UNIVERSITY OF LJUBLJANA
FACULTY OF ECONOMICS

MASTER THESIS

POST-ACQUSITON PERFORMANCE OF ACQUIRING FIRMS

Ljubljana, June 2008 Tanasoski Nikola

Tanasoski Nikola

Post-acquisition performance of acquiring firms

June, 2008

IZJAVA

Študent/ka__Tanasoski Nikola___izjavljam, da sem avtor/ica tega magistrskega/specialističnega/ dela oz. doktorske disertacije, ki sem ga napisal/a pod mentorstvom_____doc.dr. Aljosa Valentincic_____, in skladno s 1. odstavkom 21. člena Zakona o avtorskih in sorodnih pravicah dovolim objavo magistrskega/specialističnega dela oz. doktorske disertacije na fakultetnih spletnih straneh.

V Ljubljani, dne___18.06.2008__ odpis:_____

Table of Contents

List of figures:

List of Tables:

Post-acquisition performance of acquiring firms

"The stock market is efficient in respect to reacting to takeover information and although takeovers may maximize managements' welfare, they are poor for the acquiring firm's shareholders" (Firth, 1979; p. 327)

1. Introduction

As takeover activity continues, mergers and acquisitions remain one of the most extensively researched topics in finance. Here, most of the earlier research is mainly concerned with the stock returns surrounding announcement dates, and little attention is devoted to the results on the long run returns from mergers mainly because of the strong belief in market efficiency and thus, its indication what the results should be (Agrawal and Jaffe, 1999); i.e. no abnormal performance should be eminent. And while proponents of the benefits of takeovers present evidence of substantial wealth gains at the time takeovers are announced, critics postulate that the positive announcement returns reflect optimistic expectations that fail to be realized. In support of the concluding, serves the empirical evidence of average negative abnormal returns for at least twelve months following the takeover, which as argued by Franks et al (1991; p. 81) are " unsettling because they are inconsistent with market efficiency and suggest that changes in the stock price during takeovers overestimate the future gains from merger".

Consequently, the underperformance of acquiring firms raises not only the question about the profitability of corporate acquisitions, but it also undermines the market efficiency concept, since it seems that rational investors could benefit by shorting the stock of the acquiring firms once the takeover has been completed (Loderer and Kenneth, 1992). Despite the aforementioned, it is self-evident that a conclusion of underperformance based on prior research is clearly not warranted mainly due to the fact that, as it will be demonstrated in this thesis, the results are not one-sided. As it would be presented later on, results on some instances would not support our stance on existence of abnormal returns.

Moreover, it can be said that a finding of underperformance has three main important implications. First, as already mentioned is the concept market efficiency. Asserting that financial markets are "informationally efficient", or that prices on traded assets, e.g., stocks, bonds, or property, already reflect all known information, is by all means a rather vague statement. However, even if taken for granted on the level of investor important information and their reflection in the share price movement, it can be hypothesized that

most of the markets are efficient. In our case this constitutes a major paradigm. In other words, as it would be reflected later on, systematically poor performance after acquisitions is inconsistent with the market efficiency theory. (Loderer and Martin, 1992)

Second, many examine returns surrounding the announcement dates in order to infer the wealth effects. Such studies were undertaken by Langetieg (1978), Asquith (1983) and Magneheim and Muller (1988), where all of them used the aforementioned approach where market efficiency is directly assumed to theoretical level, since returns following the announcement dates are ignored. Lastly, a finding of underperformance may also reinforce or support certain studies that used poor accounting performance as a beacon after takeovers; even that is not a one-sided argument due to different research results obtained from other studies. (Agrawal et al, 1992, p.1606)

Whilst earlier studies placed primary emphasis on announcement gains, this thesis focuses exclusively on the evaluation of the long run post-merger performance of US acquiring firms. Effectively, we try to address two questions or considered from the point of statistical inference we postulate the hypothesis testing on the below stated two questions. Firstly, based on the entire sample, analyses are done in order to conclude whether or not there is abnormal performance and whether that post-acquisition performance is indeed negative. The answer to this question is of great importance because it carries the obvious implication for market efficiency, and it clearly informs the debate on gains from mergers. Namely, a finding of negative performance after mergers can overturn the conclusion of studies that have focused on announcement period performance and have found significant wealth gains to stockholders of the target and acquiring firms combined. As it would be presented in the methodology part, all this would be defined and tested accordingly in different hypotheses.

Secondly, in order to benchmark and consider the validity of the results a rather theoretical approach is to be considered that would address the possible explanations for the literature findings on long run performance. Here, while no explanation will be needed if long run performance is insignificantly different from zero; if the results suggest under/out-performance, a convincing explanation and evidence from prior studies will strengthen the plausibility of the findings. Eventually, market should not be slow to adjust to the acquisition event. To be more precise, the long-run performance should reflect part of the net present value of the acquisition to the acquirer that is not captured by the announcement period return. (Agrawal et al, 1992, p.1607)

The thesis is structured the following way. Section 2 provides a review on the possible types of analysis following acquisitions and then in section 3 we a review of the literature

to date focusing on studies that have been employed to examine the long run acquirers' returns primarily in US, together with some insights and limitations of the models used. Section 4 looks into the methodology used, with particular attention placed on the benchmarks used to calculate abnormal returns. In the next section a detailed sample description is provided together with some limitations that we encountered. Section 6 presents the main results and analysis. Finally, Section 6 concludes and presents implications for future research.

2. Types of analyses on acquisitions

Mergers and acquisitions have been in the focus of financial researchers and scholars. Few corporate maneuvers attract as much attention as they do. Starting from the way they are handled to their impact on the general environment, they remain one of the most controversial topics in finance with issues still to be examined and procedures that require consensus as being the right ones for estimations or tests. (Agrawal et al, 1992) In continuation, a brief literature overview would be provided in order to present all the different points of analysis that can be employed in this area of finance.

As for the types of analysis that have been extensively employed we can refer to only a part of them: studies on probability of acquisitions (Wansely et al, 1983; Ambrose and Megginson, 1992); studies assessing the influence of expectations on stock price changes (Malatesta and Thomphoson,1985; Beayless, 1994); acquisitions performance due to changes in legislations (Sloan, 1996); the completive impact of acquisitions (Cartwright et al,1987; Gaugham, 1999) ; strategic objective of acquisitions (Walker, 2000) and what is our point of interest- the wealth effects and post-merger performance of companies. In order to present the different approaches used and their objective a brief explanation would be provided on each of them.

As far as probability of acquisitions is concerned, there have been quite a lot contradicting studies in the last two decades. Wansley et al. (1983) eventually developed a model for predicting the profile of target firms. Based on financial ratios describing price-earning ratio; compound growth in net sales; natural log of net sales and long-term debt they concluded that a certain level of probability exists to earn abnormal returns, i.e. if firms had a constantly low price-earning ratio and moderate compound growth in net sales, if acquired there had highest probability of earning "more than expected". (p.161) In another research, Basu (1977) reported that portfolios of firms with low price-earnings ratios achieved annual returns of 4.5 percent in excess of that expected, given their level of risk. Due to data unavailability of how precisely the profiling was done we were not

able to cross-check our sample to the pattern profile. Moreover, another study done by Ambrose and Megginson (1992) an acquisition bid is positively related to the level of tangible assets and inversely related to the firm size and the change in institutional holdings. On the other side there were quite many scholars arguing that acquisitions targets and acquirers can not be predicted and that reaction of market forces can not the modeled. For example, Hazelkorn and Zenner (2004) in their research found that instead of the widely held believe that high growing companies are best targets, they showed that "the excess acquirer returns were higher when the target had low projected earnings-growth rate". (p.86)

In regards to studies covering expectations theory several scholars such as Malatesta and Beayless have do quite extensive researches. In their studies they assessed the influence of expectations on the stock price changes as direct consequence of acquisition. For example, Malatesta and Thomphosn (1985) examined investors' reaction on partial anticipation, which can affect the abnormal returns to firms that engage in acquisitions. In a related study Beayless (1994) found that after controlling for the predictability of debt and equity announcement used for acquisitions, the primary reaction of the "interested investors" for the seasoned equity issues is significantly greater than for the second equity issue. The matter of a fact is that most of the literature suggests that target firms gain when an acquisition is announced, (Melicher and Rush, 1974; Agrawal and Jaffe, 1999) but these studies fail to differentiate between anticipated and unanticipated acquisitions.

While most of the research is focused on the market perspective of the acquisitions, there are some focused on the legislative structure and its changes as pillars for explaining abnormal returns. In other words, this kind of research were not to measure the operational gains to takeover per se, but rather whether any change in operating performance or cumulative investor returns are associated with changes in accounting provisions. For example, Sloan (1996) who documented that stock prices due to "gray" areas in accounting principles do not fully reflect information about earnings persistence. Also he found support for his hypothesis, that firms reporting small profits use accruals to delay reporting bad news.

Another a rather unfamiliar field in acquisitions is the competitive impact of acquisitions. The very notion that is merger is seen as attainment of efficiency, security prices of the competitors should fall, whereas expectations of synergy should be revealed in increase in stock prices. Cartwright et al (1987) after extensive research in collecting data found a positive correlation and increase in stock returns in challenged mergers rather than what he saw as uncompetitive ones. Also he noted the positive abnormal returns if the

acquisition is horizontal rather than vertical or by simple competitor buy-out. Lastly, one interesting fact was the tendency of the betas of group of rivals to decline as a result in reduction of uncertainty for unchallenged merges. This implies that before that the industry was unsettled and investor's expectations were low or uncertain, however after the acquisition the prospects were settled. (Gaugham, 1999)

As far as research is concerned with the strategic objectives together with stock price performance of acquiring firms, different researchers have found different objectives and employed rather different models in order to prove the connection between them. In terms of the wealth increasing strategic objectives or motivation for takeovers various studies identified five common grounds. First, acquisitions can increase efficiency by creating economies of scale or by disciplining inefficient mergers; secondly they can exploit asymmetric information between acquiring-firm managers and target-firm shareholders; they can mitigate agency problems and lastly they can enhance market power and utilize tax credits. (Walker, 2000)

Until this point, the presentation of the general overview was in order to get familiarized with the different types of acquisition analysis that could be employed. However, the field of our interest that is considered in depth in the thesis is the notion or existence of abnormal returns over a period of time due to acquisition activity. Having in consideration the vast research done on this subject and differences in models that were considered while measuring performance, in our case three different models were considered and compared in order to reach a final conclusion. In remaining part of the thesis, holding the same structure as before on the overviews, more is discussed on the different research results obtained though the years.

3. Empirical Evidence on Bidder Returns

While most empirical research on mergers is concerned with the daily stock returns surrounding announcement dates, quite a few studies focus on the long run performance of acquiring firms after the mergers. By and large the evidence to date on post-merger performance of US firms report strong evidence of both economically important and statistically significant negative abnormal returns, thus challenge the efficiency of the market and question the validity of announcement gains as estimates of the gains from merging.

Nonetheless, it has been documented that the greatest difficulty with an event study methodology is that of benchmarking, i.e. vast evidence exists that the choice of a

benchmark affects the magnitude and the significance of abnormal returns. For example, Franks, Harris and Mayer (1988) examine post-acquisition returns by using the market model with two different estimation periods, the CAPM and the market-adjusted returns model to calculate abnormal returns. And while the cumulative average abnormal returns (CAARs) under the latter two models seem to be around -0.18 % over the first two years following the announcement month; the estimates from the market model are insignificant and their magnitude depends on the estimation period.

One of the most comprehensive studies to date is the one conducted by Franks et al (1991) also demonstrated the lack of robustness in the results to different benchmark specifications used to calculate abnormal results. More precisely, while post-merger performance is negative using an equally weighted index, the results generated with multiple portfolio benchmarks exhibit no statistically significant abnormal performance for the overall sample of bidders.

Contrary to the above studies, however, Agrawal et al. (1992) by using a nearly exhaustive sample of mergers between NYSE acquirers and NYSE/AMEX targets over 1955 to 1987 and adjusting for both size and beta, demonstrated that acquiring firms' stockholders suffer a statistically significant loss of about -10 % over a 5 year period, and this result is robust to various specifications.

Consequently, given the unresolved dispute over the appropriate asset pricing model to be used, and the fact that "previous findings of poor performance after takeover are likely due to benchmark errors rather than mispricing at the time of the takeover" (Franks et al, 1991; p. 81); it seems important to check the robustness of the conclusions to different specifications of normal returns. As a result, the abnormal returns in this thesis will be calculated by using three different asset pricing models.

In addition to examining the entire sample, with the aim of evaluating the possible determinants of post merger performance, we classify our sample by the medium of exchange (all-stocks vs. all equity acquisitions), the size of the deal, and whether the acquisition is of a conglomerate or a non-conglomerate form. Finally, we would consider a rather segregated approach where classification would be made on two characteristics together: the medium of exchange and whether the acquisition is of a conglomerate or a non-conglomerate form. All the variables have been examined in the context of post-acquisitions gains.

3.1. All-cash vs. all-equity mergers

Cash financed transactions are often regarded as carrying significant pressure resulting of the debt issuance or loan with creates a pressure for creating successful mergers. On the other side, we face the constant claim of faith in overpriced stock therefore issuance of more stock in order to complete merger is a common thing. (Firth, 1989) However, which of the pressures are to be realized in abnormal returns has been a field of interest and contradicting results of many scholars.

Barnes (1984) conducted the first study that assesses the gains following all-cash as opposed to all-equity mergers. The author documented a significantly negative performance of -0.056 % and -0.054 % in the first 60 months following the takeover of cash and equity acquisitions respectively. Contrary to Barnes's results, Franks, Harris and Mayer (1988) find that while all-equity acquirers experience abnormal losses in the first two years following the acquisition, all-cash bids did not suffer post-merger losses. Loderer and Kenneth (1992) examined post-merger performance of 11, 020 acquisitions compiled by using three different sources. The authors by controlling for size effects, changes in the risk free rate, and changes in the systematic risk document -0.25 % CAAR for the equity-financed mergers group and a positive 0.617 % CAAR in the case of all-cash financed bids. Both results show a five years post-acquisition performance, and are significantly different from zero.

3.2. Conglomerate vs. non-conglomerate acquisitions

The evidence to date on the long run returns on conglomerate versus non-conglomerate acquisitions in US is at its best scant, and very few researchers have examined the importance of the former classification as a guide to identifying the determinants of post-merger performance. Companies often cite the potential for synergies in costs and revenues as the very reason for the acquisition. Focused transactions (non-conglomerate acquisitions) may be more successful than diversifying transactions because it is easier to realize the transformation and management if the firm operates in the same industry. In addition, it can be said that strategic objective for a non-conglomerate bid may be easier to articulate and realize rather than those across industries. Finally, cultural and social issues are often regarded in conglomerate acquisitions as the very problem for failure. (Sudarsanam, 1995)

Here, in contrast with the popular belief that conglomerate mergers are less likely to succeed because managers are not familiar with the target industry, Agrawal et al (1992) finds that it is non-conglomerate mergers (-25.5%) that perform worse than conglomerate

bids (-8.6%) over the 60 months following the announcement date. One interesting finding was discovered by Melicher and Rush (1974), where in their research regarding performance of conglomerate firms, found that "conglomerate firms were acquiring firms and diversifying in areas which were relatively more profitable than their existing areas of operation. (p.145) Gregory (1997), on the other hand, by considering mergers in UK demonstrates significant average negative returns of -11.33% over the first 24 months, as opposed to insignificant -3.48% in the case of non-conglomerate acquisitions.

.

3.3. Size of the deal

The expected scenario would be that the successfulness of the acquisition and company's future performance depends on the relative size of the transaction involved. Certainly, one expected outcome would be better performance of the small acquisitions due to the ease of integration in operations and ease of management, rather when considering big deals. On the other side you might face another argument in regards to the pressure that "big deals" create on the companies to make them (un)successful. Having this pressure considered relative to the size of the company, positive performance should be an every day outcome and goal.

Finally, the importance of the relative size of the deal has been well documented factor regarding the long run performance of mergers. Here, Franks et al. (1991) show that the mean excess return over 36 months is higher for small firms than for large companies, and the former outperform the latter by 1.62% per month. Opposite results are generated in Loderer and Kenneth (1992) who argue since the performance over the five years post-acquisition period negative performance is not affected by the size of the acquisition. However, the results are altered during the second post-acquisition year when the middle quintile of deals experience significant negative returns. Additionally, Hazelkorn and Zenner (2004) also did not find relationship between transaction size and long-term success.

