep on falling.

Electric Utilities are public agencies and privately owned companies that generate power for public use. The U.S. electric industry contains over 3,100 electric utilities. Investor owned electric utilities are privately owned, represent 8 percent of the total, approximately 75 percent of utility generating capability, generation, sales, and revenue. Historically, most investor owned electric utilities were operating companies that provide basic services for the generation, transmission, and distribution of electricity. Publicly owned electric utilities are nonprofit local government agencies established to provide service to their communities and nearby consumers at cost.

Publicly owned electric utilities involve municipals, public power districts, state authorities, irrigation districts, and other state organizations. Municipal electric utilities mostly disperse power, although some large ones produce and transmit electricity as well. There are 2,009 municipal utilities, supplying about 10 percent of the generating capability, and accounting for 14 to 15 percent of resale revenue. Cooperative electric utilities are owned by their members and operate in rural areas with low concentrations of consumers. There are 912 cooperatives, operating in 47 States; accounting for 9 percent of total revenue, and around 4 percent of generation and generating capability.

Federal electric utilities are non-profitable, and the power they produce is marketed by TVA and five DOE agencies. Power Marketers are now considered utilities by FERC, because they buy and sell electricity, but do not own or operate generation, transmission, or distribution facilities.

Non-utility power producers accounted for 7% of US power generation in 1989. In 1998, they accounted for 11%, 14% in 1999, and 20.6% in 2000. These are privately owned entities that produce power for their own use and/or for sale to utilities and others.

#### 1.2.2 M&A's in the Utility Industry

In the past of a few decades, utility companies attempted to increase the wealth of shareholders or bidders by using mergers and acquisitions (M&A). But how and how deeply does the M&A impact of the wealth of shareholders or bidders or some others like rival firms?

M&A's can reduce cost in the current market of financial, regulatory and market pressures for utilities. Framing synergistic goals around financial scale remains the key driver of achieving increasing in value and good performance. Given the current marketplace, integrating operational synergies in a coherent manner is emerging as a strategic part of capturing and sustaining value – whether financial or operational – as well as addressing current market issues.

Any wealth effects for utility mergers are likely to be associated with one or more of three specific hypotheses: synergy, hubris and collusion. The synergy hypothesis illustrates that shocks from deregulation that cause larger and geographically broader deals which allow utilities to better gains economies of scale and scope. Based on contract, the hubris hypothesis argues that the freedom afforded by deregulation capacitates overconfident managers to more easily build empires via mergers. Finally, the collusion hypothesis assumes that the large firms and higher concentration tied to merger activity will lead a less competitive industry. Each of this

hypothesis has different senses for the wealth effect to bidders, target and rival firms.

#### 1.3 Energy Industry in the U.S.

U.S.A is an enriched resources and energy country. Because of this, utility industry plays a significant role in the U.S.'s economy. This kind of industry mainly includes petroleum products and crude oil, electricity and natural gas.

In the year of 2013, the energy industry was approximately 7.8 percent of the U.S.'s GDP, which is the same as year 2012. The main points of statistics of the utility energy are as presented in Table 1.3.1 below. It illustrated that the utility industry in the U.S. is growing at an rising rate. For instance, from the perspective of annual utility energy export revenues we can see, the main difference between the year 2013 and 2012 is around positive \$13 billion. Moreover, utility companies in the U.S. could be separated into five categories, which are oil, natural gas coal, uranium mining and power.

Energy Statistics for the U.S.A, 2012-2013 (Table 1.3.1)

	2012	2013	Difference 2012-2013
The energy industry's			
direct contribution to	7.8	7.8	0
GDP (per cent)			
Annual energy export			
revenues (Billion \$)	92	105	+13
The energy industry's			
direct contribution to			
export revenues (per	34	36.3	+2.3

cent)			
Monthly Average Oil			
Price (US\$/bbl)	73.26	85.74	+12.48

Sources: Statistics U.S.A, Energy Information Administration

This paper tried to focus on the U.S.'s utility industry for two reasons. Firstly, the utility industry is globally in engages and nature in M&A activity extensively. Therefore, many scholars focus on the utility industry have a advantage which is worldwide applicability. Secondly, utility industry is quite different from the others. The reason is that its products associated with nature energy resources. There is a native incentive for companies in use of M&A activity to expand its business and make more benefits. Now we know that abnormal short-term returns could be expected offer a higher returns needed to offset higher risks. Quite similar, focus on strengthen post-M&A efficiency and its accounting impact could possibly reflect the synergies declared in the interpretations by companies which engaging in M&A transactions.

#### 1.4 Organization of the study

In Chapter 2, the main concept of the efficient market hypothesis (EMH) will be given. In addition, some previous research on mergers and acquisitions will be included. In Chapter 3, the paper will explain and analyze the market reaction to merger and acquisitions in the US utility industry and to test the market efficiency based on the data from 2010 to 2013. The objective is to determine whether there exists abnormal returns before or after a M&A announcement date. According to Copeland and Weston (1988), there are three types of models to test event studies,

including: the Market Model, the Average Abnormal Return Model and the Capital Asset Pricing Model. This paper will provide test and analyze results in Chapter 4 and Chapter 5 and give the conclusion, limitations and recommendations of the evaluation and wealth effect impact to the merger and acquisition of U.S. utility industry.

