When the parts are greater than the sum: An event study analysis of vertical, horizontal, and conglomerate mergers

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Abstract

I conduct an event study analysis on an initial sample of 223 mergers during a 3 year period (2011-2014) after the "Great Recession." I first use this to shed new light on merger characteristics and effects in the post-crisis period, and I then categorize my sample into vertical, horizontal, and conglomerate mergers and calculate the equity-wealth effects for each category. Comparison of the equity-wealth effects of each merger type produces little evidence in support of theories espousing the *relative* value-decreasing effects of corporate diversification, and no evidence in support of theories claiming *absolute* value-destruction. In terms of merger antecedent theories, comparison of vertical, horizontal, and conglomerate merger returns reveals evidence that may be consistent with both collusive and synergistic theories of value creation in mergers. Additional insights derived through the analysis of this paper include results which provide evidence that the equity-wealth effects of mergers have become significantly more positive in the most recent period, and that the traditional methods by which financial researchers classify mergers into types may need further reevaluation.

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I. Introduction and Motivation

The global financial crisis of 2007-2009 was an impetus for change across a wide range of social, economic, and financial platforms. Not only did the magnitude of the collapse famously cause market participants and pundits to question the very constructs upon which our financial system was formed, but it also generated an environment in which corporations themselves began to re-evaluate the way that they did business. From an academic perspective, this widespread transformation in corporate financial policy, behavior, and profits represents an opportunity to re-approach some of the most widely debated issues in financial economics with a new bevy of exogenous shocks, economic conditions, and refined methodologies at our disposal.

In line with capitalizing on the idiosyncrasies of our current time period, this paper provides evidence and insight on age-old financial theoretic debates by using a fresh approach. In particular, it uses an event study methodology and a comparison of the equity wealth effects of vertical, horizontal, and conglomerate mergers in order to provide answers to the following questions: How have the characteristics and value-effects of mergers changed in the post-crisis period? What is the value of corporate diversification in the post-crisis period? What are the explicit pathways for value-creation displayed by mergers occurring after the crisis?

Ultimately, categorical event study analysis of 223 mergers during the post-crisis period, from 2011 to 2014, yields several key findings. First, it yields little evidence in support of theories espousing the *relative* value-decreasing effects of corporate diversification, and certainly no evidence of *absolute* value-destruction. Next, in terms of merger antecedent theories, comparison of vertical, horizontal, and conglomerate merger returns reveals evidence that may be consistent with both collusion and synergy being drivers of value-creation in mergers. The results also provide evidence that mergers in the most recent period have universally displayed more value-increasing tendencies, and that the traditional methods by which financial researchers classify mergers into types may need to be reexamined.

The remainder of the paper is structured as follows. Section II discusses the competing theories being tested and their empirical predictions. Section III reviews literature related to corporate diversification and merger antecedent research. Section IV describes the data and sampling procedure. Section V details the method used to classify mergers into vertical, horizontal, and conglomerate types. Section VI presents summary statistics on sample distribution and sample characteristics. Section VII explains the method of analysis. Section VIII outlines both the primary and secondary results. Section IX concludes.

II. Theories/Testable Predictions

There are two main theoretical issues that this paper aims to address. First, there is the long-standing debate over the "value of corporate diversification." The ideas behind this debate are quite simple: some argue that corporate diversification destroys value, while others argue the opposite.[1] Those who argue in the value-destroying direction point to the fact that, in general, shareholders should be able to more effectively diversify on their own and that companies should stay focused on their core competencies. Those who argue that corporate diversification is value-enhancing point to more beneficial effects of corporate diversification-things like decreased reliance on specific industries/customers and lower overall business risk. By breaking my merger sample into vertical, horizontal, and conglomerate classifications I am able to generate unique, testable hypotheses that directly address this corporate diversification debate. Further, examination of a post-crisis time period allows me to extend the analysis of Kuppuswamy & Villalonga (2010), who find that the value-effects of corporate diversification change significantly *during* the crisis, by evaluating the value of corporate diversification *after* the crisis.

A second, but equally significant, part of this paper focuses on testing competing theories on the fundamental causes of mergers. More specifically, it aims to differentiate between some of the leading neoclassical theories on the sources of merger gains: namely the "synergy" and the "collusion" hypotheses.[2] The title of each respective theory is fairly self-explanatory. The first argues that merger gains emanate from some sort of synergistic/efficiency-based effect, while the other views any perceived "value-creation" for the transacting firms in a merger to be a result of increased market power. Each of these hypotheses strings from the "value-enhancing" side of a wider theoretical debate on the principal drivers of value in mergers.[3] The contributions of my analysis to this theoretical framework are again rooted in an ability to evaluate merger effects individually across merger type (i.e. in terms of vertical, horizontal, and conglomerate classifications).

Ultimately, the testable predictions that I am able to generate in my analysis are simple and direct.[4] In terms of corporate diversification, I posit that high combined firm abnormal returns

[1] See Martin & Sayrak (2003) for a detailed description of this corporate diversification debate.
[2] Many, such as Trautwein (1990), have concluded that these are the two antecedent theories garnering the most empirical support.
[3] See, for instance, Fee & Thomas (2004)
[4] My results may also offer some insight on fundamental corporate finance theories. For instance, if conglomerate mergers experience low returns this may be due to information asymmetry effects consistent with those described by Myers and Majluf (1984), as sophisticated market participants adjust their valuations to reflect the fact that managers of the acquiring firm probably inherently have less information/expertise about firms that are unrelated to their current line of business and, thus, ultimately end up overpaying for the acquired firm. Similarly, but under different theoretical constructs, Jensen's (1986) free cash flow hypothesis suggests conglomerate mergers may be

for conglomerate mergers as compared to the other two categories will provide support for the value-enhancing theory of corporate diversification, whereas relatively low returns for conglomerate mergers will signal more of a value-destroying diversification effect ("destroying" in the relative, sub-optimal investment sense). In a similar manner of thinking, I propose that if vertical mergers display the greatest positive combined firm equity-wealth effect, then this should help substantiate the "synergy"/"efficiency" hypothesis, whereas if horizontal mergers generate the biggest effect, then this would seem to support the "collusion" hypothesis.[5] Conversely, if the equity-wealth effects generated by horizontal and vertical merges are similar, I would interpret this as evidence that both sources are likely active generators of value in mergers. A full description of my testable hypotheses can be seen in *table 1*.

III. Literature Review

There are numerous studies analyzing the equity-wealth effects of corporate mergers. When reviewing this vast literature, two main observations begin to emerge. First, it becomes clear that the proliferation of merger-based research across a wide range of disciplines (for instance, finance, economics, strategy, management, psychology, and accounting) has significantly deepened our understanding of both the behavior and the consequences of mergers.[6] Second however, it becomes clear that there is still much more to learn in this area. Becher et al. (2012) sum up much of what we know by commenting on the "stylized facts" established thus far: "On average, targets gain, bidders lose or break even and merged firms returns are positive." Others, such as Jensen and Ruback (1983), point to the unfinished nature of merger research by commenting that many questions remain about fundamental merger antecedents. These authors, quite famously, allude to the complex nature of research in this area and conclude that studies which look at abnormal returns to takeover participants in isolation (i.e. not across type, characteristics, etc.) will not be able to "distinguish between (these) alternative sources of gains."

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a signal of excess "free cash flow" on hand for bidding firms, wasteful managerial spending, and general agency theoretic issues such as managerial entrenchment, and we would again expect to see a negative price reaction to the announcement of a conglomerate merger. Ultimately, evidence for these two theories might be differentiated by viewing differences in horizontal & vertical abnormal return rankings or in extending my analysis to include supplementary information.

