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We present empirical evidence on acquirer firms that have violated or are about to violate a loan covenant within four quarters of undergoing an acquisition. We find that firms that violate a covenant within the four quarters before the acquisition announcement have the highest announcement period abnormal returns, while firms that violate a covenant within the four quarters after the acquisition announcement but not within the four quarters before it have the sharpest decline in abnormal returns after the acquisition announcement. Also, firms that violate or are about to violate a loan covenant within four quarters have a significantly lower mean target firm deal size than those that have not violated covenants within those time periods. Such results indicate that when firms violate or are about to violate a loan covenant, corporate governance shifts in power cause creditors to enforce stricter rules on management's actions, making sure that the acquisitions that management pursues adds to firm value.

I. Introduction

Nini, Smith, and Sufi (2010) reveal that many corporate governance shifts of power occur when a firm violates a loan covenant, as creditors rewrite covenants and set rules that restrict the borrower's actions. For example, creditors may limit capital expenditure spending and which types of acquisitions are permitted. Regarding the topic of acquisitions, the results from Betton, Eckbo, and Thorburn (2008) and Amira, John, Prezas, and Vasudevan (2009) reveal that abnormal returns are significantly positive around the announcement period for an acquisition. Combining the material of all these papers, we wonder about the effect of loan covenant violations on the effectiveness of a borrower's business decisions, as shifts of power occur across the parties related to the borrower. We use acquisition announcement period abnormal returns to measure this effect based on the stock market's perception of the acquirer.

We hope that our research provides a better understanding of corporate governance, allowing readers to have a clearer view of who is in charge (creditors, board of directors, management, etc.) and how the actions of certain groups influence the company's market value. From our analysis of acquisition announcement period returns, readers will have a better understanding of whether firms make better business decisions after they violate loan covenants and which factors affect the market's perception of these decisions the most.

The main research question that we focus on is whether there are differences among acquirer firms that have violated a loan covenant within the four quarters before the acquisition announcement (Violation Before Acquisition), acquirer firms that have violated a loan covenant within the four quarters after the acquisition announcement but not within the four quarters before (Violation After Acquisition), and acquirer firms that have not experienced such violations (No Violation). Violation Before Acquisition and Violation After Acquisition act as

treatment groups, while No Violation acts as a control group. The differences that we are interested in are those for acquisition announcement period abnormal returns as well as those for the following acquisition type characteristics: target firm deal size, industry match between acquirer and target, and deal financing type.

We first compare the abnormal returns for the three samples by using Eventus, an event study program, and graphing the mean cumulative abnormal returns to determine the trends and magnitudes of each sample's mean cumulative abnormal return across time and around the announcement period. From the graphs, we notice that Violation Before Acquisition's cumulative mean abnormal return rose the most dramatically at the announcement period, and Violation After Acquisition's cumulative mean abnormal return falls the most dramatically after the announcement period. The rise in Violation Before Acquisition's cumulative mean abnormal return at the announcement period may support the hypothesis that after loan covenant violations, creditors control the firm's management more strictly, limiting the allowed acquisitions to only those that generate value to the firm. The stock market's favorable view of this shift in corporate governance may be reflected in the rise in abnormal returns. Violation After Acquisition's dramatic drop in mean cumulative abnormal return after the announcement period may indicate both that the market overreacts positively to acquisition announcement, and that the stock market's pessimistic prediction of an impending loan covenant violation begins to override its optimistic sentiment towards the acquisition.

For the acquisition type characteristics, we use two-tailed t-tests to test for statistically significant mean differences. We find that the only significant differences occur for target firm deal size between Violation Before Acquisition and No Violation, and between Violation After Acquisition and No Violation. This may be evidence that when firms violate a covenant or are

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about to violate a covenant, creditors may limit the deal size of acquisitions to avoid overly large acquisitions, which may be both too expensive and too risky.

The results of our analysis reveal that stock markets have favorable announcement period reactions towards companies that undergo an acquisition after violating a loan covenant and that acquirers that violate a loan covenant have smaller target firm deal sizes than those that do not. These results may support Nini, Smith, and Sufi (2010), providing further evidence that many corporate governance shifts of power occur when a firm violates a loan covenant, as creditors rewrite covenants and set rules that restrict the borrower's actions, such as which types of acquisitions are permitted.

The rest of the paper is organized as follows. Section II touches upon background information, including explanations of concepts and research results from related literature. Section III outlines the hypotheses and research that supports them. In Section IV, we explain the details of our datasets. Next, we explain our methodology for data analysis in Section V. Then we analyze the results of our research in Section VI. Section VII concludes.

II. Background

A. Covenant Violations

Debt covenants are conditions in credit agreements that direct or restrict the borrower's actions. There are three categories of covenants: affirmative, negative, and financial. Affirmative covenants force the borrower to take certain actions, such as meeting GAAP standards of accounting, maintaining equipment and buying insurance, and operating within legal bounds. Negative covenants restrict the borrower from taking certain actions, such as shifting the firm's main business, divesting assets, and making excessive capital expenditures. Financial covenants

are accounting-based risk and performance limits, restricting measures, such as a firm's leverage and interest coverage.

Covenants occur in all types of debt agreements, including bond and note indentures, but are typically much stricter in private loan agreements (Kahan and Tuckman (1993), Gilson and Warner (1998), Verde (1999), and Sansone and Taylor (2007)). Private loan contracts have maintenance covenants, meaning that the borrower must comply with the covenant consistently, for example by maintaining a certain debt/EBITDA ratio on a quarterly basis. On the other hand, bond indentures have incurrence covenants, for which the borrower only needs to comply with the covenant during a particular event, such as only having to maintain a certain debt/EBITDA ratio during a debt or equity issuance. Between the two types of contracts, private loan contracts are much stricter because they must use the more restrictive maintenance-based covenants.

Violations of covenants are considered events of default, which allow the creditor to demand immediate repayment of (or "accelerate") the entire loan balance. However, the creditor rarely accelerates the loan and instead, usually renegotiates the contract with the borrower. Such renegotiations can lead to modifications of the loan terms and more restrictions on certain metrics of the firm, such as stricter limits on leverage, capital expenditures, and acquisitions (See Figure 1). After a covenant violation, clear limits on capital expenditures are likely to be set for the first time, and ratio-based covenants are replaced by restrictions on the level of EBITDA (Nini, Smith, and Sufi (2010)). Figures 2 and 3 reveal that loan covenant violations cause decreases in a firm's abnormal returns.

