

THE MEASUREMENT OF THE MARKET'S REACTION TO MERGER ANNOUNCEMENTS

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Abstract: This paper measures the capital markets' reaction to merger announcements within the announcement month using the sample of 37 mergers from USA. Research findings indicate that targets earn positive average abnormal returns of 19 percent that is statistically significant, whereas acquirers earn positive average abnormal returns of 5 percent that is not statistically significant. The weighted average of the abnormal returns to acquirer and targets is 7 percent and statistically significant. These results indicate that the gains around the merger announcements reflect synergetic gains, not the wealth transfer from acquirer shareholders to target's. The method of payment, business overlap degree of acquirer's and target's industries and the price-to-book ratio of acquirers significantly affect the division of the synergetic gains between the shareholders of target and acquirer firms.

Keywords: *Mergers, Abnormal Returns, Event Studies, Method of Payment, Price-to-Book Ratios*

Özet: Bu çalışmada ABD ekonomisine ait 37 şirket birleşmesi örnek alınarak sermaye pazarlarının şirket birleşmeleri haberine tepkisi analiz edilmiştir. Araştırmada satın alınan firma hisse sahiplerinin birleşme haberinin ilan edildiği ayda istatistiksel olarak anlamlı ortalama % 19 pozitif getiri elde ettiğini göstermiştir. Satın alan firma hisse sahiplerinin getirisinin ise ortalama % 5 ve istatistiksel olarak anlamsızdır. Satın alınan ve satın alan firma hisse sahiplerinin getirilerinin ağırlıklı ortalaması % 7 olup, istatistiksel olarak anlamlıdır. Bu sonuç şirket birleşmeleri sırasında oluşan getirilerin bir sinerjik kazanç olduğunu, satın alan firma hisse sahiplerinden satın alınan firma hisse sahiplerine yapılan bir varlık transferi olmadığını göstermektedir. Ödeme yöntemi, birleşme stratejisi ve satın alan firmanın piyasa değeri/defter değeri oranının birleşme ilanı sırasında oluşan getirilerin satın alan ve satın alınan firmalar arasında bölünmesinde önemli etkenler olduğu saptanmıştır.

Anahtar Kelimeler: *Şirket Birleşmeleri, Anormal Getiri, Ödeme Yöntemi, Piyasa Değeri/Defter Değeri Oranı*

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I. INTRODUCTION

The announcement period abnormal returns is the indicator of the market's reaction to merger announcements and supposed to bear informational content about the surviving firm's postmerger performance if markets are efficient. One stream in the financial literature claims that the gains to target shareholders represent wealth transfers from acquiring firms' shareholders and not necessarily synergetic gains (Roll (1986)), while another stream claims that mergers result in the synergetic gains. The overwhelming majority of the financial literature supports the latter claim by providing evidence that targets of successful mergers earn significantly positive abnormal returns on the announcement of the offers, whereas the returns to acquirers are on average zero ((Jensen and Ruback (1983), Bradley, Desai and Kim (1983), Desai and Kim (1988), Nathan and O'Keefe (1989)).

The primary objective of this paper is to study the magnitude and sign of the abnormal returns in the merger announcements. I also study the factors that determine the division of these gains between acquirer and targets. Specifically, I test whether method of payment, business overlap degree of acquirer's and target's industry, and the acquirers past performance record affect the magnitude and division of the gains between acquirer and targets. For this purpose, I collected a sample of 37 mergers between U.S. public industrial firms completed between 1995 and 1997. I calculate abnormal returns using the market model and test the abnormal performance.

The research findings indicate that targets' shareholders gain significantly positive abnormal returns around the merger announcements, whereas acquirers' shareholders gain positive, but not statistically significant abnormal returns. The combined abnormal returns are significantly positive which indicates that the gains to target shareholders do not reflect wealth transfer from acquirer shareholders and additional value is created in the announcement period. The research findings are not conflicting with the existing researches in the financial literature.

The method of payment is found to be important determinant of the allocation of abnormal returns between acquirer and targets. Markets favor cash-financed bids, whereas mixed-financed bids gets lower returns.

