

Value Creation Estimates Beyond Announcement Returns: Mega-Mergers versus Other Mergers^{*}

Dinara Bayazitova
Kenan-Flagler Business School
University of North Carolina at Chapel Hill
dinara_bayazitova@unc.edu

Matthias Kahl
Leeds School of Business
University of Colorado at Boulder
matthias.kahl@colorado.edu

and

Rossen Valkanov
Rady School of Management
University of California, San Diego
rvalkanov@ucsd.edu

This version: February 7, 2012

Abstract:

Much of the literature considers only short-term acquirer announcement returns when analyzing which mergers create value for the acquirer. However, announcement returns combine information about value creation because of the merger and a revaluation of the acquirer's stand-alone value. We use three methods to infer revaluation-free value creation directly because of the merger. We find that despite their negative average announcement returns, acquisitions of public targets typically do not destroy value and, by most measures, create value. Only mega-mergers, the top 1% of mergers in absolute transaction value, destroy value for the acquirer. In contrast, non-mega-mergers create value for the acquirer. We also show that the value destruction in mega-mergers is driven by managerial motives and weak corporate governance.

^{*} An earlier version of this paper was entitled "Which Mergers Destroy Value? Only Mega-Mergers." We would like to thank Sanjai Bhagat, Greg Brown, Bhagwan Chowdhry, Eric de Bodt, Diego Garcia, Mark Garmaise, Eitan Goldman, Amit Goyal, Harrison Hong, Chris Leach, Mattias Nilsson, David Robinson, Jörg Rocholl, Sergey Sanzhar, Merih Sevilir, Chris Yung, Jaime Zender, and seminar participants at the University of Colorado at Boulder, the University of North Carolina at Chapel Hill, and the University of Notre Dame for helpful comments and suggestions. Matthias Kahl gratefully acknowledges financial support from the Bank of America Faculty Development Fund at the Kenan-Flagler Business School, University of North Carolina at Chapel Hill. We are grateful to Value Line Publishing, Inc. for making their Estimates & Projections file available to us. All remaining errors are solely our responsibility.

1. Introduction

One of the key questions in the extensive literature on mergers is whether the acquirer's shareholders gain or lose. This question is important because it sheds light on why mergers occur. If acquirers gain, this suggests that mergers are driven by value-maximizing firm behavior. In contrast, if acquirers lose, this indicates that managers make acquisitions to pursue their own interests at the expense of their shareholders or that they suffer from overconfidence. Understanding which mergers create value is also important for advising managers, shareholders, and boards of directors on which mergers to engage in.

Most of the conclusions about value creation for acquirers are based on acquirer short-term abnormal announcement returns.¹ However, acquirer announcement returns combine information about value creation because of a merger with information about a revaluation of the acquirer's stand-alone value. For example, if the merger announcement reveals negative information about the acquirer's stand-alone value and the negative information would have come out eventually even without the merger, one cannot blame the merger for the value reduction. In fact, without the acquisition, the acquirer could be worth less. Examples of such negative information revealed in a merger announcement include overvaluation in stock-financed acquisitions (Myers and Majluf, 1984) or lower than expected internal growth opportunities (McCardle and Viswanathan, 1994; Jovanovic and Braguinsky, 2004).

While there has been some work on distinguishing value creation from revaluation (see, e.g., Bhagat, Dong, Hirshleifer, and Noah, 2005, discussed below), no paper has systematically investigated value creation for the acquirer directly because of the merger for the key merger types that could be associated with value destruction according to their announcement returns. This is what we do in this paper.

The literature on mergers in the 1980s argued that, based on average acquirer short-term announcement returns, acquirers experience losses.² This view has changed since the advent of the

¹ Like most of the literature on acquirer returns, we do not consider long-term stock performance because of the well-known issues with their interpretation. A test of abnormal long-term stock performance after mergers is a joint test of market efficiency, the correct asset pricing model, and value creation. Moreover, post-merger operating performance does not measure value creation for the acquirer, but only for the combined firm.

² See, for example, Asquith, Bruner, and Mullins (1987), Banerjee and Owers (1992), Byrd and Hickman (1992), Servaes (1991), and Varaiya and Ferris (1987). See Table 8-6 in Gilson and Black (1995).

Securities Data Corporation (SDC) database with a much more comprehensive sample. Acquirer returns are positive even for mergers that were associated with negative acquirer returns in the older literature. For example, stock-financed acquisitions, as well as all mergers together, have positive average acquirer announcement returns (see, e.g., Moeller, Schlingemann, and Stulz, 2004).

The more recent literature has made important progress in understanding which mergers are associated with negative average acquirer announcement returns. They apply only to acquisitions of public targets, which account for approximately 20% of all mergers (see, e.g., Chang, 1998), while acquisitions of non-public targets have positive acquirer returns. Moeller, Schlingemann, and Stulz (2004) show that large acquirers have zero average equal-weighted announcement returns and negative value-weighted returns. In contrast, small acquirers have positive announcement returns. These findings motivate us to focus on value creation in acquisitions of public targets and by large acquirers. We add to that an analysis of the largest 1% of mergers by absolute transaction size. Such “mega-mergers” are a small subset of the acquisitions by large acquirers (about 2%) and, mostly, of public targets (about 4%).³ However, they are about as important as all other mergers combined, since almost half of all the money spent on mergers is spent on mega-mergers.

We consider U.S. acquisitions between 1980 and 2007, using the *SDC* database. We show that acquirers in mega-mergers have strongly negative average announcement returns of -3.2%. In contrast, acquirers in non-mega mergers have positive average announcement returns of 1.5%. The difference in returns between mega- and other mergers is robust to the known determinants of acquirer returns, such as acquirer size and the target’s public status.⁴ This difference in returns is similar if we measure deal size by pre-merger target value, excluding the premium, instead of transaction value. Hence, the result is not mechanically driven by using a measure of deal size that includes the premium. Moreover, we find that mega-mergers have strongly negative dollar announcement returns, with a mean dollar abnormal loss of

³ All but about 18% of mega-mergers have public targets.

⁴ Acquirer returns in non-public mega-mergers are insignificant, but the vast majority of mega-mergers have public targets. We do not distinguish between mega-mergers with public and non-public targets in most of our analysis due to the small number of non-public mega-mergers and because we cannot estimate the value creation for acquirers in non-public mega-mergers. Two of our methods require public targets and the other one has too few non-public mega-merger observations for any reliable statistical analysis.

\$1.7 billion, leading to aggregate dollar losses of \$415.5 billion for all mega-mergers.

Acquisitions of public targets have negative acquirer returns, both in mega-mergers (-3.77%) and non-mega-mergers (-0.93%). All mega-mergers are done by large acquirers. However, large acquirers have insignificant equal-weighted returns in the 98% of their acquisitions that are not mega-mergers. They only have negative announcement returns in mega-mergers. We also show that mega-mergers are not just the acquisitions by large acquirers with the largest size of the target relative to the acquirer, which have insignificant average announcement returns. These results suggest that mega-mergers destroy value for acquirers, but so does the much larger set of acquisitions of public targets.

We employ three approaches to measure revaluation-free value creation for the acquirer. First, we analyze the acquirer's short-term abnormal returns at the time when it becomes known that a merger bid failed so that the merger is not completed. If a merger creates (destroys) value, the news that it will not occur should lead to negative (positive) abnormal returns to the bidder. We argue that abnormal returns at the time of merger failure should not be affected by a revaluation of the acquirer's stand-alone value because of the merger announcement. Such revaluation should already be incorporated in the acquirer's stock price directly after the announcement.

Our second approach infers value creation from *Value Line* analyst forecasts. *Value Line* makes these forecasts for the acquirer and target as stand-alone firms until the closing of the merger and for the combined firm after the closing. This allows us to estimate revaluation-free value creation directly because of the merger. The third approach follows Bhagat, Dong, Hirshleifer, and Noah (2005) and infers value creation from the stock market response for the initial bidder when a competing bid arrives. We compare this synergy estimate to the dollar premium.

Although these three approaches are very different, they lead to the same conclusions. The inference from announcement returns is reversed for important types of mergers. In particular, acquirers of public targets do not destroy value. Indeed, by most measures, they create value, considering both equal- and value-weighted averages, in the 96% of their mergers that are not mega-mergers, although their announcement returns are negative in these mergers. Hence, this insight arises because of the distinction

between value creation directly because of the merger and revaluation. Acquirers of public targets only destroy value in mega-mergers. We also find that the presence of a large acquirer is necessary for value destruction. However, large acquirers also destroy value only in mega-mergers, but, by most measures, create value in non-mega-mergers. In addition, we show that the set of value-destroying mergers does not extend beyond the top 1% in transaction value and therefore is indeed very small.

Supporting this conclusion, acquirer returns when a merger bid fails are positive for mega-mergers, but negative for non-mega-mergers. The mean estimate of value creation from *Value Line* and from competing bids is between -17.6% and -18.1% in mega-mergers while it is between 6.5% and 9.7% for non-mega-mergers. The results are very similar for public mega- and non-mega-mergers. These results cannot arise because smaller mergers are too small to affect the value of potentially much larger acquirers. Then these mergers should be value-neutral rather than value-creating.

Our results do not imply that the distinction between public and private targets and large and small acquirers is not important. First, only large acquirers engage in mega-mergers, and most mega-mergers have public targets. Moreover, we find that large acquirers create less value than small acquirers and acquirers of public targets create less value than acquirers of non-public targets according to the value creation measures with enough observations for these subsamples.

We also investigate why mega-mergers occur, although they destroy value for the acquirer. We find that managerial motives, as suggested by Jensen's (1986) free cash flow theory or Jensen's (2004) overvalued equity hypothesis, are partly responsible for the incidence of mega-mergers. Moreover, firms with weaker corporate governance are more likely to engage in mega-mergers. Therefore, to some extent, managerial merger theories can explain why mega-mergers occur.

To summarize, our paper makes three contributions. First, we measure revaluation-free value creation for acquirers in several ways. We find that the acquisitions with the worst announcement returns – of public targets and by large acquirers – actually create value once mega-mergers are excluded. Second, we identify an important set of mergers that destroy value, mega-mergers, while all other mergers create value. Third, we show that the value destruction in mega-mergers is driven by managerial motives

and weak corporate governance. Overall, our findings shed a more positive light on merger activity than the existing literature. Based on ex ante identifiable characteristics, acquirers should avoid only 1% of mergers (albeit the largest ones), not 20% (public targets) or even the majority (acquisitions by large acquirers).

Our paper is related to several other papers. Bhagat, Dong, Hirshleifer, and Noah (2005) offer the first detailed empirical study that distinguishes value creation from revaluation. They develop the “intervention method”, which is one of the three methods used in this paper to measure revaluation-free value creation. Bhagat, Dong, Hirshleifer, and Noah (2005) analyze tender offers, which constitute 3.5% of all mergers in our sample, and focus on combined acquirer and target value creation but also show that acquirers in tender offers break even. We confirm the importance of the distinction between value creation and revaluation but focus on value creation for the acquirer and in particular differences across several types of mergers, including acquisitions of public targets, by large acquirers, and mega-mergers.

Savor and Lu (2009) compare the long-term stock performance of successful acquirers in public stock-financed mergers to those of bidders in stock mergers whose bid failed for exogenous reasons. They conclude that, despite the poor short-term and long-term market reaction to such mergers, without the acquisition, long-term shareholders would have been even worse off. We use different methods to infer value creation, not based on long-term stock performance, look at different subsamples of mergers, and, while finding that most of the merger types we consider create value, also find an important type of mergers that destroys value, mega-mergers.

Moeller, Schlingemann, and Stulz (2005) show that a small number of “large loss deals”, which almost exclusively occur between 1998 and 2001, had acquirer dollar losses above \$1 billion, with more than half of these losses occurring in 2000. Unlike this paper, we use several methods to measure revaluation-free value creation in acquisitions of public targets and by large acquirers as well as mega-mergers. Mega-mergers are identified ex ante, which allows boards to screen out bad mergers, and therefore different from large loss deals, which are identified ex post by large losses. We find that acquirers in mega-mergers experience a positive revaluation of their stand-alone value and hence their negative

announcement returns indicate value destruction directly because of the merger. In contrast, from the average acquirer dollar loss of \$2.31 per dollar spent for the large loss deals Moeller, Schlingemann, and Stulz (2005) conclude that "... it seems probable that the acquisitions led investors to reconsider the extremely high stand alone values of the announcing firms." (p.781). Mega-mergers destroy value not just in 1998-2001 but across all time periods. The overlap between mega-mergers and large loss deals is very small, and the results for mega-mergers hold even if one excludes large loss deals.

Devos, Kadapakkam, and Krishnamurthy (2008) use *Value Line* forecasts to estimate the source of merger synergies. In contrast, we are interested in value creation for the acquirer, the difference between revaluation of the acquirer's stand-alone value and value creation directly because of the merger, and the difference between mega- and non-mega-mergers. Hence, we adjust their methodology of estimating synergies to obtain revaluation-free estimates of acquirer value creation.

