Analyzing the Market's Ability to Predict the Synergies of Mergers and Acquisitions

Lucas Cooper

Colgate University

Abstract

By adapting Abadie et al's (2010) synthetic control method, this paper uses a more accurate control group to evaluate the cumulative abnormal returns for acquiring firm share price between 2000-2014. An examination of acquisition-related outcomes informs both corporate strategy and investor arbitrage opportunity. The results indicate that M&A activity is effective in improving the long-term performance of the acquiring firm's share price and that the market tends to account for these benefits within days of the announcement of the acquisition.

I. Introduction

Since 1985, the number of mergers and acquisitions (M&A) in the United States has increased at a substantial 4.63% compound annual growth rate—leading to over $13.9 trillion invested into mergers in 2017 alone (IMAA Institute, 2017). In light of this growth, KPMG and the Fortune Knowledge group, together, set out to understand the motivations for mergers by surveying 550 U.S.-based executives in firms who had successfully completed an acquisition within the last three years. It found that approximately 84% of interviewed firms intend to pursue at least one acquisition in 2017. Of those firms, 40% cite limited organic growth opportunities as their primary motivation for an acquisition, while another 25% acquire firms in order to address a changing market place. This survey confirms the idea that companies pursue mergers and acquisitions in order to best position themselves for improved long-term performance after the acquisition. Given this dramatic increase in M&A activity, this paper uses an innovative new methodology to study acquisition-related outcomes for both the acquiring firm and for potential investors. On the corporate strategy side, this paper evaluates the effectiveness of mergers and acquisitions by measuring long-term effects on acquirer share price. To determine whether M&A activity presents arbitrage opportunities for investors, this study compares the price change surrounding the announcement of the merger to the long-term performance of the stock.

To isolate a merger's impact on a stock, one cannot merely take a cross section of the change in price before and after the acquisition, as M&A activity is not the only driver of share price. Instead, the measure of interest must capture the amount that the stock outperforms (or underperforms) expectations. In the literature, this measure is referred to as abnormal

return and is commonly calculated using the formula $AR_{it} = R_{it} - E(R_{it})$. Where R_{it} is defined as the period *t* (either day or month) simple return of a sample firm and E(R_{it}) as the period *t* expected return over that same time period. To quantify the excess returns over the long term and to limit the impact of anomalous spikes or troughs in share price, the majority of literature sums the daily (or weekly) abnormal returns over a specified time. This measure is referred to as cumulative abnormal return, and is calculated using the following formula:

$$CAR_{it} = \sum_{t=1}^{t} AR_{it}$$

Any measure of abnormal return relies on the expected return prediction to accurately capture market-level changes that influence the price of stocks. The previous literature examining abnormal returns of mergers and acquisitions has used one of three predictors of expected return: the reference portfolio approach, the Fama-French three-factor model, or the control firm approach. Overall, these approaches lead to contradicting results in both the short and long term—motivating future research.

The paper is organized as follows: Section II provides some background on the empirical concerns associated with previous literature's calculations of abnormal returns before introducing this study's biggest contribution to the literature: the synthetic control methodology. The collection of data is described in Section III. The results presented in Section IV suggest that acquisitions improve the long-term performance of the firm and that the market efficiently accounts for these benefits. Section V concludes.

II. Techniques for Measuring Abnormal Returns

In the following section, I will summarize the potential weaknesses of previous studies in both the short and long term. I will begin by discussing how the defined length of the announcement window may influence short-term abnormal returns, before delving into how the different measures of expected return may lead to inaccurate results in the long term. I will then present the new methodology that is introduced in this study.

II A. Announcement Effects

The vast majority of literature concludes that the announcement of a merger yields positive abnormal returns for the target company; but, its effect on acquiring firms is less clear (Jensen & Ruback 1983, Agrawal & Jaffe 2000, Cartwright & Schoenberg 2006). In their review of 13 studies on abnormal returns around takeover announcements, Jensen and Ruback (1983) find that the excess returns to bidding firms' stockholders gained an average of 4% around tender offers but no abnormal returns around the merger itself. Closer examination of individual papers yields similarly muddled results. In fact, studies have found statistically significant evidence of both positive announcement effects (Dodd and Ruback 1977, Bradley et al 1988, Jarrel et al. 1988) and negative announcement effects (Eger 1983, Mork et al. 1990, Sudarsanam et al 1996, Dodd 1980).

Chung and Weston (1985) argue that these conflicting results could be a result of improper calculation of abnormal returns due to significant positive returns in the pre-merger announcement period. If data from the pre-merger announcement is ignored, the observed abnormal returns would be biased downward due to the increase in price prior to the announcement. Chung and Weston's argument is further supported by Ma et al (2009), which

find statistically significant abnormal returns beginning two days prior to the announcement day—providing evidence of information leakage surrounding the announcement of an acquisition. Correcting for this leakage, Ma et al. find slightly positive, statistically significant abnormal returns for bidding firms around the announcement date.

II B. Long-Term Effects

The reference portfolio assumes that the expected return of the stock should be equivalent to a particular market index. Some studies merely use general indexes such as the S&P 500 or TSX 300 (Dutta and Jog 2009), while others use size weighted or value weighted indexes (Mitchell and Stafford 2000, Barber and Lyon 1997). With the index in place, one can calculate abnormal return by taking the long-term performance of the acquiring firm and subtracting out the performance of the market index over that same time period.

Studies that utilize the reference portfolio approach tend to find negative or insignificant abnormal returns in the long term. Asquith (1983) pioneered the application of the reference portfolio to abnormal return literature and finds -7.6% cumulative excess returns in a sample of 196 successful bids between 1962-1976. Limmack (1991) and Franks et al. (1991) each use the Asquith's reference portfolio approach on mergers in the UK between 1977-1986 and NYSE mergers between 1975-1984 respectively. Limmack (1991) finds -7.43% cumulative abnormal returns in the twenty-four months after the announcement of the merger, whereas Franks et al. (1991) find insignificant abnormal returns due to mergers. Agrawal et al. (1992) and Loughran and Vijh (1997) then adjust Asquith's original reference portfolio approach to account for size, and find -10.26% and -15.9% cumulative abnormal returns respectively.

Reference portfolios are subject to a number of biases. For one, market indexes include new companies that began trading after the merger date on which the sample company's returns are based. Since newly listed firms underperform market averages (Ritter 1991), the new listings will lead to a positive bias in the population mean of long-run abnormal returns (Barber and Lyon 1997). This bias is known as the new-listing bias. Furthermore, because abnormal returns are calculated compared to an equally-weighted market index, the long run return on the index is calculated assuming monthly rebalancing—those securities that beat the market average are sold while those that have lagged market averages are purchased. If the performances of individual securities in a given month are correlated, this rebalancing will create a strong bias in the expected return calculations. Together, the presence of both the new-listing bias and the rebalancing bias undermine the predictive accuracy of the reference portfolio approach.

The second common measure for expected return is the three-factor model developed by Fama and French (1993), which regresses the post-merger performance of the sample firm on a market factor, a size factor, and a book to market factor as outlined below:

$$R_{it} - R_{ft} = \propto_i + \beta_i\left(R_{mt} - R_{ft}\right) + S_i SMB_t + h_i HML_t + E_{i,t}$$

Where R_{it} is the simple return of the common stock of firm i, $R_{ft}$is the simple return of risk-free three-month treasury bills, R_{mt} is the return of a value-weighted market index, SMB is the average difference in returns between value-weighted small stocks and value-weighted big stocks and HML is the average difference between the return of high book to market firms and low book to market firms. With this regression in place, the value of the intercept determines the firm's performance relative to expectations, as it measures any variation in the difference

between the observed return and the risk-free return that is not accounted by the three factors. This method improves upon the reference portfolio, as it includes a market index while also accounting for two other potential causes of variation.

Moeller et al (2004), Andre, Kooli, and L'Her (2004) and Dube and Glascock (2006) each utilize the Fama-French model in their studies of abnormal returns surrounding acquisitions. These papers—analyzing acquisitions between 1980-2001, 1980-2000, 1975-1996 respectively—all fail to find statistically significant abnormal returns due to mergers and acquisitions.

