

Price reaction to  
merger and  
acquisition  
announcements  
finance essay



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Event study of stock price reaction to merger and acquisition announcement has been concerned by experts since it started being developed. The common method to estimate the price reaction around the event is residual analysis, which means that test whether there are abnormal returns before and after announcement date. Also, residual analysis can be used as a mean to test the market efficiency. In this paper, it concentrates on the study of the effect of merger and acquisition announcement on share prices of target companies and then tests the market efficiency by analyzing the result of abnormal returns before and after announcement date, whether there is inside information influence before announcement date and whether the price reflection public information quickly after the announcement. The paper first will review the literature of development of event studies and methodology used in event studies. Then, it will illustrate the data and methodology of the event study of this paper. Last but not least, it will analysis the effect of announcement on price reaction and market efficiency according to the statistic result.

### Literature review

An event study is a method to estimates the stock price impact of certain corporate events, such events can be dividend announcements, mergers and acquisitions. According to S. P. Kothari and J. B. Warner(2004), event studies that focus on announcement effects for a short-horizon around an event provide evidence relevant for understanding corporate policy decisions. In financial markets, event studies can be used to specify and test economic hypotheses. Besides, event studies also research on evidence of market efficiency focusing on long-horizon tests at least twelve months. The

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evolution of event studies started from Dolley(1933), who examined stock price reaction to stock splits, plusing several other published papers indicating that by the 1960s, which made their way into leading business economics journals(C. J. Corrado). S. P. Kothari and J. B. Warner(2004 ) reported that the total number of papers reporting event study results is 565 in five leading journals from the year 1974 to 2000, Journal of Business(JB), Journal of Finance (JF), Journal of Financial Economics (JFE), Journal of Financial and Quantitative Analysis (JFQA), and the Review of Financial Studies (RFS). The number of papers published per year increased in the 1980's. Among these papers, Fama(1991) paid attention to the relation of event studies to tests of market efficiency and Kothari and Warner(1997) summarized of long-horizon tests. Beyond financial economics, event studies are also researched by experts in related areas, such as accounting literature (Kothari(2001)), law and economics.

As a standard method of measuring security price reaction to certain corporate events, the methodology of event studies is also concentrated by experts and developed in parallel with the event studies. Initially from event study methodology being introduced by Fama, Fisher, Jensen and Roll(1969), the basic format of methodology of event studies has not changed over time. The key focus is to measure the sample securities' mean and cumulative mean abnormal return around the event(S. P. Kothari and J. B. Warner(2004)). There are two areas of changes that make the methodology more precise and sophisticated, one is the use of daily instead of monthly security return data. According to S. J. Brown and J. B. Warner(1984), as long as methodologies are based on the OLS market model and using standard

parametric tests, the characteristics of daily data present few difficulties in the context of event study methodologies. For example, the non-normality of daily returns has no obvious impact on methodologies of event studies. The other is the long-horizon event study methods used to estimate abnormal returns and calibrate their statistic significance, although there are more limits in using long-horizon event study methods compared with short-horizon methods. The basic of methodology is to measure abnormal returns as residual by using some benchmark model of normal return. Specifically, there are a variety of models can be used to measure the normal rate of return, with the addition of certain variables, and then to generate abnormal return estimates. J. J. Binder(1998)reported that abnormal returns have be measured as mean-adjusted returns, market-adjusted returns, deviations from the market model, deviations from the one factor Capital Asset Pricing Model(Sharpe(1964), Lintner(1965), Black(1972)), deviations from a multifactor model like Arbitrage Pricing Theory(Ross(1976)).

#### Stock price reaction to merger and acquisition events

There are a large number of literatures representing the impact on the market value of merging firms before and after the merger and acquisition events and numerous studies have examined the impact of merger announcements on the prices of the stocks of the acquirer and target firms(M. F. Leong, B. Ward and C. Gan(1996)). Hawawini and Swary(1990) reported the stock market reaction by examining 130 acquirer banks and 123 target banks during 1980s, they found that targets banks perform better than that of acquirer banks in mergers and the share price of a target bank increased by 11. 5 percent during the week of the merger announcement on <https://assignbuster.com/price-reaction-to-merger-and-acquisition-announcements-finance-essay/>

average. Dodd and Asquith(1980) concluded the evidence that mergers have a favourable effect on the common stocks of the merging companies, besides, they found that acquired firms' stockholders earn large positive abnormal returns from the merger and acquisition events and the acquiring firms' stockholders are affected little if at all. The same results comes from Asquith and Kim(1982)'s research, which concluded that abnormal returns are positive and statistically in acquired firms significant but are not significantly different from zero. The reason why target companies performed well is established at a condition, which is that investors do not anticipate the event before the announcement period, in another words, the market is at least semi-strong. If not, the returns of the target company around merger announcement date do not reflect the complete economic impact of the event(M. F. Leong, B. Ward and C. Gan(1996)). Leong, Ward and Gan(1996) concluded that if the market doesn't reflect to an event, it can be interpreted as evidence of the irrelevancy of the event instead of an indicator of market efficiency. They also directed that market price reaction following the announcement of the merger can be affected by either the content of the information or how its relation to previous information expectations. Gopalaswamy, Acharya and Malik(2008) reported that there was an upward trend of target companies in India between the year of 2000-2007 in the cumulative average abnormal return few days before the announcement of mergers because of anticipation or leakage of information. Besides, there is sudden downfall in the CAAR for the target companies from the day after the announcement and the average abnormal return is negative and significant after two days of announcements, as a result, they concluded that the India market is semi-strong efficient.