[5] One will ultimately also gain further insight by evaluating "rival firms" (following the lead of both Eckbo & Stillman (1983, JFE)). For instance, if we observe a big CAR for rival firms under the horizontal merger classification this would seem to provide evidence of the collusion hypothesis. Contrastingly, if we saw a negative return for industry rivals under the horizontal merger category, this would seem to provide evidence for the synergy hypothesis. There are many more ways to apply rival firms analysis in further testing these theories (and many others).

[6] For a review of the diversification literature see classic reviews by Jensen & Ruback (1983) or Jarrell et al. (1988). For more recent reviews see, for instance, Andrade et al. (2001), Martynova & Renneboog (2008), or Haleblian et al. (2009).

Staying consistent with finance fundamentals, rankings of what is known about merger antecedents is strictly relative to what is known about merger outcomes. In other words, our understanding of causes and sources of gain in mergers, while incomplete, is still considerably developed. In particular, and most relevant to the analysis in this paper, there is much empirical work that uses event study methodology to attempt to parse out support for different antecedent theories.[7] Becher et al. (2012), for instance, provide compelling evidence in support of the "synergy" hypothesis by analyzing a comprehensive sample of 384 utility mergers from 1980 to 2004. Similarly, Boone & Mulherin (2000) couple acquisitions and divestitures during the period from 1989 to 1999 and employ an event study analysis to produce results consistent with value-enhancing merger theories similar to those emanating from Coase (1937). Additional analyses of this kind are detailed in *table 2*, and include studies by Eckbo (1983), Bradley et al. (1988), Slovin et al. (1991), Singal (1996), Fee & Thomas (2004), and Fan & Goyal (2006).[8]

As with research on the antecedents of merger activity, research questions on the value of corporate diversification, despite the popularity of the topic, are still unresolved. Early research on corporate diversification seemed to reach a (general) consensus on its value destroying effects. Wernerfelt & Montgomery (1988), Lang & Stulz (1996), and Berger & Ofek (1995) for example, evaluate diversification's effect on Tobin's Q (or similar performance measures) and find a negative relationship. As Martin & Sayrak (2003) point out, corporate diversification eventually received such a "bad rap" that popular MBA textbooks such as Brealey and Myers (2000, p.946) espoused, "Diversification, by itself, cannot produce increases in value." More recently however, studies such as those by Graham et al. (2002), Chevalier (2000), and others have highlighted the inherent difficulty of research in this area and have provided basis for rethinking our view on the value effects of corporate diversification. Graham et al. (2002), for instance, find that the so-called "diversification discount" does not persist once we control for the fact that targets are in fact already being purchased at a discount. Similarly, more recent studies such as those by Villalonga (2007) and Borghesi (2007) point out other methodological issues that could be clouding results and provide evidence of a need for new and innovative ways to solve this corporate diversification debate. Such innovation could come in the form of an old finance friend- the event study. In general, standard event study analysis in the corporate diversification realm seems to have been used to a lesser degree than with research in other areas of finance. Notable exceptions include event studies such as those outlined in

[7] *Table 2* maps out a sample of such studies.

[8] The reader may note the relatively small sample sizes recorded for the Slovin et al. (1991) and Singal (1996) studies n *table 2* (both of which provide support for the collusion hypothesis). This is no accident, as both of these studies focus on a single industry (airline). As Becher et al. (2012) point out, this single industry approach is implemented in these cases so as to more precisely define firm rivals by avoiding SIC-based methods of rival classification.

table 2 by Morck et al. (1990), Kaplan & Wesibach (1992), and Chevalier (2000). While these studies provide conflicting results in terms of the value of corporate diversification, they are examples of ways in which we can measure diversification's effect without relying on potentially misleading accounting information. Further, extension of event study analysis to include classification of merger type should lead to more easily translatable results than with these previous studies.

As already alluded to, a common strain in the above analyses, both in terms of antecedent and corporate diversification research, is that they do not focus on the most recent period of merger activity, and they do not explicitly segment their study into vertical, horizontal, and conglomerate classifications. This paper addresses the most recent time period and implements an event study approach that analyzes vertical, horizontal, and conglomerate mergers independently, thus providing opportunity for new analysis and insight on several dimensions.

IV. Data

I investigate domestic (U.S.) mergers and acquisitions from 1/01/2011-1/01/2014 using data reported by Securities Data Corp (SDC).[9] I include only those deals that were ultimately completed and require both the bidder and target firms to be publically listed (so as to try to ensure retrieval of stock price data from CRSP). Following methodology similar to that of Becher et al. (2012), I restrict my results to include only those deals in which the bidder acquired 50% or more of the target firm. This approach is helpful in my case for several reasons. First, it allows me to construct a more manageable dataset, which enables me to more closely evaluate the accuracy of my merger-type classification (by hand in many cases). Second, and along the same lines, it ensures that the events that I am analyzing represent material strategic decisions for the participating firms (i.e. a target accepting acquisition of 1% of its company probably is not representative of the type of focused decision making that I am looking to evaluate in this analysis). Lastly, consistent with Fan & Goyal (2006), I exclude financial service firms from my analysis. This, again, is done for several reasons. It further manages the size of my data set, and also allows me to focus on the causes of mergers in the context of more "typical" industries where some of the motives for the deals may be less opaque.[10] My initial sample consists of 223 domestic mergers. Following a merging of SDC data with data available from the Center for Research in Security Prices (CRSP), the final sample

[9] "U.S. merger" classified via SDC standards (i.e. if the target is a U.S. firm).

[10] Ultimately it would be interesting for future researchers to have three separate samples: financial services excluded, financial services included, and financial services only. This should allow some additional analysis that will likely prove to be valuable. In particular, including financial services will most certainly increase the number of conglomerate mergers that are in the sample.

size used in my event study analysis includes 180, 178, and 152 mergers for evaluating target, bidder, and combined firm returns respectively.

V. Merger Classification Strategy

The sample data that I have provided in the *Appendix* contains multiple examples of the mechanisms by which mergers can ultimately be classified into vertical, horizontal, and conglomerate.[11] The classification scheme that I ultimately implement in this study is simple, direct, and detailed. (1) Consistent with the prior literature, I classify any merger in which the two firms had identical primary SIC codes as horizontal. This allows me to initially classify 89 of the 223 mergers as horizontal.[12] (2) Next, I sort through the remaining mergers by reading merger documents about each of them and classifying them based off of the relevant and available information.[13] During this classification process, any "ties," in the sense that I am unable to make a *definitive* distinction based off of reading merger documents, are broken by conforming to a "standard" SIC code classification strategy.[14] If the SIC codes are significantly different (meaning the first SIC number differed) I tend towards a conglomerate classification to break the tie. If the SIC codes are different but have the same first number, I tend towards a vertical classification, and if the SIC codes differ only in the last two digits, I essentially rule out conglomerate and choose between vertical or horizontal classifications. In almost all cases, I am able to make a classification based off of reading merger documents and am not forced to break a "tie" by using SIC codes.[15]

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[11] See *Table 4-Data Examples* in the Appendix.

[12] The limited scope and simplistic nature with which I implement the SIC code method of classification greatly mitigates, if not outright avoids, most of its inherent issues. Implementing the basic heuristic "if all four digits are the same, then classify as horizontal" significantly reduces the chances for more complex and prevalent methodological issues to creep in- the vast majority of which appear once the method expands to deal with all three merger types and all possible differences in SIC codes. Note also, that I have decided to use *primary* SIC codes to make my initial horizontal merger type classification. Obviously, some firms have multiple segments and thus, this method may encounter some counting issues. Fortunately however, as Kedia et al. (2011) point out, counting issues typically arise specifically in terms of under-counting vertical mergers and over-counting conglomerate. Further, it has been shown by Sharur (2005) that primary industry segments provide the majority of the business for firms in most cases, and that reporting of secondary SIC segments is somewhat erroneous (Bens, Berger, and Monahan, 2009).