The remainder of the paper is structured as follows. In Section 2, we describe the data and sample selection. Section 3 presents the results on acquirer announcement returns. In Section 4, we calculate revaluation-free value creation. Section 5 analyzes whether the worse acquirer announcement returns associated with mega-mergers can be explained by other factors. In section 6, we investigate why mega-mergers occur. Section 7 provides the conclusion.

2. Data and Sample Selection

Our data set consists of acquisitions announced between January 1980 and December 2007 from the *SDC* merger database, where both the acquirer and the target are U.S. firms. We consider acquisitions of majority interest, acquisitions of assets, mergers, and tender offers. We apply the following filters, which are common in the literature: (1) the transaction must be completed; (2) the acquirer controls less than 50% of the target before the merger but more than 50% afterward; (3) the transaction value is available and at least \$1 million; and (4) the transaction value is at least 1% of the acquirer's market value of equity. Transaction values measure the total consideration paid for the target, including the premium.

We define mega-mergers to be deals with transaction values in the top one percent of the

distribution. The one percent cut-off, although somewhat arbitrary, was chosen to give us a sufficiently large sample of the largest transactions (244). Measuring deal size by raw transaction values can lead to a bias because targets tend to have larger values in times of high aggregate stock market valuations. To address this issue, we express all transaction values as a fraction of the total U.S. stock market capitalization on the day of the announcement. Mega-mergers are then defined to be the top one percent of this stock market capitalization-adjusted transaction value. Our results are robust to using the raw deal values. Sometimes, we group non-mega-mergers into very large (95th to 99th percentile), large (67th to 95th percentile), medium (33rd to 67th percentile), and small mergers (0th to 33rd percentile).

Table 1 shows that mega-mergers have transaction values larger than 0.06% of the total U.S. stock market capitalization (see Panel A). If we measure transaction size in dollars, mega-mergers have transaction values of more than \$4.7 billion. Panel B indicates that almost 40% of all mergers and 37% of the 244 mega-mergers occur between 1996 and 2001. Panel C shows that the average transaction value in our sample is \$309 million (the median is \$33 million). One fifth of the mergers involve public targets. We also find in untabulated results that mega-mergers do not concentrate strongly by industry. Overall, our sample is similar to those used in other studies, including Moeller, Schlingemann, and Stulz (2004).⁵

[Table 1 about here]

3. Acquirer Announcement Returns

First, we measure the effect of a merger on the value of the acquirer by acquirer cumulative abnormal returns (CARs), using the market model. The parameters of the market model are estimated over 200 trading days ending 20 days before the first public announcement of the merger. We use the *CRSP* value-weighted index as our proxy for the market. Our results are robust to using other definitions of acquirer returns, including market-adjusted returns and raw (unadjusted) returns. We focus on value creation for

⁵ However, our sample is larger than the one in Moeller, Schlingemann, and Stulz (2004) even for their sample period of 1980 to 2001. The main reason is that they exclude targets for which current liabilities and current assets are not available on *Compustat*, since these data are used to calculate the size of the target relative to the acquirer to eliminate very small targets. However, one obtains more observations if one measures assets directly or measures relative size using the acquirer's market value of equity. Our main results are robust to using the same sample construction as in Moeller, Schlingemann, and Stulz (2004).

the acquirer and not for the combination of acquirer and target, because only value creation for the acquirer is informative about why the acquirer engages in a merger. Moreover, there is little debate about average short-term combined returns; they are known to be positive (Andrade, Mitchell, and Stafford, 2001).

We measure acquirer returns over the period from three days before the announcement of the merger to three days after it (-3,3). Our results are robust to other windows around the announcement day, such as (-5,5) or (-1,1). In the interest of brevity, we only report the results for the (-3,3) window. The equal-weighted average acquirer CAR in our sample is 1.40% and the median CAR is 0.32%.

3.1. Acquirer returns in mega-mergers and non-mega-mergers

Table 2 shows that acquirers in mega-mergers earn strongly negative CARs (see Panel A). The equally weighted average CAR is -3.16% and the median is -3.36%. In contrast, acquirers in non-mega-mergers earn positive CARs. The average CAR is 1.45% and the median is 0.34%. Both mean and median are significant at the 1% level for mega- and non-mega-mergers. The difference in CARs between mega- and non-mega-mergers is economically large (mean: 4.60%; median: 3.71%), compared to the sample average CAR of 1.40% (median: 0.32%), and significant at the 1% level.

[Table 2 about here]

In more than two thirds of mega-mergers (68%), acquirer returns are negative. In contrast, only 47% of non-mega-mergers are associated with negative announcement returns. The results for value-weighted average CARs are similar. Acquirer returns are strongly negative for mega-mergers (-4.78%) and much worse in mega-mergers than in non-mega-mergers, where they are only slightly negative (-0.57%).

Panel A of Table 2 also shows that acquirers have negative CARs in very large mergers (top 2-5%; the mean of -0.89% is significant at the 10% level; the median of -1.28% is significant at the 1% level). In contrast, the average CAR in large, medium, and small mergers is positive. These results suggest that negative average CARs apply mostly to the top 5% of mergers in terms of transaction size.

Panel B of Table 2 shows dollar abnormal returns (see Malatesta, 1983), calculated as the percentage

abnormal return times the equity market capitalization of the acquirer four days before the merger announcement and adjusted for inflation (using constant 2007 prices). They are strongly negative for mega-mergers (mean: -\$1.703 billion; median: -\$376.2 million), but close to zero for non-mega-mergers (mean: -\$13.3 million; median: \$0.5 million). In aggregate, mega-mergers have abnormal dollar losses of \$415.5 billion. In untabulated results, we find that acquirers lose on average nine cents per dollar spent on mega-mergers (the median is seven cents). While this is a substantial loss, it is small enough to be plausibly attributed to value destruction directly because of the merger. In contrast, the average loss in the large loss deals between 1998 and 2001 in Moeller, Schlingemann, and Stulz (2005) is \$2.31 per dollar spent. In our sample, it is \$2.09 (median \$0.45). This clearly must be driven mainly by a revaluation of the acquirer's stand-alone value, as the authors suggest, since the value destruction is larger than the price paid.

Within the top 5% of mergers, CARs are monotonic in deal size (see Panel C of Table 2). The average CAR for acquirers in the second percentile of mergers (top 1-2%) is -1.47% and for the top 2-5% of deals it is -0.69% (insignificant). These results indicate that changing the cut-off for mega-mergers slightly (for example, to 2%) would not change our qualitative conclusions regarding average CARs. One reason why we focus on the top 1% is that so much money is spent on the top 1% (43% of all merger outlays). The results are very similar to our results above if we categorize mergers by raw transaction value (see Panel D of Table 2) or raw transaction value normalized by the Consumer Price Index (untabulated).

One might argue that mega-mergers are more likely to have worse announcement returns simply because the definition of mega-mergers is built on transaction value, which includes the premium. Higher premia, *ceteris paribus*, may lead to worse acquirer announcement returns. To address this issue, Panel E of Table 2 presents what happens if we define mega- and non-mega-mergers by the target's preannouncement value (as a fraction of the total stock market capitalization), which excludes the premium. This, of course, removes all non-public deals and dramatically reduces the sample. With this alternative definition of deal size, acquirers in mega-mergers again earn much worse announcement returns (-5.25%) than acquirers in non-mega-mergers (-1.32%). Hence, our results are not driven by a mechanical relation

between transaction values and premia. Note that the negative announcement returns associated with non-mega-mergers arise because all targets are public.

Our results cannot arise because many non-mega-mergers are too small relative to the acquirer to have a measurable effect on the acquirer's value.⁶ This would predict an insignificant average CAR in non-mega-mergers. However, we observe a strongly positive effect. We also find that the results on CARs are similar to our results above if we exclude all targets less than 5% or 30% of the acquirer's size (see Panel F). Moreover, mega-mergers have negative acquirer CARs for both mergers financed with a majority of stock (for simplicity called "stock-financed") and all other mergers ("cash-financed"), and the difference between acquirer returns in mega- and other mergers is significant at the 1% level for both stock- and cash-financed deals (see Panel G).⁷

Panel H of Table 2 focuses on the acquirers that engage in at least one mega-merger. These acquirers engage in 859 non-mega-mergers and experience average CARs in these smaller deals of 0.04% (not statistically significant), which are statistically significantly different from their returns in mega-mergers at the 1% level. Hence, the negative acquirer returns seem to stem from the transaction size, a deal characteristic, and not characteristics of acquirers that engage in mega-mergers.

To see whether our results are robust to excluding the stock market boom of the late 1990s and early 2000s (Moeller, Schlingemann, and Stulz, 2005), we remove 1998-2001 from our sample. Panel I of Table 2 shows that average acquirer CARs for mega-mergers are strongly negative in both subperiods (-5.63% in 1998-2001 and -2.28% outside of this period). Acquirer abnormal returns in other mergers are positive in both subperiods, and the difference between mega-merger returns and returns in other mergers is statistically significant at the 1% level. Panel J of Table 2 considers mergers since 2002. The mean CAR in mega-mergers since 2002 is -4.80%, while it is 1.10% in non-mega-mergers. Moreover, we find that only 9% of acquirer abnormal returns in mega-mergers since 2002 are positive. Hence, acquirers do not appear to have learned from the poor stock market reaction to mega-mergers.

⁶ The correlation between absolute and relative size is only 0.06.

Panel K considers “large loss deals” between 1998 and 2001, defined ex post by a reduction in the acquirer’s value of at least \$1 billion during the event window from one day before to one day after the merger announcement (Moeller, Schlingemann, and Stulz, 2005).⁸ The overlap between the samples of large loss deals and mega-mergers is small. Only 36 of the 244 mega-mergers are large loss deals. In the sample that excludes large loss deals, acquirers in mega-mergers earn negative average abnormal returns (-1.99%), while acquirers in all other mergers earn positive average abnormal returns (1.49%). Hence, the difference in acquirer returns between mega- and other mergers holds even if one removes the large loss deals and thus is not driven by them. The magnitude of the difference between acquirer returns in mega-mergers and other mergers is somewhat smaller when one removes these acquisitions with the worst (dollar) acquirer returns, since the fraction of large loss deals is larger among mega-mergers (14.8%) than among other mergers (0.3%), although almost 70% of large loss deals are not mega-mergers. Overall, we conclude that our finding on mega- and non-mega-merger returns is not due to the large loss deals.

Interestingly, large loss deals are often quite small. In the largest merger sample to date, the median large loss deal has no deal value and the median relative deal size for large loss deals with a deal value is 0.3% of the acquirer’s size (Netter, Stegemoller, and Wintoki (2011)).⁹ This suggests that the losses incurred in large loss deals have little to do with large transaction values.

3.2. Acquirer returns in acquisitions of public targets and by large acquirers

We confirm the result from the literature that acquirer CARs are negative in acquisitions of public targets (-1.05%, untabulated), but positive in acquisitions of non-public targets (2.03%, untabulated) and insignificant for large acquirers (-0.02%, untabulated) but positive for small acquirers (3.24%). Following Moeller, Schlingemann, and Stulz (2004), we define all acquirers above the bottom 25th percentile in size

⁷ Chang (1998) shows that for public targets, stock-financed mergers are associated with lower acquirer announcement returns than cash-financed mergers while the opposite is true for acquisitions of private companies.

⁸ Since we have a larger sample to start with, we find a somewhat higher number of large loss deals (117) than the 87 in Moeller, Schlingemann, and Stulz (2005).

⁹ In untabulated results, we find that such large loss deals below 1% in relative size or without deal value have aggregate dollar losses for acquirers more than twice as large as the large loss deals in Moeller, Schlingemann, and Stulz (2005). In such a larger sample including very small deals, non-mega-mergers continue to have strongly positive average and median CARs.

on the NYSE as large acquirers and all other acquirers as small acquirers.

We add to the analysis of acquisitions of public targets and by large acquirers by separating them into mega-mergers and non-mega-mergers. Table 3 shows our results. We find that acquirers in public acquisitions experience negative CARs, both in mega-mergers and in non-mega-mergers (see Panel A). The announcement returns are substantially worse in public mega-mergers (-3.77%) than in public non-mega-mergers (-0.93%), and the difference is significant at the 1% level. Mega-mergers constitute approximately 4% of all acquisitions of public targets.¹⁰

We also find that acquirers in non-public mega-mergers have insignificant announcement returns (-0.29%, see Panel B). In contrast, acquirers in non-public non-mega-mergers have positive announcement returns (2.04%, significant at the 1% level). Non-public mega-mergers are rare (there are only 43). They are the only subset of mega-mergers in our analysis that do not have significantly negative CARs.