4. Methodology

Prior research into the profitability of takeovers has centered on two distinct types of methodology. Namely, while part of the research has examined financial characteristics based on accounting data before and after the merger; the greatest proportion of studies has used and efficient market framework and measured the impact on the share price (Firth, 1989). Here, considering the evidence that accounting information is likely to be biased, and "no inferences for efficiency could be drawn solely from the evidence of improved profitability after the merger" (Meeks and Meeks, 1981; p. 335); our approach will largely follow event study that would be considering market returns and share prices. If defined, an event study, in economics research, considers analysis of finding a statistically significant reaction in financial markets, due to past occurrences of event that is hypothesized to affect firms' market value. (Binder, 1998) In practice, event studies have been used for two major reasons:

1) to test the null hypothesis that the market efficiently incorporates information (Fama,1991)
2) under the maintained hypothesis of market efficiency to examine the some event on the wealth of the firm's security holders (Binder, 1998)

Since the fundamental question of this thesis is if acquisitions really lead to negative long run abnormal returns, the period of interest (the event window) is defined to be 12, 24, 36 and 48 months of post-acquisition returns, were on the general sample the hypothesis are defined as following:

H_0: Abnormal post-acquisition performance is non-existent i.e. acquisitions, in general, can be seen as non-wealth reducing events to the shareholders

H_1: There is significant abnormal post-acquisition performance i.e. acquisitions, in general, are considered as wealth reducing events to shareholders

Related to the choice of benchmark is whether to use pre- or post-event data to estimate the necessary model parameters for the estimation period. Namely, while the betas are not sensitive to the estimation period chosen, alpha estimates differ significantly depending on which set of the data is used. And although there is evidence that the use of pre-takeover data may bias the use of models which use cumulative average abnormal returns (CAARs), this study follows MacKinley (1997), Loderer and Martin (2001), and Loughram and Vijh (1997) in using pre-event data to estimate the appropriate model parameters. Additionally, considering the argument made by Franks et al. (1977)

demonstrated that the "risk characteristics of paired samples engaged in a merger were not statistically different pre- and post-merger" (p. 1524); the necessary model parameters are estimated using the 72 months prior the announcement month.

In the time line presented below (figure 1), we have graphically represented the event window and how the data is obtained. As it can be seen the event date (t=0) is the announcement date and the model's returns are calculated starting one month after the announcement date, while as noted before the necessary model's parameters are estimated in total 73 months prior the announcement month (since the begin counting one month before).

Figure 1: Event window

Source: Own work

Finally, considering the evidence that different benchmarks generate very different measures of abnormal performance (Dimson and Marsh, 1986; Franks, Harris and Mayer, 1988; Franks, Harris and Titman, 1991), long run abnormal returns will be calculated using different benchmarks, the potential drawbacks of which are discussed further in the thesis.

As far as the sample is concerned, in terms of the diversity of companies that are under consideration, we tired to include as diversified portfolio of acquisitions from different industries as possible which in fact would decrease any multicollinearity between firms and consequence biased results. (See Table 1, p.11)

Table 1:
Acquirer Macro Industries

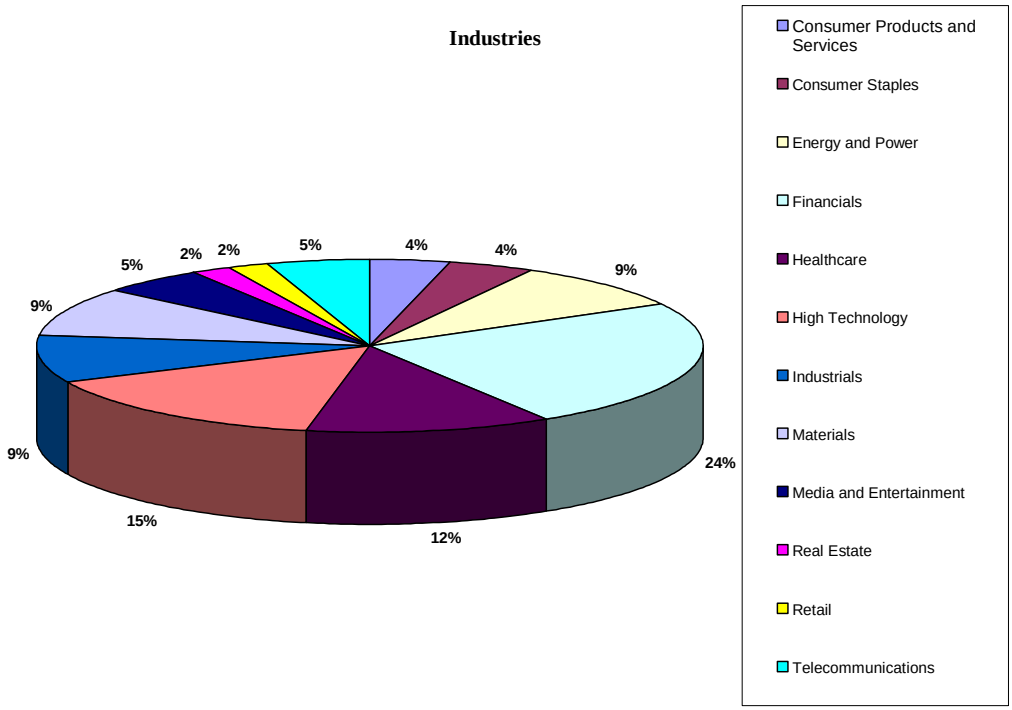
Acquirer Macro Industries

Industry	Number of acquirers
Consumer Products and Services	4
Consumer Staples	4
Energy and Power	9
Financials	24
Healthcare	12
High Technology	15
Industrials	9
Materials	9
Media and Entertainment	5
Real Estate	2
Retail	2
Telecommunications	5

Source: Own work

In order to provide a more comprehensible view of the diversity of the companies included, we provide the figure below, were it can be seen there is no dominant industry that prevails over others. (See figure 2) Even if we consider the financials industry as being most numerous with acquisitions in our sample, by reflecting on targets descriptions, it would be seen some of them are engaged in conglomerate mergers, which is needed for later analysis.

Figure 2:
Graphical representation of acquirer's industry



Source: Own work

4.1. Market-adjusted Returns

Since the use of models to calculate abnormal returns is dictated by data availability and our sample though of a reasonable size, it prevents the use of sophisticated models; the model implemented in situations with limited data availability is the market-adjusted return model where abnormal returns are calculated as:

$$u_{it} = AR_{it} = R_{it} - R_{mt}$$ [1]

(Brooks, 2002)

Where AR_{it} = is the abnormal return of company i for post-acquisition month t;
R_{it} =is the return of firm i for period t;
R_{mt} is the market return proxied by the S&P 500 index for period t.

Since the model can be seen as a restricted market model with α_i constrained to be zero and β_i constrained to be one, an estimation period is not required to obtain the parameter estimates (MacKinley, 1997).

4.2. Market Model

The market model relates the return of any security to the return of the market portfolio. The model's linear specification follows from the assumed joint normality of asset returns. Since the model removes the portion of the return that is related to variation in the return of the market, the variance of the abnormal return is reduced, and the ability to detect event effects is increased (Bodie et al, 2005). It can be said that this model represents improvement over the constant mean return model and the market-adjusted model. (MacKinley, 1997) Here, for each acquirer we estimate the following regression:

$$R_{it} = \alpha_i + \beta_i R_{mt} + u_i$$

(Bodie et al, 2005)

Where R_{it} = denominates the expected return under the model
α_i = regression's intercept; pointer for existence of abnormal returns
β_i = security-specific parameter retrieved in our case from 76 months pre-acquisition period; reflects the systematic risk on one security
u_{it} = disturbance error term; representing the non-market or idiosyncratic risk

[1] As noted before dividend announcements on the other side were not considered separately but incorporated in the models

And abnormal returns are calculated as the disturbance terms of the model calculated on an out-of-sample basis:

$$u_{it} = AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt}$$

(Bodie et al, 2005)

Where α_i is the intercept and β_i is the risk parameter of company i, as explained before. Under the null hypothesis, conditional on the event window market returns, the abnormal returns will be jointly normally distributed with a zero conditional mean and conditional variance $\sigma^2(AR_{it})$ where:

$$\sigma^2(AR_{it}) = \sigma^2{}_{\varepsilon_i} + \frac{1}{L_1}\left[1 + \frac{(R_{mt} - \mu_m)^2}{\sigma_m{}^2}\right]$$

(MacKinley, 1997)

As it can be seen the conditional variance in this case has two components. The "normal" disturbance variance and a second additional variance which represents the sampling error of alpha and beta. The latter leads to serial correlation of the abnormal returns despite the fact that true disturbances are independent though time. However in our case due to the length of the estimation window, L becomes large and the second term approaches to zero. Therefore the sampling error vanishes. (MacKinley, 1997)

4.3. The CAPM

Despite the fact that "the validity of the restrictions imposed by the CAPM on the market model is questionable" (MacKinley, 1997; p. 19), the CAPM has been one of the most popular models used in event studies since the 1970s.

The main seven assumptions of the CAPM as presented by Jordan et al. (2001)are as follows:
(1)All investors in securities are single period (say one year) expected utility wealth maximizers who choose securities on the basis of mean and variance of return;
(2) Investors borrow or lend funds at a risk-free interest rate;
(3) Investors have identical subjective estimates of the means, variances, and covariances of all securities;
(4) The market for financial securities is perfectly competitive and all investors are price takers;

(5) The quantity of securities is fixed;
(6) All securities are perfectly divisible and liquid, i.e., marketable without significant transaction costs;
(7) There are no taxes. (p.317)

As given CAPM can we written in the following way:

$$E(R_i) = R_f + \lfloor E(R_m - R_f \rfloor x\beta$$

(Ross et al, 2001)

Therefore, abnormal returns are calculated as:

$$u_{it} = AR_{it} = R_{it} - \left[R_{ft} + \hat{\beta}_i (R_{mt} - R_{ft}) \right]$$

(Ross et al, 2001)

Where R_{ft}= the risk-free return in event month t as proxied by the return on a one month Treasury bills;

α_i =the intercept parameter of the CAPM

β_i =the CAPM beta of company i.

Before proceeding to the tests designed to evaluate the significance of the calculated abnormal returns, it is important to document the fact that the presence of size effects (the tendency for stocks of small companies to outperform stock of large firms) can distort long run performance measures and hence event study results unless it is explicitly accounted for in the research design (Dimson and Marsh, 1986). However, our study does not account for the latter due to several reasons.

Firstly, as noted before in the sample description part, when we attempted to rank stocks by their shareholders equity value the year prior to the acquisition, we encountered the problem of insufficient data for the large portion of the acquirers. Furthermore, this size effect has a major influence on estimated abnormal returns when the stocks under consideration come from a single industry (Brown and Warner, 1985), or when the events are clustered in a particular time period (Dimson and Marsh, 1986). Since none of the two appear to be of a major concern in this study, and in accordance with most research in this area, we believe that simple adjustments for market movements are an adequate approach to calculate abnormal returns.

4.4. Statistical Inference

Since event studies entail a joint hypothesis about market efficiency and the validity of the benchmark employed to calculate the abnormal returns on each security; the preceding part of the thesis is devoted to testing the validity of the second leg of the latter hypothesis. The methodology used to estimate and draw inferences from the long run abnormal returns follows MacKinley (1997) and Barber and Lyon (1997).

The abnormal return (AR) on a security is the difference between the realized return R_{it}, and the stocks expected return in the absence of the event $E(R_{it})$, as calculated by using each of the three benchmarks:

$$u_{it} = AR_{it} = R_{it} - E(R_{it})$$

(MacKinley, 1997)

The abnormal return is the disturbance term of the benchmark model calculated on an out of sample basis, thus can be interpreted as a direct measure of the change of stockholders' wealth associated with the event (MacKinley, 1997).

The convention in much of the research that analyzes abnormal returns has been to sum either daily or monthly abnormal returns over time. Generally, there are two methods that are widely used in practice. The first method (CAAR method), encompasses aggregating the ARs of individual firms across firms, whereas the second methodology is known as the buy-and-hold abnormal returns (BHAR). Here, the differences between the CARs and BHARs result from the effect of monthly compounding, that is, while CAARs ignore compounding, BHARs include the effect of compounding (Barber and Lyon, 1997).

Considering the fact that none of the two methods is preferred and they both suffer from the same weaknesses, the statistical significance of the abnormal returns will be assessed by using the cumulative abnormal returns (CAARs) since the latter is more frequently used in the literature, and easier to work with; granted that its use may lead to some biasness in the results. Moreover, CAARs represent returns in event time and not in calendar time; it is not possible for investors to earn them. (McWilliams and McWilliams, 2001) Secondly, the means of the CAARs on random samples are systematically nonzero and the standard errors are understated, leading to rejections of the null too frequently. Lastly, biased CAARs are likely to be a result if the returns of firms that are clustered over time are contemporaneously correlated. (MacKinley, 1997)

In order to draw overall inferences for the effect of merger on the long run returns of acquiring firms, the abnormal return observations must be aggregated firstly across firms and then through time. Aggregation across firms is as follows:

$$AAR_t = \left(\frac{1}{N}\right)\sum AR_{it} = \left(\frac{1}{N}\right)\sum u_{it}$$

(McWilliams and McWilliams, 2001)

Where N= is the number of firms listed at time t;
Σ AR_{it} or Σ u_{it} = sum of the average returns across companies across months

This approach results in equally weighted average abnormal returns (AARs), the significance of each is done by a t-statistics defined as:

$$t = AAR_t x \frac{\sqrt{N}}{\sigma}$$

(Brooks, 2002)

With σ proxied by

$$s^2 = \left[\frac{1}{N-1}\right]\sum\left(AR_{it} - AAR_t\right)^2$$

(Brooks, 2002)

Here, significant t statistics leads to a rejection of the null hypothesis of no abnormal performance and serves as an indication of abnormal performance.

As previously mentioned, to analyze the long run performances of firms over 12, 24, 36 and 48 months following the announcement month, the AARs are aggregated over time to obtain the CAARs. Defining CAAR (T_1, T_2) as the sample cumulative abnormal return from T_1 to T_2, i.e. the CAAR (T_1, T_2) is the sum of the included abnormal returns:

$$CAAR(T_1, T_2) = \sum AAR_t$$

(Brooks, 2002)

Where T_1 = the month following the month of the announcement
T_2 = the number of months over which the long run performance is assessed.

However, since the above method assumes that all ARs are independently and identically distributed with zero mean, an assumption which is likely to be unrealistic since there is a cross-sectional heteroscedaticity in the variance of the ARs (stocks with high volatility

may cause large dispersion around the AAR and hence reduce the power of the test); to produce it[2] abnormal returns, the ARs must be weighted with the time series estimates of the standard deviation of the ARs:

$$SAR_{it} = AR_{it} / \sigma_{it}$$

(McWilliams and McWilliams, 2001)

The standardized abnormal returns (SARs) are then aggregated over all calendar months to yield the average standardized abnormal return (ASAR), the significance of which is tested with the previously described t-statistic. The ASARs are then aggregated over time to analyze the long term performance of acquiring firms:

$$CASAR(T_1, T_2) = \sum ASAR_t$$

(McWilliams and McWilliams, 2001)

Finally, to test the significance of the abnormal returns under each benchmark, the following t-statistic is calculated:

$$J_1 = CAAR(T_1, T_2) / \sqrt{\frac{(s_{t1} + ... + s_{tn})}{N}}$$

(MacKinley, 1997)

Where the null hypothesis is that the CAAR (CASAR) is zero meaning the returns around the event are not abnormal in comparison to those in the absence of the event.

The above method is of the type of parametric tests where specific assumptions are made about the distribution of abnormal returns. Alternative approaches which are non-parametric in nature thus free of assumptions concerning the distribution of returns are the sign test and the rank test. Typically, the latter tests are used in conjunction with their parametric counterparts and are aimed at checking the robustness of the conclusions from the parametric tests (MacKinley, 1997).

The sign test requires that the expected proportion of the positive abnormal returns under the null hypothesis is 0.5, that is, under the null hypothesis it is equally probable that the CAAR will be positive or negative. The test statistics is calculated as follows:

$$J_2 = \left[\frac{N^+}{N - 0.5} \right] \left[\frac{\sqrt{N}}{0.5} \right]$$

(MacKinley, 1997)

[2] Symbol representing the number observations/returns

Where N^+ is the number of cases with positive abnormal returns, and N is the total number of cases. Rejection of the null hypothesis serves as an indication of significantly negative abnormal returns. (Lind et al, 2001)

5. Description of the sample

5.1. Data

Our sample includes 110 acquisitions made by NYSE or AMEX firms during the period January 1997 to December 2002. The sample, which was collected from the Thomson One Banker Database, represents a set of acquirers in mergers satisfying the following criteria. The detailed list of companies and the deal value are presented in appendix 1 at the very end of this thesis. (See Appendix 1 on pg. 60)

For one thing, we required both the target and the acquirer to be companies with main operations based in US, possibly with a deal value greater than 20 million dollars. This cut-off is consistent with Gregory's (1997) study and was chosen to avoid the problem of noise in the data when very small companies are acquired. Moreover, Gregory (1997) in his research paper argued that "larger takeovers that larger takeovers are of greater economic significance and therefore more worthy of attention." (p. 976)

Split-offs, open market purchases and the deals whose acquirer is investor groups were excluded as done in most of the researches. (Gregory, 1997; Argawal, et al, 1992; Franks, Harris and Titman, 1991) Finally, due to the need of stock price series for each pair of companies, we required the acquirer to be a publicly listed company. The reason behind the requirement for public company is the fact that status of the target and the acquirer are primary drives of the returns both from long term and short term view. As found by Hazelkorn and Zenner (2004) when considering primary drivers for creating value in mergers and acquisitions, when the target was private company or an asset or business unit of a public company the significance of the returns was never on a satisfactory level on order to confirm the existence of abnormal return. (p. 85) As noted further in their paper, two reasons can be underlined in order to support the choice of only publicly traded companies that were at the end 100 % acquired. First, acquisitions of the whole public company tends to be broader in scope, and thus more prone to complex integration problems, than private companies or small business units. Another thing, which put the market efficiency into test, is the fact that acquisitions of public companies typically occur at a premium to an already established price. On the other side, private companies or individual assets having no public valuation benchmark can be sometimes purchased without a sizable premium. (Hazelkorn and Zenner, 2004)

Table 2[3]

Summary statistics for the takeovers in the sample, 1997-2002

Maximum Size	60.705,02
Minimum Size	4,07
Mean Size	1.664,22
Median Size	185,118

Source: Own work

Table 2 illustrates that the distribution of the value of the acquisitions. The sample maximum and minimum values are $60 billion and $4 mil respectively. One thing to mention is the biased result obtained by taking close look to the mean value which gives us a one and a half billion worth deals, however the above solely occurs due to the high maximum value and nearly 4 other deals, mainly in the pharmaceutical industry, which made the arithmetic mean unrepresentative. However, if the median size is considered a more representative value of the deals is acknowledged (about $185 million).