[13] Even after reading merger documents, it is still sometimes quite difficult to make the v,h, or c classification. The line between classifications is often blurry and the language used in announcing merger deals is often lacking in great content. That said, reading the actual merger documents is the still *the most verifiable* classification method.

[14] I say "standard" in the loosest sense of the word, as SIC classification methods appear to be fairly idiosyncratic. Nonetheless, using SIC codes as a "backup" scheme allows me to ensure that classifications made "on the margin" are done in a systematic way.

[15] This was of considerable relief as there were many times that I encountered conflicting classifications based off of reading documents versus those classifications that would have resulted from using a simple SIC code distinction. For instance, there were numerous occasions in which what was clearly a horizontal merger consisted of SIC codes that actually differed in the last two digits. This observation is consistent with many studies questioning the efficacy of using SIC codes as a pure classification scheme (e.g. Fan & Goyal 2006).

My above method may best be demonstrated with a few examples. Let's first take my method in classifying the merger between General Dynamics Corp. (GD) and Force Protection Inc. (FRPT) in late 2011. GD has a primary SIC code of 3812 while FRPT has a primary SIC code of 3711. Right away, the SIC codes would seem to indicate a vertical merger (following the heuristic described above), but let's look at the transaction in more detail to make a definitive classification. Reading through press releases related to the merger indicates that the two companies are strict rivals, and that they both compete heavily in the "tracked and wheeled military vehicle" market, which is the market that the deal appears to be centered around. Such detail clearly signals to me that the merger is horizontal, and so it is classified as such.[16] Next, let's consider a more peculiar example- the deal between Express Scripts Inc. (ESRX) and Medco Health Solutions Inc. (MHS) in the summer of 2011. ESRX has a primary SIC code of 5122 while MHS has a primary SIC code of 8099. In almost any application of the SIC code method, this merger would have been swiftly classified as conglomerate, but let's again look to the actual merger documents for a definitive (and accurate) answer. Reading through relevant merger documents reveals that these two companies are "two of the largest pharmacy benefit managers in the U.S." and that the merger had significant antitrust concerns.[17] Such detail immediately leads to a horizontal classification for the merger.

Clearly, my classification method is not the only one being implemented by researchers looking to make the distinction between horizontal, vertical, and conglomerate mergers. Fan and Goyal (2006), Acemoglu et al. (2009), and Kedia et al. (2011) all seem to favor implementing the "IO method" of classifying merger type. They use industry commodity flow information from the Use Table of Benchmark Input-Output Accounts for the US economy, as compiled by the Bureau of Economic Analysis, in order to decipher how much input/output crossover there is between two merging firms. This particular method of analysis appears to be quite promising in terms of overcoming many inherent pitfalls in the long-used SIC code classification scheme and it is also practical in dealing with classifications across large datasets. For the purposes of this study however, I am focusing on a unique three year timeframe following the 2007-2009 financial crisis and thus, my dataset is inherently manageable. As such, though the "IO method" may display many methodological improvements from previous classification techniques, I am able to capitalize on the uniqueness of my dataset and classify the mergers in my sample using what has to be the single best strategy for getting things correct- going directly to the source.

[16] Again, despite the fact that the merger may have been ***incorrectly*** classified as vertical if using solely an SIC code classification scheme.

[17] The ultimate FTC approval for this merger was in fact not unanimous.

VI. Summary Statistics

Sample Distribution

Table 5 presents a breakdown of the sample of 223 mergers by year. *Panel A* displays the distribution for the entire sample, while *Panel B* and *Panel C* lay forth the yearly distributional breakdown for vertical, horizontal, and conglomerate type mergers as classified by "Ellis Classification" and "SIC classification" respectively. In general terms, there appears to be an uptick of mergers in 2012 compared to 2011 and 2013. More careful comparison of the summary results exhibited in *Panel B* and *Panel C* , however, quickly reveals significant differences between the "Ellis Classification" scheme, which is based on reading each merger document, and the "SIC Classification" scheme, which is based on more rigid SDC industry identifiers. For instance, horizontal mergers make up 64% of the total mergers in the sample according to "Ellis Classifications," whereas they compose 40% of the sample according to "SIC Classifications"- this is a potential understatement of 24%! Similar differences can be observed when comparing vertical classifications across the two methods (17% v.s. 37%), or when comparing intra-year reported figures between the two. Such large discrepancies between a document-based method and the widely-used SIC method of merger classification again highlight the potentially significant impact the choice of classification methodology can have on the results of merger analysis. Fan and Goyal (2006), Acemoglu et al. (2009), Kedia et al. (2011), and others have raised similar points in their own input/output-based analysis, but there appears to room for more research on this matter.[18]

Sample Statistics

Table 6 reports attributes of the 223 sample mergers. *Panel A* displays summary statistics for the entire sample, while *Panel B* and *Panel C* exhibit summary statistics for vertical, horizontal, and conglomerate merger types as identified by the "Ellis Classification" method and "SIC Classification" method respectively. Beginning with *Panel A*, the mean transaction value for the entire sample of mergers is $2.16 billion and 222 of the total 223 the deals are classified as "friendly" via SDC standards.[19] The average number of segments added for mergers in the total sample is .62, indicating that, on average, bidders during this 2011-2014 period acquired less than one COMPUSTAT business segment by merging with targets. This relatively low "segments added" figure is consistent with the aforementioned distributional results displayed in *Table 5*

[18] These prior studies document a general *under*-counting of vertical mergers when using the SIC method of classification compared to using an I/O-based method, whereas this study in fact documents a significant *over*-counting in comparison to classifications derived though thoroughly reading documents about each merging company. This underscores the fickle nature of merger classification, and the need for additional research in this area in order to formulate a more complete classification scheme.

[19] This "friendly setting" is consistent with prior literature that documents a drastic decrease in the occurrence of hostile takeovers (e.g. Holmstrom and Kaplan (2001)).

in which over 60% of the mergers are classified as horizontal using the "Ellis Classification" method. Also notable from *Panel A,* is that 62% of the mergers are pure cash deals which is a bit of an increase compared to studies from previous periods such as Moeller et al. (2005) or Andrade et al. (2001), which document a proportion closer to around 30-40%.

Moving to *Panel B* of *Table 6* offers opportunity for an assessment of how each type of merger differs in makeup. Horizontal mergers have the highest average transaction value over the sample at just over $2.3 billion, while conglomerate mergers follow closely with an average value of $2.2 billion, and vertical mergers lag behind at $1.3 billion.[20] Results for the average number of segments added per merger type are consistent with expectations. Horizontal mergers average .4 segments around the transaction, while vertical mergers average slightly more at .76 segments added and conglomerate mergers average the most at 1.23 segments added.[21] In relation to the "segments added" variable it is again interesting to observe differences in results between *Panel B* and *Panel C*. Classifications based on the SIC method (*Panel C*) produce results in which horizontal, vertical, and conglomerate mergers average .46, .53, and 1.1 segments added respectively. It is thus notable that results derived from using a hand-collected classification scheme such as the "Ellis Classification" appear to be more consistent with expectations in that they yield more discernable cuts between merger type in terms of "segments added." Additional items of interest displayed in *Panel B* include a slightly higher proportion of "cash only" deals observed for vertical and conglomerate mergers as compared to horizontal mergers. In fact, a regression of "cash only" consideration structure on merger type yields results, displayed in *Panel A* of *Table 9*, suggesting that horizontal merger type does indeed have a significantly negative linear relationship with "cash only" consideration structure after controlling for other possible determinants of merger consideration structure.[22]

VII. Analysis

Summary of Methodology

Each of the merger theories being evaluated in this paper generate testable hypotheses in terms of the stock market's response to the news of a particular type of merger announcement. As such, in order to differentiate between these theories, I conduct a basic event study analysis to calculate abnormal returns for bidder, target, and combined firms. In order to make

[20] *Panel B* of *Table 9* displays results from a regression of (log) transaction value on merger type- both before and after controlling for other explanatory factors. In both cases, no significant relationship between merger type and (log) transaction value is found.