In the long run, the Fama-French model alleviates the biases that plague the reference portfolio approach because the regression estimates are assumed to be constant over time; therefore, there are no long-term influences from new listings or rebalancing (Barber & Lyon 1997). However, this approach has problems of its own. The Fama-French model does not include the acquiring firm's industry; therefore, does not account for any industry-level shock that may cause all firms within that industry to under preform relative to other firms of similar size and book to market value.

Lastly, the control firm approach matches the sample firm with a company that has not participated in an acquisition in the period of interest. The two firms are matched based on similarities—usually size or book to market ratios. The intuition behind the control firm method is that, in essence, the control firm represents the counterfactual for how the sample firm would have fared had it not pursued an acquisition. Therefore, subtracting the control-firm-returns from the observed sample-firm-returns should isolate the effects of the merger.

Studies that utilize the control firm methodology tend to yield contradicting results—creating opportunity for further research. For example, Dudda and Jog (2009) analyze a sample of 1300 Canadian acquisitions between 1993 and 2002 and find that the three-year performance of an acquiring firm is nearly identical to that of the matched firm. In contrast, Loughran and Vijh (1997) find that successful cash mergers lead to a 3.5% gain in abnormal returns for acquiring shareholders, but -24% abnormal returns for all-stock deals.

The control firm approach improves upon the reference portfolio approach in two ways. First, it successfully eliminates the new listing bias by matching control firms with acquiring firms on the event date. This pairing ensures that the observed returns of both the sample firm and the control firm exist for the entire period of interest—removing any negative influence of newly listed firms. Secondly, the control firm approach corrects for the rebalancing bias because it holds the comparison companies constant over time; there is no rebalancing of portfolios. Furthermore, if the matched firm is selected within the same industry as the acquiring firm, it would hypothetically account for the industry-level risk that is absent in the Fama-French Model. However, choosing only one firm against which to compare the treated unit exposes the findings to idiosyncratic differences between the two firms.

In this study, I adapt Abadie et al's (2010) synthetic control method to create a fourth measure of expected return, which is based on a very simple idea: a combination of units often provides a better comparison for the unit exposed to the intervention than any single unit alone. Abadie's approach is to construct a weighted average of non-treated units such that the group matches the treated unit based on a chosen set of characteristics during the pre-intervention period. With this "synthetic" version of the treated unit in place, I can analyze the

effect of an intervention by comparing the difference in share price between the acquiring firm and its matched synthetic in the post-intervention period—defined as the three years after the completion date.

As a variation of the control firm approach, the synthetic control method corrects for both the new listing bias and the rebalancing bias by holding the control firms constant over time. However, the synthetic control method improves upon the control firm approach because it limits the impact of idiosyncratic differences between. Nonetheless, the accuracy of the synthetic control method is subject to the characteristics on which the match is based. In this study, I match firms based on market capitalization, historical share price trends, and industry. Comparing companies of similar size allows me to control for any economies of scale that may come with market power. Furthermore, including historical share price trends, allows me to capture firms whose share price responds similarly to exogenous shocks in the market; thus, signaling similar exposure to market-level risk. Lastly, by restricting the matches to companies that operate within the same industry, I am able to control for any potential shocks—such as a crash in oil price—that may affect one industry more strongly than another.

With this measure of expected return in place, this paper seeks to accomplish three goals. First, this paper will analyze the short-term effects of an acquisition, defined as the period beginning two trading days prior to announcement and ending two trading days after announcement. Any share price movement during this window reflects the market's changing expectations as a result of the acquisition. Secondly, this paper analyzes the long-term effects of an acquisition to evaluate M&A as a strategy for improving long-term share price performance by measuring abnormal returns six months, one, two, and three-years after the

completion of the merger. This study will compare the announcement period effects to the long-term effects to determine whether the market is able to accurately predict the synergies of mergers. If the study yields evidence that the announcement of a merger shifts the acquiring company's share price in the same direction as the overall long-term performance of the firm, I conclude that the market efficiently predicts the synergies of mergers. Thirdly, I will analyze the determinants of cumulative abnormal return to see if particular characteristics of acquisitions lead to excess returns.

III. Data

This study utilizes the Bloomberg Database for Mergers & Acquisitions to consider all major United States acquisitions that occurred between 2000-2014 and meet certain criteria: (1) The acquirer is publically traded, (2) The deals were successfully completed, (3) Share price information is available throughout the three-year period of interest, (4) The price of the target company was at least $50 million, and (5) The acquirer had not participated in another merger in the three years prior to the completion date or within three years after the completion date. I use publically traded firms to guarantee that there is observable data to measure the impact of the acquisition on the acquirer share price. I choose to focus on large acquisitions valued at $50 million or more to ensure that the deal warranted a significant market reaction. Lastly, I drop any acquiring firm that completed an acquisition within three years of the event date to guarantee that the observed abnormal return is due to the acquisition of interest. With these filters in place, I am left with 898 acquiring firms.

In order to analyze the performance of these firms over time, I used the Bloomberg Terminal's Equity Screening Function to download daily share price information for each of the

firms between January 1, 2000 and October 31, 2017. This screener also allows me to compile each company's industry characterization, market capitalization, and day that the acquisition was first announced.

To create an appropriate control group, I begin by using the Bloomberg Equity Screener to gather a list of all publically traded companies on the New York Stock Exchange. Since the 95% of the firms in my acquisition database have market capitalizations between $12-$650 million, I used the Bloomberg Equity screener to select the publically traded firms whose market cap falls in within that range. Next, I compare my list of the publically traded companies with my compiled dataset of acquiring firms, and delete any repeated observations. To ensure that none of the firms in my control group had completed an acquisition just smaller than the $50 million cut off, I use the Bloomberg Database for Mergers & Acquisitions to generate a list of acquisitions that were completed for an overall value of $40-$49.9 million dollars between 2000-2014. I then compare this new list of slightly smaller acquisitions to my control dataset and delete any repeated observations. Lastly, in order to create accurate comparisons throughout the period of interest, I drop any firm whose shares are not traded throughout the period of interest. With these parameters in place, I am left with 2,294 potential control firms.

Using Abadie (2010) synthetic control method, I then match each acquiring firm with a weighted basket of control firms that most accurately mirror the acquiring firm's industry, market cap, and exposure to macroeconomic risk through historical share price trends. Of the 898 acquiring firms in my sample, I am able to create a statistically strong synthetic match for 713 of them. Summary statistics for these 713 firms are shown in *Table 1.* As illustrated in the table, cash is the preferred payment method for acquisitions—accounting for nearly 72% of all

deals in this dataset. I then break down the number of acquisitions by time period in *Table 2.* As expected, the number of acquisitions drops dramatically during the financial crisis period.

The synthetic control method uses weighted averages of the underlying firms' daily share prices to generate share prices for the synthetic match—both before and after the intervention. This output can then be used to compare the performance of an acquiring firm to its synthetic counterpart as illustrated in *Figure 1.* The vertical dotted line represents the completion date of the acquisition in question. As evident in the figure, the synthetic control method successfully creates a strong pairing in the pre-intervention period—allowing for researchers to more confidently draw conclusions about the effect of the intervention in the long term.

IV. Empirical Analysis

I begin my analysis by calculating the measure of abnormal return in accordance to the previous literature: $AR_{it} = R_{it} - E(R_{it})$. Where R_{it} is equal to the percent change in share price for the acquiring firm and $E(R_{it})$ is the percent change in share price for the synthetic firm. To minimize the impact of outliers, I drop both the highest and lowest 2.5% of the observations—leaving 677 firms in the sample. This measure of abnormal return allows me to both evaluate the market's prediction for the synergies of mergers during the announcement period and the returns on acquisitions in the long-term.

IV A. Determining the Market's Predictions on the Synergies of Mergers

As information is released announcing an acquisition, investors price the equity to reflect the new information. If the market expects for the acquisition to improve the long-term

performance of the firm, investors will bid up the price of the stock. Conversely, if investors are skeptical of the synergies of the merger, the ensuing sell-off will deflate share price.

In this study, I follow Ma et. al (2009) in defining the announcement period starting two trading days prior to the announcement of the acquisition and ending two trading days after announcement. This window reduces potential bias on abnormal returns, as it accounts for any shift in price due to information leakage before the acquisition is announced publically.