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## Data and methodology

To analyse the stock price reaction around merger announcement date, it is necessary to choose the appropriate sample in order to represent the entire trend of the stock market in one country. In this paper, it chose 50 target companies of France that were announced during 1/ 2010 to 3/2012. The more the companies are chose, the more the result is closed to normality. The announcement date is identified as the day when the target company first publishes disclosed information about the merger and this was specified as day zero in the event time. In order to be included in the event study, all target companies should be listed in France-continuous market. Besides, the sectors of selected companies are widely spread so that it can avoid the market impact on the specific sectors. According to S. P. Kothari and J. B. Warner(2004), constructing a portfolio of event firms for a number of days around the announcement can address the bias of estimated standard deviation of cumulative abnormal return. The information and the data of each company are obtained from the website <http://banker.thomsonib.com/ta/>. The data of each company are selected 100 days prior to the announcement date and 10 days after announcement date. The data obtained is daily price other than monthly price or else.

## OLS Market model

In order to measure the magnitude of the share price variation around the announcement date, abnormal return should be calculated. According to A. Leemakdej(2009), since an abnormal return is unobserved, it is identified by taking the difference between an actual return and an expected return

derived from a financial model. There are a variety of expected return model can be used in event studies to calculate the expected return of stocks. Here, the market model is selected to be used to calculate the expected return of stocks:

In order to calculate the expected return of stocks around the announcement date, the event study separates the data of the sample into two sections, namely estimated periods and test periods. Estimated periods are identified as the day 100 before the announcement to the day 15 before the event. While, test periods are identified as ten days before and after the event and the event window is  $[-10, 10]$ . Speaking of event window, it is a consideration that the dissemination of company-specific information may extend over more than one day. Because the release of information of a company and the financial express reporting information may not happen simultaneously, it is unsure that whether market participants had information released by companies when they are trading. So, it is necessary to extend the day of event into multiple days (M. F. Leong, B. Ward and C. Gan (1996)). Data during the estimate period is used to estimate the expected return model by representing the return of stocks in  $[-100, -15]$  as expected return.  $R_{mt}$  is the market return calculated by using the SBF120 index of France. The objective of estimate period is to calculate two parameters in the market model alpha and beta in order to estimate the expected return of the stock in event period. and are obtained by an ordinary least-squares regression of  $E(R)$  and  $R_m$ , which are used to estimate the true value of  $\alpha$  and  $\beta$ . Besides, event period data can investigate the impact from the event and the abnormal return should be calculated in this period in order to get the

cumulative abnormal return. The return of stocks can be calculated using the formula:

The equation of abnormal return is:

The equation of cumulative abnormal return is:

The sample has chose 50 target companies, in order to avoid the specific influence of some special companies, it is necessary to calculate the average cumulative abnormal return of each day in test period. The equation of average cumulative abnormal return is:

Note that by using a time-series of average excess returns, the test statistic below can take into account cross-sectional dependence in the excess returns of specific securities(S. J. Brown and J. B. Warner(1984)).

Hypotheses testing

The objective of this event study is to access whether there are any abnormal returns in the test period. So the null hypotheses is there is no abnormal performance while the alternative hypotheses is that abnormal return is not equal to zero.

$H_0: A_{Ri, t} = 0$

$H_1: A_{Ri, t} \neq 0$

The test statistic used sampling distributions and it is a random variable because abnormal returns are measured with error, which comes from two reasons, predictions about securities' unconditional expected return are



imprecise and individual firms' realised returns at test period are affected for reasons unrelated to the event. In order to reduce this error, the estimated standard deviation of cumulative abnormal return is the portfolio of 50 target firms of 10 days before and after the announcement. M. Barakat and R. Terry(2011) concluded that OLS market model is well specified under a variety of condition, for example, non-normality of daily returns has no impact on event study methods. As the deviation of abnormal return is estimated by the sample, so the hypotheses used t-statistic:

As there are two variables  $\hat{\epsilon}$  and  $\hat{\epsilon}^2$  that have been used, the degrees of freedom is  $(n-2)$ . The significant level is 5%. With the two-tail test, the null hypotheses should be rejected if

A test statistic larger than the upper-tail critical value  $t_{0.025}$  provides statistical evidence that the announcement had a significant positive impact on the price. While, a test statistic less than the lower-tail critical value  $-t_{0.025}$  provide evidence that the announcement had a significant negative impact.

Furthermore, the hypotheses can also test the market efficiency. If the market is efficient, the share price will reflect all available information and the announcement will cause the abnormal return performance.