[21] The interested reader may note the positive average "segments added" figure for horizontal mergers and wonder why it is not zero. This is due to the general complexity in the makeup of the modern corporation- often, even a firm's closest related rival may differ in terms of what secondary industry segments they operate within.

[22] Two separate regressions are run- one with no controls and one controlling for transaction value as well as year and industry effects. In both instances, the coefficient on horizontal deal type is significant at a 5% level.

additional meaningful comparisons, I then partition my analysis further by calculating the abnormal returns across vertical, horizontal, and conglomerate merger classifications, using the "Ellis Classification" scheme for primary analysis and the "SIC Classification" scheme for secondary analysis and "robustness checks." Primary analysis is presented in *Table 7* and is based off of a (-1,+1) window where day 0 is the merger announcement date as reported by SDC. Secondary analysis is presented in *Table 8* and involves evaluating abnormal returns based off of alternative (-2,+2) and (-5,+5) windows, where, again, day 0 is the merger announcement date as reported by SDC.

Calculating CARs

In the interest of thoroughness and completeness, cumulative abnormal returns (CARs) are calculated using three different measures: "Raw Returns," "Net of Market" returns, and "Market Model" returns. "Raw Returns" are simply calculated as the cumulative returns over the event window (i.e. with expected returns equal to zero). "Net of Market" abnormal returns are calculated by subtracting expected returns on the CRSP value-weighted index over the event window from the "Raw Returns" experienced by the merging firm in question. "Market Model" abnormal returns are calculated by subtracting each individual security's expected return based on the so-called "empirical CAPM" from the "Raw Returns" experienced over the event period, where the expected returns from the "empirical CAPM" are estimated with a (-255,-22) estimation period. In general, and as is usually the case in event studies with short windows, the inferences made from the results in this analysis do not change based on the return measure being utilized.[23]

VIII. Results

Primary results from the event study analysis are presented in *table 7. Panel A* presents the announcement returns for the entire sample, partitioned to display CARs for the combined, bidder, and target firms respectively, while *Panel B* and *Panel C* lay forth similar tables for vertical, horizontal, and conglomerate mergers as classified by the "Ellis Classification" scheme and the "SIC Classification" scheme respectively.

Merger Wealth Effects in Recent Time Periods

Evaluation of *Panel A* in *Table 7* is directly relevant in gaining insight on the equity-wealth effects of mergers in the most recent 2011-2014 post crisis period. Tabulated results reveal a combined firm average abnormal return of 6.1%, a bidder average abnormal return of 1.4%, and a target average abnormal return of 29.5% over this 2011-2014 time period. It is

[23] The reader will note that *Table 8* reports only the "Market Model" returns. This is done in the interest of space, and as noted, the results are qualitatively similar using either of the other two return measures.

particularly interesting that bidder returns during this sample period are significantly positive, which is contrary to the findings of numerous studies conducted on previous time periods that document significantly negative bidder returns in mergers. Moeller et al. (2005), for instance, document negative returns of $.12, or $240 billion in aggregate losses, for bidder shareholders around merger announcement in their analysis of mergers from 1998-2001. Likewise, Andrade et al. (2001) document average CARs for bidders from 1973-1998 to be -.7% over a (-1,+1) event study window. In this recent sample of mergers, the average abnormal return to bidders is not only significantly positive, but the median is positive as well, and greater than half of the bidders in the sample earn positive abnormal returns around the announcement of the merger. Along similar lines, it is also notable, then, that the average abnormal return to the combined firms, at around 6%, is also higher than that documented in previous studies. Prior studies, such as (again) Andrade et al. (2001), do document positive combined firm returns, but at a level closer to around 1-2%. In summary, the significant changes in the wealth effects displayed by mergers in my sample as compared to previous time periods may be attributable to numerous time-specific factors and is undoubtedly worthy of further investigation.

The Value of Corporate Diversification

When determining the value of any action or item, it is always important to make two separate but equally fundamental judgments. First, the action or item should be evaluated based on its absolute return, that is, it should pass the most basic test of worth: does it create value? Once the action or item has passed this necessary condition for worth however, it should ideally then be subjected to a second, more sufficient, valuation test: does it create more value than other available actions or items? It is only after passing the second of these tests that an action or item can be declared "value-creating" on a relative basis.

The results in *Panel B* of *Table 7* provide figures upon which to conduct both of the aforementioned "tests" on the value of corporate diversification. Combined firm returns reported in *Panel B* indicate that conglomerate (diversifying) mergers do not generate positive announcement returns that are statistically different from zero at least a 10% level of significance. On the other hand, the 4% average abnormal return for combined firms in conglomerate mergers, though not significantly positive, also does not indicate that corporate diversification is value-destroying on any sort of absolute level. As such, and as consistent with financial theory, analysis should move to valuing corporate diversification on a relative basis by looking at how conglomerate mergers fare compared to the other two merger types.

Panel B also lists the combined firm returns for horizontal and vertical mergers. Both horizontal and vertical mergers generate a significantly positive combined firm three day announcement abnormal return of 6.6%, with over 75% of the sample mergers generating positive combined firm returns under both merger types. Though the returns do not display the precise type of

"walking down" relationship with corporate diversification (i.e. horizontal returns > vertical returns > conglomerate returns) that is predicted by the value-destroying theory of corporate diversification, the fact that abnormal returns around merger announcement for combined firms in conglomerate mergers are incrementally less than those for combined firms in vertical and horizontal mergers does, at first glance, appear to satisfy the most critical condition for relative value-destruction on at least some level. In total however, the difference of 2.8% in CARs between diversifying and non-diversifying mergers is not statistically significant at a 10% level, and so there, in fact, does not appear to be any strong evidence that points to corporate diversification being value-destroying for firms in my sample, even in a relative sense.[24] [25]

Synergy v.s. Collusion Hypothesis

Panel B of *Table 7* also displays information relevant to the debate over the sources of gains in mergers. Namely the results from the event study analysis of vertical, horizontal, and conglomerate firms presented in *Panel B* can be used to try to distinguish between the synergy and the collusion hypotheses. Overall, the results do not appear to clearly reject either of the two antecedent theories. This is because (in accordance with my testable hypotheses) in order to accept the collusion or the synergy hypothesis it is necessary to find a significant difference between vertical and horizontal merger returns. As already mentioned, results in *Panel B* indicate that vertical and horizontal mergers have nearly identical combined firm abnormal returns around announcement date. If anything, one may glean from the results slight support for the synergy/efficiency hypothesis because of the relatively low performance of conglomerate mergers, but in general, it is probably more likely the case that in fact both antecedent theories are contributing to merger returns or that there are other explanatory factors driving merger returns.[26]

Comparison of Results with the SIC Method

Event study results based on the "SIC Classification" method are contained in *Panel C* of *Table 7*. Consistent with the discussion in prior sections, the reported figures demonstrate that a significant difference does indeed exist between classifications made using the industry code-based "SIC Classification" method and more direct methods such as the "Ellis Classification"

[24] Regression results presented in *Panel C* of *Table 9* also suggest that there is no difference between vertical/horizontal mergers and conglomerate mergers in terms of their differential effect on combined firm CARs (either before or after controlling for other factors driving returns).

[25] It is possible that the absence of a statistically significant difference between combined firm CARs for conglomerate mergers and vertical/horizontal mergers is due to issues with sample size (especially related to the number of conglomerate merger observations). Expanding the sample could provide more definitive evidence on the corporate diversification debate.

[26] Additional insight will undoubtedly be afforded to this antecedent debate by extending this analysis to evaluate rival firms (a la' Eckbo (1983)), or by further expanding the sample.

scheme. Abnormal returns around announcement date for combined firms using the SIC method are 6.9% for horizontal mergers, 5.3% for vertical mergers, and 5.8% for conglomerate mergers, with stated figures significantly greater than zero at a 5% level of significance for all three merger types.

