BARGAINING POWER AND INDUSTRY DEPENDENCE IN MERGERS*

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Abstract

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Abstract

I propose a new hypothesis based on product market relationships to explain the division of gains between targets and bidders in mergers. In vertical mergers, targets that have greater dependence upon acquirers either as key suppliers or as key customers have lower bargaining power relative to acquirers. In horizontal mergers, targets have lower bargaining power when they are more vulnerable to losses from a price war started by an acquirer. Using input and output data from the U.S. Census Bureau and a sample of 2,556 mergers of public firms, I find empirical support for these hypotheses. Though targets gain more on average than acquirers do, measures of industry dependence help explain substantial variation in the division of gains.

1. Introduction

Though there is a large literature explaining the separate returns to bidders and targets in mergers, there is little evidence explaining how the total gains from a merger are divided according to bargaining power. Yet bargaining power is important. A merger represents the largest single transaction of a firm and thus produces its largest transaction-level gain or loss. Such high stakes make the division of the gains the leading priority for each firm involved. More broadly, understanding bargaining power in mergers will provide insight into how negotiation impacts the market for corporate control.

In bargaining theory, dependence between firms plays a crucial role in determining bargaining power. Nash (1953) shows that the smaller is one firm's outside option, the greater is its opportunity cost if bargaining fails, and thus the more dependent it is on the other firm to complete the deal. The relationship between dependency and power also is presented in the incomplete contracts theories of Klein, Crawford, and Alchian (1978) and Williamson (1979). In these theories, a relationship-specific investment is more valuable within the relationship than it is outside. After a relationship-specific investment has been made by one firm, its trading partner can opportunistically renegotiate the terms of trade because the specificity of the investment has reduced the value of the investing firm's outside option. These theories imply that the degree to which one firm depends upon another is inversely related to its bargaining power.

In this paper I argue that the bargaining power of a target is inversely related to its most fundamental dependency on an acquirer: its product market interactions. To the best of my knowledge, this is the first paper to test this hypothesis. I differentiate between horizontal mergers of rivals and non-horizontal mergers where firms may have a vertical supplier-customer relationship. Looking first at vertical deals, in the merger negotiations between a supplier and a customer, the supplier could threaten to withhold its product to the customer if it did not receive a certain share of the merger gains. The greater is the value of the input required by a customer from a certain supplier, the greater is the dependence of the customer on the supplier. Likewise, the greater the extent to which a particular customer's purchases account for the total sales of a supplier's product, the greater is the dependence of the supplier on the

customer. The relative strength of these effects will determine bargaining power. A customer may be equally dependent upon a supplier as the supplier is upon the customer. Alternatively, a customer may be highly dependent upon a supplier's inputs, but the supplier may have such a large customer base, that this particular customer represents only a small fraction of its total sales. In this case, only the particular customer would be dependent upon the supplier and not vice versa.

The relative strengths of these dependencies are mitigated by the substitutability of inputs and the competitive intensity of the opposing industry. If a customer can easily switch to a different input or a different supplier of the same input, then it will be less dependent upon a particular supplying firm. Thus greater market power by a supplier of a more unique input is associated with stronger dependency of the customer on the supplier. In the converse relationship where a supplier is dependent upon a buyer, the occurrence of substitute customers is less common because firms likely sell their products to all customers possible.[1]

In contrast to vertical mergers, the dependency relationship in horizontal mergers focuses on the competitive intensity of an industry, rather than the coordination of a supply chain. A target's bargaining power will depend upon the magnitude and credibility of an acquirer's threats to either increase prices in the input market or decrease prices in the output market. Saloner (1987) formalizes this argument in a signaling model where a price war affects the terms of a subsequent takeover and signals to other firms that entry is unprofitable. Empirical evidence of predatory pricing leading to merger gains is presented in Burns (1986), where predatory pricing led to a reduction in acquisition costs of American Tobacco by an estimated 56% across 43 rival takeovers. Recent anecdotal evidence comes from statements by John Mackey, the CEO of the grocery firm Whole Foods. Internal documents quote Mackey as telling the firm's directors that an acquisition of its rival, Wild Oats, would allow the firm to "avoid nasty price wars," that could "harm [Whole Foods'] gross margins and profitability" (Kesmodel, 2007).[2]

[1]One example where this situation would occur is if the supplier provides its product to multiple customers with different elasticities of demand, but where resale prevents price discrimination. In this scenario, a supplier may optimally sell only to the low elasticity customers at high prices, forgoing the sales to the high elasticity customers (Perry, 1989). The greater is the loss of revenue from switching to the high elasticity customers, the greater is the dependence of the supplier on the low elasticity customer base.

[2]The well-known cases of predatory pricing leading to mergers occurred before the enforcement of the Celler-Kefauver Act of 1950. Subsequent antitrust enforcement will limit the degree that pricing power can be achieved via horizontal mergers. This will bias against finding any results.

Other empirical studies find mixed results on the effect of mergers on market power. Kim and Singal (1993) present direct evidence that airline mergers led to higher prices to consumers. However, Eckbo (1983), Fee and Thomas (2004), and Shahrur (2005) find that the gains from horizontal mergers are unlikely to be caused by increased market power following the merger, though there is evidence that horizontal mergers increase buying power. In my hypothesis, the threat of a price war is used simply to convey bargaining power, independent of the force that drives merger gains. Therefore, even if merger gains are driven by increased efficiency, the firms still have an incentive to threaten a price war in order to capture more of the gains.

I contend that both the credibility and the magnitude of a price war threat will depend upon the degree of similarity, the economic strength, and the relative sizes of the firms. First, the greater the degree to which a target is subject to the same forces that determine the acquirer's revenues and costs, the more threatening is a price war. I measure the credibility of this threat as the correlation between acquirer and target stock price returns controlling for market-wide risk factors. Second, the greater is the economic strength of the target, measured using market share and return on assets (ROA), the more likely it is to be able to withstand predatory pricing. Finally, the smaller is the relative size of the target to the acquirer, the less likely it is to be able to withstand a price war.

To measure target-acquirer dependence in vertical mergers I rely on industry input-output data provided by the U.S. Census Bureau. I calculate the percentage of input costs to output revenues for each industry pair in a merger. The greater is the ratio of one industry's inputs to another industry's outputs, the more dependent is the customer on the supplier industry. Second, I calculate each customer industry's purchases as a share of the total revenue of a supplying industry. The greater is the share from a particular industry, the more dependent is the supplier on this customer industry. I also account for market share as a mitigating factor while controlling for industry fixed effects.

To capture the payoffs to relative bargaining power, I use target premiums and a new measure based on the difference in dollar gains between the target and the bidder. Though variation in premiums proxies for bargaining power, it does not necessarily measure the percentage of the combined gains that the target captures. Since acquirers are much larger than targets on

average, the comparison of a target's share of the combined abnormal *dollar* returns to the acquirer's share is more useful than a comparison of percentage abnormal returns. Since one or both firm's dollar gains may be negative, I measure the target's bargaining outcome using the difference between the target's dollar gain and the acquirer's dollar gain, normalized by the sum of the acquirer's and target's pre-merger market values.

I first report that on average, targets capture more of the gains from mergers than do acquirers, though not to the degree implied by the prior literature analyzing bidder and target stock returns in isolation (Andrade, Mitchell, and Stafford, 2001). When both firms have positive dollar gains, targets capture only 49.1% of the total gain on average. This is in contrast to the popular notion that a large target premium and small acquirer return imply that a target receives the lion's share of the gain. Next, I investigate the determinants of the division of gains.

Controlling for firm sizes and prior returns, method of payment, termination fees, leverage, industry and time effects, as well as other factors, I find that a target industry's usage of a supplying acquirer industry's inputs is negatively related to target premiums and target abnormal dollar returns relative to acquirer dollar returns. Conversely, when targets are suppliers, I find a significant positive relationship between target gains and the usage of target inputs in acquirer output. I also find that when acquirer industry purchases comprise a larger share of target industry sales, targets have significantly smaller abnormal dollar returns relative to acquirers. These findings support the hypothesis that bargaining power is inversely related to industry dependence. In horizontal mergers, I find that when a target is larger relative to an acquirer, has higher ROA, and has stock returns that are less correlated with the acquirer's returns, the target receives a higher premium and greater dollar returns relative to the acquirer, consistent with less vulnerability to a price war.