Cumulative abnormal return data during the announcement period are summarized in *Table 3*. While results differ by individual industry, this sample suggests that, on average, the market predicts that acquisitions will improve the long-term share price of a firm relative to its peers. My findings corroborate those of Ma et al. (2009) in that I observe positive abnormal returns in the days prior to the public announcement of the merger—suggesting that some investors trade on leaked information. Positive cumulative abnormal returns continue throughout the announcement window, with the largest value of 1.193% occurring on the announcement day itself.

Dudda and Jog (2009) argue that, due to their expertise in the field, financial firms enjoy lower costs in completing mergers and acquisitions; therefore, could experience especially high abnormal returns. To account for this theory, I calculate all abnormal returns both with and without financial firms in the sample. After excluding the financial firms, cumulative abnormal returns become marginally more positive, on average—suggesting that the market does not expect that the lower transaction costs enjoyed by financial firms will lead to higher abnormal returns.

To determine whether investors have changed the way that they perceive mergers and acquisitions as a result of the 2008 financial crisis, I break down announcement period cumulative abnormal returns by year in *Table 4.* Cumulative abnormal returns during the crisis period (2006-2009) are significantly smaller in magnitude than in the pre-crisis period, though they are still mostly positive. However, the negative cumulative abnormal return values both two days prior to announcement and two days post indicate increased uncertainty about the synergies of mergers during the crisis. This suggests that, while the market still viewed acquisitions as a signal of strength during the crash, its expectations were tempered by the overall health of the economy. Post-crisis cumulative abnormal returns are positive starting on the announcement day itself; however, do not reach their pre-crash levels. This pattern indicates that the collapse of the housing market bubble has made investors less optimistic about the effects of mergers and acquisitions on long-term performance.

Overall, the cumulative abnormal return data in this sample suggests that equity investors expect acquisitions to improve the long-term performance of the acquiring firm compared to its peers. In the following section, I analyze long-term cumulative abnormal returns to assess both the market's predictive ability and the effectiveness of acquisitions as a strategy for improving acquirer share price.

IV B. Evaluating Mergers and Acquisitions as a Long-Term Strategy

To evaluate acquisitions as a strategy for growth, I focus on the effect of that merger on the long-term share price of the acquiring firm. In my analysis, I determine how the acquiring firm outperforms (or underperforms) its synthetic counterpart over time by measuring cumulative abnormal returns at four different cross-sections during the period of interest: six

months, one year, two years, and three years after the completion date. The results are summarized in *Table 5*.

At first glance, it seems that mergers negatively impact acquirer share price in the long term; however, a closer examination of the industry-level data shows us that the two-year and three-year cumulative abnormal returns for firms in the financial industry are negative on a magnitude of nearly eight times the average in any other industry. If we exclude these financial firms from the sample, cumulative abnormal returns become positive in all four periods. Furthermore, this sample suggests that the benefits of acquisitions persist over time—as cumulative abnormal returns increase year over year.

To see how the effects of acquisitions have changed as a result of the financial crisis, I break down cumulative abnormal returns by year in *Table 6*. When I exclude financial firms in the pre-crash periods (2000-2005), which account for a disproportionate portion of the negative returns in the sample, I find that acquisitions yield small positive abnormal returns six months, two years, and three years after completion. At the one year mark, cumulative abnormal returns are -0.004%; however, this difference is not economically different from zero. During both the crisis period (2006-2009) and the post crisis period (2010-2014) cumulative abnormal returns are slightly positive and increase over time. Eliminating financial firms from the sample does not significantly affect the results in these time periods. I find that acquisitions in the post-crisis period tend to lead to slightly larger cumulative abnormal returns than in any other eras. When analyzing these results, it is important to note that the findings may be positively biased because, when compiling the data, I drop any acquiring firm whose shares ceased to be traded during the period of interest. It is possible that bad acquisitions cause the

firm to go into bankruptcy and therefore drop out of the dataset—leading to inflated cumulative abnormal returns. However, it seems unlikely that a bad acquisition would have such drastic implications on a company's stock performance without a large number of moderately bad acquisitions driving the overall average into the negatives.

Since the compiled data focus on large acquisitions, I break down the results by value of acquisition in *Table 7* in order to determine if there are any noticeable size-effects on cumulative abnormal returns. For this analysis, I split the acquisitions into rough thirds—the smallest third valued at $120 million or less, the middle third $120-$400 million, and the largest third $400+ million. Overall, this breakdown supports the previous findings. In the short term, all three groups yield positive abnormal returns throughout the announcement window—including during the days prior to the public announcement of the acquisition. In the long-term, cumulative abnormal returns are positive and increasing over time for all three sizes. Interestingly, the magnitude of cumulative abnormal return decreases as the value of the acquisition increases—suggesting that there are diminishing returns to the benefits acquisitions and that some firms overpay for their investment.

Measures of cumulative abnormal return reveal two important patterns in the long-term post-acquisition performance of a firm. First acquisitions are successful in generating abnormal returns for the acquiring firm; however, the benefits are economically small. Second, I find that benefits of these acquisitions continue to pay dividends over time—cumulative abnormal returns increase consistently over the period of interest. Comparing these long-term effects to announcement period changes described in the previous section, suggests that the market accurately accounts for the long-term increase in firm performance at the time that the

acquisition is announced. However, I find that investors' increased skepticism of the synergies of mergers and acquisitions in light of the 2008 financial crisis are unfounded, as modern acquisitions lead to the largest increases in a firm's long-term performance.

While my findings to this point show that using the synthetic control methodology yields substantially different results than the control groups utilized in previous literature, it is possible that these differences are driven by the fact that this study focuses on a modern, previously unstudied time period. To account for this possibility, I use my dataset to calculate abnormal returns through both the reference portfolio method, as presented by Asquith (1983) and the Fama-French Model, as used in Dube and Glasscock (2006). Since the synthetic control method is merely an improved derivation of the control-firm approach, I do not find it necessary to use a traditional control-firm approach in this exercise. The results are summarized in *Table 8*.

This process illustrates two important contributions of this paper. First, the findings for both the reference portfolio and the Fama-French model differ from previous literature, as they each suggest that acquisitions lead to positive cumulative abnormal returns in the long term. These results imply that the nature of returns to mergers and acquisitions have improved over time; modern acquisitions lead to larger returns than their previous counterparts. However, In the short-term, I find that the Fama-French Model mirrors the previous literature, as it yields statistically insignificant negative abnormal returns in the short-term. Secondly, this breakdown demonstrates the importance of methodology in examining M&A related outcomes. While all three approaches have some similarity in that they yield positive cumulative abnormal returns in the long run, the magnitudes of those returns differ greatly depending upon the approach. In

fact, the positive values for the difference between the synthetic control method and each of the other approaches suggest that returns from mergers and acquisitions are larger than previously believed—both in the short term and the long term. Since these magnitudes contribute to any analysis of potential determinants of cumulative abnormal return, and since the synthetic control method improves upon the reference portfolio approach by controlling for the new listing and rebalancing biases, the Fama-French model by including an industry specification, and the control firm approach by minimizing idiosyncratic differences between firms, I elect to use only the synthetic control method for the remainder of the paper.

IV C. Determinants of Short-Term Cumulative Abnormal Return

To analyze the characteristics that make an acquisition more successful, I first estimate an OLS regression of cumulative abnormal returns on a series of acquisition characteristics. I include *lnmarketcap* and *lnvalue* to determine whether the size of the acquiring firm or the value of the acquisition itself respectively impact returns. To determine how much the acquiring firm has stretched itself financially to complete the acquisition, I use a ratio of the value of the acquisition to the acquirer market cap. I label this ratio *valuemarketcap.* I also include a series of dummies to determine whether the industry or method of payment impact long-term returns. *Table 9* provides definitions and descriptive statistics for the important variables.

Initial results, summarized in column (1) of *Table 10,* emphasize the importance of both size of the acquisition and method of payment in generating short-term cumulative abnormal returns. The coefficients on both *lnvalue* and *valuemarketcap* are negative and statistically significant. These values suggest that the market is increasingly more skeptical of acquiring

firms who pay a higher price for the target firm—both in terms of raw asking price and in terms of a percentage of their overall market capitalization. When it comes to method of payment, the initial regression results indicate that all-stock acquisitions yield highest cumulative abnormal return. Next, to determine whether particular industries typically produce larger returns, I examine the coefficients on each individual industry dummy and find that, the market tends to be pessimistic about financial firms around the announcement of an acquisition, as each of the industry dummies is positive and statistically significant in comparison to the excluded financial industry.