In terms of the value of corporate diversification, these SIC results do in fact produce somewhat different inferences than those reached using the "Ellis Classification" scheme. For instance, the average CARs for combined firms in conglomerate mergers are significantly positive, which would seem to indicate that, at least on an absolute level, the market perceives corporate diversification as value-enhancing. Also, on a relative basis, the rank-order of returns over the three merger types as constructed using the SIC method does not provide even weak evidence of corporate diversification being comparatively value-destroying. Instead, conglomerate merger returns are positioned between vertical and horizontal returns, thus making any type of definitive judgment on relative value-creation difficult.

Inferences made from the analysis in *Panel C* regarding the synergy and collusion hypotheses are again cloudy, just as they were in the primary analysis. It is interesting to note, however, that the results from the two different classification methods are, once more, slightly variant. Contrary to the primary analysis using the "Ellis Classification" scheme, evidence gathered using the SIC method would actually seem to yield very slight support for the collusion hypothesis as combined firm CARs are highest for horizontal mergers (though not significantly so). In general, however, overall inferences generated regarding these two antecedent theories are similar to those derived in the primary analysis in that it appears both synergistic and collusive forces may be driving merger gains.

IX. Conclusion

This study applies new methods in testing long-debated issues in corporate financial theory. In particular, new insight on the value of corporate diversification and the sources of gains in mergers during the recent time period from 2011 to 2014 is generated through comprehensive event study analysis of vertical, horizontal, and conglomerate mergers. Comparison of the equity-wealth effects of each merger type does not produce evidence consistent with corporate diversification being value-destroying in either a relative or an absolute sense. Further, in terms of merger antecedent theories, comparison of vertical, horizontal, and conglomerate merger returns reveals evidence suggesting that both synergistic and collusive forces may be driving value creation in mergers. In general, the results in this paper also provide evidence that each merger type displays somewhat different non-wealth-related characteristics and that the traditional methods by which financial researchers classify mergers into types may need to further evolve. Lastly, and maybe most intriguingly, results from basic event study analysis suggest that the equity-wealth effects of mergers in the post-crisis period have become

significantly more positive. This finding is consistent with other studies, such as Kuppuswamy & Villalonga (2010), that document fundamental changes in the effects of merger-related activities during the 2007 to 2009 financial crisis, and is most definitely worthy of further evaluation by researchers.

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Appendix

Table 1- Testable hypotheses and predictions across "merger type."

** "Lowest", "Middle", and "Highest" is in terms of (combined firm) CARs in relation to the other merger types.*

Merger Type	Corporate Diversification Value-Destroying	Corporate Diversification Value-Enhancing	Synergy/Efficiency	Collusion
Vertical	Middle	Middle	**Highest**	Middle-Lowest
Horizontal	Highest	Lowest	Middle	**Highest**
Conglomerate	**Lowest**	**Highest**	Lowest	Lowest-Middle

This table compares and contrasts predictions made by two separate sets of competing theories. Column 2 & 3 report predicted results under the value-enhancing versus the value-decreasing side of the corporate diversification debate. Column 4 & 5 report predicted results under the synergy versus the collusion hypotheses derived from the debate on the reasons for, and sources of gains from, mergers. Bolded text is meant to signify individual predictions that are most critical to the story of their associated theory. Predictions are made in terms of combined firm CARs and are ranked lowest to highest across the three merger types.

Table 2- Related Literature

Panel A. Selected studies offering evidence on the synergy v.s. collusion debate, but with no classification of merger type.

Study	Time period	Number of mergers	Supports synergy or collusion
Bradley et al. (1988)	1963-1984	236	Synergy
Slovin et al. (1991)	1965-1988	42	Collusion
Singal (1996)	1985-1988	14	Collusion
Boone & Mulherin (2000)	1989-1999	400	Synergy
Fee & Thomas (2004)	1980-1997	554	Synergy/Efficiency

Panel B. Selected event studies offering evidence on the value of corporate diversification.

Study	Time period	Number of mergers	Corporate diversification verdict
Morck et al. (1990)	1975-1987	326	Destroying
Kaplan & Wesibach (1992)	1971-1982	282	Enhancing
Chevalier (2000)	1980-1995	215	Enhancing

Panel C. Selected event studies that distinguish between vertical, horizontal, or conglomerate mergers

Study	Time period	Number of mergers	Theory Supported	Merger Type Classification	Method
Eckbo (1983)	1963-1978	259	Synergy/Efficiency	V,H	SIC Codes
Fan & Goyal (2006)	1962-1996	2162	N/A*	V,H,C	IO Tables
Becher et al. (2012)	1980-2004	384	Synergy	H, "Non-H"	SIC Codes/Value Line
Kedia et al. (2011)	1979-2002	1692	N/A*	V,H,C	IO Tables

* This was not the intended nature of the study.

This table presents a summary of some of the literature relevant to this analysis. *Panel A* reports selected studies that offer evidence on the causes of and sources of gain from merger activity. *Panel B* reports selected merger *event studies* that provide results on whether corporate diversification is value-enhancing or value-destroying. *Panel C* presents a snapshot of *event studies* that have made merger type classifications, with the last column identifying what method they used to make the distinction. For a richer discussion of these and other related literatures see the conversation on "Previous Literature" in this paper's text.

Table 3- Sample Selection

Imposed Restrictions:	Sample Size
Initial Sample Restrictions	
1) Domestic Mergers, 1/01/2011-1/01/2014	29275
2) Percent of Target Shares Acquired > 50%	20344
3) Deal Status: Completed	20333
4) Target Publically Traded	706
4) Bidder Publically Traded	350
5) Non-financial services	223
Initial Sample	223
Additional Data Restrictions	
6) Price and related data available from CRSP	180
Final Sample	180

This is a summary of the sample selection technique used to acquire and compile a list of U.S. mergers during the period from 1/01/2011 to 1/01/2014.[27] The data was collected from Securities Data Corp. (SDC), with requirements that the bidder owned more than 50% of the acquired firm after the merger, that the deal was eventually completed, that both the target and bidder were publically traded, and that neither participating company was a financial services firm. Careful analysis of the data before and after implementing the "target & bidder publically traded" restriction reveals that the drop from step 3 to step 4 is indeed consistent with proper sampling technique. Further, such a drop does not appear atypical when imposing public restrictions on the target. [28] The initial sample size consists of 223 domestic mergers. After merging the initial sample with data available from the Center for Research in Security Prices (CSRP), I am left with a "final" sample of 180 domestic mergers from 2011 to 2014.[29]

[27] "U.S. merger" classified via SDC standards (i.e. if the target is a U.S. firm).

[28] Netter et al. (2011), for instance, encounter a significant decrease in sample size when imposing a "public restriction" on targets in their 1992-2009 study.

[29] "Final" in the sense that this 180 figure corresponds to a matching of target firms; I also conduct analysis on returns to bidders and combined firms, and thus receive slightly different "final" sample sizes after matching for each of these individual groupings of firms (178 and 152 mergers respectively). In general, a dropping of observations in step 6 (CRSP matching) appears to be due to the bidder not being a U.S. firm or either the bidder or target not in fact being publically listed. For example, LDK Solar's acquisition of Solar Power, Inc. for $33 Million on 01/06/01 is dropped in the target and combined firm return calculations because SPI is not listed on the NYSE, NYSE-AMEX, NASDAQ, or arca exchange that are covered by CSRP (rather, it was traded on the OTC Bulletin Board).