The weighted average abnormal returns in high overlap mergers are higher than in low overlap mergers. However, low overlap merger targets gain higher abnormal returns than high overlap merger targets. It is most probably due to the high premiums paid to target firms in low overlap mergers. The high acquirer returns in high overlap mergers can be interpreted as the reflection of the market's belief in the merger's success.

Acquirers with price-to-book ratios higher than their industry median (growth firms) are viewed in the market not much value-creating deals. Therefore, the market's reaction to their merger bids is less favorable; the target, acquirer and total abnormal returns in these merger bids are less than those involving acquirers with price-to-book ratios lower than the industry median (value firms). This finding indicates that the bidders past performance record do not affect market's reaction to mergers. This

result is in contradiction with the “performance extrapolation hypothesis” by Rau and Vermaelen (1998) who claim that the mergers involving “growth” acquirers are favored well by the market.

The remainder of the paper is organized as follows. Section 2 describes sample and data used in the study. Section 3 describes the research methodology. Section 4 reports and discusses the stock returns at merger announcements. Section 5 compares the research findings with the existing researches in financial literature. Section 6 gives a brief conclusion.

II. SAMPLE AND DATA

The sample of mergers is retrieved from Mergerstat database. Total number of 458 mergers is reported in this dataset according to the following criteria:

- (1) There is a merger offer to purchase stock in the company.
- (2) The details of the offer appear in Mergerstat.
- (3) The merger deal is announced between 01.06.1995 and 31.12.1997
- (4) Transactions valued at less than \$ 350 million were eliminated. Banks, insurance, and railroad companies were eliminated, since they are subject to different regulations.
- (5) Country of the acquirers and targets is USA. Acquisitions by foreign concerns were eliminated.
- (6) The deals that did not obtain complete ownership of the target were eliminated.
- (7) The mergers that were later cancelled were eliminated.
- (8) The size of target should exceed 5% of the size of acquirer. Target firm size is computed from Compustat as the market value of common stock plus the net debt and preferred stock at the beginning of the year before the acquisition.
- (9) The acquirer’s and target’s financial and market data information appears in Compustat (North American) Database.

These selection criteria reduced the initial sample of 458 merger cases to 37. The source of the financial and market data is Compustat (North American) Database.

III. RESEARCH DESIGN

3.1. Research Methodology

The empirical evidence indicates that shareholders of target firms realize large positive abnormal returns in the completed mergers. The evidence on the rewards to acquirer firms is mixed, but the weight of the evidence suggests that zero returns earned by successful acquirer firms in mergers. Since targets gain and acquirers do not appear to lose, the evidence suggests that mergers create value (Jensen and

Ruback (1983), Nathan and O'Keefe (1989), Desai and Kim (1988) Bradley, Desai and Kim (1983)).

Jensen and Ruback (1983) synthesize the empirical evidence in the financial literature and find that abnormal returns associated with successful corporate mergers are on average 20% for targets and zero for acquirers.

The information content of a merger event is measured as the abnormal common stock return relative to the aggregate market return. In this study, the abnormal returns are calculated for the announcement month of the mergers. Abnormal returns is measured as the market-model prediction error (PE), which is an estimate of the abnormal return of for security j on event month defined as:

$$PE_j = R_j - E(R_j) \quad [1]$$

Where,

R_{jt} = market return of the securities over announcement month which is measured by summing close price at the end of the announcement month plus dividends per share within the announcement month, divided by the close price of the month preceding the announcement month.

$E(R_j)$ = expected rate of return on security i for the announcement month. It is estimated using Capital Asset Pricing Model (CAPM). CAPM is used to determine the expected rate of return for an asset at a given level of risk. Essentially, I calculate the expected rate of return for security j in the announcement month as:

$$E(R_j) = R_{rf} + \beta(R_m - R_{rf}) \quad [2]$$

Where,

R_{rf} = Risk free rate (measured by 3 month USA Treasury bill rate)
 R_m = Total market return in the event month (measured by return of the Standard & Poor's 500 Index)
 β = Sensitivity of a company's stock price to the overall fluctuation in the market return

Combined abnormal return is calculated by weighting the target and bidder returns by their relative sizes in the beginning of the year of merger announcement. Firm sizes is calculated by the market value of assets, which is the market value of equity plus the book values of net debt and preferred stock measured at the beginning of the year.