Next, I run a year fixed-effects regression to determine whether investors were more optimistic about acquisitions in particular years—leading to larger announcement window cumulative abnormal returns in those years. The results are summarized in column two of *Table 10.* The largest returns are observed in 2000 before giving way to negative returns in 2001 as a result of a pessimistic macro-economic outlook following the dot-com bubble burst. Interestingly I do not observe a similar downturn as a result of the most recent financial crisis. In fact, 2007, 2008, and 2009 all yield statistically significant positive abnormal returns in comparison to the excluded year: 2014. These findings suggest that the market perceived acquisitions as a signal of strength during the most-recent downturn. The sign and significance of the acquisition characteristic variables remain the same as in the previous OLS regression.

To analyze whether acquisition characteristics affect short-term returns differently over time, I run the fixed-effects regression from column (2) on subsamples of firms broken up by time period. The results are summarized in *Table 11*. In the pre-crisis period between 2000-2005, each of the major independent variables acts in accordance to the overall average. Smaller, less risky

acquisitions lead to larger abnormal returns, as the coefficients on *lnvalue* and *valuemarketcap* remain negative, and stock acquisitions remain the most successful method of payment. However, during the crisis, the market responds more favorably to acquisitions from large firms and switches their preference to all-cash deals. Furthermore, the coefficients on the industry dummies increase in magnitude during the crisis—suggesting that investors are particularly weary of financial firms during this tumultuous time period. In the years after the crisis, 2010-2014, the market seems to bid up the price of acquiring firms in block-buster deals, as the coefficient on *lnvalue* becomes positive and statistically significant. While investors warm up slightly to financial firms after the crisis, announcement window cumulative abnormal returns do not revert back to their pre-crisis levels for the industry.

IV C. Determinants of Long-Term Cumulative Abnormal Return

I make one small adjustment to the regressions that I use to model short-term determinants in order to measure the extent to which the market behavior surrounding the announcement of an acquisition predicts long-term abnormal returns: I include a variable for *Announcement Window CAR*. The results are summarized in *Table 12*.

Overall, the average determinants of long-term cumulative abnormal return mirror the short-term determinates. The size variables, *lnmarketcap lnvalue* and *valuemarketcap*, are all negative and statistically significant—suggesting that the market's cynicism of large acquisitions is justified. Furthermore, similar to the announcement window, all-stock deals yield the largest abnormal returns in the long-term. The *announcement window car* variable supports my previous claim that the market is able to predict the synergies of M&A, as it is statistically significant and positively correlated with long-term returns; however, the magnitude of this effect is quite small,

as a 100% increase in short-term abnormal return yields only a 0.002 percent increase in long-term returns. The coefficients for the industry dummies in column (1) suggest that arbitrage opportunities still exist in long-term investments, as the market's overall skepticism of the financial firms is not representative of long-term performance in the industry.

Including a fixed effects specification, as shown in column (2), does not change the direction or significance of the acquisition characteristic variables on long-term abnormal returns. However, year-fixed effects illustrate the fact that 2008 and 2009 yield two of the smallest returns in the dataset—suggesting that, contrary to the market's prediction, the financial crisis did, in fact, diminish acquisition-related returns.

I mirror my analysis of the determinants of short-term abnormal returns by running the fixed effects regression from column (2) on subsamples of firms broken up by time period to study how the determinants may change over time. The results are summarized in *Table 13*. Similar to the short-term determinants, acquisition characteristics act in accordance to their overall averages in the pre-crisis period. During the crisis, however, the findings suggest that the market's predictive power was diminished. For example, contrary to the short-term analysis, companies who pursued deals that represented a more significant portion of their overall market cap enjoyed larger cumulative abnormal returns—suggesting that risk-taking behavior was rewarded between 2006-2009. Furthermore, despite investor's skepticism at the time of announcement, the data suggest that mergers in the financial sector yield the second largest long-term returns. Moreover, while the short-term determinants suggest that an all-cash deal signals strength to investors, all-stock acquisitions continued to yield the most lucrative abnormal returns during this time period. Lastly, while the *announcement window car* variable remains

positive and significant, its magnitude decreases substantially during the crisis—suggesting that the market's prediction is less correlated with long-term performance.

After the crisis, the determinants of cumulative abnormal return seem to revert back toward their mean—smaller firms tend to enjoy marginally better returns over time, stock acquisitions outpace other payment methods, and positive abnormal returns in the announcement period are correlated with long term performance. However, the results suggest that there is one significant exception: *valuemarketcap*. The positive coefficient in the post-crisis period suggests that companies have become more confident in the benefits of acquisitions; therefore, are more likely to pursue highly levered deals.

While these regressions illustrate that measurable acquisition characteristics contribute to cumulative abnormal returns, the small coefficient values, paired with R-squared values of less than 20%, suggest that much of the variation in cumulative abnormal returns cannot be explained by this model. Intuitively some of the returns could be associated with factors such as public sentiment of the companies or the extent to which the acquisition is covered by a major news source. Nonetheless, this sample highlights some definitive trends in the determinants of cumulative abnormal returns over time.

V. Conclusions

This paper finds that the methodology used to predict expected returns greatly impacts observed cumulative abnormal returns surrounding acquisitions. Using Abadie et al's (2010) synthetic control method, this study examines the effect of mergers and acquisitions on acquirer share price in three ways. First, I highlight the market's response to the acquisition by measuring the cumulative abnormal return over the announcement window starting two

trading days prior to the announcement and ending two trading days post. I find that, on average, investors bid up the acquiring firm's share price to account for the expected benefits to long term performance. Secondly, I evaluate mergers and acquisitions as a vehicle to improve performance by measuring cumulative abnormal returns six months, one, two, and three years after completion. I find that acquisitions lead to positive abnormal returns in the long run, and that these returns continue to grow three years after completion. Lastly, I analyze the determinants of cumulative abnormal returns in acquisitions and find that the size of the acquisition and the method of payment impact the returns from a merger. But, more interestingly, my regression results support the idea that the market is, at least to some extent, accurate in predicting the synergies of mergers and acquisitions.

These findings have potential strategy implications for both corporations and individual investors. On the corporate side, the positive abnormal returns associated with acquisitions indicate that M&A is a viable strategy for firms looking retain a competitive edge in their respective industries and that pursuing all stock deals tend to yield larger returns. For investors, this paper seems to support the efficiency of the market in accounting for new information in the pricing of equities; however, there are still arbitrage opportunities related to acquisitions.

In trying to model the determinants of cumulative abnormal return, I find that the measurable characteristics of acquisitions account for only a portion of the variance in abnormal returns. Share price may be influenced by a host of outside influences that may motivate future studies.

References

Abadie, Alberto, Alexis Diamond, and Jens Hainmueller. 2010. "Synthetic Control Methods for Comparative Case Studies: Estimating the Effect of California's Tobacco Control Program." *Journal of the American Statistical Association* 105(490): 493-505.

Agrawal, Anup, Jeffrey F. Jaffe, and Gershon N. Mandelker, 1992, The post-merger performance of acquiring firms: A re-examination of an anomaly, Journal of Finance 47, 1605-1622.

Andre, P., Kooli, M., L'Her, J., 2004. The long-run performance of mergers and acquisitions: Evidence from the Canadian stock market. Financial Management, Winter, 27–43.

Asquith, P., Bruner, R., Mullins, D., 1983. The gains to bidding firms from merger. Journal of Financial
Economics 11, 121–139.

Barber, B.M., Lyon, J.D., 1997. Detecting long-run abnormal stock returns: the empirical power and specification of test statistics. Journal of Financial. Econ. 43, 341–372.

Bradley, M., Desai, A., Kim, E.H., 1988. Synergistic gains from corporate acquisitions and their division
between the stockholders of target and acquiring firms. Journal of Financial Economics 21, 3–40.

Campa, J.M., Hernando, I., 2004. Shareholder value creation in European M&As. Eur. Finan. Manage. 10 (1), 47–81.