The vast majority of acquisitions by large acquirers (98%) are non-mega-mergers. Large acquirers earn, on average, zero CARs in these mergers (0.04%, insignificant, see Panel C). However, large acquirers earn negative announcement returns (-3.16%) in the 2% of their mergers that are mega-mergers. In untabulated results, we find that “mega-acquirers” (firms in the top 1% of the acquirer size distribution) also have strongly negative CARs only in mega-mergers. They have insignificant CARs in non-mega-mergers. All of the acquisitions by small acquirers are non-mega-mergers. They experience positive announcement returns (mean: 3.24%, see Panel D) in these acquisitions.

These results suggest that acquirers destroy value in mega-mergers, but also, more generally, in acquisitions of public targets. In particular, acquisitions of public targets that are non-mega-mergers also destroy value. Non-mega-mergers by large acquirers are value-neutral. All other mergers, such as all non-mega-mergers together or acquisitions of non-public targets and by small acquirers, create value. Panel E of Table 3 shows that the results for large acquirers are very similar if we exclude all deals in which the

¹⁰ Note also that the average and median acquirer announcement returns in acquisitions of public targets remain negative if one excludes all large loss deals between 1998 and 2001. In untabulated results, we find that the average

transaction value is less than 5% or 30% of the acquirer's size, respectively.¹¹

Netter, Stegemoller, and Wintoki (2011) analyze a much larger sample of mergers than common in the literature by including many very small mergers (as well as private bidders). In addition to new results on merger waves, calendar day concentration of mergers, and cash and stock mergers, they also briefly show that in this larger sample, only the mergers with large acquirers and large transaction values (both defined to be above \$1 billion) are associated with negative average acquirer returns. This reflects the fact that most of these deals have public targets, which have negative average acquirer returns, while the other transactions have mostly non-public targets, which have positive average acquirer returns.¹²

We use the sample selection criteria usually employed in the literature, excluding very small deals, and show that even then, only the very largest deals destroy value, while all others create value, even among mergers with public targets. This result does not arise from announcement returns but the distinction between value creation and revaluation of the acquirer's stand-alone value, which we turn to in the next section.

Cai, Song, and Walkling (2011) argue that if one takes into account that merger bids are anticipated, bidders for public targets earn insignificant or even slightly positive average anticipation-adjusted returns. Our results also suggest that acquirers of public targets typically do not destroy value, and indeed create value in the vast majority of such mergers. However, our conclusion is not based on adjustments for merger anticipation, but the distinction between value creation and revaluation of the acquirer's stand-alone

return is -0.86% and the median is -1.11%. Both are significant at the 1% level. Hence, negative acquirer returns in acquisitions of public targets are not driven by the poor returns of large loss deals.

¹¹ In untabulated results, we categorize mergers by their ranking in terms of relative size based only on acquisitions by large acquirers. We find that only the smallest third of acquisitions by large acquirers in terms of relative size have significantly negative average acquirer CARs while the top 1% have insignificant average acquirer returns. Hence, the difference in announcement returns between mega-mergers and other mergers by large acquirers does not arise because non-mega-mergers are too small relative to the acquirer's size to have a significant effect on the acquirer's value.

¹² They also find negative acquirer CARs in public deals, whose average CAR in their sample is slightly lower than the -1.0% average for large deals by large acquirers. In untabulated results, we find that acquisitions of public targets are typically associated with negative median acquirer CARs regardless of acquirer and deal size and with negative average CARs for large acquirers (the majority of public deals) and insignificant average CARs for small acquirers, regardless of deal size. In contrast, large deals by large acquirers have positive average and median acquirer CARs if the target is not public. Loderer and Martin (1990) briefly show in an early sample from 1966 to 1984 negative correlations between acquirer size as well as deal size and acquirer CARs. They also do not consider the difference between public and non-public targets and between revaluation and value creation directly because of the merger.

value. Moreover, unlike Cai, Song, and Walkling (2011), we also analyze acquisitions by large acquirers and mega-mergers and find that one important set of acquisitions, mega-mergers, does destroy value.

4. Acquirer Returns: Revaluation or Direct Effect of the Merger on Shareholder Value?

This section investigates whether negative CARs indicate value destruction, while positive CARs imply value creation. This is not necessarily the case, because the CAR can be caused by a revaluation of the acquirer's stand-alone value and not the value creation directly because of the merger, as explained in the Introduction. In this section, we use three different approaches to address this question. First, we consider the acquirer returns at the time of merger failure. Second, we estimate value creation directly because of the merger from *Value Line* analyst forecast revisions. Third, we use the "intervention approach" by Bhagat, Dong, Hirshleifer, and Noah (2005).

4.1. Inferring value creation from acquirer abnormal returns when a merger fails

Our first approach infers value creation in a merger from the acquirer abnormal returns at the time when the failure of a merger bid is announced and the merger is withdrawn. If a merger is value-destroying, the news that it will not occur should increase the acquirer's stock price. Conversely, if the merger is value-creating, the news of its abandonment should decrease the acquirer's stock price. Moreover, the announcement returns at the time of failure of transactions should not be strongly contaminated by a revaluation of the acquirer's stand-alone value. The reason is that the news about the acquirer's stand-alone value revealed through the initial announcement of the deal should already be in the stock price right after the announcement of the transaction. Moreover, the failure of the merger bid should not contain substantial news about the acquirer's stand-alone value, in particular if it is for exogenous reasons, such as a withdrawal because of an antitrust ruling.¹³

Our sample for this analysis consists of all unsuccessful merger bids that otherwise satisfy the same

¹³ Several papers analyze the announcement returns to acquirers and targets in unsuccessful or withdrawn transactions (e.g., Dodd and Ruback, 1977; Dodd, 1980; Asquith, 1983; Davidson, Dutia, and Cheng, 1989; Chang and Suk, 1998; and Akhigbe, Borde, and Whyte, 2000). However, acquirer announcement returns in withdrawn mergers

sample selection criteria as the main sample of completed mergers. We use the merger bid failure dates reported in *SDC*. Table 4 shows our results. There are 68 unsuccessful mega-mergers and 1,390 unsuccessful non-mega-mergers. In this approach as well as the other two approaches to measure value creation directly because of the merger, a merger is classified as mega-merger if it is in the top 1% of stock market capitalization-adjusted transaction values in the *SDC* sample. We report results for a three-day, (-1,1), as well as for a seven-day window around the withdrawal announcement, (-3,3). All means in Tables 4 to 6 are winsorized at the 5% level because of the small sample size for mega-mergers.

[Table 4 about here]

Acquirers in mega-mergers earn average abnormal returns at the time of the merger bid's failure (for simplicity called "withdrawal returns" below) of 1.28% over three days (significant at the 5% level) and 1.03% over seven days (which is not quite statistically significant with a p-value of 0.11). Their median withdrawal returns are 1.18% over three days (significant at the 5% level) and 1.08% over seven days (significant at the 10% level; see Panel A). These results suggest that mega-mergers destroy value for the acquirer. In untabulated results, we find that the acquirer CARs in mega-mergers that are later withdrawn are not as negative as for other mega-mergers. In particular, they are on average -1.52% (median -1.19%) over three days and -1.92% (median: -1.95%) over seven days. Hence, the withdrawal returns are in absolute value of similar magnitude as the announcement returns.

Acquirers in non-mega-mergers earn negative withdrawal returns. The average abnormal return at withdrawal is -0.63% over three days and -1.72% over seven days. The median return is -0.33% over three days and -1.18% over seven days. All returns are significant at the 1% level. These results suggest that non-mega-mergers create value for the acquirer.

Acquirers in public mega-mergers (see Panel B) have average withdrawal returns over three days of 1.34% (significant at the 5% level) and 1.18% over seven days (significant at the 10% level). The median returns are similar. These results suggest that public mega-mergers destroy value for the acquirer.

Acquirers in public non-mega-mergers have insignificant or negative withdrawal returns. The mean

have not been used to estimate revaluation-free value creation for the acquirer.

withdrawal return over three days is 0.29% (insignificant) and -0.65% over seven days (significant at the 5% level). The median withdrawal return is 0.02% over three days (insignificant) and -0.46% over seven days (significant at the 5% level). These results suggest that public non-mega-mergers do not destroy value for the acquirer and, in fact, considering the withdrawal returns over seven days, create value.

When large acquirers announce their withdrawal from a mega-merger, they experience positive CARs of 1.28% over three days (significant at the 5% level) and 1.03% over seven days (p-value of 0.11; however, the median withdrawal CAR of 1.08% is significant at the 10% level). In contrast, when large acquirers withdraw from a non-mega-merger, they experience insignificant average returns over three days and negative returns of -0.76% (significant at the 1% level) over seven days (see Panel C). These results suggest that large acquirers destroy value when they engage in mega-mergers but they do not destroy value and, when one considers the seven-day withdrawal returns, in fact, create value in non-mega-mergers. Small acquirers engage only in non-mega-mergers. They experience negative withdrawal CARs, with a mean of -1.55% over three days and -2.75% (both significant at the 1% level) over seven days (see Panel D). This suggests that acquisitions by small acquirers create value.

In untabulated results, we find that the difference between the withdrawal returns for large acquirers (with and without mega-mergers) and small acquirers is statistically significant at the 1% level. This is also the case for the difference between the withdrawal returns of acquirers in public and non-public acquisitions (with and without mega-mergers). These results suggest that while large acquirers and acquirers of public targets typically do not destroy value or even create value, they create less value than small acquirers and acquirers of non-public targets, respectively.

Overall, the analysis of withdrawal CARs suggests that mega-mergers destroy value for the acquirer, while non-mega-mergers create value. In contrast to the inference obtained from announcement returns, acquisitions of public targets and acquisitions by large acquirers typically (in non-mega-mergers) do not destroy value, and, in fact, by some measures create value. Small acquirers create value in the mergers they engage in, non-mega-mergers.

One shortcoming of the withdrawal CAR approach is that the completion probability is likely to be

lower right before the withdrawal date than immediately after the merger announcement, because news that the completion of the merger has become less likely could have been released before the withdrawal date from *SDC*. This makes it difficult to infer the magnitude of the direct effect of the merger on the acquirer's value from the absolute magnitudes of the announcement and the withdrawal returns. Another concern associated with the interpretation of withdrawal CARs is that they could be contaminated by a revaluation of the acquirer's stand-alone value if the withdrawal is not for exogenous reasons (see also Hietala, Kaplan, and Robinson, 2003). For these reasons, we complement this analysis by two other approaches of inferring value creation directly because of the merger.

4.2. Inferring value creation from *Value Line* analyst forecast revisions

Value Line makes quarterly forecasts of items such as revenues, costs, and capital expenditures for the stand-alone acquirer and target until the merger closes. It also makes these forecasts for the combined company after the closing of the merger. Devos, Kadapakkam, and Krishnamurthy (2008) show that *Value Line* forecasts post-merger operating performance well. They also show that most synergies come from investment cuts, which one would miss if one relied only on analyst forecasts of earnings, such as in *IBES*. Analyst forecasts of operating performance have the advantage over actual operating performance that they are produced close to the merger announcement and hence are less affected by events unrelated to the merger and survivorship bias (see Devos, Kadapakkam, and Krishnamurthy, 2008, p.8). Moreover, *Value Line* provides a benchmark for operating performance in the absence of the merger through its stand-alone forecasts.

4.2.1. The *Value Line* sample

We use *Value Line*'s Estimates and Projections file from 1987 to 2007. We exclude bank mergers because the valuation model would be very different. We also make sure that the first post-announcement forecast is made before the closing of the deal so that we can estimate revaluation-free value creation directly because of the merger. This eliminates 41 observations and leaves us with a final sample size of

201. Our sample is slightly larger than the number of mergers for which Devos, Kadapakkam, and Krishnamurthy (2008) obtain synergy estimates. *Value Line* forecasts are available only for large firms. The transactions in our *Value Line* sample are much larger than in the *SDC* sample, with a mean transaction value of \$5.02 billion (untabulated), compared to \$309 million for the *SDC* sample. All mergers in our *Value Line* sample are acquisitions of public targets, while only one fifth of the mergers in the *SDC* sample are. The average CAR is much lower in the *Value Line* sample, both for mega-mergers (-5.55%) and non-mega-mergers (-1.79%, untabulated). However, the difference between the acquirer CARs in mega- and non-mega-mergers is similar in both samples (-3.76% versus -4.60%).

4.2.2. Estimating value creation from *Value Line* analyst forecasts

Figure 1 illustrates our approach. We calculate value creation for the acquirer directly because of the merger by comparing firm values inferred from the *Value Line* forecasts, as explained below.

[Figure 1 about here]

Here, we discuss only the intuition behind our approach. We formally derive it using a simple model of merger gains (see the Appendix). Our measure of value creation is VC_1 :

$$VC_1 = ((A + T)_4 - A_2 - MV_{-1}^T - \pi) / ME_{-1}^A, \quad (1)$$

where $(A + T)_4$ is the combined company's firm value after the merger, A_2 is the acquirer's stand-alone value according to the last forecast before the merger closing (but after the merger announcement), MV_{-1}^T is the target's pre-announcement market value four weeks before the merger announcement, and π is the dollar premium the acquirer pays above the target's pre-announcement market value.¹⁴ The premium is calculated relative to the target's equity market value four weeks before the merger announcement.