Table 4- Data Examples

Date Announced	Target Name	Target Short Business Description	Target Primary SIC Code	Target Industry Sector	Acquiror Name	Acquiror Short Business Description	Acquiror Industry Sector	Acquiror Primary SIC Code	Classification
07/27/12	AuthenTec Inc	Manufacture semiconductors	3674	Electronic and Electrical Equipment	Apple Inc	Manufacture personal computers	Computer and Office Equipment	3571	V
07/11/11	Arch Chemicals Inc	Manufacture specialty chemical	2899	Chemicals and Allied Products	Lonza Group Ltd	Biopharmaceutical company	Drugs	2836	V
07/20/11	Icagen Inc	Manufacture pharmaceuticals	2834	Drugs	Pfizer Inc	Mnfr,wholesale pharmaceuticals	Drugs	2834	H
07/26/11	S1 Corp	Develop financial software	7372	Prepackaged Software	ACI Worldwide Inc	Dvlp electn payment software	Prepackaged Software	7372	H
04/05/13	Intelligent Living Inc	Dvlp health program software	7372	Prepackaged Software	Feel Golf Co Inc	Mnfr,whl golf clubs,wedges	Miscellaneous Manufacturing	3949	C

This is a set of examples meant to illustrate different mechanisms by which mergers can be classified into vertical, horizontal, or conglomerate. While SIC codes can be used for classification, they sometimes lead to classifications that conflict with reality. For instance, two firms in the same industry merging will show up as horizontal via the SIC method, yet in many cases, same-industry firms are in fact significantly vertically related.

Table 5- Sample Distribution

Panel A: Overall Distribution by Year

Year	Frequency
2011	69
2012	91
2013	63
Total	223

Panel B: "Ellis Classification" Distribution by Year

Year	Overall	Vertical	%	Horizontal	%	Conglomerate	%
2011	69	14	20%	41	59%	14	20%
2012	91	15	16%	54	59%	22	24%
2013	63	5	8%	48	76%	10	16%
Total	223	34	15%	143	64%	46	21%

Panel C: "SIC Classification" Distribution by Year

Year	Overall	Vertical	%	Horizontal	%	Conglomerate	%
2011	69	27	39%	26	38%	16	23%
2012	91	38	42%	32	35%	21	23%
2013	63	18	29%	32	51%	13	21%
Total	223	83	37%	90	40%	50	22%

Panel A provides a breakdown of the number of mergers occurring per year in my 2011-2014 sample. *Panel B* and *Panel C* further partition the sample into its vertical, horizontal, and conglomerate classifications and provide figures on the number of each classification per year as well as the share of the total each classification accounts for per year. *Panel B* corresponds to distributional results from the so-called "Ellis Classification" scheme utilized in this paper, and *Panel C* corresponds to results from the more traditional "SIC Classification" scheme.

Table 6- Summary Statistics

Panel A: Summary Statistics for Initial Sample

Variable	Mean	Median	Maximum	Minimum	N	% of total
Transaction Value ($mill)	2164.80	607.83	29370.07	0.54	223	
Segments Added	0.62	0.00	12.00	0.00	146	
"Friendly"					222	99.6%
Consideration Structure:						
cash					138	61.9%
stock					26	11.7%
other					13	5.8%
hybrid					43	19.3%
unknown					3	1.3%

Panel A provides summary statistics on the 223 domestic mergers in my initial 2011-2014 sample. "Transaction value" is measured in millions of dollars and corresponds to the merger deal value as reported by SDC. "Segments added" is in terms of reported COMPUSTAT industry segments and is calculated by subtracting reported segments in the year before the merger transaction, from reported segments in the year after the transaction. A lower bound of zero is imposed on the "segments added" variable in order to eliminate noise and prevent clear non-merger related segment fluctuation from biasing the results downward. "Friendly" refers to the attitude of the merger, and "consideration structure" refers to the type of payment used in the merger deal, both as reported by SDC.

Table 6- Summary Statistics (cont.)

Panel B: Summary Statistics for V, H, & C via "Ellis Classification"

Horizontal

Variable	Mean	Median	Maximum	Minimum	N	% of total
Transaction Value ($mill)	2348.92	760.22	29370.07	7.02	143	
Segments Added	0.41	0.00	6.00	0.00	95	
Consideration Structure:						
cash					82	57.3%
stock					19	13.3%
other					10	7.0%
hybrid					30	21.0%
unknown					2	1.4%

Vertical

Variable	Mean	Median	Maximum	Minimum	N	% of total
Transaction Value ($mill)	1332.81	328.56	16182.72	0.77	34	
Segments Added	0.76	0.00	6.00	0.00	25	
Consideration Structure:						
cash					24	70.6%
stock					4	11.8%
other					1	2.9%
hybrid					5	14.7%
unknown					0	0.0%

Conglomerate

Variable	Mean	Median	Maximum	Minimum	N	% of total
Transaction Value ($mill)	2207.39	605.88	20097.79	0.54	46	
Segments Added	1.23	0.00	12.00	0.00	26	
Consideration Structure:						
cash					32	69.6%
stock					3	6.5%
other					2	4.3%
hybrid					8	17.4%
unknown					1	2.2%

Panel B provides summary statistics on the 223 domestic mergers in my initial 2011-2014 sample, partitioned via vertical, horizontal, and conglomerate as classified using the "Ellis Classification" scheme. "Transaction value" is measured in millions of dollars and corresponds to the merger deal value as reported by SDC. "Segments added" is in terms of reported COMPUSTAT industry segments and is calculated as described in previous sections (see *Panel A*). "Friendly" refers to the attitude of the merger, and "consideration structure" refers to the type of payment used in the merger deal, both as reported by SDC.

Table 6- Summary Statistics (cont.)

Panel C: Summary Statistics for V, H, & C via "SIC Classification"

Horizontal

Variable	Mean	Median	Maximum	Minimum	N	% of total
Transaction Value ($mill)	1837.48	818.87	24002.09	7.56	90	
Segments Added	0.46	0.00	5.00	0.00	57	
Consideration Structure:						
cash					49	54.4%
stock					13	14.4%
other					8	8.9%
hybrid					20	22.2%
unknown					0	0.0%

Vertical

Variable	Mean	Median	Maximum	Minimum	N	% of total
Transaction Value ($mill)	2382.50	543.27	25818.33	0.77	83	
Segments Added	0.53	0.00	6.00	0.00	60	
Consideration Structure:						
cash					58	69.9%
stock					8	9.6%
other					4	4.8%
hybrid					12	14.5%
unknown					1	1.2%

Conglomerate

Variable	Mean	Median	Maximum	Minimum	N	% of total
Transaction Value ($mill)	2392.60	421.48	29370.07	0.54	50	
Segments Added	1.10	0.00	12.00	0.00	29	
Consideration Structure:						
cash					31	62.0%
stock					5	10.0%
other					1	2.0%
hybrid					11	22.0%
unknown					2	4.0%

Panel C provides summary statistics on the 223 domestic mergers in my initial 2011-2014 sample, partitioned via vertical, horizontal, and conglomerate as classified using the "SIC Classification" scheme. "Transaction value" is measured in millions of dollars and corresponds to the merger deal value as reported by SDC. "Segments added" is in terms of reported COMPUSTAT industry segments and is calculated as described in previous sections (see *Panel A*). "Friendly" refers to the attitude of the merger, and "consideration structure" refers to the type of payment used in the merger deal, both as reported by SDC.