Mode as often used central tendency observation is not to be considered due to the fact that every deal has it own specifics and as expected no deal was of a same value in any of the considered observations.

As far as, the returns used in this thesis are concerned, they are continuously compounded monthly returns, defined as:

$$R_{it} = \ln(P_{i,t}) - \ln(P_{i,t-1})$$

(Brooks,2002)

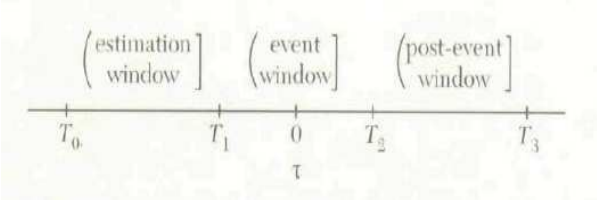
Rather than discrete due to the fact that the former are more likely to follow normal distributions, thus meet the assumptions on which the test techniques are used. (Brooks, 2002) More on this would be presented when the event study methodology would be explained. Dividend announcements on the other side were not considered separately but incorporated in the models. The reason for this was the fact that even if in our study monthly data are considered, which are thought to be highly influenced by changes in dividend, several researches supported and endorsed informational efficient stock markets for dividend announcement across all measurement criteria. (Ramesh et al, 2007; Patell and Wolfson ,1984) In other words, dividends would not significantly increase the biasness of the results or the noise in the sample. (Ramesh et al, 2007)

[3] The values above are expressed in millions of dollars

Acquirer returns are examining using monthly data beginning the month after the announcement date with the aim of avoiding picking up share price reactions in the announcement month. One thing to mention is the unavailability of data for some companies. For example, for some of the companies there were missing values on the 48 months period. However due to the fact that these were only 4 values on some specific months, taking the average as a performance measure is considered logical and it strongly believed that it would not affect the end result in any way possible. Furthermore, as it would be noted later in the thesis, we were constrained in the data availability while trying to obtain information that would help us to use more sophisticated models. This especially, turned up to be an issue when Fama-French, three factor model, was considered since even at start for several companies we were not able to calculate book-to-price ratio. Moreover, when we attempted to rank stocks by their shareholders equity value the year prior to the acquisition for size adjustments even in CAPM, we encountered the problem of insufficient data for the large portion of the acquirers.

On general terms graphically, (See figure 3) the event window eventually in our case is excluded from estimation since it considers at 0 point the announcement date and T2 is considered the end of the month of the announcement date or the beginning of the one month period after the announcement date, however it should provide a general idea as how data was obtained. The same applies for the T1 period which reflects past returns that are to be used in one of the market models as benchmark on the returns.

Figure 3: Time line



Source: MacKinely, 1997, p.15

And although the use of the announcement date as opposed to the completion date could induce bias if abnormal returns are a result of the lack of prospect of further bids rather than the value of the merger transaction, abnormal returns in the months immediately following the announcement date do not contribute significantly to the total abnormal returns (Franks et al, 1991).

5.2. The issue of double-counting

One thing that has to be mention in terms of sample description is the issue of double counting. No matter the sample, the more companies are included the higher the probability that one company would be engaged in more than one acquisition. By using our sample to full measure post-acquisition performance could result in "double-counting and the estimations bias if all acquisitions by any firm, no matter how close to each other, were not treated as separate events." (Loderer and Martin, 1992, p.70)

Having in consideration our rather limited sample as compared to some studies that considered 1000 acquisitions, we tired to consider as many as possible different companies from different industries. Even with that at the end we addressed this issue since some of the companies appeared in the cash based and equity sample, therefore the observations/ sample size for the future analysis was lowered by the double counts.

The reason behind this reflects the effect this issue has on the average post-acquisition performance i.e. consider an average negative performance as a result of counting the occasional negative experience of frequent acquirers several times instead of once. That being the case in not properly addressed might lead to estimation bias i.e. over-estimation or under-estimation of the abnormal returns. (Loderer and Martin, 1992, p.70) The results on overall sample, were and end number of 100 counts when consider the entire sample.

6. Post-Acquisition performance of US acquiring firms

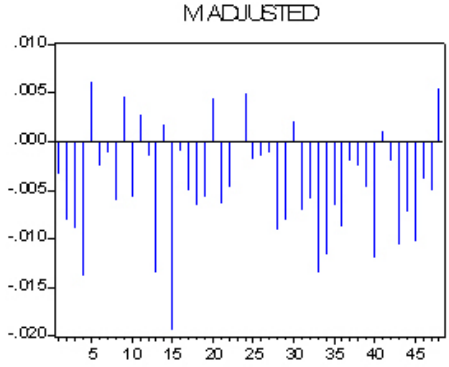
The following section of the study is divided into a first general part on the overall performance of the sample; and in a second part where the sample is partitioned into sub-samples according to the means of payment, conglomerate vs. non-conglomerate mergers, the size of the deal; and lastly with a combined sub-samples based on different characteristics of the deal; all with the aim of uncovering the possible determinants of performance as identified in the first subsection. The main aim of this part of the thesis, tries by independent research to identify if acquisitions are indeed wealth-reducing events as prior research has demonstrated, and in that way may as well serve as a test of the efficiency of US market.

6.1. Results on the performance of the entire sample

6.1.1. Summary statistics

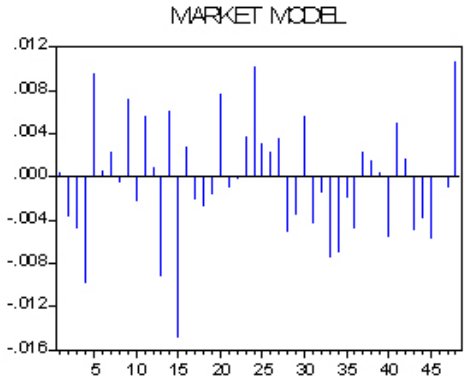
As a preliminary graphical analysis, the figures below show the pattern of the cumulative average raw returns for the different benchmark models used to calculate the abnormal returns. (See figures 4-6) Even though they represent only the last period of consideration, the 48 month one, the obvious remark is the difference that arises from the calculation of the AAR's based on model's presumptions. As expected no similarity can be found since all three models are postulated on different assumptions which give us a chance to analyze in depth different findings that were done on this subject, compare them to our results and discuss them in even more detailed manner. Based on the figures one can notice that the lowest negative abnormal returns are in all three models around the 24 and the 25 month. Even in the market and market-adjusted models we notice positive returns. It has to be said that no logical explanation or supporting research can be given on the reason behind it. Maybe, as a preliminary conclusion that can be drawn at this point is the expectation that under the CAPM model we can perhaps expect negative abnormal returns, given the graph in the figures below; however it is left to be seen and tested on the significance of these returns as to what extent they should be included in the analysis.

Figure 4:
Market Adjusted AAR's in 48 month period



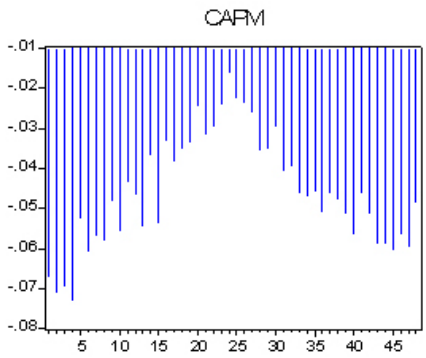
Source: Own work

Figure 5:
Market model AAR's in 48 month period



Source: Own work

Figure 6:
CAPM AAR's in 48 month period



Source: Own work

Additionally, summary statistics of the abnormal returns for each of the periods under consideration are presented in table 3, from where initial inferences can be drawn concerning the magnitude of the expected CAARs under each of the three benchmark models. In each of the columns we consider firstly the market-adjusted model, market model and lastly the CAPM. Under each of the periods considered we calculate and compare minimum and maximum value in the observations, the average abnormal return and standard deviation. Lastly we consider the skewness and kurtosis as measures for degree of asymmetry of a distribution.

It is most apparent by focusing on the average AR, i.e. the average abnormal return, generated by the CAPM are more than ten times the one generated by the market model and by the market-adjusted model; whilst both of the models do not have that kind of difference amongst them.

Table 3:
Summary Statistics

	Market-Adjusted Model	Market Model	CAPM
		ARs – 12 months	
Minimum	-0,0138	-0.0139	-0,0732
Maximum	0,0062	0,0095	-0,0435
Average AR	-0,0031	-0,0045	-0,0586
Standard deviation	0,0058	0,0054	0,0099
Skewness	-0,0453	-0,0800	0,0269
Kurtosis	2,3271	2,6078	1,7576
		ARs – 24 months	
Minimum	-0,0019	-0,0148	-0,0733
Maximum	0,0062	0,0102	-0,0162
Average AR	-0,0036	0,0002	-0,0465
Standard deviation	0,0063	0,0061	0,0161
Skewness	-0,4947	-0,4657	0,0282
Kurtosis	2,9861	3,0843	1,9711
		ARs – 36 months	
Minimum	-0,0193	-0,0148	-0,0732
Maximum	0,0062	0,0103	-0,0162
Average AR	-0,0045	-0,0005	-0,0432
Standard deviation	0,0059	0,0056	0,0149
Skewness	-0,2333	-0,2115	-0,0268
Kurtosis	2,8123	2,9234	2,2433
		ARs-48 months	
Minimum	-0,0193	-0,0149	-0,1112
Maximum	0,0062	0,0107	-0,0162
Average AR	-0,0045	-0,0003	-0,0458
Standard deviation	0,0056	0,0053	0,0138
Skewness	-0,1593	-0,0904	0,1354
Kurtosis	2,8333	3,0501	2,2941

Source: Own work

As far as the standard deviation is concerned, a rather proportional joint movement is recorded with the first two models through time, while CAPM registering highest one and a rather different movement. Also, the kurtosis of both models moves in the range from 2,3 to 3,01; which means that we can see our sample following a normal distribution (a postulate assumed before in the event methodology regarding both models). On the other side, in the case of the CAPM model, although in the first two periods we can not speak

about normal distribution, with the increase in observations as expected, the kurtosis coefficient increases.

6.1.2. Presentation of the results on the entire sample

6.1.2.1. Individual T-tests

As noted before, returns are aggregated and then each of the results is compared (tested) against the null hypothesis. In other words, each of the given months separately is tested in order to draw some preliminarily conclusions on the returns and considers the cumulative average abnormal returns.

The output results, presented in table 4 below (see table 4, p.26), represent the individual t-tests on the entire sample, separated by the 4 predefined periods under the market-adjusted model. Although, the significance of 5 % was noted as being relevant in our event methodology only in this case we consider lower significance levels for the sake of presenting a general idea, as to decisions on relevance of consideration of the observations.

It can be concluded, that individually the null hypothesis can not be rejected i.e. no abnormal returns can be registered in the majority of the observations. Moreover, it can be seen that from one period to another there is no consistent trend of increasing t-value, but rather it can be said that the volatility is extreme; ranging from significant to close to zero. Even thought this is the case, the significance of the individual returns is irrelevant, in the thesis below cumulative average abnormal returns are to be examined and tested since due to aggregation our expectation is increase in the significance of the results. At this point we might say that our expectations of abnormal negative performance might not realize, having in consideration that in this case not even 10 % of the observations can individually reject the hypothesis.

Table 4:
Individual t-statistics under the market-adjusted model[4]

Market-Adjusted Model			
12 months	24months	36months	48 months
-0,452460382	-0,452460382	-0,452460382	-0,452460382
-1,127686847	-1,127686847	-1,127686847	-1,127686847
-1,305373196	-1,305373196	-1,305373196	-1,305373196
-1,686607951	-1,686607951	-1,686607951	-1,686607951
0,732105823	0,732105823	0,732105823	0,732105823
-0,364730505	-0,364730505	-0,364730505	-0,364730505
-0,157133745	-0,157133745	-0,157133745	-0,157133745
-0,916693633	-0,916693633	-0,916693633	-0,916693633
0,621123161	0,621123161	0,621123161	0,621123161
-0,861789508	-0,861789508	-0,861789508	-0,861789508
0,430351393	0,430351393	0,430351393	0,430351393
-0,194763411	-0,194763411	-0,194763411	-0,194763411
	-1,841991969	-1,841991969	-1,841991969
	0,227088778	0,227088778	0,227088778
	-2,731695626	-2,731695626	-2,731695626
	-0,131962518	-0,131962518	-0,131962518
	-0,64497667	-0,64497667	-0,64497667
	-0,923727621	-0,923727621	-0,923727621
	-0,811989142	-0,811989142	-0,811989142
	0,625349801	0,625349801	0,625349801
	-0,947809725	-0,947809725	-0,947809725
	-0,779644871	-0,779644871	-0,779644871
	-0,010748252	-0,010748252	-0,010748252
	0,763186739	0,763186739	0,763186739
		-0,269413998	-0,269413998
		-0,199227513	-0,199227513
		-0,162751917	-0,162751917
		-1,372437481	-1,372437481
		-1,248418735	-1,248418735
		0,279279349	0,279279349
		-0,865593918	-0,865593918
		-0,948452075	-0,948452075
		-2,018568989	-2,018568989
		-1,667559195	-1,667559195
		-0,895824309	-0,895824309
		-1,28990169	-1,28990169
			-0,263245219
			-0,372429109
			-0,743560033
			-1,628197842
			0,159385716
			-0,311959463
			-1,575147138
			-1,121879884
			-1,600556885
			-0,664143038
			-0,887266839
			0,850391161
Significant Observations	1	3	5	7

Source: Own work

[4] Note that numbers (results) in red should represent significant observations at 5 % significance level, however only in this case we considered observations with lower significance level

Table 5:
Individual t-statistics under the market model[5]

MARKET MODEL			
12 months	24 months	36 months	48 months
0,088724367	0,088724367	0,088724367	0,088724367
-0,675055846	-0,675055846	-0,675055846	-0,675055846
-1,044011433	-1,044011433	-1,044011433	-1,044011433
-1,440965876	-1,440965876	-1,440965876	-1,440965876
1,460440516	1,460440516	1,460440516	1,460440516
0,097791388	0,097791388	0,097791388	0,097791388
0,389546137	0,389546137	0,389546137	0,389546137
-0,124916451	-0,124916451	-0,124916451	-0,124916451
1,324144506	1,324144506	1,324144506	1,324144506
-0,485418349	-0,485418349	-0,485418349	-0,485418349
1,348203262	1,348203262	1,348203262	1,348203262
0,147891515	0,147891515	0,147891515	0,147891515
	-1,670884476	-1,670884476	-1,670884476
	1,029342638	1,029342638	1,029342638
	-2,883471315	-2,883471315	-2,883471315
	0,511579469	0,511579469	0,511579469
	-0,359189246	-0,359189246	-0,359189246
	-0,53085679	-0,53085679	-0,53085679
	-0,315778122	-0,315778122	-0,315778122
	1,428712413	1,428712413	1,428712413
	-0,206044691	-0,206044691	-0,206044691
	-0,064746467	-0,064746467	-0,064746467
	0,707718161	0,707718161	0,707718161
	2,497917126	2,497917126	2,497917126
		0,691750809	0,691750809
		0,435632749	0,435632749
		0,827144307	0,827144307
		-1,160376548	-1,160376548
		-0,812166876	-0,812166876
		1,084359122	1,084359122
		-0,638031616	-0,638031616
		-0,340171878	-0,340171878
		-1,599408118	-1,599408118
		-1,333494703	-1,333494703
		-0,333127645	-0,333127645
			-1,048220861
			0,453808732
			0,320575749
			0,118272202
			-0,993174471
			1,25961355
			0,372465843
			-1,041427762
			-0,89489594
			-1,406615353
			0,02647839
			-0,302624488
			2,609168539
Significant Observations	0	2	2	3

Source: Own work

With the market model under consideration, as it can be seen from the table above (table 5), we face the same situations as we did when the market-adjusted model was under consideration. Even this time we have a lower number of statistically significant observations under each of the periods. However, that does not imply that the average cumulative abnormal returns would be insignificant as well.