For robustness I re-run all of my regressions using the share of total gains captured by the target when both firms have positive abnormal dollar returns. I find that my results hold using this direct measure of the division of gains. When targets rely on acquirers as key customers or suppliers, targets capture less of the total combined gains. In horizontal mergers, relative size, market share, and ROA remain significant in the robustness tests, but the direct effect

of the correlation of returns does not. In additional robustness tests, I find that my measures of bargaining power are not related to the overall size of the combined gains. This provides evidence that industry relations help explain the division of gains rather than the size of the total gains. As an alternative test of bargaining power, I analyze whether deals are renegotiated after the initial offer to favor the target or the acquirer based on product market dependence. In ordered logit models I find a negative relationship between the likelihood of a price improvement and greater industry dependence of the target on the acquirer. Finally, I show that using a much larger sample that includes non-public targets, acquirer announcement returns are lower when the acquirer's industry is more dependent on the target's industry.

The effect of inter-industry dependencies on target gains are substantial. I estimate that the difference between the first and third quartile of target dependence on acquirer inputs results in premiums that are about 4.5 percentage points lower. The decrease in excess target dollar returns (over acquirer dollar returns) is about $13 million, compared to a median excess target dollar return of $43 million. In horizontal mergers, a change from the 25th to the 75th percentile of correlation in stock returns leads to premiums that are 8.6 percentage points lower. These results are comparable to the 4% higher premiums from target termination fees reported in Officer (2003) and the 7% lower premiums when CEOs own more than 5% of all shares reported in Moeller (2005).

My study differs from prior work for at least two major reasons. First, this is the first study to propose that inter-industry dependence between targets and bidders helps to explain bargaining power. Prior studies have proposed agency stories and governance issues to explain target gains. In particular, prior work has shown that larger managerial ownership increases premiums (Stulz, 1988; Stulz, Walkling, and Song, 1990; Song and Walkling, 1993; Moeller, 2005) and that managers trade premiums for private benefits (Wulf, 2004; Hartzell, Ofek, and Yermack, 2004). Another line of research has found inconclusive evidence on the relationship between target premiums and antitakeover provisions (Varaiya, 1987; Field and Karpoff, 2002; Subramanian, 2003). Second, this paper is atypical in that I wish to explain relative bargaining power, rather than simply target gains. To this end I use measures of the division of gains based on both the difference between target and acquirer abnormal dollar returns and the

probability of a price improvement during renegotiation. Bradley, Desai, and Kim (1988), Stulz, Walkling, and Song (1990), and Bates, Lemmon, and Linck (2006) are the few papers that also seeks to capture the division of gains, rather than absolute target gains. More generally, my paper contributes to two topics of growing research interest: the relationship between the negotiation process and the outcomes of mergers (Hotchkiss, Qian, and Song, 2005; Boone and Mulherin, 2006; Povel and Singh, 2006, Officer 2003, 2004) and the impact of product market interactions on the financial decisions of firms (Maksimovic and Phillips, 2001; MacKay and Phillips, 2005; Shahrur, 2005; Campello, 2006; Fee, Hadlock, and Thomas, 2006).

The remainder of the paper is organized as follows. Section 2 describes the data used and the methodologies employed in the analysis. Section 3 presents the empirical findings and Section 4 concludes.

2. Data and Methodology

Data on mergers are from the Securities Data Corporation (SDC) U.S. Mergers and Acquisitions database. Only deals announced between 01/01/1985 and 12/23/2004 and completed within 1,000 days of the announcement are included.[3] The transaction value of the deal is restricted to be at least $1 million and the relative size of the transaction value to the market equity of the acquirer is restricted to be at least 1%. Acquirers must own less than 50% of the target before the deal and 100% after. Both acquirers and targets must be public firms with data available on the Center for Research in Security Prices (CRSP) and CompuStat databases. Multiple acquisition announcements within five days of each other made by the same firm are excluded.

To test the hypothesis of the paper, I must measure the product market dependence between targets and bidders as well as merger outcomes. I first explain the measures of the division of gains between bidders and targets and then the measures of dependence.

2.1. Measures of the Division of Gains in Mergers

Merger outcomes are measured using both target premiums and the difference between the target's and the acquirer's abnormal dollar returns surrounding the announcement of the deal.

[3]I only use completed deals in my sample because my concern is not the motive for the merger, but simply the division of gains given a merger between two firms.

The premium is the value of the transaction divided by the market value of the target 50 trading days before the announcement. Though Schwert (1996) shows that premiums and run-ups are typically uncorrelated, using a market value from 50 days prior to the announcement date helps to ensure that target run-ups prior to the announcement do not bias the premium downward. Betton, Eckbo, and Thorburn (2008) finds that bidder gains increase in target runups and premiums, suggesting that premiums may indicate large combined gains rather than target bargaining power. Therefore, I also use an alternative measure of target gains.

The second measure of the division of gains between acquirer and target is based on the announcement abnormal dollar returns. To calculate abnormal dollar returns I first calculate abnormal returns in a three-day window surrounding the announcement. Abnormal returns are calculated using estimates from factor loadings on the daily Fama-French three factor model over the period $(-239, -6)$, relative to the announcement date.[4] Using these estimates I then calculate abnormal dollar returns over the three days for each firm following the method used in Malatesta (1983) and Moeller, Schlingemann, and Stulz (2004). Summing the daily dollar returns over the three-day event window generates cumulative abnormal dollar returns.

To measure the target's share of gains from a merger, it would be ideal to take the percentage of the total dollar returns contributed by the target, analogous to splitting a pie. However, since dollar returns may be negative for either or both firms, this procedure would lead to misleading results. For instance, if the target dollar gain is \$100 and the bidder's is $-$\$99, then the target's percentage of the pie would be $\$100/\$1 = 10,000\%$. The situation is even worse if the total gains are negative. To avoid this problem, I use the difference in dollar gains between the target and bidder, Target Abnormal \$ Returns $-$ Acquirer Abnormal \$ Returns, divided by the sum of the acquirer's and target's market value at the end of the prior year. I denote this variable as $\Delta\$CAR$ throughout the paper. This measure represents the relative gain of the target versus the acquirer for each dollar of total market value, without the concern that total gains may be negative. For robustness, I also identify a subsample of deals where both target and acquirer dollar returns are positive. Within this subsample I am able to calculate the percentage of total

[4]Abnormal returns are also calculated using market-adjusted returns from the CRSP value-weighted index for robustness. No qualitative differences are found. I also require a minimum of 100 non-missing observations in the estimation window $(-239, -6)$ in order to calculate abnormal returns.

gains captured by the target, without the distortions presented above, though with potential selection issues, which I discuss below.

2.2. Measures of Product Market Dependence in Mergers

To test if the determinants of bargaining power depend upon product market relationships, I must classify mergers as horizontal or non-horizontal and then measure the degree of vertical relations between firms. To account for multiple product lines, for each firm in the sample I record the primary SIC and NAICS code provided by SDC and also all primary and secondary industry codes from the CompuStat Segments database, which reports up to 10 segments annually. This implies that there are at most 21 unique industry codes (SIC or NAICS) per firm. If I relied solely on primary industry classifications I would miss many vertical relations, especially for larger more diversified firms. I define horizontal mergers as those where the target and bidder share any 4-digit SIC code in common (NAICS codes for 1995 to 2004). Thus a vertically integrated firm acquiring a rival to its upstream division is considered a horizontal merger. All other deals are classified as non-horizontal.

2.2.1. The Measurement of Vertical Relations. To measure inter-industry relationships I rely on the 'Use Table' provided by the U.S. Bureau of Economic Analysis (BEA). This table records the input and output (IO) commodity flows between close to 500 different industries. The use of industry-level data means that an acquirer and target in the sample may not actually trade vertically, but rather they are potential suppliers or customers. Prior literature has used actual trading partners to identify when upstream horizontal mergers may affect vertical partners (Fee and Thomas, 2004; Shahrur, 2005). However, the industry-level IO data is more relevant for my study because vertical relations will affect the bargaining positions of firms even if the firms are only potential, but not existing, trading partners.

Following Fan and Goyal (2006), for each IO industry pair I calculate the dollar value of the supplier industry's output required to produce one dollar of the customer industry's output. This represents the relative importance of a supplier industry's input to a customer industry's output. Unlike Fan and Goyal (2006), I also calculate the relative importance of a customer industry's purchases to a supplier industry's output. This is measured as the percentage of the

supplier industry output purchased by the customer industry. These measures are as follows:

$$\text{Relative importance of Supplier to Customer: } V_s = \frac{\$ \text{ Supplier Input}}{\text{Total } \$ \text{ Customer Output}} \tag{1}$$

$$\text{Relative importance of Customer to Supplier: } V_c = \frac{\$ \text{ Customer's Purchases}}{\text{Total } \$ \text{ Supplier's Sales}} \tag{2}$$

Take for example the relationship between SIC industries 2631 (Paperboard mills) and 3275 (Gypsum products), which produces plaster and wall boards for construction. The 1987 BEA data reports that the gypsum products industry has a total output of $2,612 million and bought $200 million in inputs from the paperboard mills industry. Thus V_s, the relative importance of the paperboard mills industry (supplier) to the gypsum products industry (customer) is 0.077. Or in other words, for every dollar of output, the gypsum products industry used 7.7 cents of paperboard mills industry input. On the flipside, the paperboard mills industry sold a total of $41,576 million in output, which divided into the $200 million sold to the gypsum products industry yields a relative importance of the gypsum products industry (customer) to the paperboard mills industry (supplier) of $V_c = 0.0048$. This means that for every dollar of the paperboard mills industry's sales, 0.48 cents were provided by the gypsum products industry.