Cartwright S. and Schoenberg R., 2006 "Thirty Years of Merger and Acquisition Research," British Journal of Management (17).

Chung, K. S., and Weston J. F., 1985, "Model Created Bias in Residual Analysis of Mergers" University of California, Los Angeles, Graduate School of Management.

Dickerson, A., Gibson, H., Tsakalotos, E., 1997. The Impact of Acquisitions on Company Performance: Evidence from a Large Panel of UK Firms. Oxford Economic Papers 49 (3), 344–361.

Dodd, P., 1980. Merger proposals, management discretion and stockholder wealth. J. Finan. Econ. 8, 105–137.

Dodd, Peter, and Richard Ruback, 1977, Tender offers and stockholder returns: An empirical analysis, Journal of Financial Economics 5, 351-373.

Dube, S., Glascock, J.L., 2006. Effects of the method of payment and the mode of acquisition on performance and risk metrics. International Journal of Managerial Finance 2, 176–195.

Dutta, Shantanu, and Vijay Jog. "The Long Term Performance of Acquiring Firms: The Re-examination of an Anomaly." Journal of Banking & Finance 33 (2009): n. pag. Web.

Eckbo, B.E., Maksimovic, Y., Williams, J., 1990. Consistent estimation of cross sectional models in event studies. Review of Financial Studies 3,

Eger, C.E., 1983, "An Empirical Test of the Redistribution Effect in Pure Exchange Mergers" Journal of Financial and Quantitative Analysis, 547-572.

Fama, E.F., French, K., 1993. Common risk-factors in the returns on stocks and bonds. Journal of Financial Economics 33, 3–56.

Franks, Julian, Robert Harris, and Sheridan Titman, 1991, The post-merger share-price performance of acquiring firms, Journal of Financial Economics 29, 81-96.

Fuller, K., Netter, J., Stegemoller, M., 2002. What do returns to acquiring firms tell us? Evidence from firms that make many acquisitions. The Journal of Finance 57

Hackbarth, D., and Morellec E. 2008, "Stock Returns in Mergers and Acquisitions", Journal of Finance 63, 1213-1252.

Huang, Yen-Sheng, and Ralph Walking. "Target Abnormal Returns Associated with Acquisition Announcements." Journal of Financial Economics 19 (1987): n. pag. Web.

Jarrell, G. A. 1983. "Do Acquirers Benefit from Corporate Acquisition," Chicago: University of Chicago, Center for the Study of Economy and State.

Jensen, Michael C., and Richard S. Ruback, 1983, The market for corporate control, Journal of Financial Economics 11, 5-50.

King D.R., D.R. Dalton, C.M. Daily, and J.G. Covin 2004, "Metta-Analyses of Post-Acquisition Performance", Strategic Management Journal, 25(2), 187-200.

Kummer, D., Hoffmeister, R., 1978. Valuation consequences of cash tender offers. Journal of Finance 33 (2), 505–516.

Kusewitt, J. B. (1985), An exploratory study of strategic acquisition factors relating to performance. Strat. Mgmt. J., 6: 151–169.

Langetieg, Terence C., 1978, An application of a three-factor performance index to measure stockholder gains from merger, Journal of Financial Economics 6, 365-384.

Limmack, R.J., 1991, “Corporate Mergers and Shareholder Wealth Effects: 1977-86,” Accounting and Business Research, 21(83), 239-251.

Lo A. W., 2004, “The Adaptive Market Hypothesis: Market Efficiency from and Evolutionary Perspective”, Journal of Portfolio Management (30) 15-29.

Loughran, T., Vijh, A.M., 1997. Do long-term shareholders benefit from corporate acquisitions? J. Finan. 52, 1765–1790.

“M&A US - Mergers & Acquisitions in the United States.” IMAA-Institute, imaa-institute.org/m-and-a-us-united-states/#m-and-a-history.

Ma, Jianyu, José Pagán, and Yun Chu. "Abnormal Returns to Mergers and Acquisitions in Ten Asian Markets." International Journal of Business 14.3 (2009): n. pag. Web.

Malatesta, P., 1983. The wealth effect of merger activity and the objective function of merging firms.
Journal of Financial Economics 11, 155–182.

Martynova, M., Renneboog, L., 2008. A century of corporate takeovers: What have we learned and where do we stand? Journal of Banking and Finance 32,

McWilliams, A., and D. Siegal, 1997 “Event Studies in Management Research: Theoretical and Empirical Issues,” The Academy of Management Journal, 40(3), 626-657.

Meeks, G., 1977. Disappointing Marriage: A Study of the Gains From Merger. Cambridge University Press, Cambridge.

Mitchell, M., Stafford, E., 2000. Managerial decisions and long-term stock price performance. J. Bus. 73, 287–329.

Moeller, S.B., Schlingemann, F.P., Stulz, R.M., 2004 “Firm Size and the Gains from Acquisitions”, Journal of Financial Economics (73) 201-228.

Moeller, S.B., Schlingemann, F.P., Stulz, R.M., 2005. Wealth destruction on a massive scale? A study of acquiring-firm returns in the recent merger wave. Journal of Finance 60 (2), 757–782.

Morck, R., Shleifer, A., Vishny, R., 1990. Do managerial objectives drive bad acquisitions? J. Finan. 45 (1), 31–48.

Mueller, D.C., 1985. Mergers and market share. Rev. Econ. Statist. 67 (2), 259–267.

Mulherin, J.H., Boone, A.L., 2000. Comparing acquisitions and divestitures. J. Corporate Finan. 6, 117–139.

“New York Stock Exchange (NYSE) - FXCM.” FXCM Insights, 22 Aug. 2017, www.fxcm.com/insights/new-york-stock-exchange-nyse/.

Papadopoulos, Dimitrios & N. Subeniotis, Demetres & Tampakoudis, Ioannis. (2017). The Wealth Effects of Mergers and Acquisitions to Target Companies in USA for the Period 1920-2000: A Critical Examination of Related Empirical Studies. University of Piraes.

Ravenscraft, D.J., Scherer, F.M., 1987. Mergers, Sell-offs and Economic Efficiency. The Brookings Institution, Washington, DC.

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

Roll, R., 1986. The hubris hypothesis of corporate takeovers. Journal of Business 59, 197–216.

Servaes, H., 1991. Tobin’s Q and the gains from takeovers. J. Finan. 46 (1), 409–419.