#### Chapter 2

#### Literature Review

To review literature on mergers and acquisition, we should focus on the efficient market hypothesis.

#### 2.1 Efficient Market Hypothesis (EMH)

The main idea of efficient market hypothesis (EMH) has been defined by Fama during the year of 1960's. In a Recent article, Fama (1976) agreed that a security's price is fairly priced in the stock market, the reason why this happened is because the information is fully reflected the price. Moreover, people can use the information that is widely available to everyone in the stock market. Stock prices fluctuate in a random walk pattern, and nobody can predict tomorrow's stock prices based on historical stock prices, under the efficient market hypothesis. There are three forms supported or in another word associated with EMH which maintained Strong form, semi-strong form and weak form.

Strong form made some statements about that all the information maintained inside information which has already been reflected in the stock prices. This refers that nobody can earn an extra return regardless for both insiders and outsiders under the strong form EMH. Let's take this assumptions: if the insider can gain an abnormal return, we can easily made an conclusion that the strong form market efficiency does not exist at all. For example, Khan and Ikram (2011) did the analysis on the Indian Capital Market to test whether the strong form market efficiency exist

or not by texting the performance of mutual funds. The results concluded that the mutual funds had been outperformed the market. All in all, we can say that the strong form market efficiency does not exist in the Indian capital market.

Semi-strong form indicated that all the public information are widely and available for everyone, and all the public information has already been reflected in the stock prices. Fundamental analysis seems not very useful under semi-strong form EMH. The event study method could be used to texting the macro and micro events. Macro events indicated that economic policies and condition. For instance, monetary policy, fiscal policy, financial crisis and something like that. Micro events shows that firms' specific events which consisting of dividend announcements, new products announcements, stock splits, and news of change in CEO, etc. Tobias (2011) had been tested the semi-strong form of efficiency at the Nairobi Stock Exchange using the way of dividend announcement and firm value. Hussin et al (2011) had been listed approximately 120 companies to investigate the announcement influence for both dividend and earnings on stock prices to determine the semi-strong form in the Malaysian Stock Exchange. Their test illustrated that after dividend and earnings rising announcements there is a positive abnormal return. But after dividend and earnings declining announcements there is a negative abnormal return.

After analysis, Ball and Brown (1968) made an announcement that after a firm's earning announcement, there is not a significant affect on the security prices. Majority of the annual earning's information had been combined into security price movement and they was taken account by the market. Because of this, it offered empirical evidence for semi-strong form efficiency.

During the period of 1972, Scholes had been tested the effect of secondary offerings on the stock price. The stock prices declined resulting from some non-public information but was just known by the minority number of sellers. Beaver (1968) tested and analysis a sample of around 143 firms from the New York Stock Exchange (NYSE), which including Security Returns Variability (SRV) and Trading Volume Activity (TVA), In order to test market reaction to annual earnings announcements. The results illustrated that after the earnings announcement around 33 percentage increased in TVA and the rest of 61 percent was increased in SRV.

Weak form illustrate that all the market data which maintained trading prices and trading volumes, and they have already been reflected in the stock prices. Under weak form EMH, technical analysis will have no useful. Many previous study on weak form test illustrate that the stock prices moves not randomly and the abnormal return could be earned. For instance Asma (2000) deliberated the Dhaka stock market and he found that some of the share return series do goes randomly and the weak-form of EMH has been rejected. Francesco et al (2010) investigated the EMH for Eastern and Central Europe equity markets during the period of 1999 to 2009. Many evidence told people that a lot of markets are not weak form efficient. Kashif et al (2010) developed a research on Asia-Pacific markets, and he's conclusion is that investors possibly can earn benefit and abnormal returns from arbitrage among many different capital markets.

#### 2.2 Event studies on M&A

Recently, financial literature appear to say that majority of empirical analysis of M&A is based on event studies. As far as we know, those previous study could be separated into four categories

based on the results. First of all, based on part of previous study, someone get the result that significant positive abnormal returns could more likely be earned after M&A's announcement. Secondly, the result of significant negative abnormal return do exist in some papers. Thirdly, some people focus on the relationship between firm size and M&A. This could reflect the result that the smaller size of the firm, the more benefit it makes after M&A. At last I have to say that there is a little bit of confusion for the study of this area because it's no very clear conclusion in some of the articles.

If we can focus on the evidence of the study which indicates that acquiring firms attain significant positive returns from M&A. For instance, Jensen and Ruback (1983) reported that acquiring firms could earn about 30 percent target return in tender offers and around 20 percent target return in mergers. More like this, Baldwin and Gorecki (1987) found that there is a big ascend in productivity efficiency after takeovers as long as they made the analysis of the relationship between M&A and productivity, picking up the North America (i.e. Canadian) manufacturing sector from the year 1971 to 1979.