We use *Value Line*'s estimate of the acquirer's stand-alone value right before the closing of the deal,

¹⁴ To estimate the combined company value, we use the first forecast for the combined company, which occurs within three months of the closing of the transaction. To identify such a forecast, we require sales of the combined company to be larger than the acquirer's pre-closing sales. Note that we do not consider stakes that acquirers hold in the target before the merger, because for 98% of observations, this item is missing on *SDC*. However, these stakes are typically small (with a median of zero; see, e.g., Bhagat, Dong, Hirshleifer, and Noah, 2005, for tender offers).

A_2 , because we want to have this estimate as close as possible to the estimate of the combined company value to obtain the gross gain from the merger as accurately as possible. This also means that the time from announcement to completion of a merger, which is likely to be longer for mega-mergers, does not affect our estimates. Note that the value creation for the acquirer depends on the actual price paid for the target, its pre-announcement market value plus the premium. Hence, we use market values for the target in calculating the value creation for the acquirer. However, we must use *Value Line* estimates for the acquirer to exclude the acquirer's revaluation because of the merger announcement. Both the last pre-closing but post-announcement stand-alone forecast for the acquirer, as well as the combined company forecast after the closing of the transaction, incorporate any revaluation because of the merger announcement, since they occur after the announcement of the transaction. By taking the difference between the two, we eliminate the revaluation of the acquirer's stand-alone value.

4.2.3. Estimating firm value from *Value Line* forecasts

We use compressed adjusted present value to estimate firm value, following the methodology in Devos, Kadapakkam, and Krishnamurthy (2008) very closely. First, we estimate capital cash flows:

$$CCF = SL \cdot OM \cdot (1 - T) - I + D \cdot R \cdot T, \quad (2)$$

where SL denotes sales, OM the operating margin, T the average tax rate, I investments in fixed assets and working capital net of depreciation, D the debt level, and R the cost of debt. *Value Line* provides forecasts for the first year after the date when the forecast is made and the average forecast for years three to five. We consider the medium-term forecast for years three to five to be for year four. We linearly interpolate the forecasts of operating profits, depreciation, capital expenditures, debt, and the ratio of working capital to sales for the intervening years and use the fifth year forecast in calculating the terminal value. We estimate firm value according to the following formula:

$$PV(CCF) = \sum_{t=1}^n (CCF_t / (1 + K)^t) + (CCF_n \cdot (1 + Inf)) / ((K - Inf) \cdot (1 + K)^n), \quad (3)$$

where t ranges from 1 to n , and n is the year of the last available forecast (in our case $n = 5$). K is the cost of capital estimated using the CAPM and the asset beta, a market risk premium of 7%, and the yield on the 10-year Treasury bond as the risk-free rate. We estimate the asset beta from *Value Line*'s equity beta and the firm's current capital structure, assuming that the debt beta is zero. For the terminal value of capital cash flows, we assume that the capital cash flows grow forever at the rate of expected inflation (Inf , the long-run inflation forecast from the Philadelphia Federal Reserve Bank). Devos, Kadapakkam, and Krishnamurthy (2008) show that synergy estimates from *Value Line* are robust to reasonable changes in the underlying assumptions, including the debt beta and long-term cash flow growth.

4.2.4. Results

Table 5 reports our results. Mega-mergers destroy on average 17.6% of the acquirer's value (significant at the 10% level). In contrast, non-mega-mergers create on average 9.7% of the acquirer's value (significant at the 5% level). The median value creation in mega-mergers is -14.4%. The median value creation in non-mega-mergers is 1.8%. Both are significant at the 10% level. The value-weighted results are qualitatively similar, but smaller. Mega-mergers destroy 10.2% of the acquirer's value. Non-mega-mergers create 4.8% of the acquirer's value.

[Table 5 about here]

The magnitude of the value loss for acquirers in mega-mergers is substantially larger than indicated by the announcement returns (-5.55% in the *Value Line* sample). One reason is that the estimates of value creation assume that the deal is completed with certainty, while at the time of announcement there is a significant probability that the deal is not completed. Moreover, if the announcement of a mega-merger leads to a positive revaluation of the acquirer's stand-alone value, then revaluation-free value creation will be more negative than the probability-scaled announcement return (which is the announcement return divided by the probability of completion).

The results for public mega-mergers and large acquirers are virtually the same as for mega-mergers overall, since there is no non-public acquisition and only one acquisition by a small acquirer. Because of

the lack of non-public acquisitions and acquisitions by small acquirers, we cannot measure the value creation for acquirers in these acquisitions. However, the inference from the withdrawal returns strongly supported that from the announcement returns, suggesting that acquirers in these mergers create value.

Overall, these results suggest that mega-mergers destroy value while non-mega-mergers create value. This is also true for acquisitions of public targets and by large acquirers: Acquirers in public non-mega-mergers and large acquirers in non-mega-mergers create value. They only destroy value in mega-mergers.

4.3. Inferring value creation and revaluation from competing bids

Our last approach to estimate revaluation-free value creation is the intervention method developed by Bhagat, Dong, Hirshleifer, and Noah (2005). We present this structural estimation approach only very briefly. It is derived and justified in detail in Bhagat, Dong, Hirshleifer, and Noah (2005). The idea behind the intervention approach is that a competing bid reduces the probability that the initial bidder wins the contest, but should not reveal much about the initial bidder's stand-alone value. Hence, one can infer the direct effect of the merger on the initial bidder's value from the change in its stock price upon the announcement of the competing bid. This can be done by adjusting this stock return for the probability of the initial bidder winning the takeover contest and the effect of the competing bid on the premium that must be paid by the initial bidder to win the contest. The intervention method generates an estimate of the synergies in the merger that do not come from revaluation, which can then be compared to the premium.¹⁵

¹⁵ Bhagat, Dong, Hirshleifer, and Noah (2005) use three structural equations to derive the following reduced-form formula for the revaluation-free synergies in a merger, scaled by the combined companies' pre-announcement value (see eq. (13) in their paper): $\frac{\bar{V}^I}{V_0^C} = \frac{R_3(P_1/V_0^C)}{\varphi_3 - \varphi_1} + (1 - \alpha)(\lambda(\frac{\bar{B}_1}{V_0^T}) + (1 - \lambda)(\frac{\bar{B}_3}{V_0^T}) - 1)(\frac{V_0^T}{V_0^C})$, where \bar{V}^I is the expected value improvement from the merger (the combined value of the companies minus the sum of the pre-announcement stand-alone values of acquirer and target net of any toehold the acquirer holds in the target, which we call synergies), V_0^C is the combined value of acquirer and target before the merger announcement, and R_3 is the return of the initial bidder at the announcement of the competing bid, which we measure over the seven days surrounding its announcement. P_1 is the initial bidder's stock price just after the initial bid, φ_1 is the probability that the initial bidder wins the takeover contest, φ_3 is the probability that the initial bidder wins the takeover contest after a competing bid has occurred, α is the pre-merger stake (toehold) the initial bidder holds in the target, and $\lambda = \frac{\phi_1}{\phi_1 - \phi_3}$. \bar{B}_1 is the expected price paid by the first bidder if s/he wins the takeover contest, as assessed right after

We scale the revaluation-free synergies by the acquirer's pre-announcement equity value, V_0^A (using the notation in Bhagat, Dong, Hirshleifer, and Noah, 2005, as we do also below), rather than the combined company value, to make them comparable to acquirer announcement returns. To infer revaluation-free value creation for the acquirer (called VC_2), we follow the intervention approach to estimate revaluation-free synergies and then compare them to $B - V_0^T$, the actual premium paid by successful bidders or the last premium offered by unsuccessful bidders, adjusted for the toehold α :

$$VC_2 = \frac{\bar{V}^I - (1 - \alpha)(B - V_0^T)}{V_0^A}, \quad (4)$$

where \bar{V}^I is the expected value improvement from the merger (the combined value of the companies minus the sum of the pre-announcement stand-alone values of acquirer and target net of any toehold the acquirer holds in the target, which we call synergies). Since the intervention method considers all merger announcements and not just completed deals, we first enlarge our *SDC* sample by including unsuccessful bids. However, there are relatively few mergers with competing bidders. Our sample of initial bids followed by a competing bid has 190 observations, 25 of which are mega-mergers. Because of the small sample size for mega-mergers, our inferences should be treated with some caution. We estimate the expected values \bar{V}^I , \bar{B}_1 , and \bar{B}_3 and the probabilities φ_1 and φ_3 from actual outcomes of the takeover contests separately for mega- and non-mega-mergers. The other variables are firm- or deal-specific.

We also infer the revaluation of the acquirer's stand-alone value from the intervention approach. Again, we follow the approach in Bhagat, Dong, Hirshleifer, and Noah (2005) with some modifications. They are mainly interested in value creation for the combined entity of acquirer and target. Hence, they also calculate revaluation for the combined entity of acquirer and target from combined returns for acquirer and target. We calculate revaluation of only the acquirer's stand-alone value directly from acquirer returns. We calculate first the probability-scaled acquirer announcement return. This is the

the initial bid, \bar{B}_3 is the expected price paid by the first bidder if s/he wins the takeover contest, as assessed directly after the competing bid occurs, and V_0^T is the stand-alone value of the target before the acquisition announcement.

acquirer CAR under the assumption that the probability of the merger being completed is one. Since this is not the case at the time of the merger announcement, we divide the acquirer CAR by the probability that the first bidder succeeds in its acquisition attempt (θ). We estimate this probability as the mean in our sample for each deal type for which we report results. For example, the merger completion probability for the first bidder in a mega-merger is 0.69.

Revaluation (REV) is inferred as the part of the probability-scaled acquirer announcement return that cannot be attributed to value creation directly because of the merger. Hence, it is the difference between the probability-scaled acquirer CAR and the estimate of value creation directly because of the merger, VC_2 :

$$REV = \frac{CAR}{\theta} - VC_2. \quad (5)$$

4.3.1. Results

Table 6 presents the results. Mega-mergers destroy on average 18.1% of the acquirer's value (see Panel A). The median value destruction is 16.2%. Both are significant at the 1% level. On average, non-mega-mergers create 6.5% of the acquirer's value (significant at the 1% level). The median value creation is 0.3% (significant at the 10% level). The value-weighted results are substantially smaller. Mega-mergers destroy 3.1% of the acquirer's value. Non-mega-mergers create 2.1% of the acquirer's value. The results for acquisitions of public targets are again the same as for the whole sample, since the intervention method applies only to acquisitions of public targets.

[Table 6 about here]

Large acquirers destroy value in mega-mergers. The mean value creation is -17.2% and the median is -13.8% (see Panel B).¹⁶ In contrast, large acquirers create value in non-mega-mergers. The mean value creation in non-mega-mergers is 4.2% (significant at the 5% level; however, the median is -0.2% and insignificant). Small acquirers only engage in non-mega-mergers. Their acquisitions create value (see

Panel C; the mean is 15.5% and the median is 4.6%).

In untabulated results, we find that the mean value creation for large acquirers in non-mega-mergers is smaller than that of small acquirers. The difference is 11.3 percentage points and significant at the 1% level. The difference in the medians value creation is 4.8 percentage points and significant at the 5% level. These results show that while large acquirers create value in non-mega-mergers, they create less value than small acquirers.

Table 6 also shows the estimates of revaluation of the acquirer's stand-alone value. Acquirers in mega-mergers experience a positive revaluation. The mean is 15.7% and the median is 5.8% (see Panel D). Both are significant at the 5% level. The value-weighted average is again substantially smaller (1.5%). One reason for the positive revaluation could be that engaging in a mega-merger signals strength. Only a firm confident in its future performance may be willing to engage in a risky transaction such as a mega-merger. The positive revaluation explains why our measures of value creation in mega-mergers are even more negative than the acquirer CARs. The CARs look better than the direct effect of the merger because the merger announcement reveals positive news about the acquirer's stand-alone value. In contrast, revaluation is negative for acquirers in non-mega-mergers. The mean is -9.6% and the median is -3.5%. Both are significant at the 1% level.

Our results for public mega- and non-mega-mergers are again the same as for the whole sample, because the intervention method applies only to acquisitions of public targets. Hence, our results show that acquirers in public non-mega-mergers experience a negative revaluation of their stand-alone value, which more than offsets the value creation because of the merger. This explains why their announcement returns are negative, while the direct effect of the merger on the acquirer's value is positive. Table 6 also shows that the revaluation of the acquirer's stand-alone value is positive in mega-mergers and negative in non-mega-mergers for large acquirers (see Panel E). This can explain why non-mega-mergers by large acquirers create value although their announcement returns are insignificant. Small acquirers, who only engage in non-mega-mergers, experience a negative revaluation of their stand-alone value (see Panel F).

