U.S. Mergers and Acquisitions: A Test of Market Efficiency

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ABSTRACT

The purpose of this study is to test market efficiency with respect to merger and acquisition announcements using standard event study methodology. Specifically, this study analyzes the effects of U.S. company mergers and acquisition announcements on stock price's risk adjusted rate of return using twenty recent mergers, as of August 31st, 2007. The weak, semi-strong, and strong form efficient market hypotheses which test an investor's ability to earn a positive abnormal return on the basis of merger announcements are examined. Specifically, this work focuses on the semi-strong form test in an effort to test the efficiency of merger announcement public information. Evidence here supports semi-strong market efficiency along with a positive signal exhibited by the sample of acquiring firms during the event period. Evidence of lingering excess returns after the merger announcement was also observed.

Keywords: Mergers, Acquisitions, Market Efficiency, Strong, Semi-Strong, Weak

INTRODUCTION

Mergers and acquisitions, also referred to as M&A, involve the buying, selling, and combining of companies. The acquiring and target companies feel that by joining they can somehow aid, finance, or help each other within their industry, or sometimes between industries, without having to spend the time and capital to create another unit. Sometimes a company may acquire another company against their will through what is known as a hostile takeover, where they will purchase the majority of outstanding shares of a target company. Firms, after merging, may take the name of the acquiring company, the target company, or just create a new name. Some companies will merge at the corporate level, but for all other purposes allow the two individuals to continue business as if they were still separate entities. This decision is based on what the managers feel will allow them to be the most successful in branding themselves in their respective industry. (Yahoo finance, n.d.)

M&As are under strict regulation in the United States, requiring several approvals to be met, such as the Federal Trade Commission and the Department of Justice. The major concern of these industry regulators is to avoid the creation of monopolies, which the government first began to control under the Sherman Act of 1890. Because Mergers and Acquisitions are so difficult to complete, it is usually unsure how many attempted mergers there actually are a year, especially since they are usually kept secret, even from their own employees. (Federal Trade Commission, n.d.)

When M&As are successful and they are announced to the public, it is generally a good thing for shareholders. By joining efforts the company should be able to lower the costs of the company while maintaining revenue, therefore yielding more profit. Also, if a company is joined with a competitor, the two together will now have more market power and an increased market share. (Ross, 2008)

There are three forms of Market Efficiency: Weak, Semi-Strong, and Strong, that explain how quickly the Market will react to publicly announced information, such as a merger. The Efficient Market Hypothesis states that investors should not be able to earn above normal returns in the Market, due to the fact that the Market operates with all pertinent information taken into account. This event study will test this particular hypothesis to see if it is actually possible to achieve a positive, significant and abnormal return, with the announcement of a company merger. (Ross, 2008)

PROBLEM AND PURPOSE

This event study will test the idea of whether or not it is possible for an investor to earn above normal return with the announcement of a merger. This will therefore be a test of the Market Efficiency theory, seeing how quickly the stock price of a firm reacts to the particular announcement. The effect of twenty company mergers on the firms' risk adjusted stock price will be examined to test if the announcement includes the Strong form, Semi-Strong form, or the Weak form of the hypothesis with respect to timing and stock price change.

The study will include fifteen recent stock merger announcements, as provided by Yahoo Finance, and will use the standard risk adjusted event study methodology. By reviewing the acquiring sample company's stock around the announcement date, it will be possible to tell if there is some kind of relationship between the two. If the Market exhibits the movement similar to the company, then the theory of an Efficient Market would hold true and an investor would

not be able to receive an above normal return. But, if the firm exceeds the Market for a certain period of time relative to the announcement date, then the possibility of gaining an above normal return may occur, thus possibly challenging the Efficiency theory.

LITERATURE REVIEW

The Efficient Market hypothesis, as defined by Ross (2008) can be divided into three forms: the Weak form, the Semi-Strong form, and the Strong form. The Weak form theory states that it is impossible for an investor to achieve a positive abnormal return by using past information on stock prices. If the Market is Weak form efficient then it is believed that the stock prices will already have incorporated this past information. The Random Walk theory (Ross, 2008) explains that investors may not always agree on the value of a stock and therefore its price will fluctuate up and down. The theory explains that even though its real value may be unknown, the price will wander around its intrinsic value, making the Market efficient.

The next theory of the Efficient Market hypothesis is the Semi-Strong form. Ross defines this form as a market that fully reflects all public information, making an investor unable to outperform the Market. This theory has been tested (Fama, Fisher, Jensen and Roll. 1969) numerous times by examining adjustment of the Market to publicly available information, such as announcements.