Moreover, Healy et al (1992) texted 50 of the largest U.S. M&A from the year 1979 to the year mid-1984 and reported that compared with the industrial average level, the acquiring firms looks significantly improving their asset productivity. Therefore, after M&A, they accessed with higher operating cash flow (OCF) returns.

Whereas, some study performance that there is a negative return occurred for the acquiring firm after firms' M&A. For instance, Andre et al (2004) picked up a sample which include 267

Canadian mergers and acquisitions events from the year 1980 to 2000, and then he used different calendar-time approaches which including and excluding overlapping cases. The results illustrated that Canadian acquirers have been obtained significant negative returns over the 3 years after firms' M&A. Loughran and Vijh (1997) made an study of 947 acquisitions during the period of 1970 to 1989. They recommended that the sample firms with stock transaction could earn significantly negative excess returns of approximately negative 25.0 percent. Ravenscraft and Scherer (1989) analysis the manufacturing sector in the U.S. during the period time from 1957 to 1977 and concluded that the profitability of sample firms declined rapidly after M&A.

What's more, there is also some evidence for some study to show that the returns to acquiring firms is depend on firm size. Sara et al (2003) studied around 12023 acquisitions by public firms during the period time of 1980 to 2001. They said that the announcement return for acquiring firms' shareholders is approximately 2 percentage points higher for small acquirers irrespective of the form of financing and it does not concerned whether the sample firm is public or not. The result is not very outstanding to show if M&A performance good or not in the long-term acquiring firms, and the existing evidence is confused us. Franks et al (1991) said that there is no evidence to show significant abnormal returns exceed a 3 years period after M&A. Agrawal et al (1992) showed that acquisitions are always associated with insignificant abnormal returns. However, significant abnormal returns of around negative 10 percent over a 5 years period of time after mergers.

From previous study illustrated that from the empirical side, the concept of M&A was mainly explained from the difference between stock transaction and cash transaction and the relationship

between specific events and M&A. However, this paper is going to study and analysis the market effect to M&A announcements of U.S. utility industry.

#### Chapter 3

#### **Data Resources and Methodology**

In this chapter, different models will be used to texting the collected data, and to see whether the data is significant or not. The steps followed the steps below:

#### **Data Description**

For each company, there are sixteen columns datasets in the sample, including company list, event date and historical stock price list (which include open price, high price, low price, close price adjust close price for daily and returns), and same thing for daily index list which is in the other part, right side of the form. There are also some other factors like alpha, beta, standard error term and R would be provided. (An example will be given in Appendix 2) On the company list, it covers M&A of 50 U.S. utility companies during the period time from January 2010 to August 2013. Moreover, the M&A took place in May, June, July, and August. The daily stock price of these U.S. firms are also included in the daily stock price list and it includes daily stock price from 2010 to 2013. However, it excludes firms with M&A more than once, which means that if another M&A happened within the estimate event window of the first M&A, this would be identified as an over-lapping event.

This paper has showed the study based on a different database, which do not include the overlapping events. Due to the passed time period (second and third time period) might be effect the first time period M&A, if it is not ignored, the conclusion is high likely to be biased. It also study the daily volume of the companies during the period time of 2010 to 2013 to text the change in trading volume is ex or post of the M&A.

#### 3.1 Market Model

Market Model could be used to text semi-strong form of EMH. First of all, we need to figure out the return on the stocks. The formula (Equation 3.1) has been given as follow:

$$R_t = P_t/(P_{t-1})-1$$
 (Equation 3.1)

where:

R<sub>t</sub>= return on stock during period t

P<sub>t</sub>= stock price during period t

P<sub>t-1</sub>= stock price during period t-1

Secondly, the next formula which has been given in (Equation 3.2) illustrated the Market Model.

$$R_{i,t} = \hat{\alpha}_i + \hat{\beta}_i R_{m,t} + \varepsilon_{i,t}$$
 (Equation 3.2)

where:

R<sub>i,t</sub>= return on security i during period t

 $\alpha_i$ = intercept of the equation for security i

 $\beta_i$ = slope of the equation for security i

 $R_{m,t}$ = return on the market during period t

 $\epsilon_{i,t}$ = error term

STATA program is the on could be used to do the regression of Equation 3.2. I choose NYSE index as  $R_{m,t}$ . And  $\epsilon_{i,t}$ , represents the error term, which stands for the risk of the specific firm.

In order to do the simple linear regression, there are four assumptions below:

The expected value of the random error e: E(e)=0

The variance of the random error e:  $var(e) = \sigma^2$ 

The covariance between any pair of random errors ei and ej: cov(ei, ej)=0

The values of e are normally distributed about their mean:  $e \sim N(0, \sigma^2)$ 

(See Hill et al 2012)

# 3.2 Three sectors: Average Abnormal Returns (AAR), Average Cumulative Abnormal Returns (ACAR) and Abnormal Returns (AR)

Equation 3.3 represents the Abnormal Return (AR).