¹⁶ The results for mega-mergers overall and for mega-mergers by large acquirers are slightly different, because one

Overall, these results support our conclusions from the other two approaches to calculate revaluation-free value creation. While each of the three approaches has its own shortcomings, the fact that all of them lead to the same qualitative conclusions is reassuring. We find that mega-mergers destroy value while non-mega-mergers create value. This is also true for acquisitions of public targets and by large acquirers: Acquirers typically create value in acquisitions of public targets or by large acquirers – in particular, in non-mega-mergers. They only destroy value in mega-mergers. We note that public non-mega-mergers as well as non-mega-mergers by large acquirers, by most measures, create value; they are not value-neutral. This shows that our results cannot be explained by transactions of larger relative size simply having a more measurable influence on the acquirer's value.

4.4. How large do mergers have to be to destroy value?

In this section, we analyze how large the set of mergers is that destroys value. Table 7 shows our results. First, we consider transactions in the second percentile (top 1-2%) of stock market capitalization-adjusted transaction value (see Panel A). The withdrawal returns are insignificant. The value creation measure from *Value Line*, VC_1 , is positive but insignificant (mean: 10.7%, median: 1.8%). The value creation measure from the intervention approach is also insignificant. It can be calculated only for 15 observations and hence is not very informative. Overall, these results suggest that the top 1-2% of mergers in terms of deal size are value-neutral for the acquirer.

[Table 7 about here]

Next, we consider the mergers in the next three percentiles (top 2-5%) of stock market capitalization-adjusted transaction value (see Panel B). The withdrawal CARs are insignificant over three days. However, they are strongly negative (mean: -2.44%; median: -1.76%) and statistically significant at the 1% level over seven days. The negative withdrawal returns suggest value creation. The mean of our first value creation measure, based on *Value Line* analyst forecasts, is positive (24.7%) and significant at the 10% level. The median is also positive but insignificant. The mean of our second value creation measure

initial mega-merger bid that is unsuccessful is made by a small acquirer.

from the intervention approach is positive (15.2%) and significant at the 5% level. The median is slightly negative (-0.1%) but insignificant. These results indicate that mergers in the top 2-5% of the transaction size distribution do not destroy value for the acquirer. Indeed, by several measures, they create value.

Overall, these results suggest that the set of value-destroying mergers is indeed very small and, when identified by transaction size, does not extend beyond the top 1%.

5. Do Other Acquirer or Transaction Characteristics Explain the Value Destruction in Mega-Mergers?

In this section, we analyze whether factors that the previous literature has found to affect acquirer returns can explain the difference in the value creation between mega- and non-mega-mergers. We consider announcement returns, and not our measures of value creation from the previous section, to have a much larger sample and to make our results comparable to those in the large literature on acquirer returns.

We run multivariate regressions with the acquirer CAR as the dependent variable. The key independent variable is a mega-merger indicator variable MEGA that takes on the value of one if a merger is a mega-merger and is zero otherwise. We control for a large number of variables that have been linked to acquirer announcement returns. The exact definitions are given in the legend to Table 8. In the interest of conserving space, we only briefly mention them here. We control for acquirer size by including an indicator variable LARGE ACQUIRER or the logarithm of the market value of the acquirer's equity (ACQUIRER ME) or the logarithm of the acquirer's book value of assets (ACQUIRER TA). These three variables are not strongly correlated with MEGA; the correlations are 0.09, 0.19, and 0.18, respectively. We also control for the "bubble" period from 1998 to 2001, the public status of the target, bidder competition, relatedness of the acquisition, acquisition mode (merger or tender offer), the means of payment, hostility, the acquirer's market-to-book ratio (see Servaes, 1991; Dong, Hirshleifer, Richardson, and Teoh, 2006), the acquirer's market leverage ratio, and the acquirer's free cash flow (OCF/ASSETS). In some of our regressions, we also include the absolute transaction size or the transaction value relative

to the acquirer's size, defined as the ratio of the transaction value to the equity market capitalization of the acquirer at the end of the year preceding the acquisition announcement.¹⁷ The correlation between acquirer size and relative size is slightly negative (-0.01). We also control for the GIM index of corporate governance developed by Gompers, Ishii, and Metrick (2003) and for the logarithm of the number of directors (BOARD SIZE), the fraction of independent directors (INDEP DIRECTORS), and the fraction of busy directors (holding three or more directorships), BUSY DIRECTORS (Fich and Shivdasani, 2006).¹⁸

Table 8 shows our results.¹⁹ In all regression specifications, MEGA enters negatively and is statistically significant at the 1% level. The coefficient shows that acquirers in mega-mergers have CARs that are between 2.85 and 4.95 percentage points lower than in non-mega-mergers. This magnitude is slightly smaller but comparable to the one in the univariate analysis (4.6%) and economically large relative to the average CAR (1.4%). Hence, the difference between acquirer returns in mega- and non-mega-mergers survives controlling for the factors affecting acquirer returns known in the literature.

[Table 8 about here]

Since firms choose to engage in mega-mergers, there is a potential endogeneity problem in our regression analysis. We address it in Section 6 below. Our main results are unchanged once we do so.

Gains on shares held in the target by the acquirer's shareholders could compensate them for the losses on the acquirer's shares if announcement returns are negative (Matvos and Ostrovsky, 2008, and Harford, Jenter, and Li, 2011). Using institutional ownership data from the *Thomson Financial*

¹⁷ While this is not the focus of his analysis, Officer (2003) reports a regression of acquirer CARs in a sample of public targets with transaction size as a control variable, which enters negatively. Ismail (2011) analyzes management's forecasts of synergies in a sample of 336 acquisitions of public targets and finds, among other results, some evidence that the likelihood that the premium exceeds the value of the synergies forecast by management is higher if the target is larger. We do not claim a general transaction size effect for all targets or all public targets, which would suggest that larger public acquisitions destroy more value (while acquisitions of public targets on average destroy value). Instead, we show that mega-mergers destroy value, while all other mergers (including the vast majority of acquisitions of public targets) create value. This is why we focus on the indicator variable MEGA in the regressions.

¹⁸ We thank Andrew Metrick for making the GIM index available to us. Masulis, Wang, and Xie (2007) consider the relationship between corporate governance measures and acquirer returns. Yermack (1996) shows that firms with smaller boards of directors have higher market valuations.

¹⁹ Our results are very similar if we include interaction terms between MEGA and STOCK and between STOCK and PUBLIC.

CDA/Spectrum Institutional (13f) Holdings database, we replicate the analysis in Harford, Jenter, and Li (2011) for mega-mergers. In untabulated results, we find that on average only 11.6% (median: 11.1%) of the acquirer's shares in mega-mergers are held by institutional investors who have a larger stake in the target than the acquirer and hence would benefit from overpayment. In mega-mergers with negative acquirer CARs, on average only 11.0% (median: 5.1%) of the acquirer's shares are held by institutional investors whose gains from their target shares outweigh their losses from their stake in the acquirer. Finally, only in three mega-mergers (2.3%) with negative announcement returns the majority of shares are held by institutional investors who have net positive announcement returns from the merger because of their holdings in the target.

This evidence on mega-mergers is consistent with the findings that Harford, Jenter, and Li (2011) report for public targets in general. It indicates that mega-mergers generate negative announcement returns for the vast majority of shareholders even if one takes into account cross-holdings in the target.

6. Do Managerial Motives Drive Mega-Mergers?

In this section, we shed some light on why mega-mergers occur, although they destroy value for the acquirer. Managerial merger theories argue that managers make acquisitions at the expense of their shareholders (e.g., Morck, Shleifer, and Vishny, 1990; Amihud and Lev, 1981; Shleifer and Vishny, 1989; May, 1995). They can explain why mega-mergers occur. Managers may prefer to run larger firms to obtain higher pay (Bliss and Rosen, 2001), more prestige, more power, or more perks and may want to make large acquisitions to increase their empire or reduce the chance of their firm becoming a takeover target (Gorton, Kahl, and Rosen, 2009).²⁰ Managers may also want to maximize firm value, but overestimate their ability to create value in an acquisition. This is the so-called hubris theory of takeovers proposed by Roll (1986).²¹ Both managerial merger theories and the hubris theory seem more plausible

²⁰ For a discussion of managerial empire-building, see Marris (1964), Jensen (1986), and Jensen (1993).

²¹ The misvaluation theory (e.g., Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004; Rhodes-Kropf, Robinson, and Viswanathan, 2005; and Dong, Hirshleifer, Richardson, and Teoh, 2006) argues that mergers are driven by misvaluations in the stock market. This theory cannot explain the negative announcement returns in cash mega-mergers.

for large acquisitions such as mega-mergers. In contrast, non-mega-mergers may be value-maximizing responses to economic shocks, as suggested by the neoclassical merger theory (see, e.g., Mitchell and Mulherin, 1996; Maksimovic and Phillips, 2001; Jovanovic and Rousseau, 2002; and Andrade and Stafford, 2004).

In this section, we test whether managerial motives and weak corporate governance can explain the incidence of mega-mergers. If managers are tempted to make acquisitions at the expense of their shareholders, firms with strong corporate governance should be less likely to engage in value-destroying acquisitions, because the board of directors or other governance mechanisms prevent bad transactions.

We run logit regressions that model the probability of a mega-merger, conditional on a merger taking place. The dependent variable takes on the value of one if the merger is a mega-merger and zero if it is a non-mega-merger. We measure corporate governance by using the same proxies as in the acquirer return regressions above, the GIM index of corporate governance (a larger value indicates weaker corporate governance) and several board variables. We expect a positive coefficient for the GIM index, BOARD SIZE, and BUSY DIRECTORS, and a negative coefficient for INDEP DIRECTORS.

We also use two other variables as proxies for managerial incentives. Following Jensen (1986), who suggests that firms with more free cash flow are more likely to engage in value-destroying activities, we include free cash flow, OCF/ASSETS, as an independent variable. We expect a positive coefficient on this variable. Harford (1999) shows that acquirers with more excess cash have lower announcement returns. Jensen (2004) argues that firms with overvalued equity are more likely to engage in value-destroying activities. Hence, we include the acquirer's market-to-book ratio, ACQUIRER MB, expecting a positive coefficient for this variable.

Table 9 presents our results. First, we consider specification (1). The probability of a merger being a mega-merger is positively related to the availability of free cash flow (significant at the 1% level). A one standard deviation increase in OCF/ASSETS increases the probability of a merger being a mega-merger from 0.10% (evaluated at the mean of all variables) to 0.36%. This is approximately a one-quarter increase relative to the unconditional probability of mega-mergers. Mega-mergers are also more likely if the

acquirer's market-to-book ratio is higher (significant at the 1% level). A one standard deviation increase in ACQUIRER MB increases the probability that a merger is a mega-merger from 0.10% to 0.14%.

[Table 9 about here]

Regression specifications (3) and (4) include the corporate governance variables and hence use a much smaller sample. First, we consider specification (3). The GIM index is not statistically significant (and enters unexpectedly with a negative coefficient). BOARD SIZE enters positively, as expected, and is significant at the 10% level. A one standard deviation increase in BOARD SIZE increases the probability that a merger is a mega-merger from 0.46% to 0.69%. INDEP DIRECTORS enters negatively, as expected, but is not significant. BUSY DIRECTORS enters positively, as expected, and is significant at the 1% level. A one standard deviation increase in BUSY DIRECTORS increases the probability of a merger being a mega-merger from 0.46% to 0.74%. Inclusion of the corporate governance variables renders the coefficient on free cash flow insignificant (and switches its sign), but the market-to-book ratio still enters positively and remains significant at the 1% level.

Regression specifications (2) and (4) use the logarithm of the market value of the acquirer's equity, ACQUIRER ME, as the measure of acquirer size, instead of the logarithm of the acquirer's total assets, ACQUIRER TA. The results are similar. However, the market-to-book ratio loses its statistical significance (and switches sign). BOARD SIZE is statistically significant at the 5% instead of the 10% level. Firms with a larger fraction of independent directors are less likely to engage in mega-mergers, and the coefficient on INDEP DIRECTORS is now statistically significant at the 10% level. BUSY DIRECTORS still enters positively, but loses its statistical significance.

Overall, these results show that firms with weaker corporate governance and with higher valuations and more free cash flow are more likely to engage in mega-mergers. These findings suggest that managers do not make value-maximizing decisions in the interest of their shareholders when they engage in mega-mergers, but exploit weak corporate governance to further their own objectives.

We can apply the logit model discussed above to address the endogeneity concerns briefly mentioned in Section 5, where we presented multivariate regressions explaining acquirer CARs. In

untabulated results, using a Heckman (1979) selection model, we find that our results on acquirer CARs are robust to controlling for the endogeneity of mega-mergers.

7. Conclusion

In this paper, we analyze which mergers create value for the acquirer and which destroy value. Much of the literature infers value creation in mergers from short-term announcement returns. However, these returns measure both value creation and any revaluation of the acquirer's stand-alone value triggered by the merger announcement. We use several methods to distinguish between such revaluation and value creation directly because of the merger and apply them to several types of mergers. This reverses some important conclusions about value creation inferred from short-term announcement returns.