The third form of Market Efficiency is the Strong form. The Strong form basically includes all information, public and private (Fama, 1965). Therefore it is expected that any type of information that may be relevant to the value of a stock, even if it is only known by one investor, will already be adjusted for in the Market. Even" inside information" is expected to be included. Ross (2008) gives the example of an insider knowing that a mining company had struck gold. The insider would not be able to realize an above normal gain compared to the Market, because the Market will have already realized what was going on and adjusted to it. Evidence shows that the Strong form is generally not true within the Market.

METHODOLOGY

This particular study includes fifteen recent mergers, as of December 2007, as provided by Yahoo Finance (2008). The Mergers take place from April 2nd, 2007 to August 31st, 2007. All of the acquiring companies are either traded on the NYSE or NASDAQ. The table below, Table 1, shows the sample mergers

Table 1: Description of Sample

Acquiring	Target	Announcement Date	Acq. Traded Index
New York Community Bank (NYB)	Pennfed Financial Services (PFSB)	April 2nd, 2007	NYSE
Simon Property Group, Inc.(SPG)	Mills Corp. (MLS)	April 3rd, 2007	NYSE
Symantec Corp.(SYMC)	Altiris, Inc.(ATRS)	April 6th, 2007	NASDAQ
Ailliance Bernstein Global Fund (AWF)	Alliance World Dollar Gov't Fund(AWG)	April 13th, 2007	NYSE
Oracle Corp (ORCL)	Hyperion Solutions Corp.(HYSL)	April 19th, 2007	NASDAQ

BB&T Corp. (BBT)	Coastal Financial Corp (CFCP)	May 1st, 2007	NYSE
Goldman Sachs Group Inc. (GS)	USI Holdings Corp (USIH)	May 7th, 2007	NYSE
Deere Co. (DE)	Lesco, Inc (LSCO)	May 7th, 2007	NYSE
CAE Inc. (CGT)	Engenuity Technologies Inc (EGY.TO)	June 1st, 2007	NYSE
Monsanto Company (MON)	Delta & Pine Land Corp (DLP)	June 1st, 2007	NYSE
Psychiatrics Solution (PSYS)	Horizon Health Corp (HORC)	June 1st, 2007	NASDAQ
Northwest Bancorp (NWSB)	Penn Laurel Financial Corp (PELA.OB)	June 22nd, 2007	NASDAQ
Hunington Bancshares inc (HBAN)	Sky Financial Group Inc (SKYF)	July 2nd, 2007	NASDAQ
State Street Corp. (STT)	Investors Financial Service (IFIN)	July 2nd, 2007	NYSE
Walgreen Co. (WAG)	Option Care Inc. (OPTN)	July 2nd, 2007	NYSE
MDU Resources (MDU)	Cascade Natural Gas Corp. (CGC)	July 3rd, 2007	NYSE
Agnico Eagle Mines (AEM)	Cumberland Resources (CURSF.PK)	July 10th, 2007	NYSE
First Busey Corp (BUSE)	Main Street Trust, Inc (MSTI.OB)	July 31st, 2007	NASDAQ
Genentech Inc (DNA)	Tanox Inc (TNOX)	August 2nd, 2007	NYSE
Whole Foods Market (WFMI)	Wild Oats Market Inc (OATS)	August 31st, 2007	NASDAQ

Hypotheses

In order to test the Semi-Strong Market in relation to the announcement of company mergers the follow hypotheses are formulated:

$H1_0$: The Risk Adjusted Return of the stock price of the sample of forms announcing a merger is not significantly affected by this type of information on the announcement date.

$H1_1$: The Risk Adjusted Return of the stock price of the sample of firms announcing a merger is significantly affected in a positive way by this type of information on the announcement date

$H2_0$: The Risk Adjusted Return of the stock price of the sample of firms announcing a merger is not significantly affected by this type of information around the announcement date, as defined by the event period.

$H2_1$: The Risk Adjusted Return of the stock price of the sample of firms announcing a merger is significantly affect in a positive way around the announcement date, as defined by the event period.

As stated, the Standard Risk Adjusted Event Study methodology will be used. The information will be retrieved from Finance.Yahoo.com, such as the historical data for the company and the market (S&P 500). The announcement date of the merger will be used as Day zero.

1. All of the information about the stock price and market price within the duration of -181 days to +30 days is attained. The time period from Day -30 to Day 30 is referred to as the event period.
2. The holding period return for the firms (**R**) and the market ($\mathbf{R_m}$) will be calculated by using the following formula:

$$R = \frac{\text{(Current day close price - Previous day close price)}}{\text{Previous day close price}}$$

$$Rm = \frac{\text{(Current day market close price - Previous day market close price)}}{\text{Previous day market close price.}}$$

A regression analysis was performed comparing the actual daily return of each company to the Market daily return. The return on the firm is the dependent variable and the S&P 500 return is the independent variable. The regression will cover the pre-event period (Day -180 to Day -31) to find the intercept alpha and the standardized coefficient beta. This is shown in Table 2.