Figure 1 depicts the industry relationship between the paperboard mills industry and the gypsum products industry. The top row lists the suppliers of the gypsum products industry in declining order of the percentage of the total purchases of inputs of the gypsum products industry. Nonmetallic minerals supplies the largest value of inputs to the gypsum products industry. Paperboard mills is the fourth largest supplier with 7.67% of total inputs. The bottom row lists the customers of the paperboard mills industry in declining order of the percentage of total sales. The paperboard containers industry is the largest customer of the paperboard mills industry. The gypsum products industry is the 25th largest customer with only 0.48% of total sales. The width of the lines in Figure 1 connecting suppliers and customers is proportional to these ratios of input and output. Clearly the supply of the paperboard mills industry is more important to the gypsum products industry than are the purchases of the gypsum products industry to the paperboard mills industry. My hypothesis states that because the paperboard

mills industry is relatively less dependent upon the gypsum products industry, a paperboard firm would have more bargaining power in a merger.

I calculate V_s and V_c for both acquirers and targets, giving four measures of vertical relations: V_s and V_c assuming the acquirer is a supplier and the target is customer and V_s and V_c under the opposite assumptions. This accounts for the possibility of both forward (acquirer is supplier) or backward (acquirer is customer) integration, or both simultaneously. In the above example, the corresponding V_s and V_c assuming the paperboard mills industry is the customer and the gypsum products industry is the supplier are both zero. Thus, the vertical relation only flows in one direction, with the gypsum products industry as customer and the paperboard mills industry as supplier. Some industries have bilateral vertical relations where each industry is both a supplier and customer (for example, the Iron Ore industry (SIC 1011) and the Blast Furnace industry (SIC 3312)).

To measure industry classifications for the sample firms, I match 4-digit SIC and 6-digit NAICS codes to the IO industry codes using the concordance tables provided by the BEA. The BEA data is updated every five years between 1982 and 1997.[5] For announcements between 1985 to 1989, 1990 to 1994, and 1995 to 2004, I use the 1987, 1992, and 1997 Use tables, respectively. The IO industries are based on 4-digit SIC codes in 1987 and 1992 and 6-digit NAICS codes in 1997. In a few cases, SIC/NAICS codes are mapped to more than one IO industry. In these cases, I calculate the vertical relations between all mappings and record the median values of V_s and V_c. For each deal in the sample I compute V_s and V_c for every combination of target and bidder industry codes and record the maximum of V_s and V_c. For example, if an acquirer has three unique SIC codes and a target has two, I find the maximum among the six possible industry vertical relations. On average, acquirers have 2.8 unique SIC or NAICS codes (median of 2) and targets have 1.3 unique industry codes (median of 1).

I do not set an input-output cutoff to separately identify non-horizontal mergers as vertical versus purely conglomerate deals, but instead allow this measure to vary continuously. I do however, identify relevant industries using a 1% cutoff, following Fan and Goyal (2006).[6]

[5]The data for 2002 was not yet available at the time of the analysis. However, if the IO relations are not stable over time it biases against finding significant results.

[6]Kedia, Ravid, and Pons (2008) study the wealth effect of vertical mergers and find negligible differences based on a 1% or 5% cutoff threshold.

Relevant vertical industries are all industries where V_c or V_s for either target or acquirer is greater than 1%. Relevant horizontal industries are recorded as all shared 4-digit SIC codes. Thus, multiple relevant industries are possible for a single merger. In the horizontal sample, the average number of shared SIC/NAICS codes is 1.10 (median = 1). In vertical mergers, there are an average of 2.7 industry combinations with vertical relations greater than 1% (median = 2). Identifying the multiple industries allows a more precise measure of a firm's market share for the industry or industries that are relevant to the merger and not unrelated industries.

As argued in the introduction, substitutability of suppliers and customers may mitigate dependence in vertical mergers. I have no direct measure of substitutability of inputs. To do so I would need to measure the marginal rate of technical substitution between all inputs in all industries. However, since I can not separately identify the mitigating role of substitutability of inputs, my analysis will be biased toward finding no effect of industrial relations on bargaining power.

I do measure a firm's market power however, to proxy for the substitutability of suppliers within the same industry. I calculate each sample firm's market share of sales in the prior year for each relevant industry in a merger. I aggregate sales at the three-digit SIC code in order to have a large enough industry-year sample.[7] If multiple industries are relevant to a deal I record the average market share across the industries. If a supplier has a large market share, I anticipate that customers have less bargaining power. I measure both market share's direct effect and its interaction with the industry dependence measures. I use industry fixed effects to control for the competitive intensity of an industry as well as other unobserved industry characteristics.

2.2.2. The Measurement of Horizontal Dependency Relations. For horizontal mergers, I want to measure the degree to which a merging firm would be harmed by a pricing war. I use market share as defined above to proxy for the pricing power of each firm. To capture the economic strength of the firm, I calculate ROA as income before extraordinary items divided by book assets at the end of the prior year. I also calculate the relative value of the target to the

[7]Using 4-digit SIC codes produced market shares that were implausibly high because of the narrowness of the industry definition and the availability of Compustat data.

acquirer as an additional proxy of vulnerability. Targets that are larger relative to acquirers are expected to be able to better withstand the threat of price competition. Finally, targets that share greater exposure to the same industry conditions of acquirers have less defenses against a pricing war. Though the firms are in the same industry, there may be differences in customer bases and suppliers or firms may operate in additional product lines that will be unaffected during a price war. To proxy for similarity I calculate the correlation in stock returns between the acquirer and target, controlling for market conditions. In particular, for each deal in the sample I estimate the following regression over days -239 to -10, relative to the announcement date,

$$R_{\text{Acquirer},t} = \beta_0 + \beta_1 R_{M,t} + \beta_2 SMB_t + \beta_3 HML_t + \beta_4 UMD_t + \beta_5 R_{\text{Target},t} + \varepsilon_t \qquad (3)$$

where $R_{\text{Acquirer},t}$ is the daily acquirer return, $R_{\text{Target},t}$ is the target return, $R_{M,t}$ is the CRSP value-weighted index, and SMB_t, HML_t, and UMD_t are mimicking portfolios to capture risk related to size, book-to-market characteristics, and momentum as described in Fama and French (1993) and Carhart (1997).[8] Thus β_5 is a proxy for the common risks between acquirer and target after controlling for market-wide risk factors. I expect that the larger is this coefficient, the more susceptible is a target to losses from an acquirer-induced pricing war, and hence the lesser is its bargaining power.

2.3. The Effect of Other Deal Characteristics on Bargaining Power

Target firms often commit to a negotiation strategy through the use of termination fees by imposing costs on themselves if they reject a bidder's offer. These commitments theoretically lead to more aggressive bidding by acquirers (Hotchkiss, Qian, and Song, 2005; Povel and Singh, 2006) and hence greater bargaining power for targets. Empirical evidence supports this hypothesis (Officer, 2003; Boone and Mulherin, 2006). To account for this, I use SDC's record of termination fees. Also, bidder competition is expected to lead to a greater target share of the gains. I measure how many bidders are competing for each target using SDC's data.[9]

[8]These data are generously provided on Kenneth French's Web site.

[9]Boone and Mulherin (2006) document that SDC has a distinctive time bias in their recording of termination fees. Since these fees are not central to my hypothesis I use the SDC data, but include time-dummies to alleviate

Schlingemann, Stulz, and Walkling (2002) shows that the liquidity of an industry's corporate assets affects announcement returns. Following this research, I include the number of mergers announced in the acquirer's industry in the prior year as a measure of asset liquidity. In addition, Mitchell and Mulherin (1996) and Harford (2005) find evidence that merger waves cluster by industry. Therefore I include an industry merger wave dummy variable in my regressions. This variable is calculated as in Harford (2005) except that I do not confine merger waves to occur in only one Fama-French 49 industry code in each decade of my sample, as does Harford. Instead, I allow multiple industry-waves within one decade.