I conduct significance tests using standard errors following Jensen and Ruback (1983). The t statistic is calculated as:

$$t = \frac{PE_j \sqrt{N}}{S}$$

[3.3]

where,

PE_j = market-model prediction error
 N = number of observations
 S = standard deviation

I also use a binomial test to determine whether the proportion (p) of firms experiencing changes in a given direction is greater than would be expected by chance (typically testing whether p = 0.5). This test will provide information about which proportion of firms changed performance in the same direction and significance of this change.

3.2. Subsample Analyses

Financial literature suggests that market reaction to the merger announcement is dependent of merger process characteristics. Therefore, the following subsets are analyzed besides of the whole sample.

3.2.1. Method of Payment Subsets

The method of payment is very important in determining abnormal returns, since they reveal information to the market. There is evidence, consistent with Myers and Majluf's (1984) adverse selection problem with equity issuance, that acquirer and target returns for stock offers on average lower than for cash offers. Asquith, Bruner, and Mullins (1987) have found that announcement period returns to acquirers in mergers are significantly more negative for acquisitions with stock than those financed with cash. Huang and Walkling (1987) find that acquisitions involving cash payments yield significantly higher returns to target shareholders. The explanations they provide is that target shareholders require higher payment for having to recognize taxable gains immediately in cash transactions.

Four key factors are important in choosing the means of payment in takeovers.

1. Stocks are preferred since value of equity frequently used in limiting overpayment
2. Cash is an indicator of high valuation and equity is an indicator of low valuation.
3. The equity is used to exploit the target's private information.
4. Equity has a tax advantage.

Martin (1996) shows that the form of payment is partly endogenous to the mode of acquisition. Mergers are often financed with acquirer's stock whereas tender offers are predominantly cash financed. Hansen (1987) develops a theory under asymmetric information. According to his theory, when target firm knows its value

better than potential acquirer, the acquirer will prefer to offer stock, which has desirable contingent-pricing characteristics, rather than cash. Either tax effects or asymmetric information on the acquiring side can make the acquirer's choice acquisitions a nontrivial one. With asymmetry on both sides of the transaction, acquisitions signaling equilibrium develop whereby the target uses both exchange medium offered and the amount of any stock offer as signals of the acquiring firm's value.

Following financial literature, I hypothesize the highest abnormal returns for targets in cash-financed mergers among all other subsets.

The sample is divided into three subsets according to the method of payment. Equity-financed mergers subset includes cases where only the acquirer's common stock was used to pay for an acquisition. Cash-financed mergers subset includes cases where only cash was used for payment. All other cases in which the payment terms were neither pure stock nor pure cash are classified under mixed-payment mergers subset. In some cases, both stock and cash were used and in other cases cash and senior securities were used. Equity-financed subset includes 23 (62%) out of 37 mergers are, whereas 9 (24) cases are cash-financed and 5 (14%) cases are mixed-financed.

3.2.2. Business Overlap Subsets

Business overlap of merging firms comes to be important determinant of the market's expectations about improvements in the postmerger performance. Jensen (1986) suggest that conglomerate mergers are less likely to succeed, because managers of acquiring firms are not familiar with the target industry or they waste free cash flow on bad acquisitions. Porter (1987) finds that over 50% of the acquisitions made by 33 conglomerate acquirers in "new" or unrelated industries were later divested.

Following financial literature, it is logical to hypothesize low short-term abnormal returns for acquirers in the low overlap mergers, since the acquiring firm is apparently unfamiliar with the target's industry. However, target shareholders' gains should be greater, since target firms are usually offered larger premiums in this type of mergers..

I classify mergers as those with high and low business overlap between the target and acquiring firms. High overlap mergers are merger cases between those acquirer and target firms whose at least three first SIC Code numbers are the same, whereas remaining mergers are classified as low overlap mergers. Sample analysis shows that 21 (57%) out of 37 mergers are high overlap mergers, whereas 16 (43%) cases are low overlap mergers.