[5] Please note the numbers in red represent significant observations i.e. the satisfy the criteria ONLY for 5 % significance level

Table 6:
Individual t-statistics under the CAPM model[6]

CAPM			
12 months	24 months	36 months	48 months
-2,468869833	-2,468869833	-2,468869833	-2,468869833
-2,755952858	-2,755952858	-2,755952858	-2,755952858
-2,879614001	-2,879614001	-2,879614001	-2,879614001
-3,04676262	-3,04676262	-3,04676262	-3,04676262
-2,250188856	-2,250188856	-2,250188856	-2,250188856
-2,753283668	-2,753283668	-2,753283668	-2,753283668
-2,708535321	-2,708535321	-2,708535321	-2,708535321
-2,792156923	-2,792156923	-2,792156923	-2,792156923
-2,258891504	-2,258891504	-2,258891504	-2,258891504
-2,714180501	-2,714180501	-2,714180501	-2,714180501
-2,119898258	-2,119898258	-2,119898258	-2,119898258
-2,328163124	-2,328163124	-2,328163124	-2,328163124
	-2,655608487	-2,655608487	-2,655608487
	-1,801918723	-1,801918723	-1,801918723
	-2,77548993	-2,77548993	-2,77548993
	-1,730033663	-1,730033663	-1,730033663
	-2,076713527	-2,076713527	-2,076713527
	-1,887230345	-1,887230345	-1,887230345
	-1,913126546	-1,913126546	-1,913126546
	-1,383236666	-1,383236666	-1,383236666
	-1,868730717	-1,868730717	-1,868730717
	-1,819127626	-1,819127626	-1,819127626
	-1,459195746	-1,459195746	-1,459195746
	-1,00325239	-1,00325239	-1,00325239
		-1,306637913	-1,306637913
		-1,42063283	-1,42063283
		-1,528594096	-1,528594096
		-2,18899632	-2,18899632
		-2,012163149	-2,012163149
		-1,699188512	-1,699188512
		-2,552338977	-2,552338977
		-2,184431961	-2,184431961
		-2,615095559	-2,615095559
		-2,551118358	-2,551118358
		-2,336689165	-2,336689165
		-2,608102482	-2,608102482
			-2,406413278
			-2,195872139
			-2,400130596
			-2,58748505
			-1,941690558
			-2,194164516
			-2,447854438
			-2,365963036
			-2,35966736
			-2,129730659
			-2,143194493
			-1,702906979
Significant Observations	12	16	24	35

Source: Own work

As it can be seen from the table above (table 6), in the last case we have a completely different situation. It has been shown over the years that CAPM "explains" around 80 % of the stock performance, where on the other two models no consensus has been reached. (McWilliams and McWilliams, 2001) Seeing CAPM as a more comprehensive model if compared to the previous two in reflecting the performance of the stock on the market, we now register more observation as being significant. To be more precise in the first period all 12 observations, individually are significant to the average abnormal return of

[6] Please note the numbers in red represent significant observations i.e. the satisfy the criteria under 5 % significance level

the month they represent. Furthermore, in every other period the significant observations gradually increase never going below 50 %. The preliminary conclusion that can be drawn at this point is that indeed there might be abnormal negative performance.

By this point, it can be concluded that in the first two models based on the individual t-tests not much can be expected on general rejection of the null hypothesis, while under CAPM the probability of registering abnormal negative performance is increased. Certainly, that would be in details tested and explained in the following part of the thesis.

6.1.2.2. Cumulative average abnormal returns (CAARs) on the entire sample

The results in from Models 1 to 3 above are shown in Table 7 which presents evidence on how the market would react to an acquisition announcement over a period of 12, 24, 36 and 48 months.

A brief explanation on the values in the table below (See next page) is to be presented. The table shows the estimated CAARs which as previously mentioned were obtained by summing the average returns per month across firms. The figures in brackets are the J_1 statistics (MacKinley, 1997) and the results of the sign test are in squared brackets. It is important to note that although similar, the results for the SARs are to be presented later on and the variation of the CASARs as compared to the CAARs explained; the remainder of the dissertation will present the estimation results for the CAARs only.

Lastly, all the results were checked at 95 % significance level, with no consideration to other intervals (significance levels).

Table 7:
Post-acquisition performance of US acquiring firms

	Market – Adjusted Model	Market Model	CAPM
CAAR 12 months	-0,0377	0,005	-0,704***
	(-0,403)	(0,066)	(-4,275)
	[-1,732]	[0,577]	[-2,887]
CAAR 24 months	-0,089	0,004	-1,115***
	(-0,675)	(0,037)	(-5,044)
	[-2,45]	[-0,408]	[-4,491]
CAAR 36 months	-0,16	-0.012	-1,558***
	(-1.010)	(-0,881)	(-5,888)
	[-3.67]	[-0,33]	[-5,667]
CAAR 48 months	-0,215	-0,016	-2,200***
	(-1,177)	(-0,104)	(-6,997)
	[-4,33]	[-0,289]	[-6,639]

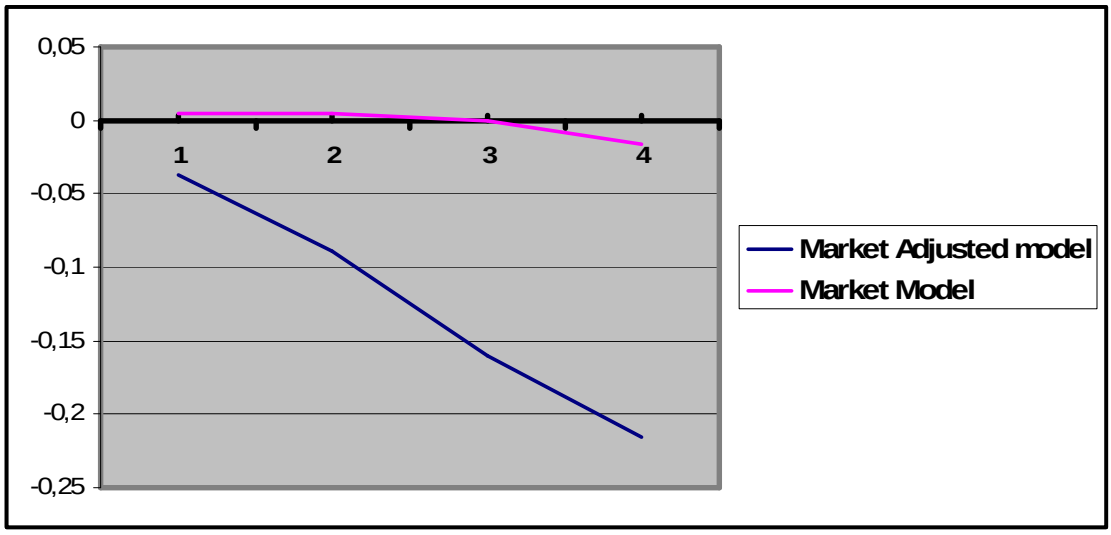
Note: For all results *** indicates a statistical significance at 5% significance level

Source: Own work

If markets react efficiently, there should be no apparent over/under-reaction as documented by the economic and statistical significance of the CAARs. Here, while the estimates from the market-adjusted model and the market model appear to support the efficient market hypothesis in the sense that no significant abnormal performance is detected, the latter is not so when the CAPM is used as benchmarks to calculate abnormal returns. Namely, the analysis of the CAARs from the CAPM indicates significant negative abnormal performance of acquiring firms during the 12, 24, 36 and 48 months following the announcement month at 5 % significance. The latter appears consistent with the largest portion of the empirical research of the US market to date. (Franks, Harris and Mayer (1988); Franks, Harris and Titman (1991); Agrawal, Jaffer and Mandelker (1992); Rau and Vermaelen (1998)) Consequently, the message from CAPM event-study model demonstrate an anomaly following mergers, i.e. the long-run shareholders returns of acquisitions in US are, on average, significantly negative, and acquisitions instead of being wealth-enhancing activities lead to large losses. These results are further confirmed by the sign test which shows that for the periods where statistically significant negative abnormal returns are documented by the J_1 statistics, the null hypothesis of positive abnormal returns is also rejected at 5 percent significance level.

Were not able to reject the null hypothesis for the two other models, but if closely observed it can be seen that as time passes i.e. as longer periods are considered so does the t-value and the negative CAARs increase. For example in both models higher negative returns are observed. To be more precise in the first period an increase in the negative return of 4 and 2 times was estimated in the market-adjusted and market model. The increase of negative abnormal returns for both models although not significant can be best seen from figure 7 below.

Figure 7:
Comparison of market-adjusted and market model returns (in %)



Source: Own work

The reason for not comparing the other models in the figure above with CAPM is the very fact that CAPM exerts, as it would be mentioned later, 10 times higher difference. That being the case would increase the measurements on the y-axis on figure 10, which would result with lighten or even unnoticeable downward trend of the two models, a fact that we want to be noted.

However, as it can be noticed from Table 7, different abnormal returns benchmarks do lead to economically significant differences as examined by the magnitude of the negative abnormal returns. More precisely, the level of CAARs differs between models with the market-adjusted model showing the smallest negative CAARs, and the CAPM yielding the biggest CAARs after 12, 24, 36 and 48 months following the month of the announcement. In other words, at best case CAPM yields 10 times higher difference in returns as compared to the other two models. Seen on its own the returns from one period to another differ by more than 40 %. In other words, abnormal returns have been increasing by 58, 39, and 41 %, respectively each period starting from the first year.

Eventually under in the last period (4th year) of consideration, CAPM registers a 2, 2 % negative return.

Even the two other models amongst themselves differ a lot if compared; in the last period the market model registers 13 times less negative returns as compared to the market-adjusted model. Seen as separate under the market-adjusted model we record the highest difference from one period to another 130 %. However seen in percentage points, this is even incomparable to the lowest difference from CAPM.

This, however, is not unexpected as all of these models rest on different assumptions and make different adjustments for the risk of individual firms. For one thing, the market-adjusted returns model is consistent with the Asset Pricing model if all securities have a systematic risk of unity, which is an implausible assumption (Brown and Warner, 1980). As a result, since this model makes no adjustment for the beta risk of individual securities it will be left out of the analysis in the remainder of the dissertation. The CAPM model, on the other hand, is found to impose some questionable restrictions on the market model, thus brings the possibility that the results of the study may be sensitive to these restrictions. And since this potential for sensitivity can be easily avoided at no cost by using the market model, the use of the CAPM has been limited (MacKinley, 1997). The latter is increasingly so if one considers the Brown and Warner's (1980) argument that beyond a simple one factor model, there is no evidence that more complicated methodologies convey any benefits; and alternative benchmarks should be used only when the stocks under consideration come from the same industry which is not the case with our study since the observed stocks are scattered across a number of different industries.

Consequently, in the preceding analysis the market model which generates efficient estimates and at the same time adjusts for beta risk and reduces the influence of the previously discussed size effect (Dimson and Marsh, 1986), will be the only benchmark model used to calculate abnormal returns.

In conclusion we can note that at this point we managed to reject the null hypothesis of no abnormal returns for all the periods in consideration only in the case of Capital Asset Pricing Model; whilst we were not able to reject the null hypothesis when the other two models were observed. With - 2,2 % CAAR the CAPM if compared to the other two models reflected difference ten and hundred times higher than the market-adjusted and market model in the last period respectively. However, although without significant negative returns we were able to observe an increasing negative return pattern in both models over the periods.

6.1.3. Cumulative average standardized abnormal returns (CASARs) for entire sample

As far as, the second postulate of the analysis is considered, which was part of the event study methodology previously explained, the results for the CASARs for all the models and periods are presented in continuation. Following step by step the very same analysis is done. First individual significance tests are done as previously, and then significance or tests of the null hypothesis are done on the cumulative abnormal returns. The analysis that would be presented would be in light of the comparison between CAAR and CASAR; therefore later on a decision would be made based on some arguments as which of the two better reflect the situation.

6.1.3.1. Individual t-tests for ASAR[7]

Following similar method, returns are aggregated and then each of the results is compared (tested) against the null hypothesis. In other words, each of the given months separately is tested in order to draw some preliminarily insights on the returns and considers the cumulative average abnormal returns.

As it can be seen from the table below (table 8) the individual significance tests only in once instance in the 4 periods managed to reject the null hypothesis of no abnormal returns. If compared to the power of the individual tested without standardization, it can be claimed that there is a vast difference between the two. While in the first case we had at a bit below 10 % rejection rate of the hypothesis, now we only have one case in each of the 4 periods. The difference in the latter would be discussed later when decision would be brought on which of two ways to be used for the other part of the analysis.

[7] Average Standardized Abnormal Returns

Table 8:
Individual t-statistics under the market-adjusted model

MARKET MODEL CASAR			
12 months	**24months**	**36months**	**48 months**
-0,452460382	-0,452460382	-0,452460382	-0,452460382
-1,127686847	-1,127686847	-1,127686847	-1,127686847
-1,305373196	-1,305373196	-1,305373196	-1,305373196
-1,686607951	-1,686607951	-1,686607951	-1,686607951
0,732105823	0,732105823	0,732105823	0,732105823
-0,364730505	-0,364730505	-0,364730505	-0,364730505
-0,157133745	-0,157133745	-0,157133745	-0,157133745
-0,916693633	-0,916693633	-0,916693633	-0,916693633
0,621123161	0,621123161	0,621123161	0,621123161
-0,861789508	-0,861789508	-0,861789508	-0,861789508
0,430351393	0,430351393	0,430351393	0,430351393
-0,194763411	-0,194763411	-0,194763411	-0,194763411
	-1,841991969	-1,841991969	-1,841991969
	0,227088778	0,227088778	0,227088778
	-2,731695626	-2,731695626	-2,731695626
	-0,131962518	-0,131962518	-0,131962518
	-0,64497667	-0,64497667	-0,64497667
	-0,923727621	-0,923727621	-0,923727621
	-0,811989142	-0,811989142	-0,811989142
	0,625349801	0,625349801	0,625349801
	-0,947809725	-0,947809725	-0,947809725
	-0,779644871	-0,779644871	-0,779644871
	-0,010748252	-0,010748252	-0,010748252
	0,763186739	0,763186739	0,763186739
		-0,269413998	-0,269413998
		-0,199227513	-0,199227513
		-0,162751917	-0,162751917
		-1,372437481	-1,372437481
		-1,248418735	-1,248418735
		0,279279349	0,279279349
		-0,865593918	-0,865593918
		-0,948452075	-0,948452075
		-2,018568989	-2,018568989
		-1,667559195	-1,667559195
		-0,895824309	-0,895824309
		-1,28990169	-1,28990169
			-0,263245219
			-0,372429109
			-0,743560033
			-1,628197842
			0,159385716
			-0,311959463
			-1,575147138
			-1,121879884
			-1,600556885
			-0,664143038
			-0,887266839
			0,850391161
Significant Observations	**0**	**1**	**1**	**1**

Source: Own work

Table 9:
Individual t-statistics under the market model

MARKET MODEL CASAR			
12 months	**24 months**	**36 months**	**48 months**
0,088724367	0,088724367	0,088724367	0,088724367
-0,675055846	-0,675055846	-0,675055846	-0,675055846
-1,044011433	-1,044011433	-1,044011433	-1,044011433
-1,440965876	-1,440965876	-1,440965876	-1,440965876
1,460440516	1,460440516	1,460440516	1,460440516
0,097791388	0,097791388	0,097791388	0,097791388
0,389546137	0,389546137	0,389546137	0,389546137
-0,124916451	-0,124916451	-0,124916451	-0,124916451
1,324144506	1,324144506	1,324144506	1,324144506
-0,485418349	-0,485418349	-0,485418349	-0,485418349
1,348203262	1,348203262	1,348203262	1,348203262
0,147891515	0,147891515	0,147891515	0,147891515
	-1,670884476	-1,670884476	-1,670884476
	1,029342638	1,029342638	1,029342638
	-2,883471315	-2,883471315	-2,883471315
	0,511579469	0,511579469	0,511579469
	-0,359189246	-0,359189246	-0,359189246
	-0,53085679	-0,53085679	-0,53085679
	-0,315778122	-0,315778122	-0,315778122
	1,428712413	1,428712413	1,428712413
	-0,206044691	-0,206044691	-0,206044691
	-0,064746467	-0,064746467	-0,064746467
	0,707718161	0,707718161	0,707718161
	2,497917126	2,497917126	2,497917126
		0,691750809	0,691750809
		0,435632749	0,435632749
		0,827144307	0,827144307
		-1,160376548	-1,160376548
		-0,812166876	-0,812166876
		1,084359122	1,084359122
		-0,638031616	-0,638031616
		-0,340171878	-0,340171878
		-1,599408118	-1,599408118
		-1,333494703	-1,333494703
		-0,333127645	-0,333127645
		-1,048220861	-1,048220861
			0,453808732
			0,320575749
			0,118272202
			-0,993174471
			1,25961355
			0,372465843
			-1,041427762
			-0,89489594
			-1,406615353
			0,02647839
			-0,302624488
			2,609168539
ant Obse **0**	**2**	**2**	**3**

Source: Own work

Although, more observations now can reject the null hypothesis as compared to the market-adjusted model, if compared to the market model return without standardization, we obtain the same results. (See Table 9) They are even more significant for the same months in both of the models, which to some extent prove the small difference between both ways of calculating average abnormal returns.