B. Acquisitions

Much existing research covers acquisitions. For a summary of various types of research on acquisitions, see "Corporate Takeovers" by Betton, Eckbo, and Thorburn (2008). Our interest

in this paper lies in the studies concerning takeover gains. These studies use a sample of 15,987 initial control bids by public bidders for public or private targets, in the time period from 1980 to 2005. For the cumulative abnormal stock returns, an average daily abnormal stock return is measured for firm j over event window k as the event parameter AR_{jk} according to

$$r_{jt} = \alpha_j + \beta_j r_{mt} + \sum_{k=1}^{K} AR_{jk} d_{kt} + \varepsilon_{jt}, \, t = day\{-293, \, ..., \, end\}$$

where r_{jt} is the return (in logarithmic form) to firm j over day t, r_{mt} is the value-weighted market return, and d_{kt} is a dummy variable that equals one if day t is in the kth event window and zero otherwise. Day 0 is the day of the initial control bid, and days -1 to 1 is the announcement period. For the announcement period for the whole sample of 15,987 initial control bids, the mean cumulative abnormal stock return is 0. 73% and has a z-statistic of -2.5297. This indicates that the return is significantly positive, at a level of confidence of 0.01. However, 49.39% of the sample size is made up of positive returns, revealing that most returns are negative.

Betton, Eckbo, and Thorburn (2008) extends this data analysis further by dividing their sample of 15,987 initial control bids into subsamples based of the following factors: bidder market capitalization of the target, whether the target was public or private, form of initial bid, method of payment of initial offer, and time period of initial offer. Out of these factors, they determined that the two key drivers of acquirer (bidder) returns are bidder size and the target's status as public or private. For bidder market capitalization subsamples, which allow one to examine the effect of the bidder's size on announcement period returns, the sample is divided into the lowest quartile and highest quartile. For the lowest quartile, consisting of 3,995 initial bids, the mean cumulative abnormal return is 4.04%, the z-statistic is 21.7874, and 58.27% of returns are positive. For the highest quartile, consisting of 10,480 initial bids, the mean cumulative abnormal return is -0.49%, the z-statistic is -17.5109, and 45.99% of returns are

positive. These results indicate that the returns are inversely related to bidder size, with the lowest quartile having a mean cumulative abnormal return 4.53% higher than that of the highest quartile. One can also see the influence of the target's status as public or private on the acquirer's announcement period cumulative abnormal return. For an acquirer with a public target, of which there are 6,301 initial bids, the mean cumulative abnormal return is -0.87%, the z-statistic is -19.0462, and 42.69% of returns are positive. For an acquirer with a private target, of which there are 9,686 initial bids, the mean cumulative abnormal return is 1.76%, the z-statistic is 12.1118, and 53.75% of returns are positive. Therefore, acquirers with private targets have higher cumulative abnormal returns than those with public targets, with acquirers with private targets having a cumulative abnormal return that is higher by 2.63%.

Overall, the best-case scenario for returns consists of a small bidder (lowest quartile of market capitalization), private target, and all-stock payment, producing an average bidder announcement period cumulative abnormal return of 6.46%. The worst-case scenario for returns consists of a large bidder (highest quartile of market capitalization), public target, and all-stock payment (again), producing an average bidder announcement period cumulative abnormal return of -2.21%.

Amira, John, Prezas, and Vasudevan (2009) also present conclusions relevant to our research. They use cross-sectional regressions, to control for various factors for a sample of 414 US industrial firms that acquired assets between 1986 and 2001. The announcement period is from days -1 to 1 with day 0 as the announcement of the asset purchase, and cumulative abnormal returns are based on a single-factor market model estimated from day -255 to day -46 for each firm. The results reveal that buyer announcement period returns increase directly with buyer leverage and are higher for buyers with private debt than those with public debt. Also,

announcement period returns have an inverse relationship with buyer size, number of buyer's anti-takeover provisions, and relative size of acquisition. For the full sample, the announcement period mean cumulative abnormal return is 1.238%, which is statistically positive at the 0.01 level of significance.

Amira, John, Prezas, and Vasudevan (2009) split up the sample to analyze the data for debt level and type of debt. For debt level, the sample is divided into high debt and low debt asset buyers, with "high debt asset buyers" defined as firms with a total debt-to-total asset ratio higher than median ratio for all firms that bought assets in the same year and "low debt asset buyers" as the opposite. The mean cumulative abnormal return for high debt asset buyers, which make up a sample size of 203, is 1.813%, which is statistically different from zero at the 0.01 level of significance. The mean cumulative abnormal return for low debt asset buyers, which make up a sample size of 211, is 1.686%, which is statistically different from zero at the 0.01 level of significance. From these mean cumulative abnormal returns it is evident that asset buyers with higher total debt-to-total asset ratios have higher returns, confirming that announcement period returns increase along with buyer leverage. For debt type, the sample is divided into public debt and private debt asset buyers, with "public debt asset buyers" defined as firms with a public-to-private debt ratio greater than one, and "private debt asset buyers" as the opposite. The mean cumulative abnormal return for private debt asset buyers, which make up a sample size of 170, is 2.343%, which is statistically different from zero at the 0.01 level of significance. The mean cumulative abnormal return for public debt asset buyers, which make up a sample size of 244, is 0.469%. These mean cumulative abnormal returns indicate that private debt asset buyers have higher announcement period returns than public debt asset buyers.

III. Hypotheses

A. Announcement Period Abnormal Returns

We think that announcement period abnormal returns for Violation Before Acquisition and Violation After Acquisition are larger than those for No Violation. We also feel that Violation Before Acquisition has the highest abnormal returns and that No Violation has the lowest. Based on the findings from Nini, Smith, and Sufi (2010), creditors impose tighter restrictions on borrowers following a loan violation. Therefore, we think that these restrictions only allow firms to make acquisitions that add to the firms' value, and that the benefits of these acquisitions are reflected by the stock price around the announcement period.

In addition, we think that the acquirers that Violation After Acquisition have the second highest abnormal returns because even though they have not yet actually violated a loan covenant, their financial position must be deteriorating, leading to their eventual violation. Therefore, even though creditors have not imposed rules as strict as those following a loan violation, creditors are likely to caution and guide the struggling company. A possible alternative hypothesis for Violation Before Acquisition having the highest abnormal returns may be that these firms have suffered an overdramatic decline in their stock price after the actual loan covenant violation. As a result, the stock market sees the ability to carry out an acquisition as a sign that the market overreacted to the violation, resulting in enormously positive stock returns.

B. Types of Acquisitions

In addition to our predictions for announcement period abnormal returns, we think that Violation Before Acquisition and Violation After Acquisition have smaller target sizes, less across industry deals, and more all-stock financed deals. In addition, we think that acquirers that have violated a loan covenant within the previous four quarters exhibit these characteristics the

most. These predictions come from Nini, Smith, and Sufi (2010), which indicates that the cash acquisitions scaled by average assets decreases greatly after a covenant violation. We think that this implies that creditors may limit the size of all acquisitions that occur close to the date that a covenant violation occurs or is likely to occur, in order to guide the firm to engage only in acquisitions that increase the firm's value. We also think that these creditors guide violating acquirers towards deals in which the industry of the buyer and seller match and most likely result in higher returns due to synergies. In addition, since Betton, Eckbo, and Thorburn (2008) reveals that acquirers with all-stock deals yield the higher announcement period abnormal returns, we think that creditors make sure that violating acquirers pursue deals that are financed by stock. However, we are unsure about this hypothesis because the same research shows that all-stock deals also yield the lowest announcement period abnormal returns.