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{m,t})$$
 (Equation 3.3)

where,

 $AR_{i,t}\!\!=\!\!the\;abnormal\;return\;on\;security\;i\;during\;period\;t.$ 

R<sub>i.</sub>=return on security i during period t.

 $R_{m,t} = NYSE index.$ 

Equation 3.4 represents Average Abnormal Return (AAR).

$$\mathbf{AAR_t} = \frac{1}{N} \sum ARit$$
 (Equation 3.4)

where, N is the number of securities.

T-test would be used. Null hypothesis is stated:

 $H_0$ :AAR<sub>t</sub>=0 (if it is true, market is efficient)

Alternative hypothesis is stated:

 $H_a$ : AAR<sub>t</sub> $\neq 0$  (if it is true, market is not efficient)

If do not reject null hypothesis, we will get the conclusion that market is efficient. If reject null hypothesis, then the market is not efficient.

#### 3.3 Research Steps

In this part, four main factors will be given, which maintained Trading volume, Stock price, Data selection and Data sources.

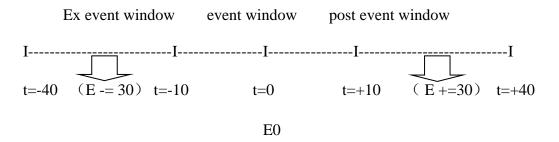
#### 3.3.1 Trading Volume

I use event studies to test market reaction of M&A's. Firstly, an event window of 20 days had been chose, which refers to 10 days before t=0 (M&A) and 10 days after that time. E0 represents the return on the event window. Secondly, I choose 30 days ex event window and 30 days post event window. E- and E+ represents return on ex event window and return on post event window respectively.

In this situation, STATA has been used to test E0, E- and E+. At first, compared E0 with E- to find out if the M&A announcement has an impact on trading volume or not. If E0 is greater than E-, which means it is positive and significant, and we can get the result that M&A announcement effect changes in trading volume and vice versa for sure. On the other hand, compared E- with E+ in order to test if post-M&A can create value for U.S utility firms or not. If E+ is greater than

E- which refers it is significantly positive, and get the result that the value of U.S utility firms is growing up after M&A transaction and vice versa.

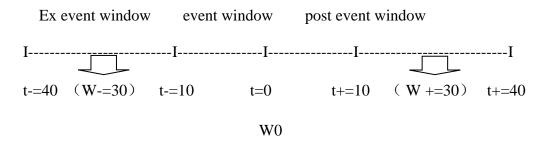
Figure 3.3.1 Event Window



#### 3.3.2 Stock price

The method to test stock price is the same as before text trading volume. STATA could be used to test W0, W- and W+. First of all, compared W0 with W- to find out whether M&A announcement has effect on stock price. If W0 is greater than W- which means it is positive and significant, and can get the result that stock prices are effected by M&A announcements. If the conclusion is the reverse, which means M&A announcements will not impact stock prices. Moreover, compared W- with W+, in order to test if post-M&A can create value for U.S utility firms or not. If W+ is greater than W- which means it is significantly positive, then, can get the result that the value of U.S utility 1 firms is growing up after M&A transaction and vice versa.

Figure 3.3.2



3.4 Data Selection

In this paper 50 Utility companies have been chose which traded on the New York Stock

Exchange (NYSE) and merger and acquisitions that took place during the period time of January

2010 to August 2013. And there are some rules which the company list in the sample should

qualified by the following criteria:

1) It must be a common stock and traded on the New York Stock Exchange.

2) Data for these companies must undertake an IPO for at least 1 year before M&A

announcement and continue at least 1 year after M&A.

3) The companies should not include overlapping cases in the whole event window.

3.5 Data sources

The data of daily closing prices and M&A announcement from the year 2010 to 2013 for were

collected from Bloomberg.

Data of daily trading volume from 2010 to 2013 could be found in the website which offered

below:

http://www.finance.google.com/

#### Chapter 4

#### **Analysis of Results**

In this chapter, the method and main steps to run STATA program will be provided. What's more the analysis based on each of the result will be offered as well. In each time, whether to reject or do not reject the null hypothesis to illustrate how significant the results are. Every detail will be showed below.

#### 4.1 Overview

This section is going to analyze and explain the results of the models, which derive from Chapter 3.2.1 and 3.2.2, M&A from 2010 to 2013 (the list of firms is attached in Appendix). Those data has been collected and run them in STATA to get these results. Put the Excel form in to the STATA to run the regression, and the orders are:

- 1. set obs, 'obs'
- 2. tempvar r x y
- 3. gen'r'= invnorm (uniform())
- 4. gen 'x'= invnorm (uniform ())
- 5. gen'y' = 'a' + 'b' \* 'x' + 'r'
- 6. sum
- 7. regress'y' 'x'
- 8. return scalar alpha = b (\_cons)
- 9. return scalar beta = b ('x')

#### **4.2 Stock Price**

#### 4.2.1 Regression Analysis

Market Model (Equation 3.2) describe the linear relationship between expected return and beta. In this sample, I used the NYSE index as the market return.