I also measure toeholds, leverage, and the form of payment for each deal. If supply curves of target shares are upward-sloping, then premiums will be lower if acquirers have larger ownership stakes in the target before the merger (Stulz, 1988). Stulz, Walkling, and Song (1990) report empirical evidence supporting this theory. Also, a co-insurance effect of firm leverage may affect the value of a deal, and hence premiums (Lewellen, 1971; Kim and McConnell, 1977). Kaufman Jr. (1988) argues that cash deals incur greater tax consequences for the target than stock deals, and hence the use of cash leads to higher premiums. Since Officer (2004) shows that a price collar affects negotiation, I also include it as a dummy variable. Tender offers may also affect bargaining power, so I include a dummy variable for their existence in a deal. Other negotiation tactics exist, such as preemptive bidding, which may affect bargaining, but these are not likely to be related to the vertical relations that exist between two firms. If anything, omitting these tactics from my analysis will simply make it harder to find significant results.

Finally, there is a growing literature that shows that target managers trade private benefits in exchange for lower premiums (Stulz, Walkling, and Song, 1990; Wulf, 2004; Moeller, 2005). I do not believe that this relationship is correlated with my hypothesis and so I do not attempt to control for this effect. It is unlikely that the degree to which managers maintain large stakes in their firms is related to the product market dependence between one or many of their suppliers or customers. In a similar line of research, the relation between premiums and target antitakeover provisions has been debated (Varaiya, 1987; Field and Karpoff, 2002; Subramanian, 2003).

some of the bias. Also, observed SDC records of competed deals are not reliable measures of competition. Potential entry of a new bidder is all that is required to increase premiums even when only one bid is observed (Demsetz, 1973; Boone and Mulherin, 2007).

For the same reasoning, I do not measure these effects. Instead, I view my hypothesis as an alternative, but not competing hypothesis to these theories.[10]

3. Results

3.1. Summary Statistics

The data restrictions described above yield a sample of 2,603 deals. Of these, 2,556 have enough daily stock return observations in order to calculate abnormal returns. Table 1 presents summary statistics for the entire sample and for the horizontal and diversifying subsamples separately. There are 1,659 horizontal deals versus 897 non-horizontal deals in the sample. Target CARs are 20% on average versus acquirer's average CAR of −1.6%. Abnormal dollar returns are \$140 million and −\$169 million on average for targets and acquirers, respectively. Of the performance measures, only premiums and combined returns are significantly different in horizontal compared to non-horizontal mergers. Horizontal mergers generate premiums of 71.5% on average, whereas premiums in non-horizontal mergers average 64.1%. These results are consistent with reported returns to acquirers of public targets in Fuller, Netter, and Stegemoller (2002), target returns as reported in Moeller (2005), and reported premiums in Officer (2003). Higher combined returns in horizontal versus non-horizontal mergers is consistent with results in Kedia, Ravid, and Pons (2008). The difference in dollar gains is 5.9 on average. This means that for every dollar of the pre-merger combined market values of the target and acquirer, the target gains roughly six cents more than does the acquirer in the merger.

Looking next at the characteristics of targets in the sample, I find that targets in horizontal mergers are significantly larger than targets in non-horizontal acquisitions, both in absolute and relative size. Horizontal targets also have significantly lower prior-year returns, lower market share, and higher leverage than diversifying targets. Finally, not surprisingly, target and acquirer stock returns are more highly correlated in horizontal deals than they are in non-horizontal deals. Yet average correlations are still positive even in non-horizontal mergers, suggesting that firms in these mergers are related.

[10]In unreported tests I included CEO ownership, age, and tenure data from Compustat's ExecuComp database with no effect. The lack of an effect likely reflects the much smaller sample size possible using these data.

Compared to targets, acquirers are on average larger with higher prior returns and greater market share in their output market. Acquirers making horizontal mergers have significantly lower returns in the prior 12 months than those firms making non-horizontal acquisitions, though size and leverage are not significantly different. Termination fees are more common for both acquirers and targets in horizontal mergers than in non-horizontal mergers, though toeholds, collars, tender offers, and the number of bidders in a merger do not differ significantly between the two subsamples.

Table 2 presents summary statistics of the IO industry relation variables for the sample of non-horizontal mergers. When targets are suppliers and acquirers are customers, the target industry supplied 3.8 cents of inputs for every dollar of acquirer industry output, on average. In the same relationship, 4.4% of all target industry sales were to the acquirer industry. When the acquirer is the supplier and the target is the customer, the inter-industry dependencies are similar. Target customer industries accounted for 4.6% of acquirer industry sales on average, and for each dollar of target output, acquirer's contributed 4.09 cents of inputs. These customer-supplier relationships are substantial. As mentioned above, prior research considers industries to be vertically related if their ratios exceed 1% (Fan and Goyal, 2006). The percentiles of the IO industry relations are also presented in Table 2. Medians are slightly less than the means.

Table 1 reports that the mean difference between target dollar returns and acquirer dollar returns is positive in both horizontal ($349 million) and non-horizontal ($272 million) deals, implying that targets capture more of the gains from mergers. To better understand how merger gains are divided between firms, I identify 850 deals where both the acquirer and target have positive dollar gains. In these deals, targets captured 49.1% of the total dollar gains on average. The distribution of the target's share of the total gains is presented in Figure 2. A Kolmogorov-Smirnov test finds that the distribution is statistically indistinguishable from a uniform distribution ($p-$value $= 0.127$). Of course this sample only represents the deals where both firms had positive returns and should not be construed to mean that merger gains are split evenly between targets and acquirers on average. Instead, these results imply that though targets capture more of the gains overall, there is considerable variation across deals and targets do not always capture the lion's share of the gains.

3.2. Empirical Results on Target Gains in Non-Horizontal Mergers

The first tests of the inverse relationship between product market dependence and bargaining power are presented in Table 3. I use both the premium and the normalized difference in abnormal dollar gains between acquirers and targets as dependent variables in least squares regressions in samples of non-horizontal acquisitions. The first four explanatory variables are the measures of product market dependence.

Controlling for firm sizes, prior returns, form of payment, and year and industry effects, the coefficient estimates reported in column 1 of Table 3 reveal a positive relationship between the premium paid to the target and the acquirer's dependence on the target's input. A negative relationship with premiums is found between the target's use of the acquirer's input, when targets are customers and acquirers are suppliers. These results are consistent with my hypothesis. The greater is an acquirer's dependence on a target's supply, the larger will be the share of gains to the target. Conversely, targets that depend more heavily on an acquirer's supply have reduced bargaining power, and hence capture less of the gains.

The industry relations are not significantly related to the difference in dollar gains in column 2, but after additional controls are added in column 6, the difference in dollar returns for targets is positively related to an acquirer's usage of target inputs, but negatively related to the fraction of purchases by the acquirer industry relative to the total sales in the target's industry. This suggests that when targets are more dependent upon the purchases of acquirer industry customers, targets gain less in merger dollars relative to acquirers.

Columns 3 through 8 in Table 3 show that the measures of industry dependence remain significant after the inclusion of additional control variables. Firm market share does not exhibit any significance in any of the specifications, either directly or as an interaction with measures of product market dependence. The coefficients on additional control variables have signs in the directions expected. Larger toeholds reduce premiums, but target leverage increases premiums. However, the collar, tender offer, and termination fee dummies, and the number of bidders, are insignificant in all specifications. The number of bidders variable is a poor proxy as discussed earlier, which likely explains its statistical insignificance.

In summary, in almost all regressions, two of the industry dependence variables are significant and have a sign consistent with my hypothesis. The most robust result is when there is a key supplier, whether acquirer or target. In these cases, I find a positive relationship between target gains and the percentage of target industry inputs used in the acquirer industry's output. Second, when acquirers supply to targets, I find a negative relationship between the ratio of acquirer industry input to target industry output and target gains. These results imply that the importance of a supply of inputs affects the bargaining positions of the merging firms, and hence, the returns from the merger.

3.3. Empirical Results for Horizontal Mergers

Table 4 presents results for similar regressions, but where mergers are restricted to be horizontal. A clear size effect is present in the results. Large targets command smaller premiums than do small targets but gain more in dollar value. The results are exactly opposite for the acquirer. In most specifications, target prior returns are unrelated to premiums, consistent with Schwert (1996), though in some regressions there is a negative relationship as in Betton, Eckbo, and Thorburn (2008). Prior-year acquirer returns are positively related to premiums and to dollar returns.