IV. Data

A. Previous Construction

The two sets of data used in our research are a sample of acquisitions and a sample of covenant violations. One set of data consists of 15,211 acquisitions from 1996 to 2010. We use about 8,750 of these acquisitions when analyzing the announcement period abnormal returns with Eventus, an event study application explained in our "Methodology" section. The data for the acquisitions are all U.S. deals for nonfinancial companies from Zephyr, a database of deal information, such as details of deals, deal rumors, and financial summaries and structures of firms involved in deals. For more information on Zephyr, see

http://www.bvdinfo.com/Products/Economic-and-M-A/M-A/ZEPHYR.aspx. Our acquisition

data includes the rumor date, date of acquisition announcement, deal completion date, deal value, percentage of initial and final stake, acquirer and target names, and acquirer CUSIP.

The other set of data consists of covenant violation information from Nini, Smith, and Sufi (2010), financial information for firms on a quarterly basis taken from Compustat. Compustat is a database of U.S. and Canadian fundamental and market information for over 24,000 companies, providing annual and quarterly financial statements and supplemental data. For more information on Compustat, see http://www.compustat.com/myproducts.aspx. For our data, the broadest sample of Compustat observations contains of 7,661 non-financial U.S. firms and 181,702 firm-quarter observations from the second quarter of 1997 to the fourth quarter of 2008. The main focus of this data is an indicator of whether or not the firm reports a violation of a financial covenant during the corresponding quarter.

Construction of the covenant violation data begins with data for all nonfinancial U.S. firms in Compustat from1996 to 2008, initially limited to only firms with average book assets greater than $10 million in 2000 dollars and to firm-quarter observations with five available data items (total assets, total sales, common shares outstanding, closing share price, and the calendar quarter of the filing). Next, Nini, Smith, and Sufi investigate the firms' 10-K and 10-Q SEC filings, using a text-search algorithm that first locates the word "covenant" in the filing, and then conditional on finding the word "covenant," searches for the following five terms within seven lines surrounding the initial hit: "waiv," "viol," "in default," "modif," and "not in compliance." Then they manually check the filings mentioning covenant violations. Finally, they merge the data from Compustat with the data generated from their algorithm.

Our data centers on new financial covenant violations, defined as financial covenant violations for firms that have not violated a covenant in the previous four quarters. The focus is

on new financial covenant violations because they reveal the initial measure of creditor

intervention, providing the cleanest identification of the effect of violations on corporate

behavior. A firm-quarter observation is only included in the sample if there exist four previous

quarters to measure whether a given violation is new. For more details about the construction of

this data, see Nini, Smith, and Sufi (2010).

B. Formation of Samples

The previous construction of data from Nini, Smith, and Sufi (2010) allow us to start with

a 10,722 sample size for acquisitions and 273,509 sample size for covenant violations. We have

to arrange the data into three separate samples, for acquisitions that occurred within four quarters

after a covenant violation, acquisitions that occurred within four quarters before a covenant

violation but without a covenant violation within the previous four quarters, and acquisitions that

fit neither of the previous two categories. This way, the first two samples, in which recent

violations occurred, would be treatment samples, and the last sample, in which recent violations

did not occur, could serve as an overall control sample.

To form the samples, we first match the CUSIP numbers for acquirers in the dataset for

acquisitions with those for acquirers in the dataset for covenant violations. Then we place the

data that did not match up by CUSIP into the control sample, generating a smaller sample size to

work with. Then we write an Excel macro that compares all the acquisitions' announcement

dates with covenant violations dates to identify the acquisitions in which violations occurred

within four quarters. The announcement date we use is the earliest of the actual announcement

date, rumor date, and actual acquisition date, to represent the earliest date that acquisition

information is leaked to the stock market. After we obtain this data, we put the data that do not

match the date criteria into the control group. Then we use Excel to sort the remaining data into

acquisitions that occurred within four quarters before the covenant violation and acquisitions that occurred within four quarters after the covenant violation without a covenant violation within four quarters before, completing our two treatment samples. We end up with a sample size of 598 for Violation Before Acquisition, 569 for Violation After Acquisition, and 9555 for No Violation. These sample sizes sometimes diminish slightly during our analysis due to some acquirer data experiencing incompatibility with Eventus and lack of certain acquisition details.

C. Sample Characteristics

After forming the samples, we collect data on the target firm deal size, industry match, and deal financing for each of the three samples. The target deal size, denominated in millions of assets, is from the previously constructed dataset. For the industry match, we use Standard Industrial Classification (SIC) codes, which are used to classify a company's main business. We check if the acquirer and target have the same first two digits in their SIC codes, which represent the major industry group, and if they have the same first full SIC codes, which represent the industry, a more specific classification. For industry match we use a dummy variable for each of the two situations, assigning 1 if the SIC codes match up and assigning 0 otherwise. Next, we look for what type of deal financing each of the three samples use, checking to see if each transaction is financed mainly by cash or stock. We focus on cash and stock because these make up the vast majority of financing types. We also use a dummy variable for each of the two situations, cash and stock, assigning 1 if the acquisition uses the given financing type and 0 otherwise. For each characteristic for each sample, we calculate the required numbers to perform t-tests to judge the statistical significance of differences between two samples at a time: mean difference, standard deviations, and sample sizes.

D. Summary Statistics

Table 1 presents our summary statistics. For each of the three samples, we reveal the

mean cumulative abnormal returns and sample sizes for days -30 to 30 and days -3 to 2, the two

time windows that we focus on the most. We also reveal the mean and sample sizes for the

acquisition type characteristics: target firm deal size, industry match and major industry group

match, and cash and stock financing. Later, we will expand upon and analyze both the mean

cumulative abnormal return data and acquisition type characteristics data mentioned in our

summary statistics.

V. Methodology

We use Eventus to determine the abnormal returns around the announcement period and

compare cross-sectional returns. Eventus performs event studies, allowing the user to have

control over estimation periods and cumulative return windows, as well as a choice of

benchmarks, such as comparison period mean returns, market returns, and the market model. For

more information on Eventus, see Arnold R. Cowen's *Eventus 8.0 Users Guide*. The

announcement date is day 0, with day -1 as the day before the announcement. We focus on days -

3 to 2. Eventus measures the abnormal return as

$$AR_{it} = R_{it} - E(R_{it}|X_t)$$

given that *i* is the firm and *t* is the event date. R_{it} is the actual ex-post return of security *i*, and

$E(R_{it}|X_t)$ is the expected return without conditioning that the event will take place over the event

window. For a conceptual diagram regarding Eventus, see Figure 4.