Table 2: Alpha and Beta for each firm

Acquiring Firm Name	Alpha	Beta
BB&T Corp. (BBT)	-0.000771688	0.829153445
Goldman Sachs Group Inc. (GS)	0.000783945	1.961993547
Deere Co. (DE)	0.002179391	1.714883734
CAE Inc. (CGT)	0.001858743	0.665124618
Monsanto Company (MON)	0.000572839	1.395168726
Psychiatrics Solution (PSYS)	0.000339846	1.366414635
Northwest Bancorp (NWSB)	-0.000551781	1.576864622
Hunington Bancshares inc (HBAN)	-0.001044231	0.920047732
State Street Corp. (STT)	-0.0006292	1.383975716
Walgreen Co. (WAG)	-0.000225414	0.8107937
MDU Resources (MDU)	0.001264402	0.911948847
Agnico Eagle Mines (AEM)	-0.000576617	1.507094274
First Busey Corp (BUSE)	-0.001407801	1.324621183
Genentech Inc (DNA)	-0.000788804	0.585194353
Whole Foods Market (WFMI)	-0.001690459	0.901863726
New York Community Bank (NYB)	-0.000145597	0.736809721
Simon Property Group, Inc.(SPG)	0.00132723	1.146677563
Symantec Corp.(SYMC)	0.000245138	0.783491027
Ailliance Bernstein Global Fund (AWF)	0.00106721	0.2200713
Oracle Corp (ORCL)	0.000917543	-0.027223155

3. The Risk-Adjusted method was used to get the normal expected returns. The expected returns for each stock, for each day during the event period (Day -30 to day +30) was calculated using the following formula: **E(R) = alpha + Beta (R_m), R_m** is the return on the market.
4. The Excess Return (**ER**) was calculated using:
   ER = the Actual Return (**R**) – Expected Return **E(R)**
5. Average Excess Returns (**AER**) were calculated from days -30 to +30 by simply averaging all of the excess returns:
   AER= sum of the excess returns for day/number of firms (15)
6. Cumulative AER, or CAER, was found by adding the AERs from each day from -30 to +30.
7. Graphs of the AER and the CAER from days -30 to +30 were then created.

QUANTITATIVE TESTS AND RESULTS

This study looked to see how quickly the Market reacts to information, exploring the idea of an investor's ability to earn an above normal return against the Market. In essence, is it possible to outperform the Market? With the new information being introduced, like a merger, it would be expected that the Actual Average Return, within the event period, and the Expected Average Returns within the event period would differ. If a significant difference is shown, then the hypothesis that states the information announcement did increase or decrease the stock should be supported. A paired sample t-test was conducted and found that the announcement of the merger may be insignificant in determining its effect on the Risk Adjusted stock price. A reaction in the Market can be seen in the days leading up to the announcement and shortly after, but the merger announcement may not be the reason.

The Average Excess Return (AER), shown in Figure 1, and the Cumulative Average Excess Return (CAER), shown in Figure 2, display the market efficiency. The graphs show the AER and CAER relationship to time, specifically the announcement date (DAY 0). By looking at the Figure 2, it is obvious that the merger announcement had an impact on the stock price, being under zero until about Day 5 and then consistently increasing with time. Therefore, this information does show evidence that it could be possible for an investor to outperform the Market with the announcement of a company merger. But the Market does begin to show signs of Semi-Strong Market Efficiency on Day 5 and again on Day 25 as the prices start to be driven back down to equilibrium. There are also some signs of insider information, as the price begins its climb 5 days prior to the announcement.