Table 4.1

MS	df	SS	Source
. 020679535	1	. 020679535	Model
.000365241	659	. 240694115	Residual
.000396021	660	. 26137365	Total
Err. t	Std.	Coef.	return
020679535 000365241 000396021		1 659 660	.020679535 1 .240694115 659 .

Table 4.1illustrate the regression results of the Market Model. If look at the output, it shows that  $\alpha$  (cons), the intercept of market model which regard as -0.000292. And  $\beta$  (idx return), the slope of market model which regard as 0.7330951. In order to measures the sensitivity of the security to the market return we should focus on the value of  $\beta$ . The result is the greater the value of  $\beta$ , the more sensitive the security to the market return. This conclusion illustrate that the change in these securities is sensitive to the change of market return.

The other important term R-squared is a broad application in linear regression. It measures if the original data points match the linear regression or not. In another words, the R-squared value is to measure how well does the final line fits the original data points. A higher R-squared value represents stocks price match the market model better, which refers that the securities is tracking the performance of the market index. In the paper, it equals to the US utility stocks price following the pattern of the NYSE index. But, from the graph above, the results show R-squared is about 0.0791 and adjusted R-squared is around 0.0777. The value is relatively too low. The movement of stocks price in this sample does not tracking the demonstration of the NYSE index.

#### 4.2.2 Average Abnormal Return (AAR) Results

There are totally three main purposes to test average abnormal returns. Firstly, is to test whether the market is efficient or not. Secondly, is to test whether M&A's can affect stock price or not. Last but not the least, is to test whether the value of US utility firms can grow up or not after M&A. Table 4.2 is to show the output of average abnormal return. This paper offered the use of the daily stock price list and the event window maintained at 10 days, which refers 5 days before M&A and 5 days after.

Table 4.2

One-sample t test

Variable	0bs	Mean	Std.	Err.	Std.	Dev.	[95%	Conf.	Interval]
ar	661	0003239	. 000	0747	. 019	2052	001	7906	. 0011429
mean = 1	mean(ar)							t	= -0.4336
Ho: mean = (	)				d	egrees	of fr	eedom	= 660
Ha: mean	1 < 0		Ha: me	ean !=	0			Ha: m	ean > 0
Pr(T < t) =	0.3324	Pr (	T  >  t	:1) =	0.6648		Pr	(T > t	) = 0.6676

For this time, the T-test could be used. Null hypothesis is:  $H_0$ :  $AAR_t = 0$ . The alternative hypothesis is:  $H_a$ :  $AAR_t \neq 0$ . Through the text, if P-value is more than 0.05 which means P>0.05, do not reject the null hypothesis. If P-value is less than 0.05 which refers P<0.05, do reject the null hypothesis. For the output, AR represents average abnormal return (AAR). The value of P-is 0.6648, which is greater than 0.05. Therefore, we can get the result that the semi-strong market is efficiency.

Table 4.3

SECONOMIC TO US	989808	WEX-2000		WED023643	57200
Variable	0bs	Mean	Std. Dev.	Min	Max

Table 4.4

One-sample t test

Variable	0bs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
aar2_1	661	.0003488	.0002946	.0075742	0002297	. 0009273
mean = 1	mean (aar2	_1)			t	= 1.1840
	<u> 1</u> 1			4	of freedom :	
Ho: mean = (	)			degrees	or rreedom .	= 660
Ho: mean = (	-01 -00		Ha: mean !=	1975		= 660 ean > 0

The aar2\_1 appears in both Table 4.3 and Table 4.4 which represents the difference between return  $(R_{-1})$  in ex-event window and return  $(R_0)$  in event window. The value of P- is 0.2369, which is greater than 0.05. Thus, we do not reject null hypothesis and get the result that M&A do not have any effect on stock prices.

Table 4.5

Variable	0bs	Mean	Std.	Err.	Std.	Dev.	[9	5% Conf	In	terval]
aar3_1	661	.0003155	. 000	2017	. 005	1851	0	000805		0007115
mean = 1	mean(aar3	_1)						t	-	1.5642
Ho: mean = 1	0				ď	egrees	of	freedom	=	660
Ha: mean	n < 0		Ha: m	ean !=	0			Ha: 1	nean	> 0
Pr(T < t)	= 0.9409	Pr()	T  >  1	E1) = 1	0.1182		9	Pr(T > t	:) =	0.0591

Table 4.5 identical the difference output between the return in the ex-event window  $(R_{-1})$  and return in the post-event window  $(R_{+1})$ . The aar3\_1 illustrate the difference between  $R_{-1}$  and  $R_{+1}$ . If look at the output, the result represents that the difference between two is 0.0003155. But, value of P- is 0.1182. Do not reject the null hypothesis, the null hypothesis  $H_0 := 0$ . The result shows that M&A's do not generate any value for U.S. utility firms.