For Eventus, we set the estimation period used to measure $E(R_{it}|X_t)$ as the default with

the end before the event date as day -46, the minimum estimation length as 3 days, and the

maximum estimation length as 255 days. We find the mean daily abnormal returns and mean

cumulative abnormal return for time windows for days -30 to 30, -30 to -2, -3 to 2, 1 to 30, -1 to

1, -2 to 2, and -2 to 30. Each time, we use a single-factor market model estimated based on

ordinary least squares for the estimation period. We also select options for both the equally

weighted index and value-weighted index. The equally weighted index weighs all NYSE,

AMEX, and Nasdaq stocks equally, while the value-weighted index weighs them based on value.

Our focus is on the time windows for days -30 to 30, which give the most comprehensive view

of the trend of the abnormal returns across time, and days -3 to 2, which centers in on the trend

of the abnormal returns across time around the acquisition period. We graph the mean

cumulative returns across time for these two time windows for both the equally weighted index

and value-weighted index to visually capture the trends.

Next, we look for differences in target firm deal size, industry match, and deal financing

across the three samples. We use independent t-tests for samples of unequal sizes and unequal

variances to compare two samples at a time for each characteristic, in order to determine whether

the differences in the means for characteristics between the two samples are statistically

significant at the 0.05 level of significance for a two-tailed test. We use the following formula for

t-tests:

$$ t = \frac{(\overline{x}_1 - \overline{x}_2) - (\mu_1 - \mu_2)}{\sqrt{\dfrac{s_1^2}{n_1} - \dfrac{s_2^2}{n_2}}} $$

VI. Results

A. Announcement Period Abnormal Returns

For Figure 5, we can notice clear trends in the graphs of the mean cumulative abnormal

return for days -30 to 30. The trends are consistent between the equally weighted index and

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value-weighted index. Well before the acquisition date, the mean cumulative abnormal returns of the three samples are very similar and slightly below 0.00%. However, on the acquisition announcement date, the abnormal return for Violation Before Acquisition increases significantly more than that for Violation After Acquisition. The abnormal return for Violation After Acquisition increases significantly more than No Violation, which stays close to a 0.00% mean cumulative abnormal return. For graphs of the time window for days -3 to 2, see Figure 6 and the corresponding cumulative abnormal return from Table 2. Table 2 indicates that for the equally weighted index, Violation Before Acquisition experiences a 3.07% mean cumulative abnormal return, while Violation After Acquisition experiences 1.52% and No Violation experiences 0.72%. For the value-weighted index, Violation Before Acquisition experiences a 3.00% mean cumulative abnormal return, while Violation After Acquisition experiences 1.51% and No Violation experiences 0.65%.

The much greater increase in abnormal return for Violation Before Acquisition may support our hypothesis that after a company violates a loan covenant, creditors only allow the company's management to make acquisitions that add value to the firm. The stock market recognizes this and views the acquisition as favorable to the shareholders, reflecting the high abnormal returns during the announcement period. We also think that for the Violation After Acquisition acquirers, the creditors can predict that these companies may violate a loan covenant soon. Therefore, they are strict in only allowing the company's management to make acquisitions that benefit the firm's value but are less strict than they would be for a firm that has actually violated a loan covenant. As a result, the announcement period abnormal return is higher than that for the control group No Violation but lower than that for Violation Before Acquisition.

After this point, the mean cumulative abnormal returns for all three samples drop. However, Violation After Acquisition drops the most dramatically, and No Violation drops the least dramatically, falling much less than the others from days 1 to 30. The differences in such drops are evident from both Figure 5 and Table 2's results for the time window for days 1 to 30. Table 2 indicates that for the equally weighted index, Violation After Acquisition experiences a -3.78% mean cumulative abnormal return, while Violation Before Acquisition experiences -1.53% and No Violation experiences -1.05%. For the value-weighted index, Violation After Acquisition experiences a -4.43% mean cumulative abnormal return, while Violation Before Acquisition experiences -1.94% and No Violation experiences -1.50%.Such drops in abnormal returns after the announcement period may indicate that the market overreacted to the acquisitions announcement. Also, the steepness of Violation After Acquisition's drop in abnormal return may indicate that the stock market's pessimistic prediction of an impending loan covenant violation begins to override its optimistic sentiment towards the acquisition. For mean cumulative abnormal returns for all time windows for both the equally weighted index and value-weighted index, see Table 2.

B. Types of Acquisitions

We apply the two-tailed t-tests to the acquisitions' characteristics of target firm deal size, industry match, and deal financing. For target firm deal size, it is evident from Table 3 that No Violation's mean target firm deal size is significantly different from those of Violation Before Acquisition and Violation After Acquisition for the 0.05 level of significance. On the other hand, Violation Before Acquisition and Violation After Acquisition are not significantly different. For both major industry group match and industry match, Table 4 shows that there are no significant differences between sample means. For deal financing, Table 5 shows that only the t-statistics for

the mean difference between Violation Before Acquisition and No Violation seem significant for both cash financing and stock financing. However, we conclude that despite the t-tests, these sample means may not be actually significantly different. No Violation's comparatively very large sample size greatly shrinks the standard error for the t-test, and the mean differences of the two samples do not seem drastically different in terms of magnitude.

From these results, it seems that the only significant mean differences are those for target firm deal size between Violation Before Acquisition and No Violation, and between Violation After Acquisition and No Violation. The target firm deal size is much smaller for Violation Before Acquisition and Violation After Acquisition, than for No Violation. This may be an indication that when a firm violated a covenant or is about to violate a covenant, creditors may limit the deal size of acquisitions. This is in line with the figure that reveals a dramatic decrease in acquisitions after the loan covenant violation date. Overly large acquisitions may be both too expensive and too risky, thus absorbing too many cash flows and diminishing firm value. Since the other t-test produced insignificant results, we do not reach any strong conclusions for industry match and deal financing.

VII. Conclusion

From our research, it seems that firms undergo significant shifts of corporate governance when a loan covenant is violated or about to be violated. Power shifts from management to the creditors, as creditors impose stricter rules, such as limiting the size of acquisition targets. The stock market likely realizes these shifts in power and views them as beneficial for firm value. This favorable perspective is reflected in positive acquisition announcement period abnormal returns for acquirers that violate a loan covenant near the announcement date.

Even though our conclusions are supported by convincing results and background research, we must realize that there are many factors that come into play when firms violate loan covenants and undergo acquisitions. There exist numerous business and economic reasons why firms fail to satisfy loan covenants and decide to pursue acquisitions. To extend our research further, it may be helpful to examine many of the other acquisition type characteristics, such as acquirer size in assets, geographic region, and number of previous acquisitions by the acquirer.

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Figure 1 – Effect of Financial Covenant Violation on Acquisitions

This figure presents the mean and median for cash acquisitions scaled by average assets after a financial covenant violation occurs for a firm that has not violated in the previous four quarter. The violation is first reported at quarter 0, implying that it occurred sometime between quarter -1 and 0.