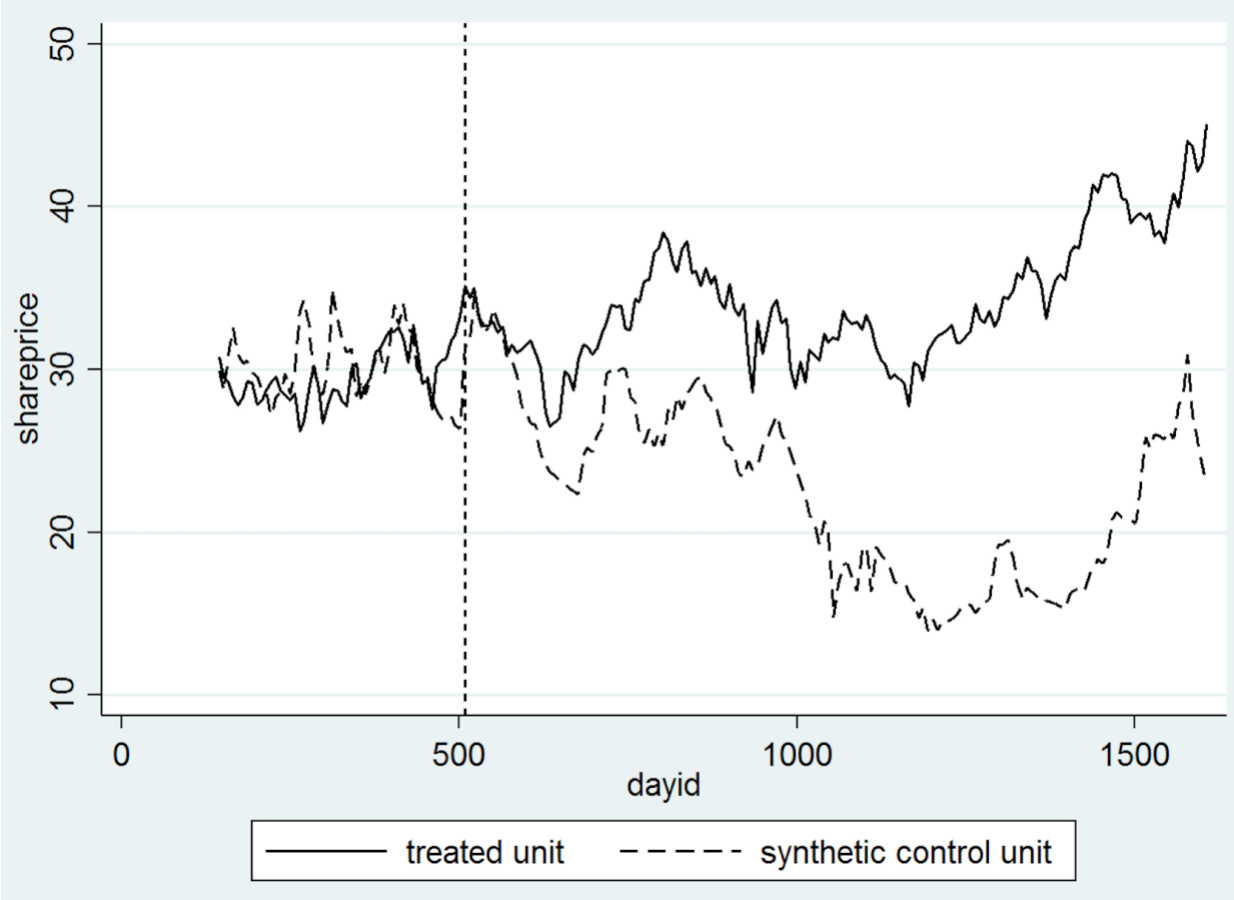
Sudarsanam, S., P. Holl, and A. Salami, 1996, “Shareholder Wealth Gains in Mergers: Effect of Synergy and Ownership Structure,” Journal of Business Finance and Accounting, 23(5), 673-698.

Tiemann, Daniel. “ M&A Experts Weigh in on Deals for 2017.” KPMG M&A Pulse, KPMG, info.kpmg.us/ma-survey 2017.html?gclid=Cj0KCQiA6enQBRDUARIsAGs1YQib7Wb13qXD0enpeaGBIRT7VDAQB22dmDoYug7rdFJ6b526AuEUvvAaAt18EALw_wcB.

Weston, J. F. and Mansinghka, S. K. (1971), TESTS OF THE EFFICIENCY PERFORMANCE OF CONGLOMERATE FIRMS. The Journal of Finance, 26: 919–936.

Wong, Anson, and Kui Yeng Cheung. "The Effects of Merger and Acquisition Announcements on Security Pricing of Bidding Firms and Target Firms in Asia." International Journal of Economics and Finance 1.2 (2009): n. pag. Web.

Figure 1: Treated vs. Synthetic Firm Share Price



*Note: The treated firm illustrated in the figure is in the consumer cyclical industry. Completion date in figure is May 15, 2001

Table 1: Summary Statistics by Industry

Acquiring Firms					
Industry	Number of Firms	Mean Market Cap (in Millions)	Number of Stock	Number of Cash	Number of Combined
Basic Materials	34	18,232	7	24	3
Communications	98	21,605	23	61	14
Consumer, Cyclical	61	6,866	10	47	4
Consumer, Non-Cyclical	138	23,464	19	108	11
Energy	62	204,062	15	36	11
Financial	118	56,870	29	70	19
Industrial	103	30,700	8	88	7
Technology	89	114,338	12	68	9
Utilities	10	10,262	1	9	0
Total	713	54,508	124	511	78

Control Firms					
Industry	Number of Firms	Mean Market Cap	Number of Stock	Number of Cash	Number of Mixed
Basic Materials	178	14,660	-	-	-
Communications	217	5,824	-	-	-
Consumer, Cyclical	312	7,800	-	-	-
Consumer, Non-Cyclical	414	23,254	-	-	-
Energy	143	194,602	-	-	-
Financial	462	43,264	-	-	-
Industrial	294	30,895	-	-	-
Technology	226	186,254	-	-	-
Utilities	41	11,864	-	-	-
Total	2287	42,862	-	-	-

*Note: Table presents summary statistics for both the acquisition and control groups. Acquisition group summary statistics represent only the 713 firms that were successfully matched with a synthetic counterpart. Number of Stock, Cash, and Combined refer to the number of acquisitions using that type of payment method

Table 2 : Summary Statistics of Acquiring Firms by Industry and Year

	2000-2005		2006-2009		2010-2014	
Industry	Number of Firms	Market Cap (in Millions)	Number of Firms	Market Cap (in Millions)	Number of Firms	Market Cap (in Millions)
Basic Materials	11	4,185	10	22,620	14	26,454
Communications	57	23,592	21	10,873	20	27,527
Consumer, Cyclical	27	4,323	16	6,990	19	10,456
Consumer, Non-Cyclical	60	26,917	31	19,005	47	22,071
Energy	29	29,820	11	14,763	20	65,575
Financial	57	13,706	28	87,701	33	106,306
Industrial	35	14,223	30	14,645	38	56,654
Technology	35	93,353	25	192,986	29	70,153
Utilities	7	7,559	0	0	3	16,447
Total	318	26,885	172	52,453	223	50,101

*Note: Table presents summary statistics for the 713 firms that were successfully matched with a synthetic counterpart broken down by year. Summary Statistics for the full period can be found in *Table 1*.

Table 3: Announcement Effect Cumulative Abnormal Returns by Industry

Industry	Two Days Prior	One Day Prior	Announce Day	One Day Post	Two Days Post
Basic Materials	-0.412	-0.716	-0.692	-0.241	0.525
Communications	0.391	0.849	1.057	1.145	1.239
Consumer, Cyclical	0.676	0.803	0.31	0.322	0.494
Consumer, Non-Cyclical	0.705	0.872	1.19	1.557	0.785
Energy	-0.372	-0.58	0.531	0.995	-0.015
Financial	0.171	0.03	-0.535	-0.242	0.246
Industrial	0.225	0.488	0.189	-0.265	0.078
Technology	0.271	0.712	0.96	1.16	1.203
Utilities	-0.284	-0.569	-0.317	-0.055	-0.345
Total	**0.515**	**0.999**	**1.193**	**1.034**	**0.756**
Total Excluding Financial Firms	0.576	1.173	1.382	1.188	0.894

*Note: Table presents daily cumulative abnormal returns during the announcement window-- defined as the period of time beginning to days prior to the announcement of an acquisition and ending two days after the announcement.

Table 4: Announcement Effect Cumulative Abnormal Returns by Industry and Year

	2000-2005				
Industry	Two Days Prior	One Day Prior	Announce Day	One Day Post	Two Days Post
Basic Materials	-0.232	-0.493	-0.275	0.203	1.065
Communications	0.563	1.061	1.381	1.488	0.793
Consumer, Cyclical	0.453	0.73	0.491	0.588	0.956
Consumer, Non-Cyclical	0.0127	0.2917	0.495	0.775	0.852
Energy	-0.229	-0.54	-1.351	-0.781	0.155
Financial	0.645	0.651	0.597	0.992	0.832
Industrial	0.203	0.328	0.076	-0.077	0.097
Technology	0.254	0.559	1.735	1.614	0.213
Utilities	-0.245	-0.864	-0.793	-0.221	-0.27
Total	**0.171**	**1.15**	**1.767**	**1.002**	**0.989**
Total Excluding Financial Firms	0.289	1.453	1.991	1.292	1.309
	2006-2009				
	Two Days Prior	One Day Prior	Announce Day	One Day Post	Two Days Post
Basic Materials	0.029	0.074	-0.07	-0.042	0.368
Communications	0.033	0.121	0.756	0.625	-0.04
Consumer, Cyclical	-0.069	0.065	0.234	0.497	0.638
Consumer, Non-Cyclical	-0.373	-0.312	0.139	-0.03	-0.525
Energy	-0.625	-0.747	0.709	0.332	-0.785
Financial	-0.108	-0.199	-1.08	-1.303	-0.976
Industrial	0.926	1.172	0.261	-0.168	0.58
Technology	0.977	1.456	0.38	0.222	0.242
Utilities	-	-	-	-	-
Total	**-0.034**	**0.089**	**0.254**	**0.083**	**-0.174**
Total Excluding Financial Firms	0.169	0.343	0.736	0.558	-0.03
	2010-2014				
	Two Days Prior	One Day Prior	Announce Day	One Day Post	Two Days Post
Basic Materials	-0.949	-1.578	-1.01	-0.276	-0.036
Communications	0.304	0.996	0.451	0.789	1.134
Consumer, Cyclical	-0.12	-0.232	0.072	0.436	0.316
Consumer, Non-Cyclical	-0.042	0.306	0.349	1.061	1.839
Energy	-0.173	-0.202	0.047	0.663	0.785
Financial	0.344	-0.235	-1.999	-2.221	-0.683
Industrial	-0.273	-0.777	-0.671	-0.514	-0.331
Technology	-0.259	0.038	0.469	0.742	1.426
Utilities	-0.324	-0.276	0.159	0.113	-0.42
Total	**-0.133**	**-0.156**	**0.214**	**0.723**	**0.803**
Total Excluding Financial Firms	-0.183	-0.139	0.479	1.061	0.966