#### 4.3 Volume

Another data resource is the daily volume of M&A firms in U.S. utility industry. The goal of the test is to figure out if there is a change in volume before or after M&A. The result has been showed in Table 4.6.

Table 4.6

Paired t test

Ť						
Variable	0bs	Mean	Std. Err.	Std. Dev.	[95% Conf.	Interval]
avg2	1271	4614869	349025.9	1.24e+07	3930139	5299600
avgl	1271	3245529	331266.8	1.18e+07	2595639	3895419
diff	1271	1369341	68208.16	2431695	1235527	1503154
mean(d	liff) = mes	m(avg2 - av	<b>g1</b> )		t:	= 20.0755
Ho: mean(d	liff) = 0			degrees	of freedom :	= 1270
Ha: mean(d	liff) < 0	На	: mean(diff)	!= 0	Ha: mean	(diff) > 0
Pr(T < t)	= 1.0000	Pr(	T  >  t ) =	0.0000	Pr(T > t)	= 0.0000

Avg1 ( $V_{-1}$ ) and Avg2 ( $V_0$ ) in the output illustrates the average volume in ex event window and event window. They are around 3245529 and 4614869, respectively, and the difference between those two is 1369341. It apparently represents that the average volume ( $V_0$ ) in the event window is much more than the average volume ( $V_{-1}$ ) in ex event window. Moreover, the value of T- and P- are approximately 20.0759 and 0.0000. Therefore, do reject the null hypothesis. Null hypothesis regard as  $V_0$  and  $V_0$  is statistically significant.

#### Chapter 5

#### Conclusion

The aim of this paper is focus on and trying to solve two questions. Firstly, do M&A's have impact on stock prices? Secondly, do M&A create value for US utility firms? If yes, is it large or small? The daily stock price and volume of US utility firms during the period of 2010 to 2013 have been used to progress the empirical analysis research.

#### **5.1 Conclusions**

This paper acquired the results from running STATA program, and can get 5 results from above. Firstly, use the Bloomberg to run STATA to do the regression analysis of the Market Model. Based on the output, the target security which refers the sample has been chosen do not track the expression of the NYSE index. Secondly, According to the results of the average accumulative return (AAR), the result shows that the market is efficiency. The reason is do not reject the null hypothesis. Null hypothesis H0: AARt =0. Thirdly, from above, there is totally no abnormal return during the 10 days event window. Therefore, M&A do not effecting stock prices at all. Fourthly, there is no changes exist between the return in the ex-event window and the post-event window. Thus, it is easy to get this result: M&A couldn't generate value for U.S. utility firms. Finally but not the least, the trading volume is greater during the event window than that in the ex-event window.

#### **5.2 Limitations and Recommendations**

The result illustrate that M&A do not have any effect on stock prices and M&A can't generate firm's value either. The reasons to explain this result are: First of all, a lot of factors might impact stock prices, not only because of M&A. Moreover, M&A is not the most important factor to effect and determine the stock prices. Therefore, it is reasonable that there is no impact. Secondly, 50 companies' M&A events of U.S. utility industry have been used as the sample to analysis. The specialties of the utility industry are stable, and the volatility is relatively low.

The case also has a disadvantage, which is just 50 events of the U.S. utility stocks have been chosen on the NYSE, perhaps the sample is relatively small. That's why there is no statistically significant results. But the sample is qualified to meet the requirement to do the test, and the result could be accepted. However if the result needs to be more accurate and favorable, probably the sample should enlarged and choose more output and stocks.