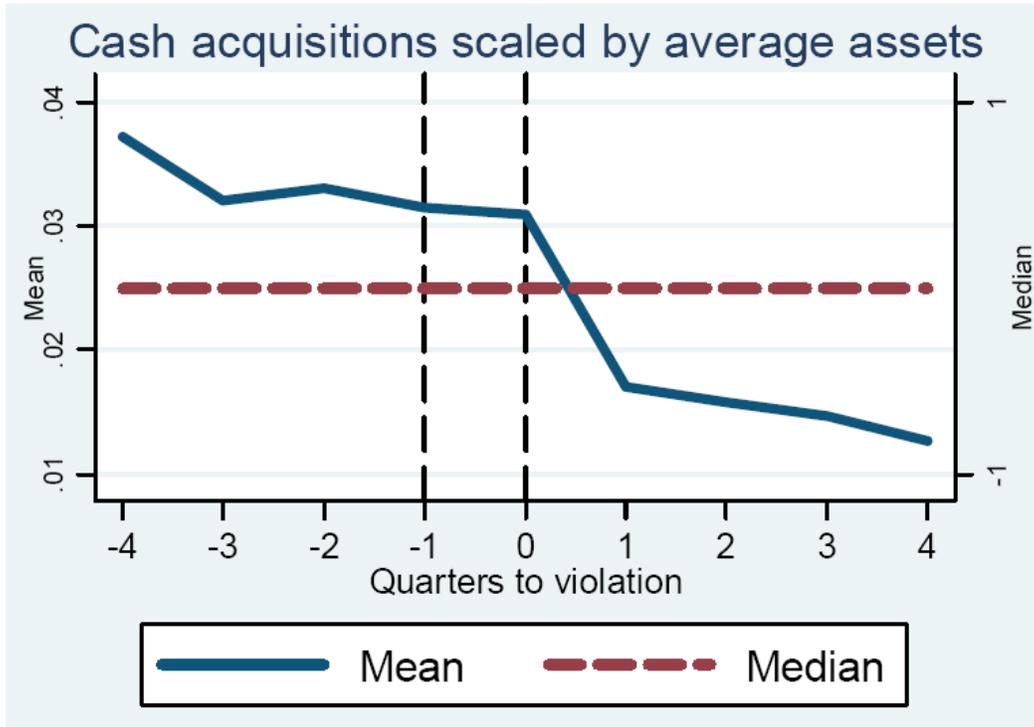Source: Nini, Greg, David C. Smith, and Amir Sufi (2010)

Figure 2 – Financial Covenant Violations and Stock Price Performance (Event Time)

This figure displays results from a stock price event study around the occurrence of a new covenant violation by estimating the event-study monthly abnormal returns of stocks following the report of a new loan covenant violation in their SEC 10-K or 10-Q filing. A new violation is a violation by a firm that has not violated in the previous four quarters. The estimates are for event months September 1997 through June 2009 and include 3,699 observations. The violation occurs at month 0, and the figure shows monthly cumulative average abnormal return estimates beginning one year before the violation. Abnormal returns are measured against a four-factor return model, measured on a monthly basis, are: (1) the excess return on the NYSE/AMEX market return, (2) the difference between the returns on small and big stocks, (3) the return performance of value stocks relative to growth stocks, and (4) the return performance of high momentum stocks relative to low momentum stocks.

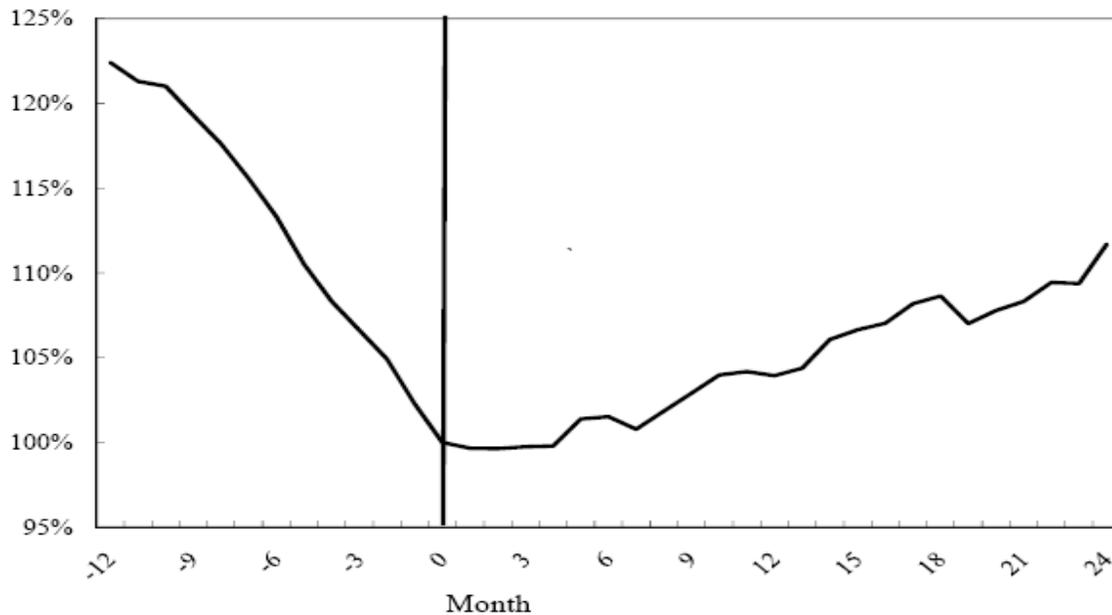Source: Nini, Greg, David C. Smith, and Amir Sufi (2010)

Figure 3 – Financial Covenant Violations and Stock Price Performance (Calendar Time)
This figure displays cumulative stock returns for a covenant violator portfolio and the implied return for a portfolio of all stocks (including non-violators) of similar risk as measured a by four-factor benchmark model. The figure covers the period September 1997 through March 2010, and includes violations reported between September 2007 and June 2009. The covenant violator portfolio is formed by purchasing stocks of firms that report a new covenant violation and holding the stocks for 2 years. A new violation is a violation by a firm that has not violated in the previous four quarters. The stocks are purchased on the first trading day of the month following the reported violation, and the portfolio is equally weighted. The implied returns are constructed using a 4-factor benchmark portfolio based on: (1) the excess return on the NYSE/AMEX market return, (2) the difference between the returns on small and big stocks, (3) the return performance of value stocks relative to growth stocks, and (4) the return performance of high momentum stocks relative to low momentum stocks.