3.2.3. Value-Growth Subsets

Rau and Vermaelen (1995) developed the performance extrapolation hypothesis, which claims the market overextrapolates the past performance of the acquirer when

it assesses the value of an acquisition. At the same time, managers and other decision makers (such as shareholders and the board of directors) who have to approve an acquisition, indirectly receive feedback on the quality of the acquirer's management from the market. Rau and Vermaelen argue that in companies with low book-to-market ratios ('glamour' firms), managers are more likely to overestimate their own abilities to manage an acquisition. This argument is consistent with the hubris argument developed by Roll (1986). Indeed, glamour firms are firms with high past stock returns and high past growth in cash flow and earnings, which should presumably strengthen the management's belief in its own actions. Moreover, other stakeholders in these firms, such as the board of directors and large shareholders, are more likely to give the management the benefit of the doubt and approve its acquisitions plans. On the other hand, in companies whose management has a poor track of acquisition, such as companies with high book-to-market ratios ('value' stocks), managers, directors, and large shareholders will be more prudent before approving acquisitions major transaction that may well determine the survival of the company. Because these acquisitions are not motivated by hubris, they should create shareholder value rather than destroy it. The performance extrapolation hypothesis also assumes that the market only gradually reassesses the quality of the acquirer as the results of the acquisition become clear. Hence, in the short run, i.e., around the announcement of the acquisition, glamour acquirers should experience higher abnormal returns than value acquirers, while in the long run this performance will reverse.

In order to test the performance extrapolation hypothesis's predictions in the short-term, I classify mergers into two separate subsets based on acquirers' price to book ratios relative to their industry median in the year before the announcement of the acquisition. If acquirer companies' price to book ratio is higher than industry's median price to book ratio book, the merger case is classified as 'growth' merger, otherwise as "value" merger. As a result of this ranking, 11 (30%) mergers appeared to be 'value' mergers and 26 (70%) acquirers as 'growth' mergers.

IV. EMPIRICAL RESULTS

In this section I present and discuss my empirical results for the full sample of mergers and subsamples. I first present and discuss my empirical results for the complete sample of 37 mergers. Then I discuss my results for the following subsamples of my data: cash financed versus mixed financed versus equity-financed mergers; high overlap versus low overlap mergers; value versus growth mergers. For each of these partitions, I examine and report (in the text and in Table 1) whether each subsample of firms experience abnormal returns around the merger announcement date.

a. The Whole Sample Analysis

Consistent with the research predictions, target firms experience large abnormal returns than acquirers. The average (median) abnormal return for the targets is 19 percentage points (19 percent) and 86 percent of all targets experience positive abnormal returns. The t-statistics and binomial test z-statistics is significant at 1 percent significance level.

Acquirer companies experience positive, but insignificant abnormal returns. The average (median) abnormal return for the targets is 5 percentage points (1 percent) and only 57 percent of all acquirers experience positive abnormal returns. The t-statistics and binomial test z-statistics are not significant at conventional levels.

Combined abnormal return, which is calculated by weighting the target and acquirer returns by their relative sizes in the beginning of the year of announcement, is significantly positive. The average (median) abnormal combined return is 7 percentage points (5 percent) and 70 percent of all mergers experience positive combined abnormal returns. The t-statistics and binomial test z-statistics is significant at 5 percent significance level.

These results suggest that markets react favorably to mergers and mergers create additional value. The value is created, not transferred, since significant abnormal returns to targets do not come at the expense of acquirer shareholders.

b. The Subsamples Analysis

i. Method of Payment Subsets

Since method of payment reveals information to the market, acquirer and target returns for equity-financed deals are predicted to be on average lower than for cash offers.

The empirical results are in the same line with the research predictions. Cash-financed mergers experience higher average and median abnormal returns in all categories (target, acquirer and combined). The average (median) target abnormal return is 27 percent (32 percent) in cash-financed mergers, whereas it is 16 percent (19 percent) abnormal returns for equity-financed targets and 20 percent (19 percent) in mixed-financed mergers. The percentages of targets that experience positive abnormal returns are 89, 83, and 100 percent for cash, equity, and mixed-financed merger targets respectively. The t-statistics and binomial test z-statistics are significant at 1 percent significance level for equity-financed subsamples. Since the number of observations is less than 10, we didn't employ statistical tests for cash-financed and mixed-financed mergers.

Cash-financed merger acquirers experience higher abnormal returns than equity-financed and mixed-financed mergers. An interesting result is the market's negative reaction to mixed-financed merger acquirers. Mixed-financed merger acquirers experience average 2 percentage point negative abnormal returns, whereas median

change is zero. This result suggests (not conclusive, because of small number of cases) that the market does not favor mixed-financed mergers.