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## APPENDIX A COMPANY LIST

1	Deal Type	Announce Date	Acquirer Name	Announced Total	Payment Type	Deal Status
2	DIV	09/10/2010	JPMorgan Chase 8	8529.27	Cash	Complete
3	DIV	23/11/2012	JPMorgan Chase 8	3670.92	Cash	Complete
4	DIV	16/02/2010	JPMorgan Chase 8	1700	Cash	Complete
5	DIV	14/12/2011	National Welfare I	1000	Undisclosed	Complete
6	DIV	22/10/2010	Caterpillar Inc	807.53	Cash	Complete
7	DIV	01/07/2011	General Electric Co	805	Cash	Complete
8	DIV	29/06/2012	Brookfield Renewa	600	Cash	Complete
9	DIV	31/12/2012	General Electric Co	461.89	Cash	Complete
10	ACQ	03/03/2010	JPMorgan Chase 8	427.68	Cash	Complete
11	DIV	07/10/2010	JPMorgan Chase 8	220	Cash	Complete
12	DIV	25/05/2010	Global Partners LP	200	Cash	Complete
13	DIV	31/03/2010	General Electric Co	150	Cash	Complete
14	DIV	11/12/2013	Regency Energy Pa	139	Cash	Complete
15	ACQ	03/07/2010	American Internat	133.42	Cash	Complete
16	DIV	22/04/2011	Exxon Mobil Corp,	113.81	Cash	Complete
17	DIV	29/07/2013	JPMorgan Chase 8	76.6	Cash	Complete
18	ACQ	27/09/2011	General Electric Co	75	Cash	Complete
19	ACQ	13/04/2012	AllianceBernstein	l 69	Cash	Complete
20	DIV	20/05/2010	General Electric Co	68	Cash	Complete
21	DIV	16/04/2011	Maxim Power Cor	52.9	Cash	Complete
22	ACQ	23/03/2010	Intel Corp,CGX En	41.4	Debt	Complete
23	ACQ	24/01/2011	Intel Corp,Credit S	25.65	Cash	Complete
24	ACQ	17/03/2011	General Electric Co	20	Cash	Complete
25	DIV	26/01/2011	General Electric Co	N/A	Cash	Complete
26	JV	27/01/2011	General Electric Co	N/A	Undisclosed	Pending
27	DIV	25/08/2010	Mid-Atlantic Conv	N/A	Cash	Complete
28	DIV	31/01/2011	GDF Suez	N/A	Cash	Complete
29	JV	18/06/2011	Alcoa Inc	N/A	Undisclosed	Pending
30	ACQ	06/07/2011	General Electric Co	N/A	Cash	Complete
31	DIV	28/07/2011	GDF Suez	N/A	Cash	Complete
32	JV	23/08/2011	General Electric Co	N/A	Undisclosed	Pending
33	JV	19/09/2011	General Electric Co	N/A	Undisclosed	Pending
34	ACQ	12/10/2011	General Electric Co	N/A	Cash	Complete
35	DIV	16/11/2011	State Oil Co of the	N/A	Undisclosed	Pending
36	DIV	06/12/2011	Helen of Troy Ltd	N/A	Cash	Complete

37	DIV	06/12/2011	Helen of Troy Ltd	N/A	Undisclosed	Complete
38	JV	26/02/2012	General Electric Co	N/A	Undisclosed	Complete
39	ACQ	04/12/2011	UnitedHealth Grou	N/A	Undisclosed	Complete
40	ACQ	25/07/2010	JPMorgan Chase 8	N/A	Undisclosed	Complete
41	JV	13/06/2011	Alcoa Inc	N/A	Undisclosed	Complete
42	ACQ	30/12/2011	Constellation Ener	N/A	Cash	Complete
43	DIV	30/04/2013	Contact Energy Ltd	N/A	Undisclosed	Complete
44	DIV	17/09/2012	Keyera Corp	N/A	Cash	Complete
45	DIV	31/10/2012	PE Wheatstone Pt	N/A	Cash	Complete
46	DIV	08/05/2011	Electric Power Dev	N/A	Undisclosed	Complete
47	ACQ	15/11/2012	General Electric Co	N/A	Undisclosed	Complete
48	DIV	28/09/2013	Electric Power Dev	N/A	Undisclosed	Complete
49	JV	16/09/2010	AES Corp/VA	N/A	Undisclosed	Complete