Table 10:
Individual t-statistics under the CAPM model

CAPM MODEL CASAR			
12 months	24 months	36 months	48 months
-2,468869833	-2,468869833	-2,468869833	-2,468869833
-2,755952858	-2,755952858	-2,755952858	-2,755952858
-2,879614001	-2,879614001	-2,879614001	-2,879614001
-3,04676262	-3,04676262	-3,04676262	-3,04676262
-2,250188856	-2,250188856	-2,250188856	-2,250188856
-2,753283668	-2,753283668	-2,753283668	-2,753283668
-2,708535321	-2,708535321	-2,708535321	-2,708535321
-2,792156923	-2,792156923	-2,792156923	-2,792156923
-2,258891504	-2,258891504	-2,258891504	-2,258891504
-2,714180501	-2,714180501	-2,714180501	-2,714180501
-2,119898258	-2,119898258	-2,119898258	-2,119898258
-2,328163124	-2,328163124	-2,328163124	-2,328163124
	-2,655608487	-2,655608487	-2,655608487
	-1,801918723	-1,801918723	-1,801918723
	-2,77548993	-2,77548993	-2,77548993
	-1,730033663	-1,730033663	-1,730033663
	-2,076713527	-2,076713527	-2,076713527
	-1,887230345	-1,887230345	-1,887230345
	-1,913126546	-1,913126546	-1,913126546
	-1,383236666	-1,383236666	-1,383236666
	-1,868730717	-1,868730717	-1,868730717
	-1,819127626	-1,819127626	-1,819127626
	-1,459195746	-1,459195746	-1,459195746
	-1,00325239	-1,00325239	-1,00325239
		-1,306637913	-1,306637913
		-1,42063283	-1,42063283
		-1,528594096	-1,528594096
		-2,18899632	-2,18899632
		-2,012163149	-2,012163149
		-1,699188512	-1,699188512
		-2,552338977	-2,552338977
		-2,184431961	-2,184431961
		-2,615095559	-2,615095559
		-2,551118358	-2,551118358
		-2,336689165	-2,336689165
		-2,608102482	-2,608102482
			-2,406413278
			-2,195872139
			-2,400130596
			-2,58748505
			-1,941690558
			-2,194164516
			-2,447854438
			-2,365963036
			-2,35966736
			-2,129730659
			-2,143194493
			-1,702906979
Significant Observations	12	16	24	35

Source: Own work

As expected, the relevance of the CAPM model is again proved on individual level and with majority of the observations being significant we can reject the null hypothesis on individual level and assume existence of negative returns in the long run. (See Table 10) Also it has to be noted the similarity between the result amongst both models with and without standardization.

At this point we can conclude, that on individual level testing we observe similarities amongst the market and capital asset pricing model on the significance of the individual tests, with t-statistics notably higher/stronger than the ones obtained by CAAR. However, for the first model, we obtained even lower significance in the results as compared to CAARs, which to some extend was unexpected.

6.1.3.2. Cumulative average standardized abnormal returns (CASARs) on the entire sample

Additionally, we have to consider testing the null hypothesis on higher level, the cumulative average level and compare it to the results obtained previously under CAAR. The cumulative average standardized abnormal returns results are presented in the table below. (See table 11)The figures in brackets are the J_1 statistics and the results of the sign test are in squared brackets.

Table 11:
Post-acquisition performance of US acquiring firms (CASAR)

	Market – Adjusted Model	Market Model	CAPM
CASAR 12 months	-0,528	0,109	-3,108***
	(-1,525)	(0,314)	(-8,971)
	[-1,732]	[0,577]	[-2,887]
CASAR 24 months	-1,249***	0,123	-5,345***
	(-2,550)	(0,251)	(-10,910)
	[-2,45]	[-0,408]	[-4,491]
CASAR 36 months	-2,315***	-0,299	-7,845***
	(-3,858)	(-0,499)	(-13,076)
	[-3,667]	[-0,667]	[-5,667]
CASAR 48 months	-3,131***	-0,247	-10,534***
	(-4,519)	(-0,357)	(-15,203)
	[-4,33]	[-0,289]	[-6,639]

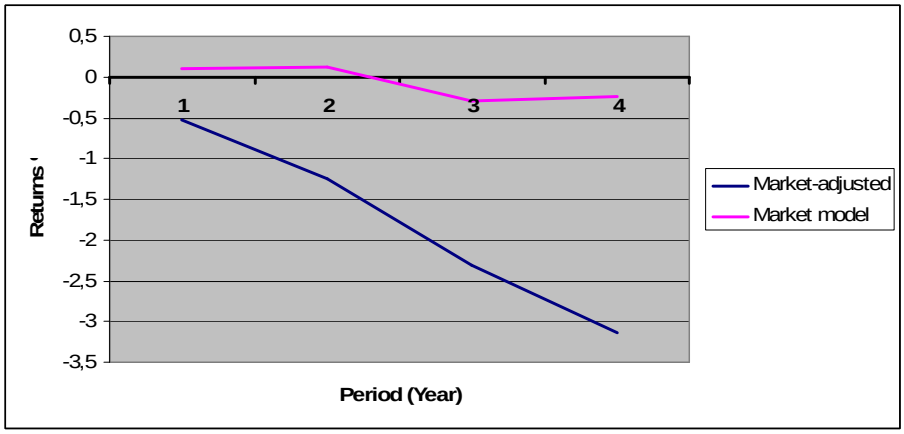
Note: For all results *** indicates a statistical significance at 5% significance level

Source: Own work

Definitely, the first thing to notice is the statistical significance in the last 3 periods of the market-adjusted model. Although before when CAAR's were considered we could not reject the null hypothesis at this instance we can conclude at 5 % significance level that negative returns indeed are present. This unquestionably supports our given claim before on the existence on negative returns based on the changes recorded previously from one period to another.

Having the standardized returns now, we can see that if compared to the CAARS's the above values are at least few times higher. However as concluded by Brown and Warner (1980) this phenomenon is expected cause when standardize with the standard deviation, we ought to calculate the nominal change rather than the real, which is always lower.

Figure 8:
Comparison of Market-adjusted and Market model under CASAR (in %)



Source: Own work

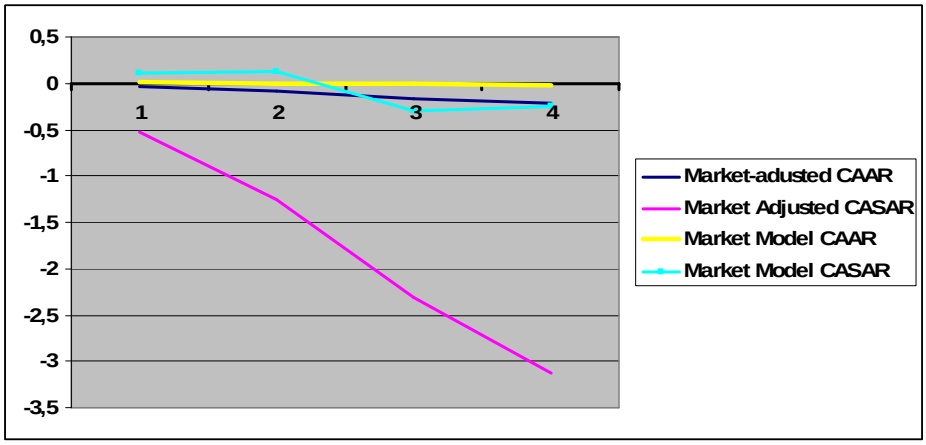
From the figure above (figure 8) we can see the trend of negative performance that we "speculated" about before under CAARs. Now with higher level significance, we can conclude on the negative performance under CASAR.

However, as also argued by Brown and Warner (1980), if we consider the percentage change from one period to another, the difference should be negligible. Therefore, having said that all the analysis would be done by using CAPM, it can be seen that the change from the last two periods were 34% and 41 % for CAAR's and CASAR's respectively.

6.2. The difference between CAAR and CASAR

Standardized methods by Patell (1976) and Boehmer, Musumeci, and Poulsen (1991) have been shown to outperform traditional, non-standardized tests in event studies. However, standardized tests are valid only if there are cross-sectional correlations between the observations' returns. A basic assumption in traditional event study methodology, such as the one employed in this thesis, is that the abnormal returns are cross-sectionaly uncorrelated. This assumption is valid when the event day is not common to the firms. Even in the case when the event day is common, if the firms are not from the same industry, Brown and Warner (1982, 1985) show that use of the market model to derive the abnormal return reduces the inter-correlations virtually to zero and, hence, can be ignored in the analysis.
In order to represent the difference in a more understandable manner, we consider the returns compared to each other graphically. (See figures 9 and 10 below)

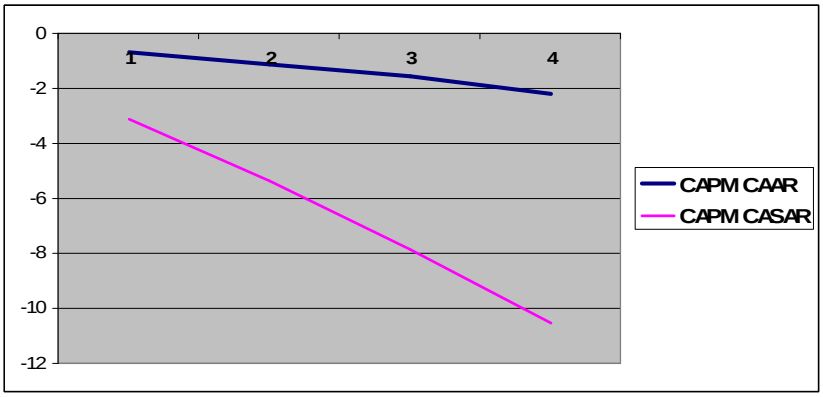
Figure 9:
Comparison of CARRs and CASAR under the first two models (in %)



Source: Own work

As can be seen from the first figure (above), the difference between two market models under different calculations is vast and definitely more noticeable than under the market-adjusted models. To be more precise, the difference between the periods is approximately 21, 30, 24 and 15 times as compared to each other by the respective periods.

Figure 10:
Comparison of CAAR and CASAR under the CAPM (in %)



Source: Own work

Another proof for the "over-performance" of the standardized tests as compared to the standardized ones is figure 10 above which compares the CAPM model under the two different assessments. Compared differently, the standardized returns are on average 4,7 times higher that the ones we obtained previously under CAAR. For example if the highest recorded negative abnormal return under this model was 2,2 % registered in the 4 year, under the standardized method the higher negative abnormal return is also registered in the last period however it is around 10,5 %.

Moreover, neither of the above mentioned standardizing methods, however, do not account for the possible cross-sectional correlations that can exist when the event day is the same for the firms. The fact that stock returns are typically positively correlated, ignoring such correlations leads to underestimation of the abnormal return variance and, "in turn, over-rejection of the null hypothesis of no event effect when it is true." (Maletesta, 1986, p.30) An issue was already addressed earlier in this thesis, but now we considered it from a different perspective.

In conclusion, we can say that in consideration of the fact that later on we did not record significant difference between returns and for statistical issues stated in this chapter we can surely chouse one of the ways to perform cumulative returns estimations, therefore for sake of simplicity, ease of understanding as well as benchmarking the results to other studies, from now on only CAARs are to be considered.

6.3. Analysis Based on the Method of Payment

The overall sample was first partitioned according to whether the acquisition was financed by stock or cash only, an approach which resulted in two sub-samples of 47 all-cash financed and 53 all-equity financed acquisitions. The same significance tests and analysis were imposed as it was the case for the entire sample. In appendix 2 on the very end of the thesis, individual t-tests are presented and explained in the same manner as it was done in the analysis on the whole sample. (See Appendix 2) As far as the cumulative results are concerned the figures in brackets are the J_1 statistics and the results of the sign test are in squared brackets. (See Table 12)

A more logical rather that methodically proven approach to the results, would be that a cash acquisitions can send a positive signals to investors about the acquirer's confidence in its ability to replenish the cash balance. Additionally, cash-financed transactions offer changes the balance sheet since after that one might notice a debt issuance from a bank in order to finance the merger. The latter results with pressure to repay this debt and can provide the needed drive or incentive to realize synergies and to closely manage the integration process. (Hazelkor and Zenner, 2004)

On the other side, equity offers can signal as we would note also later, the market that acquirer believes its stock is overpriced. This might result with downward pressure on the stock, at least in the short-term. (Firth, 1989) Moreover, one interesting situation that happens is when arbitragers buy the target company stock acting on some "inside" information. When the same are sold to the acquirer this might put a downward pressure

as well. (Hazelkor and Zenner, 2004) However that case scenario has been excluded from our sample as noted in the beginning of the thesis.

The finding that equity financed acquisitions perform significantly worse than cash offers is in accordance to the literature on seasoned equity offerings (SEOs), and it is also consistent with the Myers and Majluf (1984) theory on capital structure. Referring to the Myers and Majluf's theory, the authors postulated a link between the firm's capital structure and its valuation, arguing that a firm tends to issue stock when its shares are over-valued and finance out of retained earnings when the equity is under-valued. Consequently, while a firm's share price should drop following an equity issuance, a cash offer which is interpreted as a positive signal by the market is expected to result in higher post-acquisition performance of the stock price. (Myers and Majluf, 1984)

Table 12:
Post-acquisition performance of US acquiring firms by method of financing

		CAPM
All-cash financed acquisitions	CAAR 12 months	-1,309*** (-5,046) [-3,46]
	CAAR 24 months	-2,155*** (-5,99) [-4,899]
	CAAR 36 months	-2,665*** (6,384) [-6,000]
	CAAR 48 months	-2,947*** (-6,559) [-6,928]
All stock financed acquisitions	CAAR 12 months	-0,167 (-0,844) [-3,464]
	CAAR 24 months	-0,193 (-0,791) [-4,899]
	CAAR 36 months	-0,576*** (-1,834)

		[-6]
	CAAR 48 months	-1,539*** (-3,736) [-6,928]
Average monthly difference (in percentage points)	12 months	-1,142*** [-36,973]
	24 months	-1,962*** [-21,492]
	36 months	-2,089*** [-8,818]
	48 months	-1,408*** [-3,331]

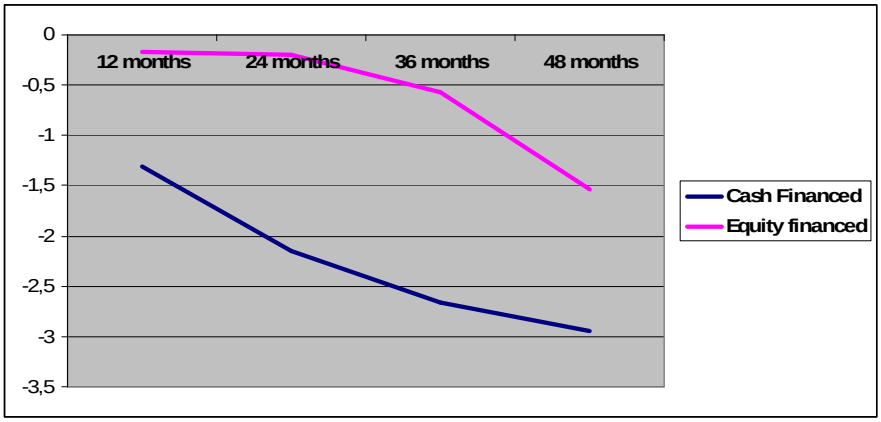
Note: For all results *** indicates a statistical significance at 5% significance level

Source: Own work

The table above (see table 12) shows that although cash financed acquisitions exhibit incomparable performance to all-equity acquisitions during the first 12 months following the announcement date, the former earn substantially lower returns (or accumulate higher negative returns) in the 24, 36 and 48 months after the announcement month. Nonetheless, these findings are statistically significant for the two periods of 36 and 48 months post-acquisition period only, whereas for the rest of the periods all-equity financed mergers are associated with post-merger performance which is not statistically different from zero, whilst the all-cash acquisitions lead to significantly negative post-acquisition performance. These findings appear not to be consistent with several prior studies and for different countries (e.g. Franks, Harris and Mayer, 1988; Franks, Harris and Titman, 1991; Gregory, 1997; Loughran and Vijh, 1997; Mitchell and Stafford, 1998).

As it can be clearly seen from figure 11 (see figure 11 on pg. 43), all-cash financed acquisition as unexpected, perform substantially worse than all-stock based. Just for example, we can consider two periods, 36 and 48 months after acquisition, all-cash perform worse than all-stock financed acquisitions by 2 and 1, 4 percentage points respectively, where both of the results are confirmed under 5 % significance level. Although unconfirmed under the significance test and unavailability to reject the null hypothesis in first place, we can still confirm to some extent the under-performance of cash-based acquisition as compared to stock-based for the first two periods.

Figure 11:
Comparison between all-cash and all-stock financed acquisitions (in %)



Source: Own work

However, whilst Myers and Majluf (1988) predict an immediate drop in price of the stock, which after a short time period should revert back to its mean as suggested by the market; the observed negative long run performance here would be more consistent with the underperformance following seasoned equity offerings (SEOs). As documented by Loughram and Ritter (1995) the poor performance of firms conducting SEOs during 1970-1990 was not a result of long term return reversals, nor can be attributed to differences in betas; but can be seen as a manifestation of firms issuing equity when, on average, they are substantially overvalued. Even though, this is the case, when cash-based acquisitions are concerned little researched is done as comparison on performance if compared to equity-based under this method.

It can be concluded that although unexpected, however in line with some pervious researches cash based acquisitions performed worse that equity based. Moreover, throughout all four periods on average cash based underperformed by 1, 65 percentage points if compared to equity based.

6.4. Conglomerate vs. Non-conglomerate Deals

The break-down of the results from the entire sample was further investigated by classifying the sample into conglomerate and non-conglomerate bids. Conglomerate bids are those where the first two-digit SIC code differs between the acquiring and the acquired company; if the two digits of the SIC code are the same, the acquisition is classified as a “horizontal” merger, that is, a merger between two companies in the same

industry. Before reflecting to the cumulative results, individual significance test on monthly basis are presented in Appendix 3 on both conglomerate and non-conglomerate acquisitions.