Source: Nini, Greg, David C. Smith, and Amir Sufi (2010)
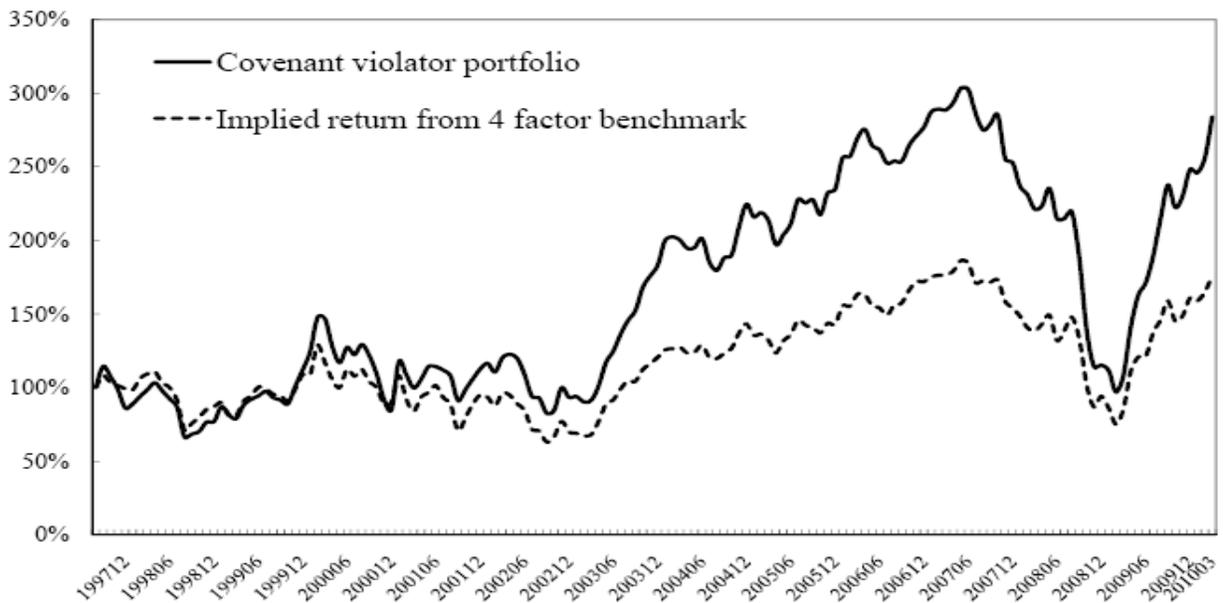
Figure 4 – Eventus Diagram

This figure presents how Eventus calculates abnormal returns. The returns from the estimation window are used to estimate the parameters, which are used to calculate the abnormal return. The event window represents the days for which abnormal returns are calculated. The estimation window and event window are chosen by the user.

Source: Gines (2008)

Figure 5 – Mean Cumulative Abnormal Returns for Days -30 to 30

These two graphs are of the mean cumulative abnormal returns for the three samples Violation Before Acquisition, Violation After Acquisition, and No Violation, across the time window (-30, 30). Both graphs' data are from Eventus, using the market model. The first graph uses the equally weighted index, and the second uses the value-weighted index.
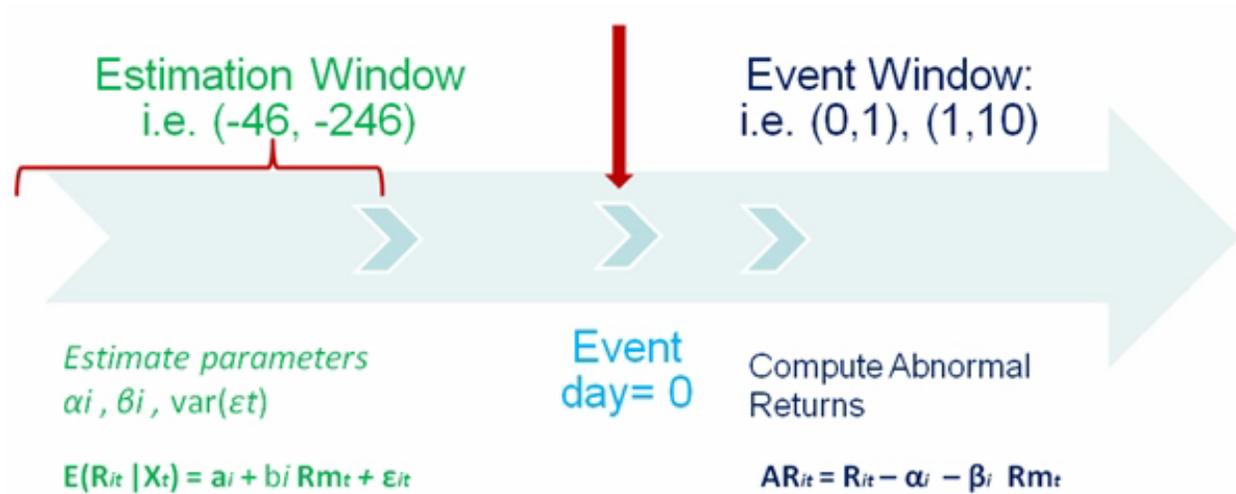
Figure 6 – Mean Cumulative Abnormal Returns for Days -3 to 2