Table 7- Primary Event Study Analysis (-1,+1)

Panel A: Announcement Returns for Full Sample

Combined

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	152	0.063	0.038	0.561	-0.158	0.757	7.490	<.0001
Net of Market	152	0.061	0.031	0.558	-0.161	0.743	7.350	<.0001
Market Model	151	0.060	0.031	0.551	-0.165	0.743	7.290	<.0001

Bidder

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	178	0.015	0.012	0.320	-0.328	0.618	2.460	0.0148
Net of Market	178	0.014	0.009	0.309	-0.345	0.590	2.250	0.0258
Market Model	175	0.012	0.007	0.297	-0.350	0.573	2.020	0.0452

Target

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	180	0.297	0.269	1.440	-0.248	0.917	16.300	<.0001
Net of Market	180	0.295	0.259	1.429	-0.277	0.900	16.230	<.0001
Market Model	179	0.295	0.259	1.396	-0.369	0.900	16.070	<.0001

Panel A reports the cumulative abnormal returns (CARs) around announcement date for the entire set of sample firms. The table is partitioned to display CARs for the total combined, bidder, and target firms respectively, where combined firm returns are calculated as a market-value-weighted-average of bidder and target firm returns. Differences in sample size across firm and return type are simply due to data restrictions arising from requiring returns to be listed on CRSP. Three methods of calculating CARs are implemented, all of which are calculated using a (-1,+1) window where day 0 is the merger announcement date as reported by SDC. "Net of Market" returns are calculated by subtracting the CRSP value-weighted index from "Raw Returns," and "Market Model" excess returns are calculated using an estimation period of (-255,-22), where day 0 is again announcement date. "% Positive" refers to the proportion of total calculated CARs that are greater than zero, and p-values ("Pr>|t|") are in terms of testing whether CARs are statistically different from zero.

Table 7- Primary Event Study Analysis (-1,+1) (cont.)

Panel B: Announcement Returns for V, H, & C via "Ellis Classification"

Combined Firm Returns

Horizontal

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	103	0.067	0.053	0.318	-0.118	79.6%	8.140	<.0001
Net of Market	103	0.066	0.043	0.327	-0.094	77.7%	8.170	<.0001
Market Model	102	0.066	0.044	0.340	-0.092	77.7%	8.130	<.0001

Vertical

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	20	0.071	0.032	0.512	-0.066	75.0%	2.340	0.0303
Net of Market	20	0.066	0.027	0.484	-0.046	75.0%	2.300	0.0329
Market Model	20	0.064	0.030	0.458	-0.055	70.0%	2.270	0.0351

Conglomerate

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	29	0.042	0.023	0.561	-0.158	62.1%	1.640	0.1123
Net of Market	29	0.038	0.012	0.558	-0.161	62.1%	1.460	0.1562
Market Model	29	0.036	0.010	0.551	-0.165	65.5%	1.410	0.1703

Difference in means: Horizontal v.s. Vertical

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	120	0.11	0.916
Satterthwaite	Unequal	22	0.08	0.937

Difference in means: Horizontal v.s. Conglom

Method	Variances	DF	t Value	Pr > |t|
Pooled	Equal	129	1.47	0.144
Satterthwaite	Unequal	34	1.12	0.273

Panel B reports CARs around merger announcement date for horizontal, vertical, and conglomerate type mergers as defined by the "Ellis Classification" scheme. The table is partitioned into three parts to display CARs for the total combined, bidder, and target firms respectively, where combined firm returns are calculated as a market-value-weighted-average of bidder and target firm returns. Three methods of calculating CARs are implemented, all of which are calculated using a (-1,+1) window where day 0 is the merger announcement date as reported by SDC. "Net of Market" returns are calculated by subtracting the CRSP value-weighted index from "Raw Returns," and "Market Model" excess returns are calculated using an estimation period of (-255,-22), where day 0 is again announcement date. "% Positive" refers to the proportion of total calculated CARs that are greater than zero, and p-values ("Pr>|t|") are in terms of testing whether CARs are statistically different from zero.

Table 7- Primary Event Study Analysis (-1,+1) (cont.)

Panel B: Announcement Returns for V, H, & C via "Ellis Classification" (cont.)

Bidder Firm Returns

Horizontal

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	118	0.026	0.016	0.320	-0.189	64.4%	3.460	0.0008
Net of Market	118	0.025	0.011	0.309	-0.198	61.9%	3.460	0.0008
Market Model	117	0.024	0.013	0.297	-0.215	61.0%	3.290	0.0013

Vertical

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	25	-0.008	0.004	0.284	-0.328	52.0%	-0.380	0.7073
Net of Market	25	-0.013	0.000	0.277	-0.345	48.0%	-0.640	0.5309
Market Model	23	-0.016	-0.002	0.277	-0.350	40.0%	-0.690	0.4964

Conglomerate

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	35	-0.004	0.008	0.069	-0.205	60.0%	-0.440	0.6621
Net of Market	35	-0.006	0.009	0.066	-0.208	57.1%	-0.630	0.5341
Market Model	35	-0.008	0.003	0.067	-0.212	57.1%	-0.800	0.4312

Target Firm Returns

Horizontal

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	121	0.277	0.240	1.440	-0.248	88.4%	11.880	<.0001
Net of Market	121	0.276	0.242	1.429	-0.277	86.8%	11.850	<.0001
Market Model	120	0.277	0.239	1.396	-0.369	86.8%	11.720	<.0001

Vertical

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	25	0.386	0.401	0.914	0.049	100.0%	8.520	<.0001
Net of Market	25	0.382	0.397	0.909	0.036	100.0%	8.760	<.0001
Market Model	25	0.382	0.401	0.907	0.032	100.0%	8.710	<.0001

Conglomerate

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	34	0.304	0.283	0.790	-0.097	97.1%	8.780	<.0001
Net of Market	34	0.298	0.277	0.786	-0.081	94.1%	8.480	<.0001
Market Model	34	0.296	0.275	0.778	-0.089	94.1%	8.390	<.0001

This is a continuation of *Panel B* which reports CARs around merger announcement date for horizontal, vertical, and conglomerate type mergers as defined by the "Ellis Classification" scheme. Above results are for Target and Bidder firms respectively, with Combined firm returns reported on the previous page.

Table 7- Primary Event Study Analysis (-1,+1) (cont.)

Panel C: Announcement Returns for V, H, & C via "SIC Classification"

Combined Firm Returns

Horizontal

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	65	0.070	0.055	0.316	-0.062	80.0%	6.790	<.0001
Net of Market	65	0.069	0.043	0.327	-0.048	78.5%	6.670	<.0001
Market Model	65	0.067	0.037	0.340	-0.044	78.5%	6.520	<.0001

Vertical

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	60	0.053	0.040	0.512	-0.158	73.3%	3.800	0.0003
Net of Market	60	0.053	0.036	0.484	-0.161	75.0%	3.980	0.0002
Market Model	59	0.053	0.037	0.458	-0.165	73.3%	3.980	0.0002

Conglomerate

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	27	0.068	0.031	0.561	-0.090	70.4%	2.590	0.0154
Net of Market	27	0.058	0.014	0.558	-0.102	63.0%	2.210	0.0358
Market Model	27	0.058	0.016	0.551	-0.111	66.7%	2.220	0.035

Panel C reports CARs around merger announcement date for horizontal, vertical, and conglomerate type mergers as defined by the "SIC Classification" scheme. The table is partitioned into three parts to display CARs for the total combined, bidder, and target firms respectively, where combined firm returns are calculated as a market-value-weighted-average of bidder and target firm returns. Three methods of calculating CARs are implemented, all of which are calculated using a (-1,+1) window where day 0 is the merger announcement date as reported by SDC. "Net of Market" returns are calculated by subtracting the CRSP value-weighted index from "Raw Returns," and "Market Model" excess returns are calculated using an estimation period of (-255,-22), where day 0 is again announcement date. "% Positive" refers to the proportion of total calculated CARs that are greater than zero, and p-values ("Pr>|t|") are in terms of testing whether CARs are statistically different from zero.

Table 7- Primary Event Study Analysis (-1,+1) (cont.)

Panel C: Announcement Returns for V, H, & C via "SIC Classification" (cont.)