Table 13:
Post-acquisition performance of US acquiring firms, conglomerate vs. non-conglomerate acquisitions

		CAPM
Conglomerate Acquisitions	CAAR 12 months	-0,08*** (-3,126) [-3,464]
	CAAR 24 months	-1,554*** (-4.608) [-4,899]
	CAAR 36 months	-2,258*** (-5,631) [-6]
	CAAR 48 months	-2,674*** (-5,548) [-6,928]
Non-conglomerate acquisitions	CAAR 12 months	-0.611*** (-2,812) [-3,464]
	CAAR 24 months	-0,795*** (-2,709) [-4,082]
	CAAR 36 months	-1,084*** (-3,074) [-4,667]
	CAAR 48 months	-1,842*** (-4,442) [-5,774]
Average monthly difference (in percentage points)	12 months	0.531*** [-3,457]
	24 months	-0,759*** [-7,294]

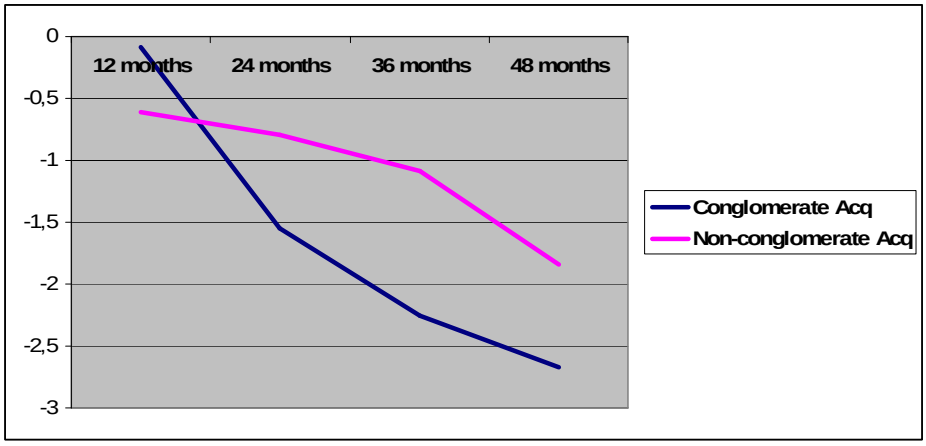
	36 months	-1,174*** [-9,951]
	48 months	-0,832*** [-3,675]

Note: For all results *** indicates a statistical significance at 5% significance level

Source: Own work

The figures in brackets are the J_1 statistics and the results of the sign test are in squared brackets. Analysis of the table above (see table 13) shows that conglomerate acquisitions tend to record significantly higher negative returns as compared to non-conglomerate acquisitions with the average monthly difference being 0,7; 1,17 and 0,8 percentage points over the 24, 36 and 48 months post-acquisition period respectively. The only exception is recorder in the 12 month period where non-conglomerate acquisitions underperformed as compared to conglomerate for 0,5 %. And while the latter finding appears consistent with the Gregory's (1997) study, however the results conflict with Agrawal et al. (1992) who found that it is in fact non-conglomerate acquisitions that exhibit poorer performance.

Figure 12:
Comparison between conglomerate and non-conglomerate acquisitions (in %)



Source: Own work

What can be seen from the figure 12 (above) is that in the first year, conglomerate acquisition generated significantly lower returns, however from then and until the forth year non-conglomerate acquisitions generated by far lower returns. In the next three years, they outperformed the conglomerate acquisitions by 0,7; 1,2 and 0,8 percentage points respectively. Also we did not managed to prove the assumption noted by Melicher and Rush (1974) that conglomerate firms ought to diversify in areas where are relatively more profitable than the ones that are existent in their present operations, therefore exhibiting better performance.

Instead of a conclusion we can reflect on some reasons why would conglomerate mergers perform poorly. One possible explanation for the poorer performance of conglomerate mergers is that the fact that they involve an acquirer entering an unrelated business from its core activities, lead to higher uncertainty and thus less support on the side of investors. (Hazelkorn and Zenner, 2004) Another explanation for the underperformance of conglomerate acquisitions is that the acquiring firms' managers use the free cash flows to grow firms more than optimal because this increases both the resources under their control and their compensation. This phenomenon of pursuing non-strategic acquisitions is known as "empire building". (Sudarsanam, 1995) Finally, we can say that on average conglomerate mergers performed by 0,55 percentage point over the four years (or 48 months period).

6.5. Analysis based on the Transaction Size

In the subsequent part of the analysis aimed at identifying the possible determinants of long run performance, the sample was divided into three groups according to the size of the deal: until100 million USD; 100-500 millions USD (excluding 500); and 500 millions USD and above. Here, even though more reliable results would be generated if the size of the deal is considered as a fraction of the firm's market value of equity, as mentioned previously due to data availability constraints, this more sophisticated analysis is ruled out.

Although not used, it is worth to mention that, partitioning the sample according to the relative size of the deal, where the deal value would be divided by the shareholders' equity value, would be a better approach since it is unlikely that the negative post-acquisition returns can be considered as a result of over-estimated benefits from the merger if the deal value is a very small fraction of the acquirer's size (Franks, Harris and Titman, 1991). In terms of significance of the individual observations per period, the results are presented in Appendix 4. Moreover, as it was for all the other tables, here the figures in brackets are the J_1 statistics and the results of the sign test are in squared brackets.

Table 14:
Post-acquisition performance of US acquiring firms according to the transaction size

		CAPM
max 100 millions USD	CAAR 12 months	-0,202 (-0,764) [-2,887]
	CAAR 24 months	-0.226 (-0,267) [-2,041]
	CAAR 36 months	-0,448 (-1,006) [-3]
	CAAR 48 months	-1,258*** (-2,351) [-4,330]
100-500 millions USD	CAAR 12 months	-0,990*** (-3,871) [-3,464]
	CAAR 24 months	-1,619*** (-4,852) [-4,899]
	CAAR 36 months	-2,061*** (-5,259) [-6]
	CAAR 48 months	-2,565*** (-5,499) [-6,928]
Above 500 million USD	CAAR 12 months	-0.671*** (-2,272) [-3,464]
	CAAR 24 months	-1,144*** (-2,811) [-4,899]
	CAAR 36 months	-1,786*** (-3,767) [-6]

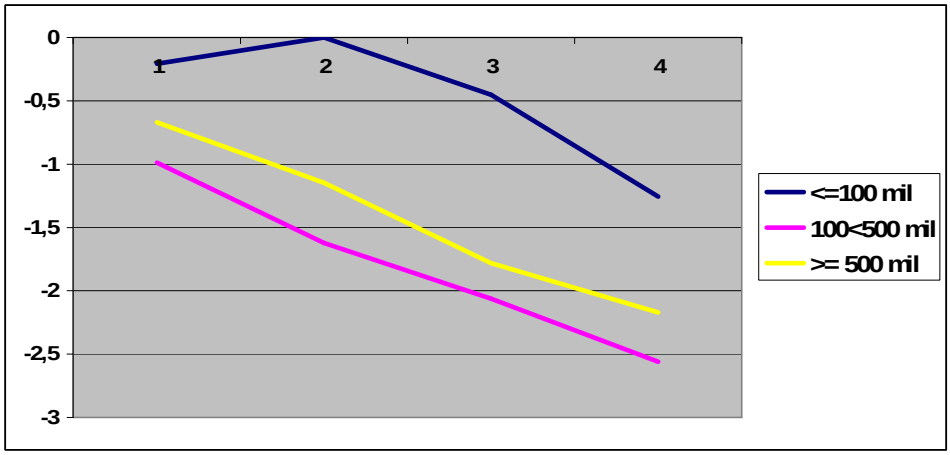
	CAAR 48 months	-2,165*** (-3,917) [-6,928]

Note: For all results *** indicates a statistical significance at 5% significance level

Source: Own work

The above results demonstrate that in the first 12 months following the announcement month the CAARs are of a comparable size, though the CAAR in the case of small deals is not statistically significant at 5% significance level. (See table 14) The importance of the size of the deal can be best seen by considering the 24, 36 and 48 months post-acquisition periods, with exception again of the first two due to low statistical significance in the case of small deals. Namely, during the former periods, not considering the CAAR in the case of small size deals which is statistically insignificant, large size deals tend to outperform medium size deals by around 50 percent. During the 36 months post-takeover period, on the other hand, although there is not substantial difference in the CAARs between large and medium size deals, large deals tend to outperform by approximately 10 percent difference.

Figure 13:
Comparison of returns based on size of the deal (in %)



Source: Own work

All the latter, if graphically presented, (see figure 13 above) gives a clear view in terms of the better performance of the larger size deals. In fact larger size deals outperform medium size ones by 0,3; 0,4; 0,2 and 0,4 percentage points respectively for each of the periods. However, the same under-perform in last period as compared to the small size deals by approximately 1,3 percentage points.

Although, one can expect an indication of the fact that the higher the deal size is, the higher the risk involved in the merger, thus making the stock less likely to outperform the market. Another interpretation of the results would be that the higher the deal size, the longer it takes for the merger to generate the expected gains. (Dodds and Quek, 1985) And this is the case in the last period where large size deals under-perform both small and medium size ones. The final explanation rests on the assumption that small firms tend to be involved in merger deals of comparable size, and if one considers the well-documented small firms effect where smaller firms are found to outperform their larger counterparts; then the smaller the deal size is, the higher the long run abnormal return.

To sum up, although abnormal negative performance was eminent in all sub-samples; the highest negative returns were observed in the medium size deals, following the large size deal with at the end the best performers small size deals. It has to be also noted that in the case of small size deals, only the last period was proven to be significant, with the first three periods being insignificant.

6.6. Combined analysis

As a last part of the analysis, we consider combination of characteristics in expectation to draw more exhaustive conclusions on acquisitions. The reason behind this analysis is to try to plot two determinates together in order to obtain more detailed insight on the reason behind abnormal negative returns.

6.6.1. Non-conglomerate cash mergers

The first part of these pooled analysis concerns the performance of the non-conglomerate cash mergers which would be later compared to non-conglomerate equity mergers. As for all the other tables, here the figures in brackets are the J_1 statistics and the results of the sign test are in squared brackets. (See table 15, p.49)

Table 15:
Post-acquisition performance of US acquiring firms, non-conglomerate cash acquisitions

		CAPM
Non-conglomerate cash acquisitions	CAAR 12 months	-1,115*** (-2,877) [-3,464]
	CAAR 24 months	-1,545*** (-2,879) [-4,899]
	CAAR 36 months	-1,721*** (-2,775) [-5,667]
	CAAR 48 months	-1,989*** (-3,006) [-6,639]

Note: For all results *** indicates a statistical significance at 5% significance level

Source: Own work

An interesting finding at this point is the fact that if we compare the non-conglomerate cash mergers to the non-conglomerate mergers in general, we can conclude a constant under-performance of the former in all the periods under consideration. (See table 15)

6.6.2. Non-conglomerate equity mergers

Although in the case of non-conglomerate equity mergers, we are not able to reject the null hypothesis at a 5 % significance level, we can say that as compared to non-conglomerate mergers in general, they perform a quite better.

Table 16:
Post-acquisition performance of US acquiring firms, non-conglomerate equity acquisitions

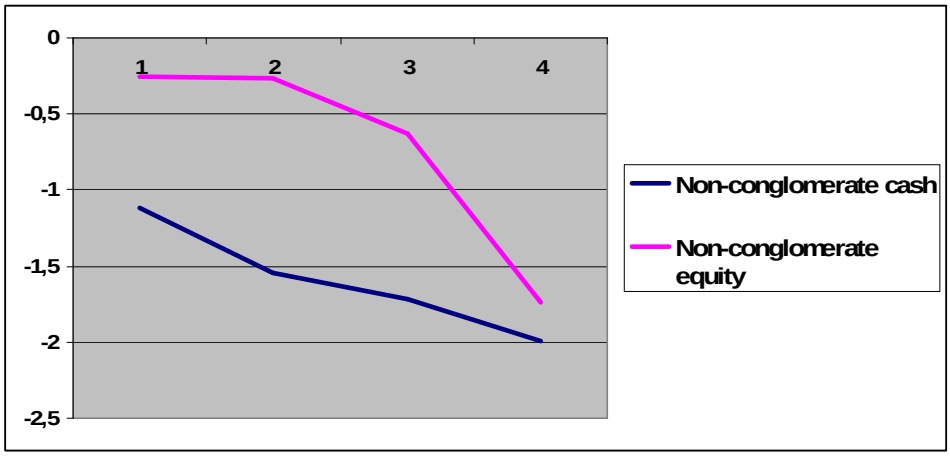
		CAPM
Non-conglomerate equity acquisitions	CAAR 12 months	-0,250 (-1,0829) [-2,887]
	CAAR 24 months	-0,260 (-0,902) [-4,899]
	CAAR 36 months	-0,629 (-1,656) [-4]
	CAAR 48 months	-1,738*** (-3,475) [-5,196]
Average monthly difference (in percentage points)	12 months	-0.856*** [-18,353]
	24 months	-1,285*** [-10,675]
	36 months	-1,092*** [-4,494]
	48 months	-0,251 [-0,642]

Note: For all results *** indicates a statistical significance at 5% significance level

Source: Own work

However, if we consider the fact that one would expect that equity mergers should under-perform cash financed ones, we are surprised to find the opposite. (Table 16) Even though it only counts from the last 48 months, equity mergers outperform cash based for 0,25 points difference. Definitely, it is best to see the difference graphically as presented below in figure 13. (see figure 13, p.52)

Figure 14:
Comparison between non-conglomerate cash based and equity acquisitions (in %)



Source: Own work

Maybe it is worth mentioning the fact that although, in our case, non-conglomerate equity mergers perform better, in the last two period we record a substantial increase in negative returns, whereas in the cash deals one can observe gradual increase in negative returns. The latter might be direct consequence of investor perceptions and expectation where one company surfaces it problems from acquisition after several years. Although that hypothesis was never to be scientifically proven it might provide some insight. Also, on this kind of information, equity acquisitions react in amplified manner rather than cash based. (Swanstorm, 2006)

We can conclude that both non-conglomerate cash and equity samples generated negative abnormal returns in all periods. If we consider the fact that equity mergers acquisitions before performed better than cash one, even with the new determinant we obtain the same result. Although volatile thought the periods, the non-conglomerate cash based underperformance was moving from a highest peak of 1,285 percentage points to an insignificant 0,251 percentage points in the last period, as compared to non-conglomerate equity mergers.

7. Concluding Remarks

The research used an efficient market framework to examine the profitability of acquisitions under different circumstances and changing postulates following different models examined; With expectation that stock market would adjust its share prices both immediately and "correctly" to new significant investor information relating to a security. Thus the market would incorporate the very information; in other words in our case upon the announcement the share prices would change in a way to reflect any gains or losses arising from the takeover activity. Having the diversity of companies from different industries, the expectations were that on average no changes or no records of abnormal return would be recorded, however a rather different outcome was obtained.

Using an event study methodology and different benchmarks to measure abnormal returns, we find mixed results. While no significant abnormal performance is present when the market-adjusted and market models are used to calculate abnormal returns, acquirers in mergers under-perform in all the four periods (years) after the acquisition when using the market model and the CAPM as benchmark models. Therefore, we can say that we can reject our null hypothesis of no abnormal performance. However, the long term underperformance of US acquiring firms in acquisitions is not uniform across firms. The latter can be best seen when the overall sample of acquisitions is partitioned by the method of payment, from where it is evident that while the all-cash financed mergers are associated with post-merger performance which is statistically different from zero, all equity acquisitions lead to significantly negative post-acquisition performance from which only for the third and forth year the results were significant.

The evidence of significant negative abnormal returns during the first four years post-acquisition period is not, however, dependent on whether the acquirer was involved in a conglomerate or non-conglomerate merger. And while in both cases the returns appear to be statistically negative, the economic significance between the latter two categories differs with the average monthly difference being 0,7; 1,1 and 0,8 percentage points higher over the 24, 36 and 48 post-acquisition period respectively in favor of non-conglomerate acquisitions. The very fact that acquiring firms' underperformance in not uniform across firms is also evident when the overall sample is partitioned by the size of the deal. Namely, while small size deals appear to exhibit no statistically significant abnormal performance except in the last year, large size deals tend to outperform medium size deals by more than 30 percent each year. Moreover, with the considered combined analysis in determinants of under-performance we found that non-conglomerate cash acquisitions did worse than their counterparts, non-conglomerate equity acquisitions. However, even it the best year of observation the "loss position" was eminent.

The interesting thing to note is the fact that "the loss" position was maintained in most of the cases, especially when considering the results from the CAPM model thought the 4 years. One of the reasons for this, amongst other, might be the fact that majority of acquired firms had poorish profitability combined with poorish stock market ratings and there might have been some recovery potential. However, the premiums paid in acquiring these companies were so high that any economic benefit from the acquisitions disappeared. Although it sounds a bit strange, having in consideration the value of the brand today and difficulty to estimate market presence, which is always valued on purchase, over-paying from them is often the case. Furthermore, following an expansion strategy of "buying your competitor" has been exercised by managers in showing their power and control over the market, leading to economically unfeasible acquisitions. In order to support the latter, a study by Firth (1979) showed that premiums paid to acquire firms expressed "as a percentage of the acquiring's firms' market capitalization, was a major determinant of losses suffered by the acquiring firm's shareholders". (p.326) Moreover, during the years there has been constant speculation regarding the connection amongst free cash flows and acquisitions. In other words, with an excess cash flow companies exert a propensity to squander that on wasteful investments, including take-over. This might be seen as the reasons for acquisition's under-performance. Although the latter was researched by Jenesen in year 1988, who made the free cash flow hypothesis, recently in his extensive research Gregory (2005) "found no support for the FCF hypothesis, therefore the aforementioned has no role in explaining long-run UK acquirer returns." (p.811)

An interesting note was made in a research done from Hazelkon and Zenner (2004) regarding "the loss" position over the years. According to them "although executive sometimes regard short-term stock price of a transaction as a temporary phenomenon that may easily be revised in the long run, that same continues over the period of time" (p. 84) In other words, in many cases the short-term excess returns/losses, on average were even magnified over the longer terms. This also gives us a rather interesting view on the efficiency of mergers over the long run.