The combined abnormal returns are positive for all subsets, though cash-financed mergers experience higher abnormal returns. The t-statistics are significant at 5 percent significance level for equity-financed mergers. Because of small number of observations, I am unable to conduct significance tests for cash-financed and mixed-financed mergers.

ii. Business Overlap Subsets

Following financial literature, low short-term abnormal returns are hypothesized for acquirers in the low-overlap mergers, since the acquiring firm is apparently unfamiliar with the target's industry. However, targets should experience greater abnormal returns perhaps, because of larger premiums offered to targets.

The research findings approve research predictions. Low overlap targets experience higher average and median abnormal returns. The average (median) target abnormal return is 25 percent (22 percent) in low overlap mergers, whereas high overlap targets experience average (median) 14 percent (19 percent) abnormal returns. 94 percent of low overlap targets experience positive combined abnormal returns, whereas this ratio is 81 percent for high overlap targets. The t-statistics and binomial test z-statistics are significant at 1 percent significance level for both subsamples.

Acquirer shareholders gain more abnormal returns in high overlap merger subset than in low overlap merger subset. Low overlap acquirers experience average (median) 1 percentage points (1 percent) abnormal returns, whereas high overlap acquirers experience average (median) 8 percent (4 percent) abnormal returns. The percentage of acquirers that experience positive combined abnormal returns are somewhat equal in both subsets; 57 percent of high overlap acquirers and 56 percent of low overlap acquirers. The t-statistics and binomial test z-statistics are not significant at conventional levels for both subsamples.

The combined abnormal returns for high overlap acquirers are greater on average and median than that of low overlap acquirers. Low overlap mergers experience average (median) 5 percentage points (5 percent) abnormal returns, whereas high overlap mergers experience average (median) 9 percent (6 percent) abnormal returns. However, the percentage of mergers that experience positive combined abnormal returns are 75 percent in high overlap mergers, whereas this ratio is 67 percent in low overlap mergers. The t-statistics for low overlap mergers are significant at 5 percent significance level, whereas binomial test z-statistics is significant at 10 percent significance level. The t-statistics and binomial test z-statistics is not significant at conventional levels for high overlap mergers. Higher standard deviation in high overlap mergers has caused insignificant results.

iii. Value-Growth Subsets

Higher acquirer, target, and combined abnormal returns are reported for value mergers than for growth mergers. Value targets experience on average (median) 8 percentage points (4 percent) more abnormal returns. An interesting point is that all

of the value merger targets experience positive abnormal returns, whereas only 81 percent of growth merger acquirers experience positive abnormal returns. The t-statistics and binomial test z-statistics are significant at 1 percent significance level for target abnormal returns in both subsets.

Value acquirers experience average (median) 16 percentage points (4 percent) abnormal returns. However, growth acquirers experience on average zero abnormal returns. 64 percent of value merger acquirers experience positive abnormal returns, whereas only 54 percent of growth merger acquirers experience positive abnormal returns.

One of the surprising results of the study is the significant abnormal return for the growth acquirers. Growth merger combined abnormal returns are on average (median) 3 percentage points (5 percent) abnormal returns. Though, value mergers experience higher average and median abnormal returns, the percentage of mergers that experience positive abnormal returns is higher in the growth merger subset (73 percent) than value merger subset (64) percent. This result is somewhat surprising, since value mergers showed better abnormal returns in all other categories.

V. CONCLUSION AND DISCUSSION

The research findings generally support the research predictions and in the same line with the previous researches in the financial literature. The announcement period abnormal returns to targets appear to be significantly positive, whereas acquirer shareholders gain positive, but not statistically significant abnormal returns. The combined abnormal returns are significantly positive which indicates that the gains of target shareholders do not reflect wealth transfer from acquirer shareholders to targets.