We find that typically acquirers do not destroy value in acquisitions of public targets and, by most measures, create value. The same conclusion applies to acquisitions by large acquirers. The only set of mergers that, on average, destroys value for the acquirer are mega-mergers, the largest one percent of mergers in absolute transaction value. These mergers are important, because almost half the money spent on mergers is spent on mega-mergers. In contrast, acquirers create value in the vast majority of mergers, which are not mega-mergers.

We also find that only large acquirers engage in mega-mergers, and most mega-mergers have public targets. Moreover, large acquirers create less value than small acquirers and acquirers of public targets create less value than acquirers of non-public targets according to the value creation measures with enough observations for these subsamples. Therefore, the distinction between public and private targets and large and small acquirers remains important.

Finally, we find some evidence that mega-mergers are driven by managerial motives and weak corporate governance. Overall, we conclude that the most important, because largest, mergers appear to be driven by managerial motives, such as empire building, or by hubris. In contrast, the vast majority of smaller mergers appear to be motivated by value-maximizing decisions, as suggested by the neoclassical merger theory.

It would be interesting to understand in more detail why mega-mergers occur although they destroy value for the acquirer. Which managerial objectives drive these mergers? Alternatively, do managers want to maximize firm value, but succumb to hubris and overestimate their ability to generate synergies in mega-mergers? Why do boards of directors allow managers to engage in mega-mergers although they destroy value? We leave these questions for future research.

Appendix: A Derivation of the Value Creation Measure used in the *Value Line* Approach.

We start with the total value gain for the acquirer, whether directly from the merger, from revaluation of its stand-alone value, or any other source:

$$G_A = ((AV + TV)_4 - AV_{-1} - TV_{-1} - \pi) / ME_{-1}^A, \quad (A1)$$

where G_A denotes the acquirer's total value gain from all sources, $(AV + TV)_4$ is the combined company's firm value after the merger, AV_{-1} is the acquirer's firm value before the merger announcement, TV_{-1} is the target's firm value before the merger announcement, π is the dollar premium the acquirer pays above the target's pre-announcement market value, and ME_{-1}^A is the equity market value of the acquirer before the merger announcement. We scale the gain to the acquirer by its pre-announcement equity market value to make the gain comparable to acquirer announcement returns. In the following, AV_t and TV_t denote generic acquirer and target values at date t , respectively, regardless of the source they come from (they could be based on *Value Line* estimates, market values, or other sources). The gross gain for the acquirer is the difference between its value after the acquisition, which is the combined company value, and its value before the acquisition. To achieve this gross gain, the acquirer incurs a cost in that it has to buy the target, and it pays the target's pre-announcement value plus a premium. The acquirer's net gain is the difference between the gross gain and the cost.²²

We can add and subtract A_1 , the acquirer's stand-alone value right after the merger announcement, as well as A_2 , the acquirer's stand-alone value right before the merger completion, both based on *Value Line* forecasts, without changing the value of G_A . Rearranging, we obtain:

$$G_A = ((AV + TV)_4 - A_2 - TV_{-1} - \pi + (A_1 - AV_{-1}) + (A_2 - A_1)) / ME_{-1}^A. \quad (A2)$$

To obtain revaluation-free estimates of value creation for the acquirer, we use estimates of firm value for the acquirer based on *Value Line* forecasts. This applies both to the combined company value,

²² In this expression, we ignore the pre-merger stake of the acquirer in the target (toehold), since, as discussed before, it is typically not available in our data sources and known to be very small (with a median of zero).

$(AV + TV)_4$, and the stand-alone value of the acquirer before the merger announcement, AV_{-1} . However, we use the target's actual (market) firm value before the merger announcement as the measure of its pre-announcement value, because the acquirer's gain depends on the actual price paid for the target, its market value, MV_{-1}^T , plus the premium, and not the *Value Line* estimate of its value (plus the premium). Hence, we obtain:

$$G_A = ((A + T)_4 - A_2 - MV_{-1}^T - \pi + (A_1 - A_{-1}) + (A_2 - A_1)) / ME_{-1}^A. \quad (A3)$$

Finally, to obtain the acquirer's gain directly because of the merger, which we call VC_1 , we have to subtract the acquirer's gain (or loss) because of a revaluation of its stand-alone value, $A_1 - A_{-1}$, as well as its gain (or loss) from other sources that lead to a change in its valuation by *Value Line* between date 1 and date 2, $A_2 - A_1$. Hence, we obtain:

$$VC_1 = ((A + T)_4 - A_2 - MV_{-1}^T - \pi) / ME_{-1}^A. \quad (A4)$$

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Table 1: Summary Statistics.**Panel A: Thresholds of Transaction Size**

This table displays the thresholds used to categorize a merger as small (0%-33%), medium (34%-66%), large (67%-95%), very large (96%-99%), and mega-merger (99%-100%, i.e., top 1%). Absolute transaction size is the transaction value of the merger without any adjustment. Fraction of market capitalization is the transaction value expressed as a percentage of the total stock market capitalization.

	Threshold					
	min	33%	66%	95%	99%	max
Absolute Transaction Size (in \$million)	1	15	71	897	4,733	164,747
Fraction of Market Capitalization (in %)	4.77E-06	2.06E-04	0.00096	0.013	0.06	0.99

Panel B: Distribution of Mergers Across Subperiods by Transaction Size

This table shows the absolute and relative number of small, medium, large, very large, and mega-mergers over the total 1980-2007 period and subperiods. The transaction size categories are defined using the thresholds of transaction values expressed as a percentage of the total stock market capitalization given in the second row of Panel A above.

Transaction Size	1980 - 2007	1980 - 1985	1986 - 1990	1991 - 1995	1996 - 2001	2001 - 2007
Number of Mergers of a Given Size in a Given Subperiod						
Small	8,027	194	326	1,686	3,829	1,992
Medium	8,029	778	682	1,732	3,043	1,794
Large	7,053	1,081	1,063	1,286	2,250	1,373
Very Large	973	205	186	134	301	147
Mega	244	58	28	35	91	32
Total	24,326	2,316	2,285	4,873	9,514	5,338
Fraction of Mergers of a Given Size in a Given Subperiod						
Small	0.330	0.084	0.143	0.346	0.402	0.373
Medium	0.330	0.336	0.298	0.355	0.320	0.336
Large	0.290	0.467	0.465	0.264	0.236	0.257
Very Large	0.040	0.089	0.081	0.027	0.032	0.028
Mega	0.010	0.025	0.012	0.007	0.010	0.006
Total	1.000	1.000	1.000	1.000	1.000	1.000

Panel C: Merger and Acquirer Characteristics

TRANS VALUE is the value of the total consideration paid by the acquirer. PUBLIC is the fraction of acquisitions of public firms. STOCK is the fraction of acquisitions in which more than 50% of the total consideration is paid in stock. COMPETED is the fraction of takeover contests where several bidders compete for the same target. ACQUIRER ME is the acquirer's market value of equity four days before the merger announcement. ACQUIRER MB is the ratio of the acquirer's market value of assets to their book value. ACQUIRER ROA is the ratio of the acquirer's EBITDA to the book value of assets.

Variable	Obs.	Mean	Median
TRANS VALUE (in \$million)	24,326	309	33
PUBLIC	24,326	0.20	
STOCK	24,326	0.29	
COMPETED	24,326	0.02	
ACQUIRER ME (in \$million)	24,326	2,134	333
ACQUIRER MB	23,123	1.77	1.20
ACQUIRER ROA	21,622	0.09	0.11

Table 2: Acquirer CARs by Transaction Size.

This table reports the acquirer cumulative abnormal returns (CARs, in %) from three days before to three days after the announcement of the merger, calculated using the market model. Market model parameters are estimated using data over the time interval of 200 trading days ending 20 days before the merger announcement. A merger is classified as MEGA if it has a transaction value in the top 1% of the *SDC* sample. All other mergers are classified as NON-MEGA. DIFFERENCE refers to the difference between MEGA and NON-MEGA. The transaction size categories are defined using transaction values measured as a fraction of the total stock market capitalization, except in Panel D, where they are defined in \$ million, and in Panel E, where they are defined using the target's pre-announcement equity market value as a fraction of the total stock market capitalization. The transaction size categories are defined using the following thresholds: small (0%-33%), medium (34%-66%), large (67%-95%), very large (96%-99%), and mega-merger (99%-100%, top 1%). In Panel B, Dollar Abnormal Return is defined as CAR multiplied by the equity market value of the acquirer at the end of the fourth day before the merger announcement adjusted for inflation (measured by the CPI Index) using constant 2007 prices. Panel F shows results for subsets of mergers where the transaction value is above 5% and 30% of the acquirer's equity market value, respectively. Panel G reports CARs for subsamples of stock and cash mergers. A merger is classified as stock-financed (STOCK) if more than 50% of the total consideration is paid in stock; otherwise it is categorized as cash-financed (CASH). Panel H compares CARs in mega-mergers and non-mega-mergers by acquirers that engage in at least one mega-merger. Panel I reports CARs for the subsamples of mergers announced during the DOTCOM BUBBLE period (1998-2001) and outside of it. Panel J reports CARs for the subsamples of mergers announced since (POST) and before (PRE) 2002. Panel K reports CARs for the subsample of ex post LARGE LOSS mergers (announced in 1998-2001 and having acquirer dollar announcement losses of at least \$1 billion) and for all other NON-LARGE LOSS mergers. The last column reports average cumulative abnormal returns weighted by the acquirer's equity market value (VW).

	Equally-weighted					Fraction > 0	VW
	Obs	Mean	t-test (p-value)	Median	Wilcoxon test (p-value)		
Panel A: Transaction Size as % of Total Stock Market							
MEGA, TOP 1%	244	-3.16	0.00***	-3.36	0.00***	0.32	-4.78
NON-MEGA	24,082	1.45	0.00***	0.34	0.00***	0.53	-0.57
Very Large	973	-0.89	0.06*	-1.28	0.00***	0.42	-1.47
Large	7,053	1.01	0.00***	0.20	0.00***	0.52	-0.29
Medium	8,029	1.63	0.00***	0.55	0.00***	0.54	0.14
Small	8,027	1.93	0.00***	0.51	0.00***	0.53	-0.04
DIFFERENCE		-4.60	0.00***	-3.71	0.00***	-0.21***	-4.21
Panel B: Dollar Abnormal Returns							
MEGA, TOP 1%	244	-1702.99	0.00***	-376.21	0.00***	0.32	
NON-MEGA	24,082	-13.33	0.00***	0.53	0.00***	0.53	
Very Large	973	-252.11	0.01**	-36.05	0.00***	0.42	
Large	7,053	-12.26	0.06*	1.04	0.66	0.52	
Medium	8,029	1.46	0.33	1.13	0.00***	0.54	
Small	8,027	-0.10	0.84	0.35	0.00***	0.53	
DIFFERENCE		-1689.67	0.00***	-376.74	0.00***	-0.21***	
Panel C: Mega Cutoff Robustness							
Top 1%	244	-3.16	0.00***	-3.36	0.00***	0.32	-4.78
1-2%	243	-1.47	0.00***	-1.36	0.00***	0.43	-2.09
2-5%	729	-0.69	0.27	-1.24	0.00***	0.42	-1.18

	Equally-weighted					Fraction > 0	VW
	Obs	Mean	t-test (p-value)	Median	Wilcoxon test (p-value)		
Panel D: Raw Transaction Value							
MEGA, TOP 1%	244	-3.75	0.00***	-3.8	0.00***	0.28	-3.94
NON-MEGA	24,082	1.45	0.00***	0.35	0.00***	0.53	-0.44
Very Large	973	-0.73	0.16	-0.92	0.00***	0.44	-1.07
Large	7,052	0.89	0.00***	0.17	0.00***	0.51	-0.14
Medium	8,036	1.67	0.00***	0.62	0.00***	0.55	0.04
Small	8,021	2.00	0.00***	0.42	0.00***	0.53	-0.08
DIFFERENCE		-5.20	0.00***	-4.16	0.00***	-0.25***	-3.50
Panel E: Pre-Announcement Target ME as % of Total Stock Market							
MEGA, TOP 1%	37	-5.25	0.00***	-5.2	0.00***	0.22	-6.84
NON-MEGA	3,668	-1.32	0.00***	-1.36	0.00***	0.4	-1.98
Very Large	148	-4.27	0.00***	-4.51	0.00***	0.28	-3.6
Large	1,067	-2.34	0.00***	-2.12	0.00***	0.39	-1.67
Medium	1,221	-1.57	0.00***	-1.46	0.00***	0.38	-1.34
Small	1,232	0.16	0.58	-0.68	0.03**	0.44	-0.42
DIFFERENCE		-3.93	0.01**	-3.85	0.00***	-0.18**	-4.86
Panel F: Robustness to Relative Transaction Size							
MEGA, TOP 1%							
Rel Size >5%	243	-3.17	0.00***	-3.46	0.00***	0.32	-4.83
Rel Size >30%	189	-3.31	0.00***	-4.39	0.00***	0.31	-6.26
NON-MEGA							
Rel Size >5%	16,777	2.13	0.00***	0.62	0.00***	0.54	-0.66
Rel Size >30%	5,674	4.39	0.00***	1.54	0.00***	0.58	-0.78
Panel G: Means of Payment							
STOCK							
Mega	142	-4.27	0.00***	-4.66	0.00***	0.30	-5.43
Non-Mega	6,784	1.03	0.00***	-0.41	0.29	0.47	-1.71
Difference		-5.30	0.00***	-4.25	0.00***	-0.17***	-3.72
CASH							
Mega	102	-1.61	0.05**	-2.11	0.01***	0.33	-2.66
Non-Mega	17,297	1.61	0.00***	0.6	0.00***	0.55	0.02
Difference		-3.22	0.00***	-2.71	0.00***	-0.21***	-2.68
Panel H: Acquirers with at least one mega-merger							
Mega	244	-3.16	0.00***	-3.36	0.00***	0.32	-4.78
Non-Mega	859	0.04	0.85	0.00	0.87	0.50	-0.46
Difference		-3.20	0.00***	-3.36	0.00***	-0.18	-4.33