Consequently, the above research demonstrates that despite the fact that there are number of reasons for making acquisitions, it would appear that, on average, acquisitions do not lead to any overall gains and are detrimental to the shareholders themselves. The reason for the latter is twofold.

Firstly, assuming the acquiring firms under-perform the market prior to the acquisition, "the underperformance subsequent to the merger may merely be artifact of the mean

reversion in long run return of individual stocks" (Agrawal et al, 1992; p. 1611). However, the latter explanation seems an implausible one since it seems unbelievable that the mean reversion takes longer than four years to occur. The under-performance of US acquiring firms can be better explained if one relies on the "managerialist" theories of behavior, and interprets the above findings as evidence that maximizing managements' utility by growing the size of the firm is more important than the alternative theory of profit maximization.

Moreover, another reason following a different perspective it fact that there are, what is referred as, "too many sellers" and "too many buyers" in the US market. The above mentioned situations should place an upward pressure on the price of the company (the one that is being acquired) forcing the other to pay premiums that are not justified. If that was the case, it might be also the fact that our time frame of 4 years was to narrow so the adjustments could not have taken place.

Nonetheless although we found existence of significant negative abnormal returns, our findings should be interpreted with caution due to several reasons. For one thing, no consensus exists on the correct model to measure abnormal returns, and while some claim that the simple market model yields efficient estimates (Brown and Warner, 1980), others argue that these returns are biased, and the use of reference portfolio methods generate more powerful estimates (Barbel and Lyon, 1997). The latter coupled with the use of more sophisticated models such as the Fama and French's three factor model or multifactor benchmarks models would be left to future research, provided the data unavailability problem can be overcome. Furthermore, considering the fact that no model predicts how long it takes for possible over/undervaluation effects to disappear, further research could make a use of longer event window such as 5 years or even decades. Finally, for a complete argument to be provided for the evidence of inefficient reaction on the side of the market to the likely wealth gains from acquisitions, further research can examine the influence of the acquisition premiums paid by acquirers, size of the target relative to the size of the bidder, the level of opposition on the side of the target management (hostile vs. friendly takeovers), and the number of competing bids for a particular acquisition.

References:

1. Agrawal, A. and Jaffe, J.F. (1999) The post-merger performance puzzle, in: Cooper, C., Gregory, A., ed.2000, Advances in Mergers and Acquisitions, Stamford, CT, JAI Press

2. Agrawal, A., Jaffe, J.F., Mandelker, G.N.: The post-merger performance of acquiring firms: A re-examination of an anomaly, The Journal of Finance, 47 (1992), 4, p. 1605-1621

3. Argawal, A. et al.: The Post-mergers Performance of Acquiring firms: A re-examination of an Anomaly, 18 (1992), 4, p.1605-1620

4. Barber, B.M. and Lyon, J.D.: Detecting long run abnormal stock returns: The empirical power and specification of test statistics, Journal of Financial Economics, 43(1997), p. 341-372

5. Barnes, P.: The effect of a merger on the share price of the attacker, Revisited, Accounting and Business Research, 15 (1984), p. 45-49

6. Basu, N: Investment Performance of Common Stocks in Relation to Their Price-Earnings Ratios: A Test of the Efficient Market Hypothesis." Journal of Finance, 12(1977), p.663-682

7. Bayless, M.: The influence of Predictability on Differences in the Market Reaction to Debt and Equity Issue Announcements. Journal of Financial Research, 17 (1994), p. 117-131

8. Binder, J.: The Event Study Methodology Since 1969. Review of Quantitative Finance and Accounting, 11 (1998), p.111-137

9. Brown, S. and Warner, J.B.: Measuring security price performance, Journal of Financial Economics, 8(1980), p. 205-258

10. Cartwright, P. et al.: The competitive impact of mergers, 1930-1979. American Business Law Journal, 25(1987), 1, p. 33-62

11. Dimson, E. and Marsh, P.: Event study methodologies and the size effect: The case of UK press recommendations, Journal of Financial Economics, 17 (1986), p. 113-142

12. Fama, E.: Efficient Capital Markets: II. Journal of Finance, 46 (1991), p.1575-1617
Firth, M.: Takeovers, shareholder returns, and the theory of the firm, Quarterly Journal of Economics, 94 (1980), p. 235-260

13. Firth, M.: The profitability of takeovers and mergers. The Economic Journal, 89(1989), p.316-328

14. Franks, J.R., Harris, R.S., Mayer, C. (1988) Means of payment in takeovers; Results for the United Kingdom and the United States, in: Auerbach, A.J., ed: Corporate Takeovers: Causes and Consequences, Chicago, University of Chicago Press

15. Franks, J.R., Harris, R.S., Titman, S.: The post-merger share price performance of acquiring firms, Journal of Financial Economics, 29(1991), p. 82-96

16. Gregory, A.: An examination of the long run performance of UK acquiring firms, Journal of Business Finance and Accounting, 24(1997), 7&8, p. 971- 1002

17. Gregory, A.: The Long Run Abnormal Performance of UK Acquirers and the Free Cash Flow Hypothesis. Journal of Business Finance and Accounting, 32(2005), 5 & 6, p. 777-814

18. Hazelkorn, T. and Zenner, M.: Creating Value with Mergers and Acquisitions. Journal of Applied Corporate Finance, 16(2004), 2/3, p.81-90

19. Jensen, M.: Agency Costs of Free Cash Flows, Corporate Finance and Takeovers. American Economic Review, 76(1986), p.323-329

20. Loderer, M. and Martin, K.: Postacquisition performance of acquiring firms, Financial Management, 21(1992), 3, p. 69-79

21. Loughran, T. and Ritter, J.R.: The new issues puzzle, Journal of Finance, 50(1995), p. 23-51s

22. Loughran, T. and Vijh, A.M.: Do long term shareholders benefit from corporate acquisitions, Journal of Finance, 52(1997), p. 1765-1790

23. MacKinley, A.C.: Event studies in economics and finance, Journal of Economic Literature, 35(1997), p. 13-39

24. Malatesta, P. and Thopson, R.: Partially Anticipated Events. Journal of Financial Economics, 14(1985), p. 237-250

25. Meeks, G. and Meeks, J.G.: Profitability measures as indicators of post-merger efficiency, The Journal of Industrial Economics, 29(1981), 4, p. 335-344

26. Melicher, R. and Rush, D.: Evidence on the acquisition-related performance on conglomerate firms, Journal of Finance, 29(1974), 1, p. 141-149

27. Mitchell, M. and Stafford, E.: Managerial decisions and long term stock price performance, Journal of Business, 73(2000), p. 287-329

28. Myers, M. and Majluf, N.S.: Corporate financing and investment decisions when firms have information that investors do not have, Journal of Financial Economics, 13(1984), p.187-221

29. Patell, J. M. and Wolfson, M. A.,: The Interday Speed of Adjustment of Stock Prices to Earnings and Dividend Announcements", *Journal of Financial Economics*, 13 (1984), p. 223-252

30. Ramesh et al.: Dividend Announcement and Informational Efficiency: An Empirical Study of Indian Stock Market. *ICFAI of Applied Finance*, 13(2007), 10, p.29-42

31. Rau, P.R. and Vermaelen, T.: Glamour, value and the post-acquisition performance of acquiring firms, Journal of Financial Economics, 49(1998), p. 223-253

32. Sloan, R.: Do Stock Prices Fully Reflect Information in Accruals and Cash Flows?. The Accounting Review, 71(1996), p.161-182

33. Swanstorm, M.: Corporate Governance and the Abnormal Returns to Acquisitions Announcements. Journal of Business Strategies, 23(2006), 2, p.115-129

34. Walker, M.: Corporate Takeovers, Strategic Objectives, and Acquiring-Firm Shareholders Wealth. Financial Management, 29(2000), 1, p.53-66

35. Wansley, J. et al.: Abnormal Returns from Merger Profiles. Journal of Financial and Quantitative Analysis, 18(1983), p. 149-162

Books:

1. Bodie et al.: Investments. 6th Edition, Singapore, McGraw-Hill, 2005, p.1002

2. Brooks, C.: *Introductory Econometrics for Finance*, Cambridge, Cambridge University Press, 2002, p.728

3. Gaughan, P.: Mergers, acquisitions, and corporate restructurings. 2nd Edition, New York, John Wiley & Sons, 1999, p. 636

4. Lind et al.: Statistical Techniques in Business and Economics. 11th Edition. New York, McGraw-Hill, 2001, p.821

5. Ross et al.: Essentials of Corporate Finance. 3rd Edition, Singapore, McGraw-Hill, 2001, p. 530

6. Sudarsanam P. Sudi: The Essence of Mergers and Acquisitions, London, Prentice-Hall, 1995, p. 303

Electronic Resources:

1. Thompson One Banker Database
http://banker.thomsonib.com/

8. Appendices

Appendix 1

List of companies

The table below represents the list of companies included in our sample and the deal value in the next column. As noted before, we tried to get as much diversity in choosing the sample. As it can be seen we tired to choose as many different companies from different industries as possible. However in some instances, we considered one company that was engaged in several acquisitions. Those companies are represented by a range number in the deal column, in which the first number represents the lowest deal value and the second the higher, disregarding the fact that the company was engaged in 3-4 other deals, whose transactions are in the specified range.

Table 1: List of acquirers

Acquiring Company	*Value of Deal ($mil)*
Allied Waste Industries Inc	*$8,960.13*
Aon Corp	*$112.37*
Arrow Electronics Inc	*$183.87*
Avnet Inc	*$484.82*
Baxter International Inc	*$148.42*
BB&T Corp	*$47.6-$363.47*
Brooks Automation Inc	*$381.69*
Cadence Design Systems Inc	*$195.71*
Capitol Bancorp Ltd,Lansing,MI	*$33.84*
CardioTech International Inc	*$8.12*
Citizens Inc	*$17.20*
City National Corp	*$86.08*
CKE Restaurants Inc	*$76.79*
Coachmen Industries Inc	*$32.38*
Consolidated Edison Inc	*$1,319.93*
Eastman Kodak Co	*$26.20-$30.797*
Eaton Corp	*$1,997.76*
El Paso Energy Corp	*$188.56*
Enbridge Inc	*$597.76*
Energy East Corp	*$149.73*
Energy East Corp	*$1,572.37*
Ennis Business Forms Inc	*$39.35*
Equity Residential	*$374.63*
Fair Isaac & Co Inc	*$688.94*
Fifth Third Bancorp,OH	*$256.51*
First American Corp	*$82.5-$89.34*
First Merchants,Muncie,IN	*$105.67*
Fiserv Inc	*$5.69*
FNB Corp,Hermitage,PA	*$378.83*
General Electric Capital Corp	*$2,131.76*
Genzyme Corp	*$5.37*
Goldman Sach & Co.	*$64.96*
Harsco Corp	*$55.83*
Hercules Inc	*$3,065.91*
Hewlett-Packard Co	*$23,518.45*
Humana Inc	*$138.01*
IBM Corp	*$106.83*
IndyMac Mortgage Holdings Inc	*$65.81*
Intel Corp	*$88.54*
Interepublic of Cos	*$231.23*
International Game Technology	*$229.39*
Interpublic Group of Cos Inc	*$2,080.87*
Inverness Med Innovations Inc	*$24.98*
ISB Financial, Inc.	*$52.00*
Isle of Capri Casinos Inc	*$218.39*
Johnson & Johnson Inc	*$10,213.08*
Kellogg Co	*$ 344.93- $4468.832*

Marshall & Ilsley Corp,WI	*$267.68*
Maxim Integrated Products Inc	*$1,368.06*
MB Financial Inc,Chicago,IL	*$342.43*
Medtronic Inc	*$252.455-$3246.57*
Merck & Co Inc	*$461.13*
MGM Grand Inc	*$6,554.05*
Motorola Inc	*$113.5-$141.042*
Mueller Industries Inc	*$94.74*
NBT Bancorp Inc,Norwich,NY	*$136.77*
Northrop Grumman Corp	*$11,958.81*
Novell Inc	*$189.61*
Olin Corp	*$176.95*
Pentair Inc	*$348.31*
Pfizer Inc	*$60,704.02*
PhotoMedex Inc	*$4.07*
Plato Learning Inc	*$14.11*
Praxair Distribution Inc	*$58.18*
Pride International Inc	*$1,995.86*
Procter & Gamble Co	*$1,976.24*
Progressive Corp	*$47.21*
Regions Financial Corp,AL	*$40.47-$49.47*
Safeco Corp	*$2,827.14*
Safeway Inc	*$328.41*
Shell Oil Co	*$2,261.31*
SmartForce PLC	*$209.85*
Southern Union Co	*$167.82*
Sprint Corp	*$406.89*
SPSS Inc	*$34.60*
Sterling Financial Corp,WA	*$70.96*
Superconductor Technologies	*$11.49*
Sybase Inc	*$351.00*
Symmetricom Inc	*$112.23*
Synopsys Inc	*$778.47*
Synovus Financial Corp,GA	*$89.43*
SYSCO Corp	*$27.34*
Technitrol Inc	*$36.73*
Terex Corp	*$168.49*
Thomas & Betts Corp	*$212.20*
TriQuint Semiconductor Inc	*$1,145.55*
Tyco International Ltd	*$186.36-$668.943*
Unisource Worldwide Inc	*$149.82*
United Fire & Casualty Co	*$39.01*
Valhi Inc	*$126.96*
Valspar Corp	*$949.67*
Verso Technologies Inc	*$400.10*
Vertex Pharmaceuticals Inc	*$555.86*
Wells Fargo & Co,California	*$127.518-$255.688*
WesBanco Inc,Wheeling,WV	*$40.22-$74.02*
Westamerica Bancorp,CA	*$16.29*
Xcel Energy Inc	*$672.56*
Xerox Corp	*$362.30*
Zions Bancorp,Utah	*$544.31*

Source: Own work

Appendix 2

Individual t-tests based on the method of payment

As noted before, returns are aggregated and then each of the results is compared (tested) against the null hypothesis. In other words, each of the given months separately is tested in order to draw some preliminarily conclusions on the returns and considers the cumulative average abnormal returns.

The output results, presented in table 2 below (see table 2), represent the individual t-tests on the entire sample, separated by the 4 predefined periods under the capital asset pricing model.

Table 2:

Individual t-tests on cash deals

CAPM MODEL cash deals			
12 months	24 months	36 months	48 months
-3.164388232	**-3.164388232**	**-3.164388232**	**-3.164388232**
-3.159119837	**-3.159119837**	**-3.159119837**	**-3.159119837**
-3.077592996	**-3.077592996**	**-3.077592996**	**-3.077592996**
-3.120160345	**-3.120160345**	**-3.120160345**	**-3.120160345**
-2.802556114	**-2.802556114**	**-2.802556114**	**-2.802556114**
-3.049410083	**-3.049410083**	**-3.049410083**	**-3.049410083**
-2.611974983	**-2.611974983**	**-2.611974983**	**-2.611974983**
-2.909777824	**-2.909777824**	**-2.909777824**	**-2.909777824**
-2.495032095	**-2.495032095**	**-2.495032095**	**-2.495032095**
-2.628169401	**-2.628169401**	**-2.628169401**	**-2.628169401**
-2.517094404	**-2.517094404**	**-2.517094404**	**-2.517094404**
-2.530061095	**-2.530061095**	**-2.530061095**	**-2.530061095**
	-2.523016887	**-2.523016887**	**-2.523016887**
	-1.96110437	-1.96110437	-1.96110437
	-2.616533662	**-2.616533662**	**-2.616533662**
	-1.83017997	-1.83017997	-1.83017997
	-2.282580324	**-2.282580324**	**-2.282580324**
	-1.88143072	-1.88143072	-1.88143072
	-2.453283194	**-2.453283194**	**-2.453283194**
	-1.689968732	-1.689968732	-1.689968732
	-1.748810424	-1.748810424	-1.748810424
	-1.805646257	-1.805646257	-1.805646257
	-1.503597671	-1.503597671	-1.503597671
	-1.338636617	-1.338636617	-1.338636617
		-1.571918591	-1.571918591
		-1.415806242	-1.415806242
		-1.304665266	-1.304665266
		-1.917372786	-1.917372786
		-1.357236405	-1.357236405
		-1.680537533	-1.680537533
		-2.080404164	-2.080404164
		-1.825907534	-1.825907534
		-1.816679857	-1.816679857
		-1.810316682	-1.810316682
		-1.679638412	-1.679638412
		-1.651638508	-1.651638508
			-0.594721262
			-1.83652762
			-1.353175308
			-1.616740913
			-0.919157989
			-0.959660657
			-1.415842762
			-1.831238248
			-2.034671566
			-1.751891367
			-2.063366127
			-2.029377531
Significant Observations	**12**	**15**	**15**	**18**

Source: Own work

It can be concluded, that individually the null hypothesis can not be rejected i.e. no abnormal returns can be registered in the majority of the observations. Moreover, it can

be seen that from one period to another there is no consistent trend of increasing t-value, but rather it can be said that the volatility is extreme; ranging from significant to close to zero. Even thought this is the case, the significance of the individual returns is irrelevant, in the thesis below cumulative average abnormal returns are to be examined and tested since due to aggregation our expectation is increase in the significance of the results. At this point we might say that our expectations of abnormal negative performance might not fully realize, having in consideration that in the last two periods not even 50 % of the observations can individually reject the hypothesis.