Turning attention to the variables corresponding to my hypotheses on the threat of a price war, I find that targets that are larger relative to acquirers receive significantly higher premiums and a larger dollar gain relative to targets. Second, the higher the correlation between acquirer and target stock returns, the lower is the premium the target receives and the excess target dollar gains. Third, though acquirer ROA is positively related to premium in column 3, the target ROA is positively related to the difference in dollar gains in columns 4 and 6, consistent with the idea that economic strength increases bargaining power. In general, these results are consistent with my argument that credible threats of a price war reduce a target firm's bargaining power.

Market share exhibits a significant direct effect in columns 4 and 6. A firm with larger market share captures more of the gains from the merger. The interaction between relative value and market share is also significant. The positive effect of relative value on premiums and dollar

gains is increased as targets control more of the market sales. In addition, relative value has a positive interaction with the effect of the correlation between firm returns. This implies that the negative effect on premiums of facing similar risks is mitigated in targets that are larger relative to the acquirer. Under my hypothesis, I would interpret this to mean that a target that is larger in comparison to the acquirer is better able to withstand a price war, even when both firms are subject to the same risks.

3.4. Economic Magnitude of the Results

The industry dependence relationships presented in Table 3 have substantial economic impacts on merger gains. A one percentage point increase in the the ratio of acquirer industry input to target industry output is estimated to decrease premiums by at least 1.10 percentage points. To put this in context, the 25th and 75th percentiles of acquirer input to target output are 0.461% and 4.51%, respectively. This means that moving from the first quartile to the third in target industry dependence decreases premiums by an estimated 4.46 percentage points. This is equivalent to moving from the median premium of 51.23% down to 46.77%.

For the difference in abnormal dollar returns I find substantial impact as well. In columns 6 and 8 of Table 3, the significant marginal effect of target input to acquirer output is 0.003. Comparing the first (0.23%) to the third quartile (4.51%) of this dependency ratio, as above, the difference between the dollar returns of the target and acquirer for every dollar of pre-merger combined market equity decline by an estimated 1.28%. These numbers are quite substantial, since the mean normalized difference between target and acquirer dollar returns for this subsample is 5.88% and the median is 4.15%. In dollars, this translates to a reduction in excess target gains of $13.2 million, where the median excess target gains are $42.7 million.

In horizontal mergers I find substantial economic impacts as well. The first order marginal effect on premiums of a one percentage point increase in the correlation between acquirer and target stock returns is roughly -0.0084. A change from the 25th percentile (-0.011) to the 75th percentile (0.091) of this correlation translates into a premium that is estimated to be about 8.57 percentage points lower. For the normalized excess target dollar gain, this change yields an effect of 0.6%, about one eigth of the median value. Thus the influence of product

market dependencies, both in diversifying and horizontal mergers, has a substantial effect on the division of wealth between targets and bidders.

3.5. Alternative Tests of the Effect of Industry Relations on Bargaining Power

I have presented results consistent with an inverse relationship between bargaining power and product market dependence. However, my proxies for the target gains do not directly measure the division of gains in mergers. It is possible that higher premiums are paid when total merger gains are larger (Betton, Eckbo, and Thorburn, 2008), though targets may actually capture a smaller fraction of the total gains. Likewise, the difference between abnormal dollar returns of the target and acquirer may change based on total synergies created, though the relative shares of the gains are unchanged. In the following tests I control for these possibilities to verify the robustness of my results. First, I investigate the share of total abnormal dollar returns captured by the target, restricting my sample to those 850 deals in which both acquirer and target had positive dollar returns. This allows me to control for the total gain of the merger and concentrate my analysis on explaining the distribution of shares as reported in Figure 2. Second, I investigate whether my proxies for bargaining power in vertical mergers are related to the total merger gains.

3.5.1. Target Share When Both Firms Gains. In Table 5, I re-estimate the regressions on diversifying deals using the target share of total gains as the dependent variable. I find a significant negative relationship between the target share of the gains and both the percentage of acquirer industry input required for one dollar of target output as well as the percentage of target industry sales purchased by the acquirer's industry. Thus controlling for multiple factors, I find that the targets' shares of total gains from mergers are inversely related to the dependence of the target industry on the acquirer industry. In column 2, I also find an increase in target gains when the acquirer uses more of the target industry's input. Only the target industry's usage of the acquirer industry's input is significant in all regressions. I can not determine if this is because there truly is no relationship or because the smaller sample size reduces the statistical power of my tests.

I also find that my prior results for horizontal mergers are unchanged if I use the target share of total gains as the dependent variable. Table 6 reports that relative value, target market share, and target ROA are significantly and positively related to target gains. In this specification however, the correlation between target and acquirer is no longer significant, though the point estimates of its effect are negative. The interaction terms with correlation and market share are significant and in the predicted direction. This again may be reflective of a reduced sample size.

3.5.2. The Effect of IO Relations on Combined Returns. One possible criticism to the above results is that the sample is not selected randomly. More generally, there may be some concern that the relative bargaining power of an acquirer and target determines whether a deal will be made in the first place. Perhaps an acquirer only enters into mergers in which it has a strong bargaining position. In contrast, according to the neoclassical theory of mergers, an industry shock may force an acquirer to merge even if it does not have much bargaining power. In any event, if mergers only occur when relative bargaining power is one way or another, it would make it more difficult to statistically identify the effect of industry relations on bargaining outcomes as there would be less variation in the sample. To ensure my results about the division of gains are not confounded by selection issues, I test whether my proxies for bargaining power are related to the combined gains in a merger. If the mergers that generate the greatest combined synergy gains are those where the strongest vertical relations exist, my prior results may explain the size of the gains, rather than the division of the gains.

Table 7 presents cross-sectional regressions where the dependent variable is the weighted abnormal dollar announcement returns, using the pre-merger market values of the acquirer and target as weights. None of the four industry relations are significantly related to the combined returns. Acquirer market share is negatively related. In unreported tests, I run the same regressions as in Table 4 for horizontal mergers, but use the combined returns as the dependent variable. Relative value, the target and acquirer return correlation, and the market shares are unrelated to the total gains. Acquirer ROA is negatively related to total combined returns. This means that when an acquirer has greater economic strength, the size of the overall pie is smaller, but the acquirer gets a larger share. However, acquirer ROA is not related to the

share of the total gains when controlling for the size of the total gains in Table 6. Since the other variables are unaffected and remain consistent in the prior tests, it is unlikely that sample selection is driving my results.

3.6. Renegotiation and Industry Dependence

In this section, I analyze the relationship between merger gains and industry dependence in the context of renegotiations. If industry dependence leads to less bargaining power, I expect that the terms of the merger will be amended to favor the firm with less dependence. Deal amendments are recorded in the SDC database as either upward or downward revisions in the purchase price. There are 234 deals in my sample with amended offers where about 58.5% of these are upward revisions. Renegotiated prices could mean that there has been a change in the negotiating environment, or they could simply reflect the negotiation process itself. To better understand this, I read news stories about the mergers and the revised offers. However, no general results were obvious and in most cases the media report of the price revision simply noted that the offer price had changed but without stating a reason. I interpret this to mean that the revisions are simply part of the negotiation process that is played out in public, rather than in private. Therefore, I rely on statistical tests to identify the causes of the price revisions.

To investigate the relation between my measures of industry dependence and renegotiated deals, I run ordered logistic regressions where the dependent variable is 1 if the offer is revised upward, 0 if there is no revision, and -1 if the price is revised downward. The results for non-horizontal mergers are presented in Table 8. A positive coefficient indicates that an independent variable is associated with a higher likelihood of an upward revision in the offer price. The last three columns of the table report the estimated change in the probability of each outcome for a one standard deviation change in the independent variable centered at its mean, holding all other variables fixed at their means. For dummy variables, the change in probability is for a change from zero to one.

The results are consistent with my hypothesis in two of four measures of industry dependence in non-horizontal mergers. The more that targets rely on acquirers either as customers or suppliers, the greater is the likelihood of a downward revision in the consideration paid to the

target. For example, a one standard deviation change in the percentage of acquirer industry sales accounted by target industry purchases leads to a 0.99% greater chance of an upward revision in the offer. These results are robust to all the controls previously discussed.

Table 9 reports the results of the the same analysis for horizontal mergers. Most variables are statistically insignificant in this regression, though the interaction between the relative value of the target to acquirer and the correlation of their returns is positive and significant. As before, this implies that relative size mitigates the threat of a price war captured by comovement in stock returns.