Empirical result on stock returns

The event study chose two event windows to analyse the result from the empirical research. First, when the event window is  $[-10, 10]$ , the estimated standard deviation of the mean abnormal return is 1.626. Putting the figure

into the t-statistic test can obtain the daily critical value used to test the null hypotheses. The table below illustrated the critical values 10 days before and after the announcement.

event window

average CAR

t-statistic

-10

-0.34

-0.207671297

-9

0.10

0.061251696

-8

0.07

0.040681124

-7

0.21

0.130356535

-6

0.22

0.135745854

-5

-0.01

-0.003102476

-4

0.17

0.101805486

-3

-0.25

-0.155581646

-2

0.58

0.355347928

-1

0.63

0. 386680663

0

2. 73

1. 679904902

1

3. 81

2. 342014843

2

3. 83

2. 356724889

3

3. 69

2. 266579855

4

3. 25

2. 000369788

5

2. 99

1. 838127393

6

2. 75

1. 694045979

7

2. 77

1. 70510293

8

3. 24

1. 991626516

9

3. 40

2. 093802276

10

2. 93

1. 800949686

As the significance level is 5% and the degrees of freedom is 48, the critical value of two-tail test is 2.01. According to the table above, the t values in day 1, 2, 3 and 9 are greater than critical value, which means that the abnormal return are significantly positive in the day 1, 2, 3 and 9 after the announcement. However, the t-values of the day before the announcement are all less than the t-value, which concludes that there is no abnormal return before announcement. So, it can infer that there is no information of announcement leaking to certain market participants, the stock price does not change and investors can not acquire abnormal returns before announcement date.

If there is abnormal return before announcement, according to M. F. Leong, B. Ward and C. Gan(1996), there are two reason can be explained. First, there is insider trading. The information is leaking to some investors who then buy stocks before the announcement, as a result, the stock prices will start to react the inside information and those investors will obtain abnormal returns before the announcement. It can conclude that the market is semi-strong efficient. However, the information may not be leaked, the reason of the increase of stock prices is that public may become suspicious of merger before the announcement. So, it is impossible to monitor directly all trading motivated by the possession of inside information. No matter what happen, it can conclude that the market in France may be not semi-strong efficient because if the inside information is leaked the share prices will reflect the insider information, however, the null hypotheses should be accepted as there is no abnormal returns before the announcement. So, in these condition, the market is strong efficient and prices incorporate all

information that any investor can acquire. Therefore, non-public information is not useful for certain investors make abnormal return. On the other hand, the semi-efficient form market can not be rejected. The inside information may not be leaked and investors have no anticipation that the firm they they owned would be acquired by other companies, so they have no incentives to buy a large number of shares before the announcement and the share price would not increase beyond participants' expectation.

According to the table above, on the announcement date, the realised value is 1.68, although the figure is much larger than that one day before announcement, it still smaller than the critical value. There are two reasons that can explain this condition. First, the market is not efficient because the share prices can not reflect the public information. This may be the result of European sovereign debt crisis, during the crisis, the bond market was influenced heavily in France, even in the stock market, investors had less confident to invest fund to financial market, so even the announcement of merger can not bring them confidence to investment. However, there is also evidence that the market is efficient. According to Mitchell & Netter (1990), they reported that corporations may release information one day and the financial press may report this information on the following day, therefore, it is sometimes unclear on which day the information reaches the market. It can happen because market participants had the information during the market trading hours on the day is not the information that is released by corporations. So, the share price may not reflect to the announcement because investors did not receive the information if the financial market, or only a minority of investors have confidence to purchase stocks. From the

table above, the t-value on day one is greater than the critical value. The null hypothesis is rejected from the first day after the announcement, so the share prices reflect the announcement start from the following day of the announcement until the third day after the announcement. However, there is an abnormal condition that the abnormal return is not equal to zero on the ninth day after the announcement, which can happen for the reason beyond the merger event. In order to clear away the influence this abnormal return, the event window can shrink to five days before and after the announcement date.

event window

CAR

t-statistic

-5

-0.01

-0.003182304

-4

0.17

0.104424975

-3

-0.25



-0.159584813

-2

0.58

0.364491149

-1

0.63

0.396630085

0

2.73

1.723129414

1

3.81

2.402275663

2

3.83

2.417364204

3

3. 69

2. 324899708

4

3. 25

2. 051839968

5

2. 99

1. 885423021

The table illustrates the t-value when the event window is [-5, 5]. Similarly, there is no abnormal return before the announcement. Although the t-value on the announcement date is much larger than that before the announcement, the abnormal return is still equal to zero. The share prices begin to reflect the announcement from the following day of the announcement. So, it would thus appear that the market is efficient in France.

#### Conclusion

According to the statistic result, there is no abnormal return before announcement, which concluded that no inside information was leaked before announcement date. On the day of announcement, there was still no abnormal return, this can not be explained that the market is not efficient

because there may be a gap between the releasing of information and reporting of information. It can be demonstrated that the abnormal return emerged after announcement until the third day. However, this method used to test market efficiency has its weakness generated in its estimation of regression of market model. Nevertheless, the result presented that the market is efficient.