Table 3:

Individual t-tests on equity deals

CAPM MODEL equity deals			
12 months	24 months	36 months	48 months
-0.434532891	-0.434532891	-0.434532891	-0.434532891
-0.815777072	-0.815777072	-0.815777072	-0.815777072
-0.914366963	-0.914366963	-0.914366963	-0.914366963
-1.123003014	-1.123003014	-1.123003014	-1.123003014
-0.136498001	-0.136498001	-0.136498001	-0.136498001
-0.486858016	-0.486858016	-0.486858016	-0.486858016
-0.963096124	-0.963096124	-0.963096124	-0.963096124
-0.613604654	-0.613604654	-0.613604654	-0.613604654
-0.192468818	-0.192468818	-0.192468818	-0.192468818
-0.874464292	-0.874464292	-0.874464292	-0.874464292
0.25506644	0.25506644	0.25506644	0.25506644
-0.238112577	-0.238112577	-0.238112577	-0.238112577
	-0.957801539	-0.957801539	-0.957801539
	-0.009196343	-0.009196343	-0.009196343
	-1.04824375	-1.04824375	-1.04824375
	-0.120297217	-0.120297217	-0.120297217
	-0.057207835	-0.057207835	-0.057207835
	-0.354336008	-0.354336008	-0.354336008
	1.266737812	1.266737812	1.266737812
	0.554278481	0.554278481	0.554278481
	-0.69296694	-0.69296694	-0.69296694
	-0.41629162	-0.41629162	-0.41629162
	-0.195619669	-0.195619669	-0.195619669
	0.624522659	0.624522659	0.624522659
		0.03132558	0.03132558
		-0.448237308	-0.448237308
		-0.795191239	-0.795191239
		-1.106768799	-1.106768799
		-1.496017081	-1.496017081
		-0.767197296	-0.767197296
		-1.524561222	-1.524561222
		-1.310419165	-1.310419165
		-1.89474454	-1.89474454
		-1.826138109	-1.826138109
		-1.679448836	-1.679448836
		-2.055941234	-2.055941234
			-2.461064136
			-1.581145224
			-2.042030852
			-2.171291658
			-1.735219124
			-2.021129756
			-2.129875901
			-1.958341699
			-1.936114948
			-1.756883449
			-1.683892569
			-1.271369545
Significant Observations	0	0	1	6

Source: Own work

By observing the result in table 3 above, which represents individual t-tests on equity only deals, we can see that individually in the first two periods we can not notice abnormal returns, while in the third and forth period we record negative abnormal performance for a count of one and six observations, respectively. Although at cumulative level the significance would be tested again, if compared to the cash deals we might expect even lower significance of the results or prove of abnormal returns.

Appendix 3

Individual t-tests in conglomerate vs. non-conglomerate acquisitions

In table 4 below, we present the results on the significance test individually, every month, for the subsequent periods. What can be observed is an increasing trend of abnormal negative returns from period to period, with exception of the last one, where we observe the same number of counts as the third period. With over 50 % of the observations in every year being significant on a cumulative level we can expect occurrence of abnormal negative returns.

Table 4:

Individual t-tests on conglomerate deals

CAPM MODEL conglomerate deals			
12 months	24 months	36 months	48 months
-1.602523444	-1.602523444	-1.602523444	-1.602523444
-1.507368851	-1.507368851	-1.507368851	-1.507368851
-1.511689494	-1.511689494	-1.511689494	-1.511689494
-2.325747764	-2.325747764	-2.325747764	-2.325747764
-1.640880074	-1.640880074	-1.640880074	-1.640880074
-2.53555831	-2.53555831	-2.53555831	-2.53555831
-2.177074356	-2.177074356	-2.177074356	-2.177074356
-2.397576023	-2.397576023	-2.397576023	-2.397576023
-1.81474319	-1.81474319	-1.81474319	-1.81474319
-2.136646897	-2.136646897	-2.136646897	-2.136646897
-2.078855565	-2.078855565	-2.078855565	-2.078855565
-2.097413707	-2.097413707	-2.097413707	-2.097413707
	-2.858226652	-2.858226652	-2.858226652
	-2.178329139	-2.178329139	-2.178329139
	-2.475045474	-2.475045474	-2.475045474
	-1.852466389	-1.852466389	-1.852466389
	-2.227496299	-2.227496299	-2.227496299
	-2.508773414	-2.508773414	-2.508773414
	-2.893258501	-2.893258501	-2.893258501
	-1.968843331	-1.968843331	-1.968843331
	-3.115397788	-3.115397788	-3.115397788
	-2.998469862	-2.998469862	-2.998469862
	-3.466334835	-3.466334835	-3.466334835
	-1.938643059	-1.938643059	-1.938643059
		-2.776214128	-2.776214128
		-3.130962747	-3.130962747
		-2.273022243	-2.273022243
		-2.858559409	-2.858559409
		-2.470859697	-2.470859697
		-2.33852048	-2.33852048
		-2.555607919	-2.555607919
		-2.289417257	-2.289417257
		-2.525814115	-2.525814115
		-1.885172358	-1.885172358
		-1.884135659	-1.884135659
		-2.176157562	-2.176157562
			-1.291892005
			-1.411759885
			-1.28493098
			-1.389580523
			-0.967136009
			-0.720208836
			-0.982372031
			-0.872329433
			-0.844023525
			-0.706695078
			-0.636874432
			-0.438307861
Significant Observations	7	16	26	26

Source: Own work

Unlike, the case before, now when we consider the non-conglomerate deals (see Table 5), we can immediately see the difference in the count of individually significant observations as compared to conglomerate bids. With small counts of observations such as two in the first three periods and nine in the last one, we might say that on cumulative level we might expect lower significance if compared to the conglomerate deals on a cumulative level.

Table 5:
Individual t-tests on non-conglomerate deals

CAPM MODEL non-conglomerate deals			
12 months	**24 months**	**36 months**	**48 months**
-1.739111182	-1.739111182	-1.739111182	-1.739111182
-2.140011191	-2.140011191	-2.140011191	-2.140011191
-2.336283733	-2.336283733	-2.336283733	-2.336283733
-1.951070561	-1.951070561	-1.951070561	-1.951070561
-1.486182976	-1.486182976	-1.486182976	-1.486182976
-1.526378764	-1.526378764	-1.526378764	-1.526378764
-1.702164078	-1.702164078	-1.702164078	-1.702164078
-1.563991242	-1.563991242	-1.563991242	-1.563991242
-1.396784524	-1.396784524	-1.396784524	-1.396784524
-1.726751655	-1.726751655	-1.726751655	-1.726751655
-1.006755871	-1.006755871	-1.006755871	-1.006755871
-1.293503953	-1.293503953	-1.293503953	-1.293503953
	-1.266891522	-1.266891522	-1.266891522
	-0.652286732	-0.652286732	-0.652286732
	-1.500355117	-1.500355117	-1.500355117
	-0.711721533	-0.711721533	-0.711721533
	-0.952329089	-0.952329089	-0.952329089
	-0.710095652	-0.710095652	-0.710095652
	-0.421174867	-0.421174867	-0.421174867
	-0.363834851	-0.363834851	-0.363834851
	-0.331293092	-0.331293092	-0.331293092
	-0.317738672	-0.317738672	-0.317738672
	0.136267005	0.136267005	0.136267005
	0.076692089	0.076692089	0.076692089
		0.001244936	0.001244936
		0.034224836	0.034224836
		-0.446918997	-0.446918997
		-0.788294715	-0.788294715
		-0.974072613	-0.974072613
		-0.615293894	-0.615293894
		-1.343443461	-1.343443461
		-1.173280879	-1.173280879
		-1.432939684	-1.432939684
		-1.76760546	-1.76760546
		-1.530942493	-1.530942493
		-1.607038734	-1.607038734
			-1.980105377
			-1.626075662
			-1.913479052
			-2.070536697
			-1.600046333
			-2.096114029
			-2.208165229
			-2.191023954
			-2.189798586
			-2.036037357
			-2.118587609
			-1.682957348
Significant Observations	**2**	**2**	**2**	**9**

Source: Own work

Based on the individual t-tests result we can expect higher negative abnormal return in the case of conglomerate deals rather than the non-conglomerate ones. Surely this is only a preliminary assumption which is left to be tested on a cumulative level.

Appendix 4

Individual t-tests based on the size of the deal

On individual level, we can see that in the $ 100 million deals range only one significant observation can reject the null hypothesis of non-existence of abnormal negative returns. (See Table 6 below) It surely would be interesting to see on cumulative level whether the results would give us the right to reject the null hypothesis.

Table 6:
Individual t-tests on $100 million deals

CAPM MODEL <= $ 100 million deals			
12 months	24 months	36 months	48 months
-0.395384143	-0.395384143	-0.395384143	-0.395384143
-0.739147469	-0.739147469	-0.739147469	-0.739147469
-0.727165755	-0.727165755	-0.727165755	-0.727165755
-0.753435562	-0.753435562	-0.753435562	-0.753435562
-0.156781709	-0.156781709	-0.156781709	-0.156781709
-0.612544209	-0.612544209	-0.612544209	-0.612544209
-0.671979164	-0.671979164	-0.671979164	-0.671979164
-0.418779689	-0.418779689	-0.418779689	-0.418779689
-0.477396189	-0.477396189	-0.477396189	-0.477396189
-0.482019712	-0.482019712	-0.482019712	-0.482019712
0.032690588	0.032690588	0.032690588	0.032690588
-0.266369441	-0.266369441	-0.266369441	-0.266369441
	-0.711398974	-0.711398974	-0.711398974
	0.112074328	0.112074328	0.112074328
	-0.382720682	-0.382720682	-0.382720682
	-0.140322169	-0.140322169	-0.140322169
	0.246862877	0.246862877	0.246862877
	0.127901457	0.127901457	0.127901457
	0.152046498	0.152046498	0.152046498
	0.009959465	0.009959465	0.009959465
	-0.405962098	-0.405962098	-0.405962098
	0.259617054	0.259617054	0.259617054
	-0.026449369	-0.026449369	-0.026449369
	0.109872731	0.109872731	0.109872731
		0.433642173	0.433642173
		-0.064418463	-0.064418463
		0.05942149	0.05942149
		-0.671126216	-0.671126216
		-0.549802951	-0.549802951
		-0.305825532	-0.305825532
		-0.783330054	-0.783330054
		-0.34747488	-0.34747488
		-1.229639362	-1.229639362
		-1.084383991	-1.084383991
		-0.632541782	-0.632541782
		-1.146713749	-1.146713749
			-1.8403277
			-1.078403782
			-1.21568164
			-1.71387974
			-1.286325979
			-1.756747689
			-1.715258801
			-2.024550933
			-1.688333807
			-1.443753185
			-1.447733415
			-1.091280626
Significant Observations	0	0	0	1

Source: Own work

Unlike the case before, now when we have under consideration the interval of $100 and $500 million deals, we can observe an increasing number of individually significant

periods in every of the periods, with a constant count of 18 in the last three periods. (See Table 7 below)

Table 7:
Individual t-tests on $100 to $ 500 million deals

CAPM MODEL $ 100-500 million deals			
12 months	24 months	36 months	48 months
-2.318749547	-2.318749547	-2.318749547	-2.318749547
-2.26914602	-2.26914602	-2.26914602	-2.26914602
-2.492761508	-2.492761508	-2.492761508	-2.492761508
-2.126783257	-2.126783257	-2.126783257	-2.126783257
-2.143979646	-2.143979646	-2.143979646	-2.143979646
-2.330532269	-2.330532269	-2.330532269	-2.330532269
-2.370199547	-2.370199547	-2.370199547	-2.370199547
-2.623003346	-2.623003346	-2.623003346	-2.623003346
-2.191621429	-2.191621429	-2.191621429	-2.191621429
-2.564291342	-2.564291342	-2.564291342	-2.564291342
-2.267560684	-2.267560684	-2.267560684	-2.267560684
-2.382377828	-2.382377828	-2.382377828	-2.382377828
	-2.267992654	-2.267992654	-2.267992654
	-2.412420022	-2.412420022	-2.412420022
	-3.204568584	-3.204568584	-3.204568584
	-1.652523101	-1.652523101	-1.652523101
	-2.545119865	-2.545119865	-2.545119865
	-1.843366928	-1.843366928	-1.843366928
	-2.206963009	-2.206963009	-2.206963009
	-1.844554354	-1.844554354	-1.844554354
	-1.784343852	-1.784343852	-1.784343852
	-2.401322925	-2.401322925	-2.401322925
	-1.917940755	-1.917940755	-1.917940755
	-0.896858102	-0.896858102	-0.896858102
		-1.627388498	-1.627388498
		-1.372562733	-1.372562733
		-1.548465652	-1.548465652
		-1.418825031	-1.418825031
		-1.560741186	-1.560741186
		-1.312785885	-1.312785885
		-1.609260666	-1.609260666
		-1.987425606	-1.987425606
		-1.791358408	-1.791358408
		-1.456163191	-1.456163191
		-1.84610222	-1.84610222
		-1.748804137	-1.748804137
			-1.120777811
			-1.268448752
			-1.609568026
			-1.556805709
			-1.046563199
			-0.929058054
			-1.436692481
			-0.950631352
			-1.326012049
			-1.186320154
			-1.19458848
			-1.082722952
Significant Observations 12	18	18	18

Source: Own work

When observing the results from the third group of deals, above $ 500 million, we record smaller number of significant counts if compared to the previous sample, however higher number of individual counts if compared to the below $ 100 million deals. (See Table 8 on next page) Surely on a cumulative level all of the above groups would be further tested, however some preliminary expectations can be expected. In other words, we expect that deals that go in the range of $ 100 and $ 500 million, would record highest significance and highest negative abnormal returns if compared to the other two groups.

Table 8:

Individual t-tests above $ 500 million deals

CAPM MODEL > $ 500 million deals			
12 months	24 months	36 months	48 months
-1.359123522	-1.359123522	-1.359123522	-1.359123522
-1.43650167	-1.43650167	-1.43650167	-1.43650167
-1.457362521	-1.457362521	-1.457362521	-1.457362521
-2.258163074	-2.258163074	-2.258163074	-2.258163074
-1.387239513	-1.387239513	-1.387239513	-1.387239513
-1.509621704	-1.509621704	-1.509621704	-1.509621704
-1.473371109	-1.473371109	-1.473371109	-1.473371109
-1.439137422	-1.439137422	-1.439137422	-1.439137422
-0.974832671	-0.974832671	-0.974832671	-0.974832671
-1.539558686	-1.539558686	-1.539558686	-1.539558686
-1.299502454	-1.299502454	-1.299502454	-1.299502454
-1.174229723	-1.174229723	-1.174229723	-1.174229723
	-1.547898625	-1.547898625	-1.547898625
	-0.549738909	-0.549738909	-0.549738909
	-1.181338805	-1.181338805	-1.181338805
	-1.057147937	-1.057147937	-1.057147937
	-1.449510548	-1.449510548	-1.449510548
	-1.614670953	-1.614670953	-1.614670953
	-1.353841079	-1.353841079	-1.353841079
	-0.597433225	-0.597433225	-0.597433225
	-1.154973852	-1.154973852	-1.154973852
	-1.372081834	-1.372081834	-1.372081834
	-0.875280795	-0.875280795	-0.875280795
	-1.143510608	-1.143510608	-1.143510608
		-1.944593923	-1.944593923
		-1.728953251	-1.728953251
		-1.766582339	-1.766582339
		-2.021471447	-2.021471447
		-1.919603721	-1.919603721
		-2.158847545	-2.158847545
		-2.988862952	-2.988862952
		-2.306335215	-2.306335215
		-1.760677497	-1.760677497
		-2.356715111	-2.356715111
		-2.074745308	-2.074745308
		-1.79699998	-1.79699998
			-1.029008668
			-1.654887296
			-1.272286436
			-0.924294469
			-0.838967775
			-0.814963986
			-0.784438319
			-0.793902592
			-0.75511568
			-0.813616967
			-0.824604551
			-0.490340837
Significant Observations	**1**	**1**	**7**	**7**

Source: Own work

UNIVERZA V LJUBLJANI
EKONOMSKA FAKULTETA
Podiplomski študij

Izjava o vsebinski primernosti magistrskega/specialističnega dela

V skladu z 14. členom Pravil o magistrskih in specialističnih delih izjavljam, da je magistrsko/specialistično delo z naslovom: ____ ***Post-acquisition performance of acquiring firms***_____
katerega avtor-ica je ___**Tanasoski Nikola**__ vsebinsko primerno.

V Ljubljani, _____**18.06.2008**_____

Mentor-ica

_____