APPENDIX B

**SAMPLE** 

							0.000836								
							0. 92692								
							0. 025576 0. 160468								
						n sq -	0.100400								
			ACCEL	ACCEL	Cnx IT	Cnx IT						Total Al			
days	Firm_id	date	ock Pri	Return	Index	Return	cted ret	AR	CAR	t-test	tot	al 50 fi	AR	post_ev	ex_ev
-33	A1001	2011/6/22 2011/6/23	42. 3	-0.00709	6240. 2	0 000310	0.009473	-0.01657	-0.01657	-0 64768		-0.07879	-0.00213	aar2	<b>aar1</b>
-32	A1001	2011/6/23	42.7	0.016667			0.03038						-0.00213		
-31	A1001	2011/6/27	42	-0. 01639			0.005357						0.004893		
-30	A1001	2011/6/28	41.75	-0.00595			6. 22E-05						0.004672		
-29	A1001	2011/6/29	41. 75	0 000000			0.007263						0.002967		
-28 -27	A1001 A1001	2011/6/30 2011/7/1	42. 1	0.008383			0.008468						0. 005821 -0. 00455		
-26	A1001	2011/7/4	41.75	-0.00595			0.002377						-0.00705		
-25	A1001	2011/7/5	41.65	-0.0024			0.003962						0.005668		
-24	A1001	2011/7/6	41.65	0			0.000242						0.005955		
-23	A1001	2011/7/7		0.016807			0.012346						-0.00063		
-22 -21	A1001 A1001	2011/7/8 2011/7/11	41. 35	-0. 02361 0. 003628			-0. 00784 -0. 01458						-0. 01008 -0. 00042		
-20	A1001	2011/7/12	40.75	-0.01807			-0.02672						-0.00015		
-19	A1001	2011/7/13	41. 25	0.01227		-0.00108	-0.00016	0.012431	-0.06256	0.48604		-0. 1557	-0.00421	-0.00358	-0.00421
-18	A1001	2011/7/14	41. 15	-0.00242	6325. 9		-0.01112						-0.00103		
-17	A1001	2011/7/15	41.65	0. 012151			0.003788						0.002203		
-16 -15	A1001 A1001	2011/7/18 2011/7/19	41. 5 45. 85	-0. 0036 0. 104819			-0. 00637 0. 011022						0.000446		
-14	A1001	2011/7/20	43. 75	-0.0458			-0.00473						0.003419		
-13	A1001	2011/7/21	43.8	0.001143	6335. 9	0.001296	0.002037	-0.00089	0.009095	-0.03495			-0.00063		
-12	A1001	2011/7/22	43. 7	-0.00228			0.015846						-0.00656		
-11	A1001	2011/7/25	44.6	0. 020595 0. 019058			0.000253						0.002804		
-10 -9	A1001 A1001	2011/7/26 2011/7/27	45. 45 46. 85	0. 019058			-0. 00026 -0. 00182						-0. 00199 -0. 00064		
-8	A1001	2011/7/28	45. 05	-0. 03842			-0.01378						0.002461		
-7	A1001	2011/7/29	44. 05	-0.0222			0.004906						-0.00364		
-6	A1001	2011/8/1	44	-0.00114			0.007712						-0.00166		
-5	A1001	2011/8/2	41. 9	-0.04773			-0.01473		-0.03035				0.002502		
-4 -3	A1001 A1001	2011/8/3 2011/8/4	42. 85 42. 45	0. 022673 -0. 0093			-0. 00767 -0. 00813			1. 186476			0. 002504 -0. 00069	-0.00458	0.002504
-2	A1001	2011/8/5	40. 95	-0. 03534			-0. 03615						0.000075		
-1	A1001	2011/8/8	42.45	0.03663			-0.0399						0.008982		
0	A1001	2011/8/9		-0. 0318			-0.03186						-0.00071		
1 2	A1001 A1001	2011/8/10 2011/8/11	43. 2 42. 75	0. 051095 -0. 01042			0. 024007 -0. 00465						0.004984		
3	A1001	2011/8/11	43. 3	0. 01042			-0.00465						-0.005 -0.00242		
4	A1001	2011/8/16		-0.01963			0.009974						-0.0034		
5	A1001	2011/8/17	40.95	-0. 03534	5571.2	0.018566	0.018045	-0.05338	0.049813	-2.0871		-0.49136	-0.01328		
6	A1001	2011/8/18	39. 55	-0.03419	5348. 35		-0.03624						0.004423		
7 8	A1001 A1001	2011/8/19 2011/8/22	38. 55 38. 05	-0. 02528 -0. 01297			-0. 03981 -0. 00391						0. 002923 -0. 0023		
9	A1001	2011/8/23	40. 5	0.064389			0.00331						0.0023		
10	A1001	2011/8/24	40. 2	-0.00741			-0.01091						0.000991		
11	A1001	2011/8/25	39.65	-0.01368			-0.02142						0.001195		
12	A1001	2011/8/26	37. 15	-0.06305			-0.00062						-0.00631		
13 14	A1001 A1001	2011/8/29 2011/8/30	37. 4	0.006729			0.046447						0. 003364 -0. 00406		
15	A1001	2011/9/2	38	0.010010			-0.01057						-0.00628		
16	A1001	2011/9/5	37. 35	-0.01711			-0.01371					-0.06351	-0.00172		
17	A1001	2011/9/6	37. 5	0.004016			0.012475						0.005639		
18 19	A1001 A1001	2011/9/7 2011/9/8	38	0. 013333			0. 002347 0. 01483						-0. 00358 -0. 00844		
20	A1001	2011/9/8	39. 2	0. 031579			-0. 01902						0. 002005		
21	A1001	2011/9/12	39. 25	0.001276			-0. 03065						-0.00091		
22	A1001	2011/9/13	39.6	0.008917	5204. 75	0.009093	0.009264	-0.00035	0.066065	-0.01356		-0.22107	-0.00597		
23	A1001	2011/9/14	39.6	0 010000			0. 040078						-0.00443		
24 25	A1001 A1001	2011/9/15 2011/9/16	40. 35	0. 018939 -0. 00867			0. 022201 -0. 00853						0.004424		
26	A1001	2011/9/10	40	0.00807			-0.00853						0.007138		
27	A1001	2011/9/20	39. 9	-0.0025			0.029775						-0.00158		
28	A1001	2011/9/21	39. 1	-0.02005			-0.00022						0.000635		
29	A1001	2011/9/22		-0.02941			-0. 03581						0.003211		
30	A1001 A1001	2011/9/23 2011/9/26	38. 75 37. 4	0. 02108 -0. 03484			-0.00219 0.004272						0. 004555 -0. 00262		
32	A1001	2011/9/27		0.009358			0.004272						0.001226		
33	A1001	2011/9/28	37. 9	0.003974			0.008178						-0.00458		
					6240. 2										