*Note: Table presents daily cumulative abnormal returns during the announcement window-- defined as the period of time beginning to days prior to the announcement of an acquisition and ending two days after the announcement broken down by year.

Table 5: Long Term Cumulative Abnormal Returns by Industry

Industry	Six Months	One year	Two Year	Three Year
Basic Materials	0.0632	0.0766	0.2005	0.2402
Communications	-0.0211	-0.0063	0.4915	1.8975
Consumer, Cyclical	0.0026	0.045	0.083	0.2947
Consumer, Non-Cyclical	0.0703	0.1185	0.2271	0.3439
Energy	-0.0398	-0.1105	-0.1995	-0.2718
Financial	-0.5176	-0.7271	-4.5964	-4.9994
Industrial	-0.0135	0.0749	0.1948	0.3397
Technology	0.0619	0.0821	0.2978	0.5268
Utilities	0.103	0.2322	0.2658	0.3596
Total	**-0.0671**	**-0.0754**	**-0.5798**	**-0.3613**
Total Excluding Financial Firms	0.022	0.053	0.213	0.545

*Note: Table presents long term cumulative abnormal returns broken down by industry at four different cross sections: six months, one year, two years, and three years after the completion of an acquisition.

Table 6: Long Term Cumulative Abnormal Returns by Industry and Year

	2000-2005			
Industry	Six Months	One year	Two Year	Three Year
Basic Materials	0.242	0.265	0.421	0.362
Communications	-0.079	-0.097	0.656	2.791
Consumer, Cyclical	0.037	0.031	0.045	0.091
Consumer, Non-Cyclical	0.097	0.157	0.302	0.402
Energy	-0.132	-0.289	-0.481	-0.553
Financial	-1.161	-1.586	-9.602	-9.708
Industrial	-0.029	-0.08	-0.001	0.517
Technology	0.071	0.007	0.258	0.323
Utilities	0.106	0.31	0.312	0.522
Total	**-0.197**	**-0.286**	**-1.53**	**-1.1**
Total Excluding Financial Firms	0.13	-0.004	0.225	0.781
	2006-2009			
	Six Months	One year	Two Year	Three Year
Basic Materials	-0.207	-0.091	0.065	0.044
Communications	0.023	0.058	0.329	0.521
Consumer, Cyclical	-0.039	0.151	0.239	0.572
Consumer, Non-Cyclical	-0.061	-0.002	0.064	0.272
Energy	0.014	0.245	0.239	0.139
Financial	0.106	0.029	-0.056	0.021
Industrial	0.021	0.144	0.081	-0.155
Technology	-0.016	0.054	0.271	0.729
Utilities	-	-	-	-
Total	**-0.001**	**0.071**	**0.13**	**0.249**
Total Excluding Financial Firms	-0.021	0.079	0.165	0.291
	2010-2014			
	Six Months	One year	Two Year	Three Year
Basic Materials	0.096	0.037	0.115	0.276
Communications	0.097	0.185	0.194	0.387
Consumer, Cyclical	-0.013	-0.018	0.016	0.379
Consumer, Non-Cyclical	0.122	0.149	0.239	0.309
Energy	0.059	-0.082	-0.077	-0.097
Financial	0.066	0.115	0.197	0.314
Industrial	-0.026	0.163	0.465	0.609
Technology	0.118	0.196	0.369	0.622
Utilities		0.097	0.051	0.159
Total	**0.067**	**0.112**	**0.228**	**0.371**
Total Excluding Financial Firms	0.067	0.112	0.233	0.381

*Note: Table presents long term cumulative abnormal returns broken down by industry at four different cross sections: six months, one year, two year, and three year after the completion of an acquisition.

Table 7: Cumulative Abnormal Returns by Value of Acquisition

	Short Term Cumulative Abnormal Returns		
Time Period	$120 Million or Less	$120-$400 Million	$400 Million or More
Two Days Prior	1.27	0.095	0.086
One Day Prior	0.709	0.747	0.019
Announce Day	0.879	0.516	0.706
One Day Post	0.081	1.377	0.809
Two Days Post	0.103	0.276	0.077
	Long Term Cumulative Abnormal Returns		
Time Period	$120 Million or Less	$120-$400 Million	$400 Million or More
Six Month	-0.004	0.159	-0.048
One Year	0.066	0.164	-0.038
Two year	0.476	0.215	0.083
Three Year	1.579	0.402	0.212
Total	**0.282**	**0.201**	**0.0438**
Number of Firms	136	119	130

*Note: Table breaks down the existing data by overall value of the acquisition to examine any size-effects on cumulative abnormal returns. Value groups were selected to create the most parody in the number of firms per group.

Table 8: Differences in Cumulative Abnormal Return by Control Group

	Short Term Cumulative Abnormal Returns				
	(1)	**(2)**	**(3)**	**(1-2)**	**(1-3)**
Time Period	Sythetic Control	Reference Portfolio	Fama French	Synth v. Ref	Synth v. FF
Two Days Prior	0.515	0.001	-0.074	0.514	0.589
One Day Prior	0.999	0.002	-0.084	0.997	1.083
Announce Day	1.193	0.004	-0.219	1.189	1.412
One Day Post	1.034	0.01	-0.134	1.024	1.168
Two Days Post	0.756	0.011	-0.055	0.745	0.811
Average Difference				0.894	1.013
	Long-Term Cumulative Abnormal Return				
	(1)	**(2)**	**(3)**	**(1-2)**	**(1-3)**
Time Period	Sythetic Control	Reference Portfolio	Fama French	Synth v. Ref	Synth v. FF
Six Months	0.022	0.016	0.071	0.006	-0.049
One year	0.053	0.028	0.055***	0.025	-0.002
Two Year	0.213	0.133	0.187**	0.08	0.026
Three Year	0.545	0.093	0.222**	0.452	0.323
Average Difference				0.141	0.075

*Note: Table illustrates how cumulative abnormal return findings differ depending on the methodology used to calculate expected return. The fourth and fifth columns represent the difference in observed cumulative abnormal returns relative to the synthetic control method. A positive value in the fourth and fifth columns implies that the synthetic control method yields larger cumulative abnormal returns than the compared methodology. *denotes significance at the 10% level, ** at the 5% level, *** at the 1% level.

Table 9 : List of Included Variables and Descriptions

Variable	Description	Mean	Std Dev
ln(Market Cap)	Logarithm of the market cap of the acquiring firm	8.448	2.036
ln(Value)	Logarithm of total value of the acquisition	839	2,725
Valuemarketcap	Ratio of the total value of the acquisition to the acquiring firm market cap	24.41%	75.43%
Announcement Window CAR	Total cumulative abnormal return in the announcement window	0.053	2.191
Stock Dummy	Dummy that takes the value of one if the acquisition was paid for in all stock	-	-
Cash Dummy	Dummy that takes the value of one if the acquisition was paid for in all cash	-	-
Combined Dummy	Dummy that takes the value of one if the acquisition was paid with a combination of stock and cash	-	-

*Note: Table defines and provides basic descriptions for variables included in the determinants of cumulative abnormal return regressions. Stock, Cash, and Combined dummies have no mean and std. deviations because their values are only 0 and 1. Industry and year dummies are excluded from the table for simplicity.