3.7. Industry Relations and Acquirer Abnormal Returns

As a last test of the relation between bargaining power and industry relations, I regress acquirer abnormal announcement returns on vertical IO relations. There is likely to be a positive, though noisy, relationship between the level of an acquirer's abnormal returns and its bargaining power. Since I can calculate the industry relations for all the deals in the SDC database where industry is reported, I can use a much larger sample that includes targets that are private or subsidiaries. However, I can not include market share variables or target size and returns. The results in Table 10 are consistent with the results from the main tests presented above. Acquirers in industries that supply a larger proportion of inputs to a target's industry have significantly higher three-day abnormal returns. Conversely, when acquirers use more of a target industry's product as an input, acquirer returns are diminished. The coefficients on the customer relationship measures have signs consistent with my hypothesis. The more important is a target's industry as a customer of an acquirer's industry, the smaller is the acquirer's returns at the 0.11 significance level. Therefore, even with a noisy measure of acquirer bargaining power, I still find consistent results. Since the key variables of my hypothesis in the horizontal mergers are only available for public firms, I do not perform any additional tests for these mergers.

4. Conclusion

I propose that a target that is more dependent upon an acquirer, either as a supplier or a customer, has less bargaining power in a vertical merger, and hence will capture less of the gains.

In horizontal mergers, I define dependence as the vulnerability to a pricing war. To measure dependence for vertical mergers I calculate the ratio of target inputs to acquirer outputs at the industry level when targets are suppliers and acquirers are customers. Conversely, I calculate the percentage of total target sales that are purchased by the acquiring customer. I also calculate the same two relationships assuming the target is the customer and the acquirer is the supplier. For horizontal mergers, I measure vulnerability to predatory pricing by relative size of target to acquirer, target market share, ROA, and the correlation of acquirer and target stock returns, controlling for market wide risk factors.

I find that industry dependence is negatively related to bargaining power. When targets rely more on acquirer industry inputs or acquirer industry sales, targets command smaller premiums, have smaller excess dollar gains over the acquirer, and capture less of the shared gains. This effect is most robust when targets are customers and acquirers are suppliers. In horizontal mergers, targets that are larger relative to the acquirer, have higher ROAs, and have returns that are less correlated with the acquirer's returns command significantly higher premiums and excess dollar returns. This is consistent with my hypothesis of vulnerability to a price war as a measure of horizontal dependence. In separate tests, I also confirm my hypothesis using data on amended offers from renegotiation.

On average, targets capture more gains from mergers than do acquirers. If the motivation for the merger is related to the bargaining power of an acquirer, it is not clear why a bidder would make an offer given a small degree of bargaining power. A neoclassical view would argue that mergers are motivated by exogenous industry-wide shocks, and though bidders may have less bargaining power, it is still beneficial to undertake the merger relative to not merging. This remains an important but unexplored subject.

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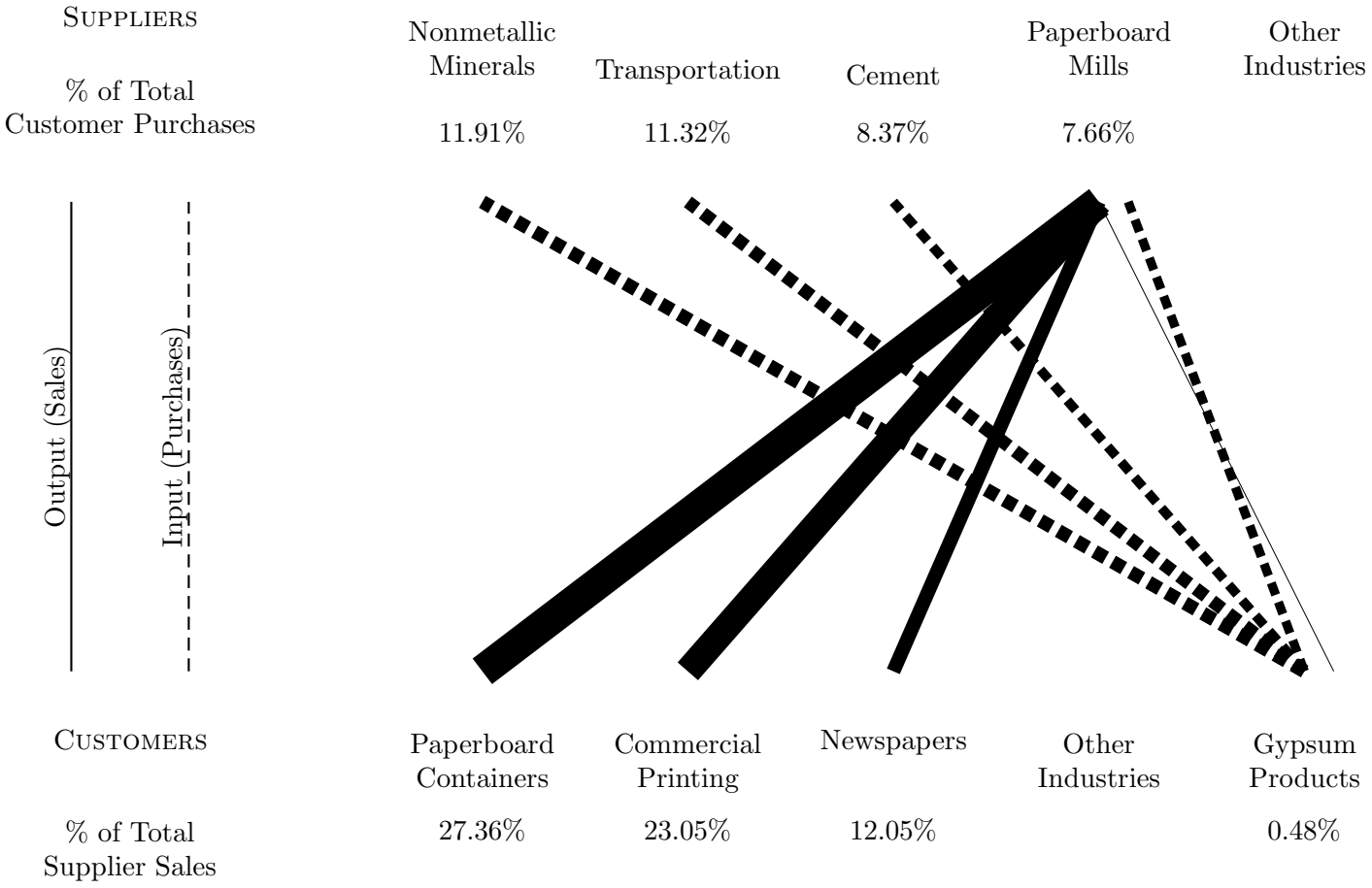

Figure 1

Input/Output relationship between the paper mill industry and the gypsum products industry

This figure depicts the customers of the paper mill industry on the bottom row and the suppliers of the gypsum products industry on the top row, arranged from left to right in descending order of the percent of paper mill sales (bottom) and percent of total input purchases by the gypsum product industry (top). The width of the lines indicating output (solid) and input (dashed) are proportional to the percent of total supplier sales and percent of total customer purchases. Percent of total customer purchases is the ratio of the dollar value of the inputs from each supplying industry to the total output of the gypsum products industry. Percent of total sales is the ratio of the dollar value of each customer industry purchases to the total sales of the paper mill industry. Thus the gypsum products industry relies more heavily on the inputs of the paper mill industry than the paper mill industry relies on the sales to the gypsum products industry. Data is from the U.S. Bureau of Economic Analysis Input/Output tables for 1987.