		Equally-weighted				Fraction > 0	VW
	Obs	Mean	t-test (p-value)	Median	Wilcoxon test (p-value)		
Panel I: Time Period							
DOTCOM BUBBLE							
Mega	64	-5.63	0.00***	-5.99	0.00***	0.27	-5.60
Non-Mega	5,643	0.99	0.00***	0.00	0.07*	0.50	-1.30
Difference		-6.62	0.00***	-5.98	0.00***	-0.23***	-4.30
NON-DOTCOM BUBBLE							
Mega	180	-2.28	0.00***	-2.66	0.00***	0.33	-4.04
Non-Mega	18,439	1.59	0.00***	0.43	0.00***	0.53	-0.20
Difference		-3.86	0.00***	-3.09	0.00***	-0.20***	-3.84
Panel J: Recent Time Period							
POST 2002							
Mega	32	-4.80	0.00***	-4.47	0.00***	0.09	-4.79
Non-Mega	5,306	1.10	0.00***	0.34	0.00***	0.53	-0.28
Difference		-5.90	0.00***	-4.81	0.00***	-0.43***	-4.52
PRE 2002							
Mega	212	-2.91	0.00***	-2.70	0.00***	0.35	-4.78
Non-Mega	18,776	1.54	0.00***	0.35	0.00***	0.53	-0.76
Difference		-4.45	0.00***	-3.05	0.00***	-0.18***	-4.02
Panel K: Ex-Post Large Loss							
LARGE LOSS							
Mega	36	-9.92	0.00***	-9.95	0.00***	0.14	-8.19
Non-Mega	81	-11.86	0.00***	-8.19	0.00***	0.17	-7.80
Difference		1.94	0.45	-1.76	0.87	-0.03	-0.39
NON-LARGE LOSS							
Mega	208	-1.99	0.00***	-2.20	0.00***	0.35	-2.74
Non-Mega	24,001	1.49	0.00***	0.36	0.00***	0.53	0.01
Difference		-3.48	0.00***	-2.56	0.00***	-0.18***	-2.74

***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 3: Acquirer CARs, Transaction Size, and Other Acquirer and Deal Characteristics.

This table reports acquirer cumulative abnormal returns (CARs, in %) from three days before to three days after the merger announcement for mega- and non-mega-mergers in subsamples based on acquirer and transaction characteristics. A merger is classified as Mega if it has a transaction value as a fraction of total stock market capitalization in the top 1% of the *SDC* sample. All other mergers are classified as Non-Mega. Panel A (B) reports CARs for subsamples of public (non-public) targets. Panel C (D) reports CARs for the subsample of large (small) acquirers, which have a market capitalization above (below) the bottom 25th percentile of NYSE firms in that year. Panel E shows results for subsets of large acquirer transactions where the transaction size is above 5% and 30% of the acquirer's equity market value, respectively. The last column reports average CARs weighted by the acquirer's equity market value (VW).

	Obs	Mean	t-test (p-value)	Median	Wilcoxon test (p-value)	Fraction > 0	VW
Panel A. Public Targets							
Mega	201	-3.77	0.00***	-4.4	0.00***	0.3	-5.07
Non-Mega	4,790	-0.93	0.00***	-1.11	0.00***	0.41	-1.73
Difference		-2.84	0.00***	-3.29	0.00***	-0.11***	-3.35
Panel B. Non-Public Targets							
Mega	43	-0.29	0.83	-1.11	0.28	0.37	-2.44
Non-Mega	19,292	2.04	0.00***	0.73	0.00***	0.55	0.38
Difference		-2.33	0.22	-1.84	0.03**	-0.18**	-2.82
Panel C. Large Acquirers							
Mega	244	-3.16	0.00***	-3.36	0.00***	0.32	-4.78
Non-Mega	13,473	0.04	0.59	-0.04	0.74	0.5	-0.63
Difference		-3.2	0.00***	-3.32	0.00***	-0.18***	-4.15
Panel D. Small Acquirers							
Non-Mega	10,609	3.24	0.00***	1.03	0.00***	0.56	1.51
Panel E. Large Acquirers, Robustness to Relative Transaction Size							
MEGA							
Rel Size >5%	243	-3.17	0.00***	-3.46	0.00***	0.32	-4.83
Rel Size >30%	189	-3.31	0.00***	-4.39	0.00***	0.31	-6.26
NON-MEGA							
Rel Size >5%	7,861	0.22	0.03**	0.06	0.08*	0.5	-0.81
Rel Size >30%	1,927	-0.13	0.60	-0.23	0.28	0.49	-1.33

***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 4: Acquirer CARs at Bid Withdrawal.

This table reports cumulative abnormal returns (CARs) for a sample of acquirers that have ultimately withdrawn their bids. CARs are calculated at the withdrawal dates for event windows (-1,1) and (-3,3). Market model parameters are estimated using data over the time interval of 200 trading days ending 20 days before the merger announcement. A merger is classified as Mega if it has a transaction value as a fraction of total stock market capitalization that is in the top 1% of the *SDC* sample. All other mergers are categorized as Non-Mega. Panel A reports CARs for the total sample. Panel B reports CARs for the subsample of public targets. Panel C (D) reports CARs for the subsample of large (small) acquirers, which have a market capitalization above (below) the bottom 25th percentile of NYSE firms in that year. All means are winsorized at the 5% level.

	Obs	Mean	t-test (p-value)	Median	Wilcoxon test (p-value)	Fraction > 0	VW
Panel A. Total Sample							
CAR (-1,1)							
Mega	68	1.28	0.02**	1.18	0.01**	0.66	0.37
Non-Mega	1,390	-0.63	0.00***	-0.33	0.00***	0.46	-0.03
Difference		1.90	0.03**	1.52	0.01***	0.20***	0.40
CAR (-3,3)							
Mega	68	1.03	0.11	1.08	0.07*	0.62	-0.76
Non-Mega	1,390	-1.72	0.00***	-1.18	0.00***	0.43	-1.26
Difference		2.76	0.02**	2.26	0.00***	0.19***	0.50
Panel B. Public Targets							
CAR (-1,1)							
Mega	62	1.34	0.02**	1.29	0.01**	0.65	0.33
Non-Mega	716	0.29	0.19	0.02	0.34	0.50	0.60
Difference		1.05	0.17	1.27	0.07*	0.14**	-0.27
CAR (-3,3)							
Mega	62	1.18	0.09*	1.77	0.06*	0.61	-0.81
Non-Mega	716	-0.65	0.04**	-0.46	0.04**	0.46	-0.31
Difference		1.83	0.09*	2.23	0.03**	0.15**	-0.49
Panel C. Large Acquirer							
CAR (-1,1)							
Mega	68	1.28	0.02**	1.18	0.01**	0.66	0.37
Non-Mega	710	0.05	0.76	-0.2	0.84	0.48	0.15
Difference		1.22	0.04**	1.39	0.01**	0.18***	0.22
CAR (-3,3)							
Mega	68	1.03	0.11	1.08	0.07*	0.62	-0.76
Non-Mega	710	-0.76	0.00***	-0.71	0.00***	0.45	-0.88
Difference		1.8	0.02**	1.79	0.01***	0.17***	0.11
Panel D. Small Acquirer							
CAR (-1,1)							
Non-Mega	680	-1.55	0.00***	-0.85	0.00***	0.45	-0.72
CAR (-3,3)							
Non-Mega	680	-2.75	0.00***	-1.73	0.00***	0.40	-1.42

***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 5: Value Creation Inferred from *Value Line* Analyst Forecasts.

This table presents estimates of value creation directly because of the merger (in percent of the acquirer's pre-announcement equity market value) based on revisions of *Value Line* analyst forecasts. VALUE CREATION 1 (VC_1) is the combined company value based on the first post-closing analyst forecast minus the acquirer's stand-alone value based on the last pre-closing but post-announcement analyst forecast, minus the market value of the target four weeks before the merger announcement, and minus the dollar premium. It is scaled by the acquirer's market value of equity four days before the merger announcement. A merger is classified as Mega if it has a transaction value as a fraction of total stock market capitalization that is in the top 1% of the *SDC* sample. All other mergers are classified as Non-Mega. All means are winsorized at the 5% level.

	Obs	Mean	t-test (p-value)	Median	Wilcoxon test (p-value)	Fraction > 0	VW
VALUE CREATION 1 (VC_1)							
Mega	41	-17.57	0.09*	-14.43	0.07*	0.39	-10.15
Non-Mega	160	9.74	0.01**	1.84	0.10*	0.53	4.83
Difference		-27.30	0.00***	-16.27	0.01**	-0.14	-14.98

***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 6: Value Creation and Revaluation Inferred from Competing Bids.

This table presents estimates of VALUE CREATION 2 (VC_2), calculated as the difference between the revaluation-free synergies estimated using the intervention method in Bhagat, Dong, Hirshleifer, and Noah (2005) and the premium paid (for successful acquirers) or the last premium offered (for unsuccessful bidders), scaled by the acquirer's equity market value four days before the merger announcement. REVALUATION (REV) is the probability-scaled acquirer announcement return minus VC_2 . A merger is classified as Mega if it has a transaction value as a fraction of total stock market capitalization that is in the top 1% of the *SDC* sample. All other mergers are classified as Non-Mega. Panel A reports results for value creation and Panel D for revaluation for the total sample. Panel B (C) reports results for value creation and Panel E (F) for revaluation for the subsample of large (small) acquirers, which have a market capitalization above (below) the bottom 25th percentile of NYSE firms in that year. All means are win-soritized at the 5% level.

	Obs	Mean	t-test (p-value)	Median	Wilcoxon test (p-value)	Fraction > 0	VW
VALUE CREATION 2 (VC_2)							
Panel A. Total Sample							
Mega	25	-18.11	0.00***	-16.2	0.01***	0.28	-3.07
Non-Mega	165	6.51	0.00***	0.29	0.08*	0.52	2.1
Difference		-24.62	0.00***	-16.49	0.00***	-0.24**	-5.17
Panel B. Large Acquirer							
Mega	24	-17.24	0.01***	-13.76	0.01***	0.29	-3.34
Non-Mega	119	4.18	0.02**	-0.18	0.75	0.48	1.52
Difference		-21.42	0.00***	-13.58	0.00***	-0.19*	-4.87
Panel C. Small Acquirer							
Non-Mega	46	15.49	0.00***	4.56	0.01***	0.63	13.59
REVALUATION (REV)							
Panel D. Total Sample							
Mega	25	15.73	0.03**	5.76	0.03**	0.72	1.5
Non-Mega	165	-9.64	0.00***	-3.49	0.00***	0.42	-5.79
Difference		25.37	0.00***	9.25	0.00***	0.30***	7.29
Panel E. Large Acquirer							
Mega	24	14.18	0.05**	5.76	0.05**	0.71	1.73
Non-Mega	119	-7.92	0.00***	-2.48	0.01**	0.45	-5.11
Difference		22.1	0.00***	8.24	0.00***	0.26**	6.85
Panel F. Small Acquirer							
Non-Mega	46	-16.14	0.01***	-11.22	0.01**	0.33	-16.99

***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 7: Do Very Large Mergers Destroy Value?

This table provides estimates of value creation for mergers with a transaction value as a fraction of total stock market capitalization in the top 1-2% (Panel A) and 2-5% (Panel B) of the *SDC* sample, respectively. Value creation is inferred using three different methods: from acquirer abnormal withdrawal returns, from *Value Line* analyst forecast revisions, and from competing bid announcements. For the withdrawals method acquirer CARs at withdrawal of the bid are reported for the (-1,1) and (-3,3) event windows. VC 1 is the value creation measure based on *Value Line* analyst forecast revisions. It is the combined company value based on the first post-closing analyst forecast minus the acquirer's stand-alone value based on the last pre-closing but post-announcement analyst forecast, minus the market value of the target four weeks before the merger announcement, and minus the dollar premium. It is scaled by the acquirer's market value of equity four days before the merger announcement. VC 2 is calculated as the difference between the synergies estimated using the intervention method in Bhagat, Dong, Hirshleifer, and Noah (2005) and the premium paid by successful acquirers or the last premium offered by unsuccessful bidders, scaled by the acquirer's equity market value four days before the merger announcement. All means are winsorized at the 5% level.