Table 10: Determinants of Short-Term Cumulative Abnormal Return

	(1)		(2)	
Variable	Coefficient	Standard Errors	Coefficient	Standard Errors
lnmarketcap	-0.176***	0.01	-0.214***	0.011
lnvalue	-0.035**	0.016	-0.024	0.015
valuemarketcap	0.003***	0.001	0.003***	0.001
Stock dummy	0.686***	0.068	0.769***	0.068
Cash dummy	-0.426***	0.068	-0.232***	0.048
Basic Materials	2.703***	0.078	2.533***	0.079
Communications	1.959***	0.068	1.942***	0.067
Consumer Cyclical	3.407***	0.071	3.38***	0.071
Consumer Non-Cyclical	2.98***	0.058	2.942***	0.057
Energy	0.698***	0.077	0.956***	0.076
Industrial	3.302***	0.062	3.285***	0.0621
Technology	0.905***	0.067	0.873***	0.067
2000			3.339***	0.115
2001			-0.022	0.097
2002			0.806***	0.101
2003			2.035***	0.1
2004			1.051***	0.107
2005			0.023	0.109
2006			1.019***	0.106
2007			0.678***	0.105
2008			0.855***	0.099
2009			1.673***	0.124
2010			-1.238***	0.109
2011			1.029***	0.101
2012			0.508***	0.104
2013			1.867***	0.108
Observations	59,806		59,806	
R-Squared	0.1109		0.1093	

*Note: Table presents the results of an OLS regression. The dependent variable is announcement window cumulative abnormal return. *denotes significance at the 10% level, ** at the 5% level, *** at the 1% level. The year 2014 and the financial dummy are dropped for collinearity purposes. Day of the week effects are included in the model but have no significant effect. They are not shown in the table for simplicity.

Table 11: Determinants of Short Term Cumulative Abnormal Return by Year

	2000-2005		2006-2009		2010-2014	
Variable	Coefficient	Std Error	Coefficient	Std Error	Coefficient	Std Error
lnmarketcap	-0.275***	0.019	0.205***	0.023	-0.528***	0.018
lnvalue	-0.025	0.026	-0.368***	0.026	0.454***	0.029
valuemarketcap	-0.783***	0.032	-0.099	0.601	0.001***	0.001
Stock dummy	1.179***	0.097	-0.155	0.187	-0.126	0.272
Cash dummy	-0.141	0.075	0.882***	0.086	-1.525***	0.228
Basic Materials	0.651***	0.121	5.919***	0.135	3.656***	0.138
Communications	-0.356	0.095	6.924***	0.116	3.111***	0.135
Consumer Cyclical	0.472***	0.104	7.633***	0.129	5.889***	0.124
Consumer Non-Cyclical	1.456***	0.085	6.369***	0.098	4.077***	0.106
Energy	-1.403***	0.111	4.436***	0.158	2.833***	0.151
Industrial	1.012***	0.1	7.546**	0.104	5.388***	0.108
Technology	-3.362***	0.098	5.962***	0.112	5.195***	0.127
2000	2.897***	0.111				
2001	-0.666***	0.089				
2002	0.719***	0.095				
2003	1.673***	0.092				
2004	1.394***	0.101				
2005						
2006			-0.195**	0.0969		
2007			-1.166***	0.0957		
2008			-0.874***	0.0951		
2009						
2010					-1.493***	0.105
2011					1.712***	0.097
2012					0.439***	0.099
2013					0.1962***	0.104
Observations	27,317		14,287		18,202	
R Squared	0.1147		0.2645		0.1483	

*Note: Table presents the results of an OLS regression. The dependent variable is announcement window cumulative abnormal return. *denotes significance at the 10% level, ** at the 5% level, *** at the 1% level. The financial dummy as well as the years 2005, 2009, and 2014 are dropped for collinearity purposes. Day of the week effects are included in the model but have no significant effect. They are not shown in the table for simplicity.

Table 12: Determinants of Long-Term Cumulative Abnormal Return

	(1)		(2)	
Variable	Coefficient	Standard Errors	Coefficient	Standard Errors
lnmarketcap	-0.078***	0.005	-0.088***	0.005
lnvalue	-0.023***	0.007	-0.002	0.007
valuemarketcap	-0.094***	0.009	-0.105***	0.009
Announcement Window CAR (in 100s)	0.002***	0.0004	0.001***	0.0004
Stock dummy	0.535***	0.038	0.621***	0.038
Cash dummy	0.102***	0.029	0.161***	0.029
Basic Materials	-0.029	0.081	-0.243***	0.082
Communications	0.348***	0.077	0.176**	0.079
Consumer Cyclical	-0.028	0.079	-0.168**	0.079
Consumer Non Cyclical	0.047	0.077	-0.114	0.078
Energy	-0.065	0.079	-0.207**	0.08
Industrial	0.071	0.077	-0.076	0.078
Technology	0.109	0.077	-0.011	0.078
2000			0.633***	0.051
2001			-0.415***	0.039
2002			-0.131***	0.041
2003			-0.188***	0.043
2004			-0.067	0.043
2005			-0.007	0.043
2006			0.236***	0.046
2007			-0.136***	0.045
2008			-0.135***	0.039
2009			-0.219***	0.051
2010			-0.018	0.046
2011			0.044	0.043
2012			0.046	0.043
2013			-0.051	0.045
Observations	59,806		59,806	
R-Squared	0.0206		0.0318	

*Note: Table presents the results of an OLS regression. The dependent variable is long-term cumulative abnormal return. *denotes significance at the 10% level, ** at the 5% level, *** at the 1% level. The year 2014 and the financial dummy are dropped for collinearity purposes. Day of the week effects are included in the model but have no significant effect. They are not shown in the table for simplicity.

Table 13: Determinants of Long-Term Cumulative Abnormal Return by Year

	2000-2005		2006-2009		2010-2014	
Variable	Coefficient	Std Error	Coefficient	Std Error	Coefficient	Std Error
lnmarketcap	-0.131***	0.011	0.023***	0.004	-0.009***	0.003
lnvalue	-0.051***	0.016	-0.044***	0.005	-0.001	0.004
valuemarketcap	-0.147***	0.015	0.312***	0.012	0.254***	0.019
Announce Window CAR (in 100s)	0.019**	0.0005	0.007***	0.0002	-0.001***	0.00007
Stock dummy	0.645***	0.056	0.264***	0.035	0.534***	0.023
Cash dummy	0.261***	0.043	-0.047***	0.021	0.069***	0.012
Basic Materials	-0.211	0.172	-0.472***	0.032	-0.122***	0.031
Communications	0.364**	0.161	-0.048***	0.027	-0.026	0.029
Consumer Cyclical	-0.244	0.163	-0.237***	0.029	0.0452	0.029
Consumer Non Cyclical	-0.138	0.159	-0.279***	0.025	0.176***	0.028
Energy	-0.325**	0.163	-0.062***	0.014	-0.019	0.031
Industrial	-0.252	0.161	-0.121**	0.026	0.305***	0.028
Technology	-0.138	0.16	0.111***	0.026	0.255***	0.028
2000	0.727***	0.073				
2001	-0.262***	0.058				
2002	0.011	0.057				
2003	-0.114**	0.062				
2004	0.056	0.061				
2005						
2006			0.319***	0.021		
2007			0.194***	0.019		
2008			0.085***	0.019		
2009						
2010					-0.071***	0.013
2011					-0.009*	0.011
2012					0.002*	0.011
2013					0.021**	0.012
Observations	27,317		14,287		18,202	
R Squared	0.0288		0.188		0.1588	

*Note: Table presents the results of an OLS regression. The dependent variable is long-term cumulative abnormal return. *denotes significance at the 10% level, ** at the 5% level, *** at the 1% level. The financial dummy as well as the years 2005, 2009, and 2014 are dropped for collinearity purposes. Day of the week effects are included in the model but have no significant effect. They are not shown in the table for simplicity.