These two graphs are of the mean cumulative abnormal returns for the three samples Violation Before Acquisition, Violation After Acquisition, and No Violation, across the time window (-3, 2). Both graphs' data are from Eventus, using the market model. The first graph uses the equally weighted index, and the second uses the value-weighted index.
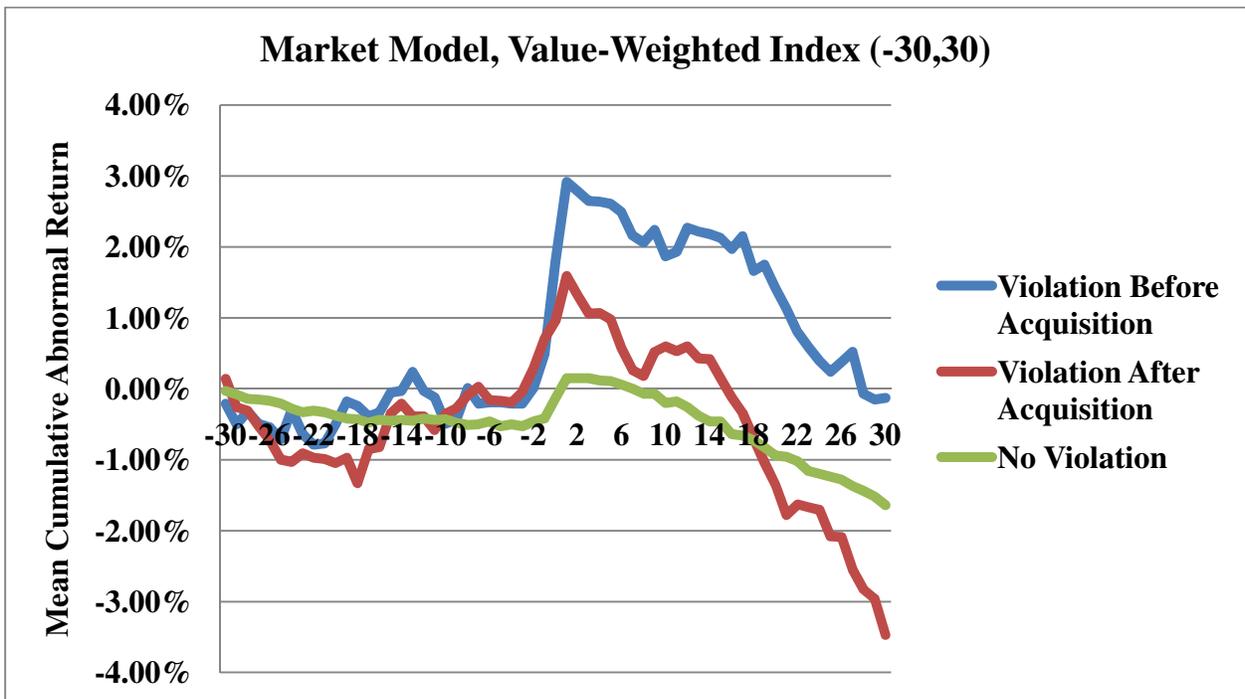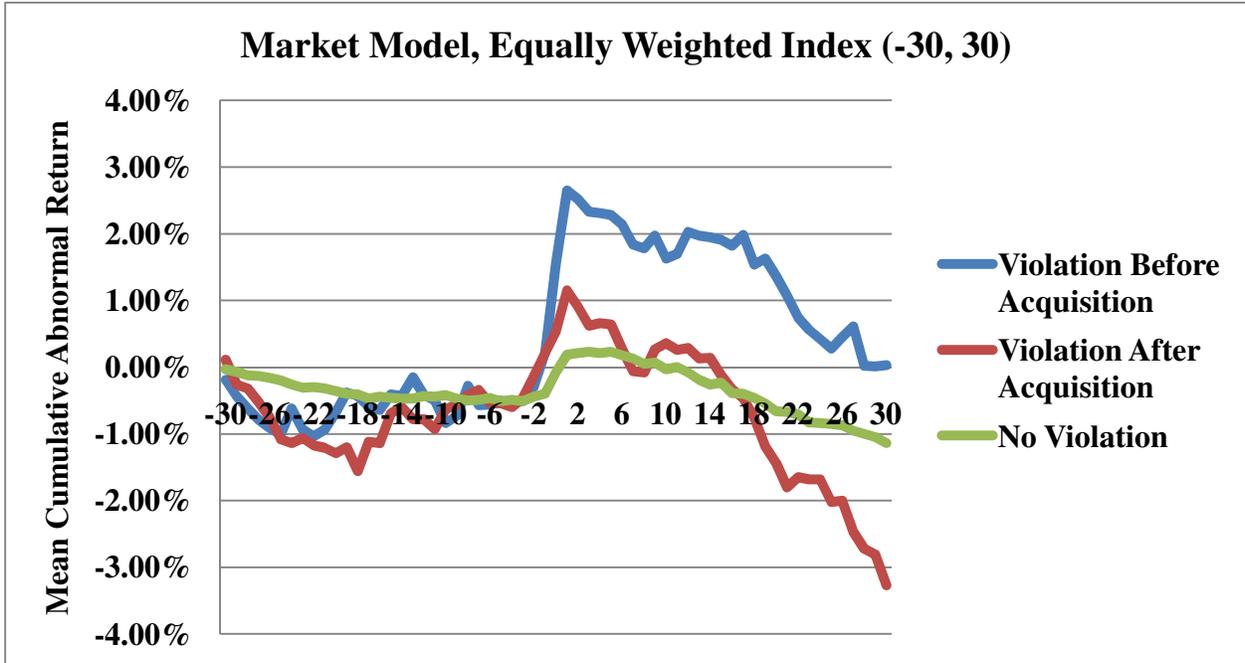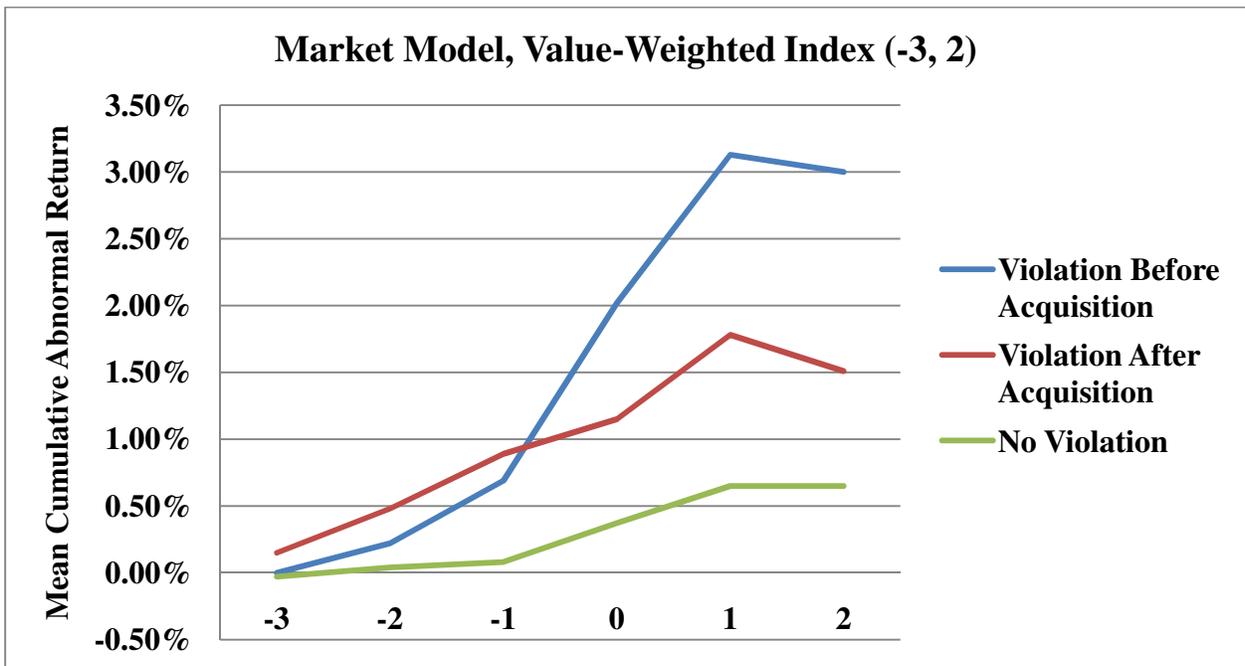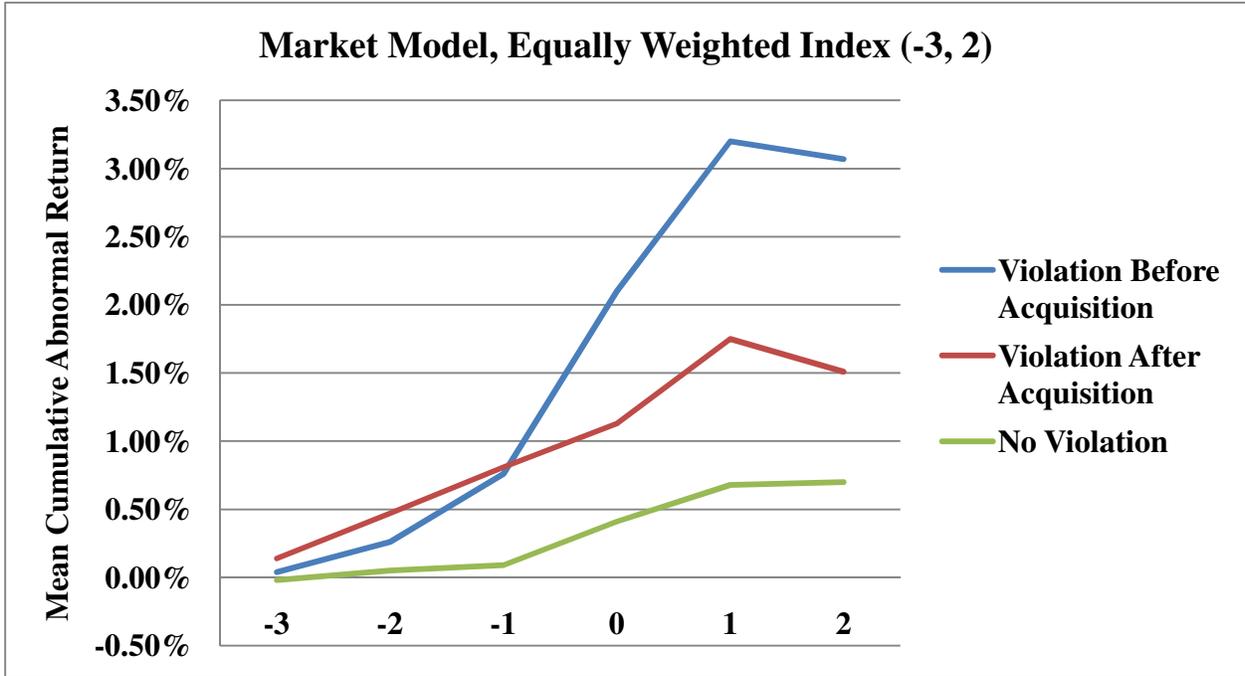
Table 1 – Summary Statistics