Bidder Firm Returns

Horizontal

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	72	0.031	0.021	0.320	-0.174	68.1%	3.230	0.0019
Net of Market	72	0.030	0.014	0.309	-0.198	62.5%	3.060	0.0031
Market Model	71	0.028	0.016	0.295	-0.215	61.1%	2.810	0.0065

Vertical

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	66	0.006	0.008	0.284	-0.205	57.6%	0.650	0.5165
Net of Market	66	0.006	0.004	0.277	-0.208	57.6%	0.750	0.4547
Market Model	64	0.006	0.003	0.277	-0.212	54.5%	0.690	0.4913

Conglomerate

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	40	0.001	0.010	0.296	-0.328	57.5%	0.090	0.9323
Net of Market	40	-0.003	0.008	0.299	-0.345	55.0%	-0.230	0.8178
Market Model	40	-0.004	0.006	0.297	-0.350	55.0%	-0.310	0.761

Target Firm Returns

Horizontal

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	76	0.226	0.201	0.822	-0.248	88.2%	9.530	<.0001
Net of Market	76	0.225	0.204	0.814	-0.277	88.2%	9.520	<.0001
Market Model	76	0.222	0.212	0.830	-0.369	86.8%	9.180	<.0001

Vertical

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	71	0.360	0.314	1.440	-0.050	93.0%	11.160	<.0001
Net of Market	71	0.360	0.314	1.429	-0.046	90.1%	11.230	<.0001
Market Model	70	0.365	0.325	1.396	-0.052	91.5%	11.370	<.0001

Conglomerate

Return Measure	N	Mean	Median	Max	Min	% Positive	t-Value	Pr > |t|
Raw Returns	33	0.325	0.277	0.814	-0.097	97.0%	8.270	<.0001
Net of Market	33	0.316	0.274	0.819	-0.081	93.9%	7.970	<.0001
Market Model	33	0.314	0.276	0.814	-0.089	93.9%	7.920	<.0001

This is a continuation of *Panel C* which reports CARs around merger announcement date for horizontal, vertical, and conglomerate type mergers as defined by the "SIC Classification" scheme. Above results are for Target and Bidder firms respectively, with Combined firm returns reported on the previous page.

Table 8- Event Study Analysis Alternate Windows (Robustness)

Panel A: Announcement Returns for Full Sample

	Total Returns	
	Mean	*(P-Value)*
Combined Firm		
(-2,+2)	6.02%	<.0001
(-5,+5)	5.84%	<.0001
Target		
(-2,+2)	29.90%	<.0001
(-5,+5)	32.62%	<.0001
Bidder		
(-2,+2)	1.28%	0.0723
(-5,+5)	1.17%	0.1449

Panel B: Announcement Returns for V, H, & C Classifications

	Horizontal Returns		Vertical Returns		Conglomerate Returns	
	Mean	*(P-Value)*	*Mean*	*(P-Value)*	*Mean*	*(P-Value)*
Ellis Method						
Combined Firm						
(-2,+2)	6.84%	<.0001	5.60%	0.0721	3.42%	0.2027
(-5,+5)	6.57%	<.0001	6.34%	0.0662	2.93%	0.2105
Target						
(-2,+2)	28.03%	<.0001	38.99%	<.0001	29.79%	<.0001
(-5,+5)	31.59%	<.0001	39.47%	<.0001	31.25%	<.0001
Bidder						
(-2,+2)	2.68%	0.0012	-2.42%	0.4052	-0.97%	0.4014
(-5,+5)	2.67%	0.005	-2.22%	0.5018	-1.62%	0.1498
SIC Method						
Combined Firm						
(-2,+2)	7.10%	<.0001	5.00%	0.0003	5.62%	0.0707
(-5,+5)	6.53%	<.0001	5.36%	0.0006	5.24%	0.0836
Target						
(-2,+2)	22.28%	<.0001	37.40%	<.0001	31.50%	<.0001
(-5,+5)	26.95%	<.0001	38.42%	<.0001	33.41%	<.0001
Bidder						
(-2,+2)	2.90%	0.0062	0.06%	0.9495	0.35%	0.8577
(-5,+5)	2.83%	0.012	0.20%	0.8737	-0.23%	0.9122

Panel A reports alternative windows for CARs around merger announcement date for the entire set of sample firms. *Panel B* reports alternative windows for CARs around merger announcement date for horizontal, vertical, and conglomerate type mergers as defined by both the "Ellis" and "SIC" method. Each panel is partitioned in terms of combined, bidder, and target firm returns. Abnormal returns are in terms of calculations based on using the market model with estimation period (-255, -22).

Table 9- Regression Analysis: Relation between Merger Type and Select Variables of Interest

Panel A: "Cash Only" Consideration Structure on Merger Type

VARIABLES	(1) cash
vdummy	-0.059
	(-0.45)
hdummy	-0.196**
	(-2.08)
Constant	0.759***
	(9.45)
Observations	152
R-squared	0.028

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(With Controls)

VARIABLES	(1) cash
vdummy	-0.112
	(-0.85)
hdummy	-0.278**
	(-2.57)
logtransvalue	0.010
	(0.31)
Constant	-0.226
	(-0.75)
Industry & Year Effects	Controlled
Observations	152
R-squared	0.351

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Panel A reports the results of an OLS regression of the "cash only" consideration structure dummy variable on variables for merger type- once without controls and once while controlling for transaction value as well as industry and year effects. The conglomerate merger variable is the "omitted contrast." In other words, it is left out of the regression equation due to multicollinearity considerations, but its effect is (at least partly) represented in the constant term. Due to nonlinearity created by having the "cash" dummy variable on the LHS, the coefficients on the explanatory variables are difficult to interpret, but the OLS equation remains the best *linear* predictor of "cash" in theory, and comparison of the coefficients is in fact still meaningful in terms of testing theories.

Panel B: (Log) Transaction Value on Merger Type

VARIABLES	(1) logtransvalue
vdummy	-0.366
	(-0.78)
hdummy	0.162
	(0.47)
Constant	6.801***
	(21.57)
Observations	152
R-squared	0.014

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(With controls)

VARIABLES	(1) logtransvalue
vdummy	-0.584
	(-1.11)
hdummy	0.393
	(0.89)
cash	0.382
	(0.93)
stock	-0.663
	(-0.99)
hybrid	0.663
	(1.43)
Constant	8.259***
	(16.91)
Industry & Year Effects	Controlled
Observations	152
R-squared	0.409

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Panel B reports the results of an OLS regression of the of the log of transaction value on variables for merger type, once without controls and once while controlling for consideration structure as well as industry and year effects. The conglomerate merger variable is the "omitted contrast." In other words, it is left out of the regression equation due to multicollinearity considerations, but its effect is (at least partly) represented in the constant term (note: "other" was also omitted in the control regression for similar multicollinearity considerations).

Panel C: Combined Firm Net of Market Returns on Merger Type

VARIABLES	(1) ccarm
vdummy	0.029
	(0.74)
hdummy	0.028
	(1.05)
Constant	0.038
	(1.47)
Observations	152
R-squared	0.012

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

(With controls)

VARIABLES	(1) ccarm
vdummy	0.010
	(0.20)
hdummy	-0.003
	(-0.08)
cash	-0.048
	(-1.44)
stock	-0.006
	(-0.13)
hybrid	-0.014
	(-0.38)
logtransvalue	0.006
	(0.89)
tenderoffer	0.014
	(0.54)
Constant	-0.205***
	(-3.84)
Industry & Year Effects	Controlled
Observations	152
R-squared	0.312

Robust t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Panel C reports the results of an OLS regression of combined firm CARs (net of market) on merger type, once without controls and once while controlling for consideration structure, transaction value, and tender offers, as well as industry and year effects. The conglomerate merger variable is the "omitted contrast." In other words, it is left out of the regression equation due to multicollinearity considerations, but its effect is (at least partly) represented in the constant term (note: "other" was also omitted in the control regression for similar multicollinearity considerations).