Figure 1

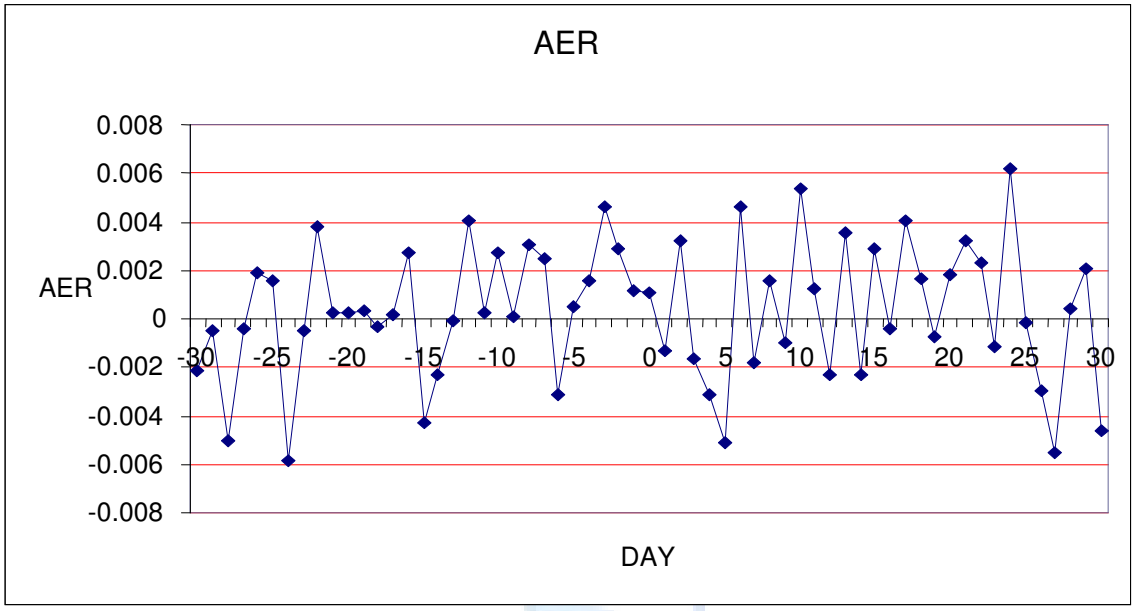
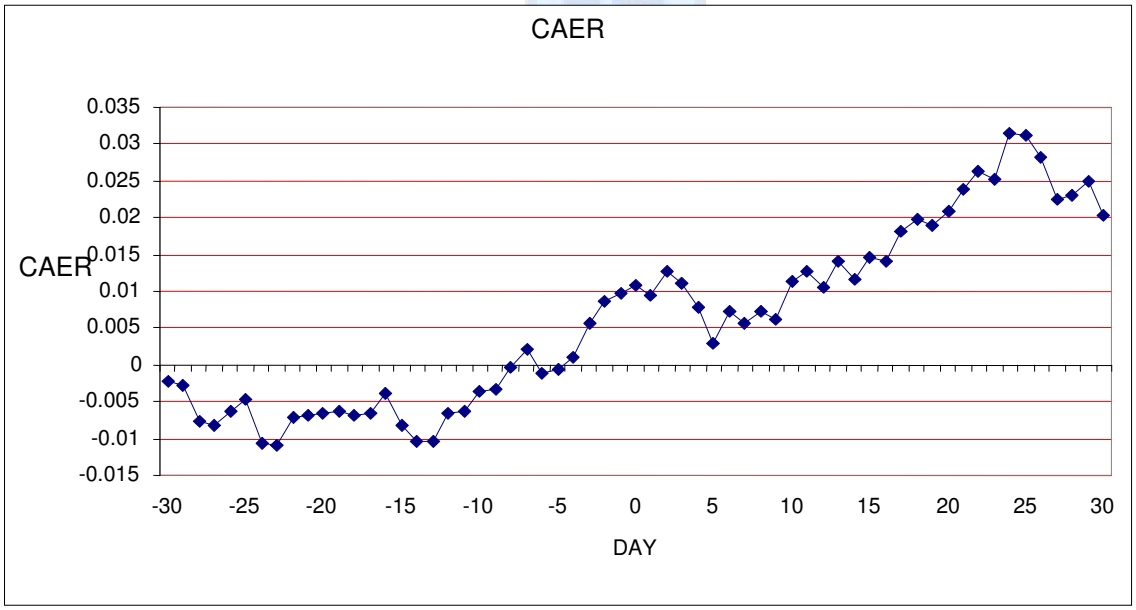


Figure 2



CONCLUSION

This event study examined the effects of a company merger announcement on stock price, testing the Market Efficiency. Twenty acquiring firms were used as the sample for the study with stock prices obtained from Yahoo Finance 180 days prior to the announcement and 30 days after. They were all traded on either the NASDAQ or the NYSE. The Standard Risk Adjusted Event Study methodology, as provided from finance literature, was used to compare the firm's returns to the Market returns (S&P 500 Index).

The findings show that there definitely is action in the stock price around Day 0, but the analysis displays that the merger may not be significant in determining the reason for the particular action. The Semi-Strong Efficiency theory begins to show signs in the 30 days after the announcement. If a larger sample is taken these signs would probably be more obvious.

Investors generally will view the announcements as something positive, being that the company will be increasing its market share. Therefore a merger should make a shareholder optimistic about returns. It is important to note that this study only analyzes the effect on the acquiring firm. Like already discussed, some firms merge at a corporate level and allow the two to act independently. This study may lead into further review of this particular type of merger and the effects of the announcement date on a target company.

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