This table presents a summary of data that we expand upon and analyze throughout our research. For both cumulative abnormal returns and acquisition type characteristics, we reveal the means and sample sizes for all three samples.

Mean Cumulative Abnormal Returns		
Market Model, Equally Weighted Index		
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
(-30,30) Mean CAR	0.03%	-3.27%	-1.14%
(-3, +2) Mean CAR	3.07%	1.52%	0.72%
Count	517	490	7973
Market Model, Value-Weighted Index		
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
(-30,30) Mean CAR	-0.13%	-3.47%	-1.64%
(-3, +2) Mean CAR	3.00%	1.51%	0.65%
Count	517	490	7973
Acquisition Type Characteristics		
Target Firm Deal Size ($ Mil)		
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
Mean	151.429	123.226	359.488
Count	412	419	6206
Industry Match		
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
Mean	0.296	0.346	0.315
Count	598	569	9555
Major Industry Group Match		
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
Mean	0.515	0.538	0.523
Count	598	569	9555
Cash Financing		
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
Mean	0.518	0.587	0.595
Count	510	482	7857
Stock Financing		
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
Mean	0.322	0.253	0.250
Count	510	482	7857

Table 2 – Mean Cumulative Abnormal Returns for Various Time Windows

This table presents mean cumulative returns for the three samples Violation Before Acquisition, Violation After Acquisition, and No Violation, for various time windows. Both sections use the market model. The first section uses the equally weighted index, and the second uses the value-weighted index. Violation Before Acquisition includes 517 acquisitions, Violation After Acquisition includes 490 acquisitions, and No Violation includes 7973 to 7975 acquisitions, depending on the time window.

Market Model, Equally Weighted Index			
Days	**Violation Before Acquisition**	**Violation After Acquisition**	**No Violation**
(-30,30)	0.03%	-3.27%	-1.14%
(-3, +2)	3.07%	1.52%	0.72%
(-30, -2)	0.09%	-0.11%	-0.43%
(+1, +30)	-1.53%	-3.78%	-1.05%
(-1, +1)	2.94%	1.29%	0.64%
(-2, +2)	3.03%	1.38%	0.74%
(-2, +30)	0.53%	-2.78%	-0.61%

Market Model, Value-Weighted Index			
Days	**Violation Before Acquisition**	**Violation After Acquisition**	**No Violation**
(-30,30)	-0.13%	-3.47%	-1.64%
(-3, +2)	3.00%	1.51%	0.65%
(-30, -2)	0.02%	0.28%	-0.48%
(+1, +30)	-1.94%	-4.43%	-1.50%
(-1, +1)	2.91%	1.30%	0.61%
(-2, +2)	3.01%	1.35%	0.68%
(-2, +30)	0.09%	-3.43%	-1.10%

Table 3 – Target Firm Deal Size, Mean Differences

This table presents the t-statistics and the values of the variables needed to calculate the two-tailed t-tests used. The target firm deal size is measured in $ millions of assets. The t-statistics for statistically significant mean differences at the 0.05 significance level are highlighted in yellow.

Target Firm Deal Size ($ Mil)			
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
Mean	151.429	123.226	359.488
Count	412	419	6206
	VBA & VAA	**VBA & NV**	**VAA & NV**
Difference	28.202	-208.060	-236.262
t	0.653	-4.068	-6.871

Table 4 – Major Industry Group Match and Industry Match, Mean Differences

This table presents the t-statistics and the values of the variables needed to calculate the two-tailed t-tests used. Major Industry Group Match and Industry Match are both dummy variables. The t-statistics for statistically significant mean differences at the 0.05 significance level are highlighted in yellow.

	Major Industry Group Match		
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
Mean	0.515	0.538	0.523
Count	598	569	9555
	VBA & VAA	**VBA & NV**	**VAA & NV**
Difference	-0.023	-0.008	0.014
t	-0.015	-0.401	0.664

	Industry Match		
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
Mean	0.296	0.346	0.315
Count	598	569	9555
	VBA & VAA	**VBA & NV**	**VAA & NV**
Difference	-0.050	-0.019	0.031
t	-0.041	-0.982	1.526

Table 5 – Cash Financing and Stock Financing, Mean Differences

This table presents the t-statistics and the values of the variables needed to calculate the two-tailed t-tests used. Cash Financing and Stock Financing are both dummy variables.

Cash Financing			
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
Mean	0.518	0.587	0.595
Count	510	482	7857
	VBA & VAA	**VBA & NV**	**VAA & NV**
Difference	-0.069	-0.077	-0.008
t	-0.045	-3.383	-0.335

Stock Financing			
	Violation Before Acquisition	**Violation After Acquisition**	**No Violation**
Mean	0.322	0.253	0.250
Count	510	482	7857
	VBA & VAA	**VBA & NV**	**VAA & NV**
Difference	0.068	0.072	0.003
t	0.059	3.378	0.166