		Obs	Mean	t-test (p-value)	Median	Wilcoxon test (p-value)	Fraction > 0	VW
Panel A. Mergers with transaction value in the top 1-2%								
1. Withdrawals	CAR (-1,1)	47	-0.24	0.7	-0.09	0.79	0.49	-0.01
	CAR (-3,3)	47	0.35	0.64	0.45	0.79	0.55	-0.16
2. Value Line	VC 1	28	10.7	0.53	1.8	0.58	0.61	2.45
3. Competing Bids	VC 2	15	19.15	0.31	0.62	0.68	0.53	3.29
Panel B. Mergers with transaction value in the top 2-5%								
1. Withdrawals	CAR (-1,1)	113	-0.34	0.41	0.05	0.88	0.51	-0.21
	CAR (-3,3)	113	-2.44	0.00***	-1.76	0.00***	0.36	-1.42
2. Value Line	VC 1	39	24.65	0.08*	2.66	0.32	0.54	8.68
3. Competing Bids	VC 2	28	15.24	0.04**	-0.07	0.57	0.46	1.43

***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 8: Determinants of Acquirer CARs.

This table presents OLS regressions for the sample of completed U.S. mergers from 1980 to 2007. The dependent variable is the acquirer cumulative abnormal return (CAR, in %) from three days before to three days after the merger announcement, calculated using the market model. MEGA is an indicator variable that takes on the value of one if a merger has a transaction value as a fraction of total stock market capitalization in the top 1% of the *SDC* sample and is otherwise zero. LARGE ACQUIRER is an indicator variable that takes on the value of one if the acquirer has a market capitalization above the bottom 25th percentile of NYSE firms in that year and is otherwise zero. ACQUIRER ME is the logarithm of the market value of the acquirer's equity. ACQUIRER TA is the logarithm of the acquirer's book value of assets. DOTCOM BUBBLE is an indicator variable that takes on the value of one if the merger is announced between 1998 and 2001 and is otherwise zero. PUBLIC, PRIVATE, COMPETED, CONGLOMERATE, TENDER OFFER, HOSTILE, and STOCK are indicator variables that take on the value of one for acquisitions of public firms, of private firms, if there is a bidder competing with the acquirer, for acquisitions of firms in a two-digit SIC code different from the acquirer's, if the acquisition is a tender offer, if it is hostile according to *SDC*, and if more than 50% of the total consideration is paid in stock, respectively, and are otherwise zero. LIQUIDITY INDEX for the target is calculated as the value of all corporate control transactions for \$1 million or more reported by *SDC* in the target's two-digit SIC code in the year of the merger announcement, divided by the total book value of assets of all *Compustat* firms in the target's two-digit SIC code in the same year. ACQUIRER MB is the ratio of the acquirer's market value of assets to their book value. ACQUIRER LEVER is the ratio of the acquirer's book value of debt to the market value of assets. OCF/ASSETS is sales minus the cost of goods sold, sales and general administration, and working capital change, divided by the book value of assets. TRANS VALUE is the value of the total consideration paid by the acquirer. RELATIVE SIZE is the ratio of the transaction value to the equity market capitalization of the acquirer at the end of the fiscal year prior to the acquisition announcement. GIM is the corporate governance index in Gompers, Ishii, and Metrick (2003). BOARD SIZE is the logarithm of the number of directors. INDEP DIRECTORS is the percentage of independent directors on the company's board. BUSY DIRECTORS is the percentage of directors on the company's board who hold three or more directorships. P-values are reported in parentheses. Standard errors are heteroscedasticity-adjusted and clustered by acquirer.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MEGA	-4.13*** (0.00)	-2.85*** (0.00)	-3.51*** (0.00)	-3.16*** (0.00)	-4.43*** (0.00)	-4.95*** (0.00)	-4.13*** (0.00)	-4.06*** (0.00)
LARGE ACQUIRER	-3.64*** (0.00)	-2.65*** (0.00)			-2.64*** (0.00)	-2.31*** (0.01)		
ACQUIRER ME			-1.89*** (0.00)				-0.79*** (0.00)	
ACQUIRER TA				-1.43*** (0.00)				-0.62*** (0.00)
DOTCOM BUBBLE	-0.56** (0.02)	-0.41 (0.10)	-0.34 (0.16)	-0.38 (0.12)	-0.05 (0.91)	-0.04 (0.92)	-0.05 (0.89)	-0.09 (0.83)
PUBLIC	-4.15*** (0.00)	-3.79*** (0.00)	-3.98*** (0.00)	-3.58*** (0.00)	-2.31*** (0.00)	-2.35*** (0.00)	-2.16*** (0.00)	-2.12*** (0.00)
PRIVATE	-0.62*** (0.01)	-0.78*** (0.00)	-0.38* (0.10)	-0.36 (0.11)	-0.49 (0.31)	-0.46 (0.33)	-0.47 (0.33)	-0.48 (0.32)
COMPETED	0.42 (0.51)	0.46 (0.47)	0.24 (0.72)	0.22 (0.74)	-0.75 (0.58)	-0.91 (0.50)	-0.97 (0.47)	-0.95 (0.48)
LIQUIDITY INDEX	-0.07 (0.94)	-0.23 (0.80)	-0.57 (0.53)	-2.19** (0.02)	0.62 (0.63)	0.39 (0.76)	0.43 (0.73)	0.17 (0.89)
CONGLOMERATE	0.57*** (0.01)	0.47** (0.02)	0.47** (0.02)	0.41** (0.04)	0.13 (0.76)	0.14 (0.73)	0.14 (0.73)	0.11 (0.79)
TENDER OFFER	2.63*** (0.00)	2.55*** (0.00)	2.31*** (0.00)	2.15*** (0.00)	0.81 (0.33)	0.77 (0.36)	0.61 (0.47)	0.62 (0.46)
HOSTILE	-1.63* (0.09)	-1.78* (0.07)	-2.87*** (0.00)	-2.53** (0.01)	-0.94 (0.59)	-1.19 (0.55)	-0.87 (0.63)	-0.82 (0.65)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
STOCK	0.43 (0.14)	0.36 (0.20)	0.21 (0.46)	0.31 (0.28)	-1.86*** (0.00)	-1.86*** (0.00)	-1.95*** (0.00)	-1.97*** (0.00)
ACQUIRER MB	-0.10** (0.04)	-0.09* (0.08)	-0.04 (0.40)	-0.28*** (0.00)	0.13 (0.24)	0.14 (0.19)	0.18* (0.10)	0.07 (0.54)
ACQUIRER LEVER	2.76*** (0.00)	2.44*** (0.00)	1.44*** (0.00)	7.06*** (0.00)	1.93* (0.08)	1.60 (0.14)	1.43 (0.20)	3.69*** (0.00)
OCF/ASSETS	-6.04*** (0.00)	-5.61*** (0.00)	-5.19*** (0.00)	-5.20*** (0.00)	4.10 (0.31)	3.43 (0.40)	2.44 (0.57)	3.33 (0.43)
TRANS VALUE	0.45*** (0.00)		1.38*** (0.00)	0.95*** (0.00)	0.09 (0.61)		0.36* (0.08)	0.23 (0.26)
RELATIVE SIZE		0.72 (0.12)				1.46* (0.08)		
GIM					-0.16** (0.02)	-0.15** (0.03)	-0.15** (0.03)	-0.15** (0.03)
BOARD SIZE					0.26 (0.69)	0.42 (0.50)	0.91 (0.20)	0.91 (0.21)
INDEP DIRECTORS					-0.80 (0.53)	-0.56 (0.66)	-0.37 (0.77)	-0.38 (0.77)
BUSY DIRECTORS					-1.47 (0.38)	-1.22 (0.45)	-0.15 (0.93)	-0.59 (0.73)
Constant	2.85*** (0.00)	3.72*** (0.00)	8.51*** (0.00)	6.70*** (0.00)	4.16** (0.02)	3.61** (0.05)	4.70*** (0.01)	3.70** (0.03)
Observations	18,675	18,675	18,675	18,675	2,262	2,262	2,262	2,262
Adjusted R-squared	0.04	0.05	0.06	0.05	0.04	0.05	0.05	0.04

***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Table 9: Who Engages in Mega-Mergers?

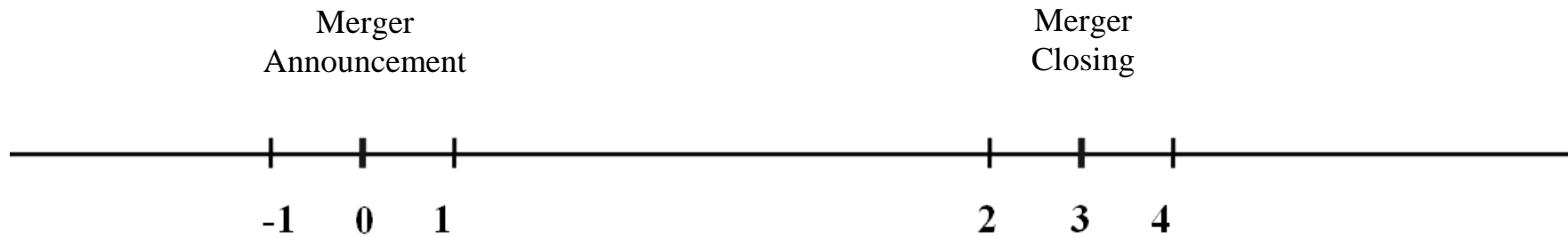
This table presents logit regressions for the sample of completed U.S. mergers from 1980 to 2007. The dependent variable is MEGA, an indicator variable that takes on the value of one if a merger has a transaction value as a fraction of total stock market capitalization in the top 1% of the *SDC* sample and is otherwise zero. ACQUIRER TA is the logarithm of the acquirer's book value of assets. ACQUIRER ME is the logarithm of the market value of the acquirer's equity. ACQUIRER MB is the ratio of the acquirer's market value of assets to their book value. OCF/ASSETS is sales minus the cost of goods sold, sales and general administration, and working capital change, divided by the book value of assets. GIM is the corporate governance index in Gompers, Ishii, and Metrick (2003). BOARD SIZE is the logarithm of the number of directors. INDEP DIRECTORS is the percentage of independent directors on the company's board. BUSY DIRECTORS is the percentage of directors on the company's board who hold three or more directorships. Marginal effects (in %) are reported in italics below the regression coefficients. P-values are reported in parentheses. Standard errors are heteroscedasticity-adjusted.

	(1)	(2)	(3)	(4)
ACQUIRER TA	0.98*** <i>0.10</i> (0.00)		0.74*** <i>0.34</i> (0.00)	
ACQUIRER ME		1.14*** <i>0.09</i> (0.00)		1.27*** <i>0.25</i> (0.00)
ACQUIRER MB	0.11*** <i>0.01</i> (0.00)	-0.02 <i>-0.002</i> (0.62)	0.14*** <i>0.07</i> (0.00)	-0.07 <i>-0.01</i> (0.38)
OCF/ASSETS	7.76*** <i>0.81</i> (0.00)	9.27*** <i>0.77</i> (0.00)	-1.98 <i>-0.91</i> (0.70)	-0.62 <i>-0.12</i> (0.93)
GIM			-0.08 <i>-0.04</i> (0.23)	0.00 <i>0.001</i> (0.97)
BOARD SIZE			1.22* <i>0.56</i> (0.08)	1.57** <i>0.31</i> (0.02)
INDEP DIRECTORS			-1.55 <i>-0.71</i> (0.17)	-2.22* <i>-0.43</i> (0.06)
BUSY DIRECTORS			3.63*** <i>1.66</i> (0.00)	1.55 <i>0.30</i> (0.23)
Constant	-13.40*** (0.00)	-14.40*** (0.00)	-12.35*** (0.00)	-17.92*** (0.00)
Observations	18,735	18,735	2,264	2,264
Pseudo R-squared	0.33	0.37	0.29	0.38

***, **, * indicate statistical significance at the 1%, 5%, and 10% level, respectively.

Figure 1: Estimation of Value Creation in the *Value Line* Sample.

This figure presents the timeline used to infer value creation directly because of the merger from revisions of *Value Line* analyst forecasts. Value Creation 1 is the combined company value based on the first post-closing analyst forecast minus the acquirer's stand-alone value based on the last pre-closing but post-announcement analyst forecast, minus the market value of the target four weeks before the merger announcement, and minus the dollar premium. It is scaled by the acquirer's market value of equity four days before the merger announcement.



$$\text{Value Creation 1} = \frac{(A + T)_4 - A_2 - MV_{-1}^T - \pi}{ME_{-1}^A}$$