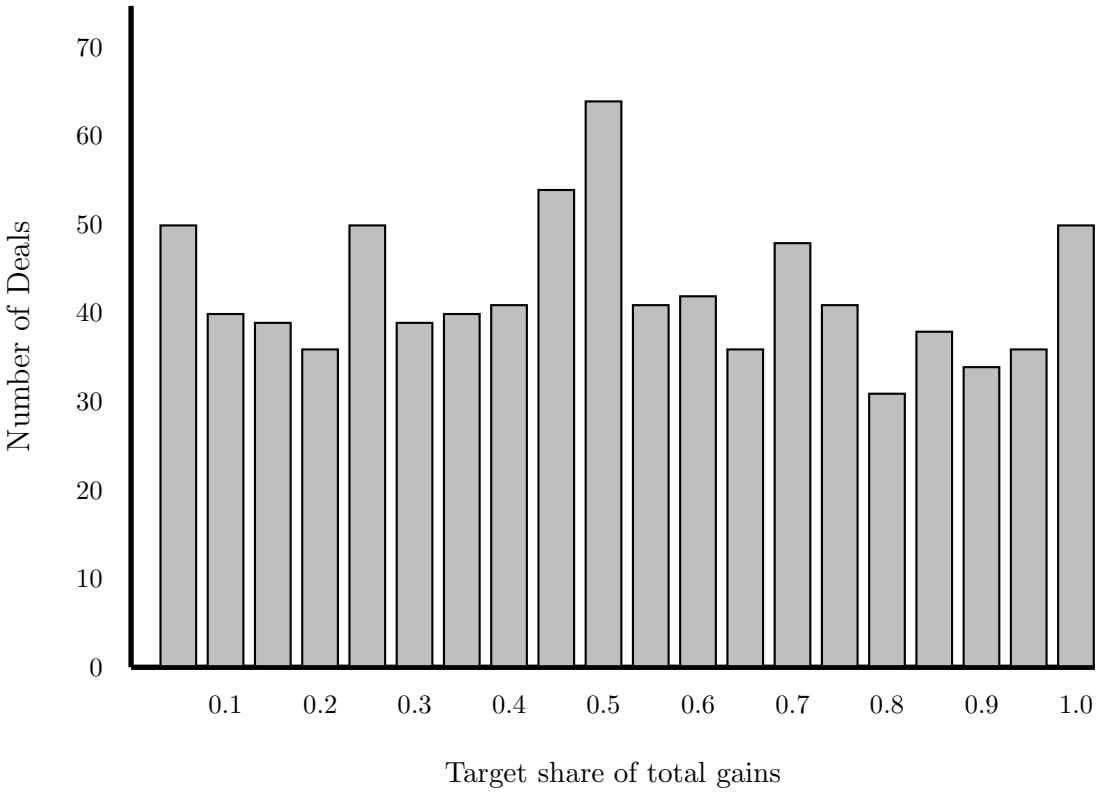

FIGURE 2
Distribution of the target share of the total merger gain
Distribution over 850 deals where both acquirer and target have positive announcement returns over the event dates $(-1, +1)$. Target share of the gains is the ratio of target dollar gains to the sum of target and acquirer dollar gains.

TABLE 1

Summary statistics by industry relationship of acquirer and target

Premium is the transaction value of the deal divided by target market value 50 trading days before the announcement minus 1. CARs are cumulative abnormal returns over three days surrounding the announcement. Abnormal returns are calculated using a daily Fama French three factor model. Dollar returns are in millions of 2005 dollars. Δ$CAR is target $CAR - Acquirer $CAR divided by the sum of acquirer and target market values at the prior year end, in percent. Combined CAR is the weighted three-day announcement abnormal return, weighted by market equity of acquirer and target. NYSE percentile refers to a variable that is a percentile in relation to the distribution of the NYSE firms. Prior returns are buy-and-hold returns over the year prior to the announcement. Market share (%) is the percentage of all net sales in the relavent three-digit SIC code in the most recent fiscal year. Leverage is debt in current assets + long term debt divided by the sum of total assets and market equity minus common equity. Relative value is the transaction value divided by the acquirer market value at the announcement date. Return correlation with acquirer is the OLS estimate of the coefficient on target returns in a regression of acquirer returns controlling for the Carhart four factors over the event period $(-239, -6)$. The sample period is 1985 to 2004. $P-$value is from a two sample $t-$test assuming unequal variances. Asterisks indicate significance at 10%, 5%, and 1% levels.

	Horizontal (1)	Non-Horizontal (2)	Difference (1) − (2)	$p-$value
Performance Measures				
Premium (%)	71.46	64.11	7.350***	0.002
Target $CAR - Acquirer $CAR	348.85	272.03	76.824	0.289
Δ$CAR (%)	5.98	5.88	0.100	0.823
Target $CAR_{(-1,+1)}$	19.95	20.05	−0.090	0.925
Target $ $CAR_{(-1,+1)}$	152.17	119.91	32.262	0.247
Acquirer $CAR_{(-1,+1)}$	−1.53	−1.79	0.260	0.399
Acquirer $ $CAR_{(-1,+1)}$	−196.68	−152.12	−44.562	0.440
Combined $CAR_{(-1,+1)}$	1.72	1.00	0.720**	0.016
Combined $ $CAR_{(-1,+1)}$	−44.52	−32.22	−12.301	0.821
Target Characteristics				
NYSE Percentile market equity	28.64	23.47	5.167***	0.000
NYSE Percentile prior returns	51.20	56.13	−4.931***	0.000
Market share (%)	1.28	2.64	−1.364***	0.001
Leverage (%)	16.55	15.01	1.540**	0.028
Relative value to acquirer (%)	32.73	22.23	10.490***	0.000
Return correlation with acquirer (%)	5.83	3.00	2.840***	0.000
Acquirer Characteristics				
NYSE Percentile market equity	56.40	54.49	1.903	0.132
NYSE Percentile prior returns	61.04	64.01	−2.971**	0.013
Market share (%)	3.15	3.83	−0.676*	0.091
Leverage (%)	14.13	14.37	−0.250	0.644

continued on next page

Table 1 - *Continued*

	Horizontal (1)	Non-Horizontal (2)	Difference (1) − (2)	$p-$value
Deal Characteristics				
Acquirer termination fee dummy (%)	21.58	14.17	7.410***	0.000
Target termination fee dummy (%)	58.73	51.48	7.260***	0.001
Toehold (%)	0.69	0.60	0.083	0.638
Tender offer dummy (%)	20.13	20.51	−0.004	0.820
Collar dummy (%)	10.32	11.45	−1.140	0.395
Number of bidders	1.08	1.06	0.015	0.252
Observations	1659	897		

TABLE 2

Summary statistics of industry IO relationships

Target input/Acquirer output (%) is the industry-level percentage of dollars of target industry input for each acquirer industry output dollar. Target purchases/Acquirer sales (%) is the percentage of all acquirer industry sales purchased by the target industry. The sample period is 1985 to 2004. The sample is 897 non-horizontal mergers.

			Percentiles				
	Mean	Std. Dev	10%	25%	50%	75%	90%
Target input/Acquirer output (%)	3.796	5.503	0.000	0.233	3.276	4.507	9.495
Acquirer input/Target output (%)	4.085	5.943	0.007	0.461	3.545	4.508	9.493
Target purchases/Acquirer sales (%)	4.552	8.537	0.005	0.364	3.609	4.592	10.889
Acquirer purchases/Target sales (%)	4.408	7.122	0.000	0.454	3.609	4.592	10.250

TABLE 3

Cross-sectional determinants of premiums and dollar return differences in non-horizontal mergers

Coefficient estimates from ordinary least squares regressions. The dependent variable is premium (transaction value of the deal divided by target market value 50 trading days before the announcement) or Δ$CAR (Target abnormal dollar returns - acquirer abnormal dollar returns cumulated over $(-1,+1)$ divided by the sum of acquirer and target market values at the prior year end). Target input/Acquirer output (%) is the industry-level percentage of dollars of target industry input for each acquirer industry output dollar. Target purchases/Acquirer sales (%) is the percentage of all acquirer industry sales purchased by the target industry. 'A' and 'T' indicate acquirer and target. NYSE percentile refers to a variable that is a percentile in relation to the distribution of the NYSE firms. Prior returns are buy-and-hold returns over the year prior to the announcement. Market share (%) is the percentage of all net sales in the relavent three-digit SIC code in the most recent fiscal year. Industry merger waves identified similar to Harford (2005). Prior year industry deal volume is the total number of completed acquisitions above $1 million in the acquirers Fama-French 49 Industry. Transaction value is all consideration paid in a deal minus the costs and fees as reported by SDC. Majority cash (stock) dummy equals one if cash (stock) is the largest component of payment form. Majority Other is the unincluded dummy. Year effects are dummies for each year in the sample 1985 to 2004. Industry effects are acquirer Fama French 49 industry codes. Standard errors are clustered by the Acquirer-Target industries match. $p-$values in parantheses. Asterisks indicate significance at 10%, 5%, and 1% levels.