The transaction characteristics (method of payment), acquirer and target characteristics (business overlap of merging firms, value-growth status of acquirer, size of mergers) are found to be important factors in the allocation of abnormal returns to acquirer and targets. Subsample analyses show that the method of payment affects the magnitude of the gains. The acquirer and target shareholders of the cash mergers experience higher gains than those of equity-financed and mixed-financed mergers. Business overlap degree of the acquirer and targets affects mainly the division of the gains between acquirer and target shareholders. High overlap mergers result in higher average abnormal returns for acquirer shareholders, whereas low overlap mergers result in higher gains for target shareholders. Combined abnormal returns are significantly positive for low overlap mergers. My results also provide support to the performance extrapolation hypothesis. It seems that the market are aware that glamour firms could be infected by hubris and therefore, do not favor their merger deals. Lower acquirer, target, and combined abnormal returns are observed for the mergers involving acquirers with high price-to-book ratios.

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Table 1

Summary of Results from Tests of Abnormal Returns for the Full and Subsamples of Mergers

This table presents empirical results for the full and sub samples of mergers. For each row I give the number of usable observation, the mean and median values, and standard deviation of the abnormal returns, and a test of significance of abnormal returns. The final two columns detail the percentage of firms whose abnormal returns are positive, as well as a test of significance of this ratio. Significance levels for subsets with total number of cases less than 10 are not reported.

<i>Variables</i>	<i>N</i>	<i>Mean Abnormal Return</i>	<i>Median Abnormal Return</i>	<i>Standard Deviation</i>	<i>t-statistics</i>	<i>Percentage of Firms with Positive Abnormal Returns</i>	<i>Z-Statistics for Significance of Binomial Test</i>
<i>Total Sample</i>							
Target	37	0.19	0.19	0.20	5.87***	0.86	4.27***
Bidder	37	0.05	0.01	0.25	1.25	0.57	0.66
Combined	37	0.07	0.05	0.20	2.16**	0.70	2.30**
<i>Subsets According to Method of Paymentⁱⁱ</i>							
Cash-Financed Mergers							
Target	9	0.27	0.32	0.23	1.32	0.89	2.00
Bidder	9	0.17	0.03	0.46	1.09	0.67	0.67
Combined	9	0.17	0.05	0.36	1.39	0.78	0.78
Mixed-Financed Mergers							
Target	5	0.20	0.19	0.09	4.80	1.00	1.79
Bidder	5	-0.02	0.00	0.11	0.43	0.60	0.00
Combined	5	0.04	0.03	0.06	1.39	0.80	0.89
Stock-Financed Mergers							
Target	23	0.16	0.19	0.20	3.85***	0.83	2.92***
Bidder	23	0.02	0.01	0.11	0.87	0.52	0.00
Combined	23	0.04	0.06	0.12	1.71*	0.65	1.25

*, **, *** indicates significance at 10, 5, and 1% significance levels respectively using two-tailed test.

Table 1 (Continued)

<i>Variables</i>	<i>N</i>	<i>Mean Abnormal Return</i>	<i>Median Abnormal Return</i>	<i>Standard Deviation</i>	<i>t-statistics</i>	<i>Percentage of Firms with Positive Abnormal Returns</i>	<i>Z-Statistics for Significance of Binomial Test</i>
<i>Subsets According to Strategyⁱ</i>							
High Overlap Mergers							
Target	21	0.14	0.19	0.20	3.34***	0.81	2.62***
Bidder	21	0.08	0.04	0.32	1.16	0.57	0.44
Combined	21	0.09	0.06	0.26	1.54	0.67	1.31
Low Overlap Mergers							
Target	16	0.25	0.22	0.19	5.41***	0.94	3.25***
Bidder	16	0.01	0.01	0.07	0.57	0.56	0.25
Combined	16	0.05	0.05	0.09	2.35**	0.75	1.75*
<i>Subsets According To Relative Price-To-Book Ratio Of Biddersⁱⁱⁱ</i>							
“Value” Mergers							
Target	11	0.25	0.22	0.15	5.45***	1.00	3.02***
Bidder	11	0.16	0.04	0.42	1.27	0.64	0.60
Combined	11	0.16	0.08	0.33	1.61	0.64	0.60
“Growth” Mergers							
Target	26	0.17	0.18	0.21	4.00***	0.81	2.94***
Bidder	26	0.00	0.01	0.09	0.19	0.54	0.20
Combined	26	0.03	0.05	0.10	1.70*	0.73	2.16**

*, **, *** indicates significance at 10, 5, and 1% significance levels respectively using two-tailed test.