	Premium (1)	Δ$CAR (2)	Premium (3)	Δ$CAR (4)	Premium (5)	Δ$CAR (6)	Premium (7)	Δ$CAR (8)
Target input/Acquirer output (%)	0.0180***	0.0021	0.0204**	0.0029	0.0204***	0.0031**	0.0189**	0.0030*
	(0.003)	(0.135)	(0.032)	(0.102)	(0.002)	(0.031)	(0.041)	(0.090)
Acquirer input/Target output (%)	−0.0126**	0.0004	−0.0162**	0.0001	−0.0110**	0.0003	−0.0138**	0.0000
	(0.018)	(0.719)	(0.014)	(0.947)	(0.040)	(0.796)	(0.032)	(0.987)
Target purchases/Acquirer sales (%)	0.0023	−0.0004	0.0030	−0.0016	0.0014	−0.0003	0.0028	−0.0015
	(0.478)	(0.504)	(0.679)	(0.102)	(0.684)	(0.580)	(0.718)	(0.189)
Acquirer purchases/Target sales (%)	−0.0029	−0.0007	−0.0061	−0.0014	−0.0073	−0.0016*	−0.0077	−0.0014
	(0.490)	(0.409)	(0.240)	(0.175)	(0.104)	(0.083)	(0.103)	(0.162)
Target market share (%)			0.0027	0.0008			0.0025	0.0010
			(0.337)	(0.364)			(0.488)	(0.346)
Acquirer market share (%)			−0.0030	−0.0008			−0.0024	−0.0005
			(0.388)	(0.283)			(0.513)	(0.500)
T Input/A output × T mkt share			−0.0002	0.0007**			−0.0003	0.0007**
			(0.732)	(0.012)			(0.697)	(0.025)
A input/T output × A mkt share			0.0008	0.0001			0.0007	0.0001
			(0.137)	(0.562)			(0.142)	(0.400)
Wave dummy					−0.0018	0.0043	0.0918	0.0119
					(0.975)	(0.689)	(0.209)	(0.455)
Prior year industry deal volume					−0.0004	0.0002	−0.0003	0.0000
					(0.523)	(0.251)	(0.634)	(0.797)

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Table 3 - *Continued*

	Premium (1)	Δ$CAR (2)	Premium (3)	Δ$CAR (4)	Premium (5)	Δ$CAR (6)	Premium (7)	Δ$CAR (8)
Acquirer termination fee dummy					0.0333	0.0163	0.1381	0.0301
					(0.554)	(0.307)	(0.115)	(0.139)
Target termination fee dummy					0.0466	0.0093	−0.0200	0.0015
					(0.311)	(0.493)	(0.767)	(0.937)
Collar dummy					0.0063	0.0030	−0.0517	0.0071
					(0.909)	(0.753)	(0.445)	(0.606)
Toehold (%)					−0.0166***	−0.0014**	−0.0162***	−0.0017**
					(0.000)	(0.029)	(0.000)	(0.017)
Tender offer					0.0639	−0.0088	0.0437	0.0033
					(0.255)	(0.529)	(0.522)	(0.823)
Number of bidders					0.0106	0.0069	0.0041	−0.0070
					(0.883)	(0.648)	(0.955)	(0.684)
Relative value					0.1089***	0.0368**	0.1163**	0.0206***
					(0.006)	(0.015)	(0.012)	(0.006)
Transaction value					0.0000	0.0000	0.0000	0.0000*
					(0.356)	(0.124)	(0.993)	(0.080)
Target leverage					1.0284***	0.0268	0.7856***	0.0214
					(0.000)	(0.391)	(0.002)	(0.618)
Acquirer leverage					−0.2527	0.0282	−0.2867	0.0085
					(0.193)	(0.546)	(0.286)	(0.869)
Acquirer NYSE percentile market equity	0.0031***	−0.0008***	0.0022**	−0.0006**	0.0042***	−0.0004*	0.0035***	−0.0004
	(0.000)	(0.000)	(0.036)	(0.016)	(0.000)	(0.053)	(0.006)	(0.127)
Acquirer NYSE percentile prior returns	0.0004	0.0003*	−0.0006	0.0001	0.0004	0.0001	−0.0013	0.0000
	(0.520)	(0.065)	(0.537)	(0.552)	(0.571)	(0.525)	(0.254)	(0.973)
Target NYSE percentile market equity	−0.0029***	0.0016***	−0.0023*	0.0015***	−0.0044***	0.0012***	−0.0035**	0.0013***
	(0.003)	(0.000)	(0.051)	(0.000)	(0.000)	(0.000)	(0.017)	(0.000)
Target NYSE percentile prior returns	0.0000	−0.0002	−0.0001	−0.0002	−0.0006	−0.0002	−0.0001	−0.0001
	(0.949)	(0.276)	(0.903)	(0.373)	(0.357)	(0.311)	(0.901)	(0.512)
Majority cash dummy	−0.4379***	0.0241	−0.4493**	0.0016	−0.2796**	0.0425	−0.3373*	0.0223
	(0.001)	(0.317)	(0.028)	(0.947)	(0.035)	(0.207)	(0.064)	(0.521)
Majority stock dummy	−0.4520***	0.0335	−0.4874**	0.0119	−0.3046**	0.0484*	−0.3442*	0.0328
	(0.001)	(0.124)	(0.019)	(0.610)	(0.016)	(0.073)	(0.055)	(0.271)
Constant	2.1039***	0.2038***	1.9148***	−0.1503***	1.1362***	−0.0109	2.3154***	0.0881*
	(0.000)	(0.000)	(0.000)	(0.002)	(0.000)	(0.827)	(0.000)	(0.078)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	849	720	462	439	634	630	399	397
Adjusted R^2	0.160	0.139	0.217	0.254	0.285	0.184	0.286	0.264

TABLE 4

Cross-sectional determinants of premiums and dollar returns in horizontal mergers

Coefficient estimates from OLS regressions. The dependent variable is premium (transaction value of the deal divided by target market value 50 trading days before the announcement) or Δ$CAR (Target abnormal dollar returns - acquirer abnormal dollar returns cumulated over $(-1,+1)$ divided by the sum of acquirer and target market values at the prior year end). NYSE percentile refers to a variable that is a percentile in relation to the distribution of the NYSE firms. Prior returns are buy-and-hold returns over the year prior to the announcement. Mkt share (%) is the % of all net sales in the relavent three-digit SIC code in the most recent fiscal year. Acquirer & target return correlation is the OLS estimate of the coefficient on target returns in a regression of acquirer returns controlling for the Carhart four factors (Carhart, 1997). Industry merger waves similar to Harford (2005). Prior year industry deal volume is the number of completed acquisitions ($\geq$ \$1 mil.) in the acquirers Fama-French 49 Industry. Majority cash (stock) dummy is 1 if cash (stock) is the largest component of payment form. Majority Other is the unincluded dummy. Year effects are dummies for each year in the sample 1985 to 2004. Industry effects are dummies for Fama French 49 industry of the acquirer. Standard errors clustered by the deals' Fama-French 49 industry. $p-$values in parantheses. Asterisks indicate significance at 10%, 5%, and 1%.

	Premium (1)	Δ$CAR (2)	Premium (3)	Δ$CAR (4)	Premium (5)	Δ$CAR (6)
Target NYSE percentile market equity	-0.0042^{***}	0.0010^{***}	-0.0068^{***}	0.0001	-0.0069^{***}	0.0002
	(0.000)	(0.000)	(0.000)	(0.667)	(0.000)	(0.585)
Target NYSE percentile prior returns	-0.0013^{**}	0.0000	−0.0007	-0.0002^{***}	−0.0003	-0.0003^{***}
	(0.011)	(0.809)	(0.223)	(0.008)	(0.611)	(0.001)
Acquirer NYSE percentile market equity	0.0041^{***}	-0.0008^{***}	0.0067^{***}	0.0000	0.0065^{***}	−0.0001
	(0.000)	(0.000)	(0.000)	(0.940)	(0.000)	(0.511)
Acquirer NYSE percentile prior returns	0.0023^{***}	0.0005^{***}	0.0016^{**}	0.0005^{***}	0.0019^{**}	0.0005^{***}
	(0.001)	(0.000)	(0.038)	(0.000)	(0.014)	(0.000)
Majority cash dummy	-0.5886^{***}	0.0092	-0.5438^{***}	0.0178	-0.4965^{***}	0.0157
	(0.000)	(0.411)	(0.000)	(0.139)	(0.000)	(0.147)
Majority stock dummy	-0.6966^{***}	0.0220^{*}	-0.6282^{***}	0.0330^{***}	-0.5365^{***}	0.0422^{***}
	(0.000)	(0.072)	(0.000)	(0.006)	(0.000)	(0.000)
Acquirer market share (%)			−0.0024	-0.0010^{**}	−0.0009	-0.0009^{**}
			(0.474)	(0.027)	(0.734)	(0.034)
Target market share (%)			0.0055	0.0016^{*}	0.0030	0.0016^{***}
			(0.220)	(0.071)	(0.281)	(0.006)
Relative value			0.1944^{***}	0.0875^{***}	0.1991^{***}	0.0912^{***}
			(0.000)	(0.000)	(0.000)	(0.000)
Acquirer & target return correlation			-0.8484^{***}	−0.0446	-0.8367^{***}	-0.0587^{**}
			(0.002)	(0.106)	(0.001)	(0.039)
T mkt share × return corr.			−0.0318	−0.0046	−0.0543	−0.0009
			(0.505)	(0.627)	(0.261)	(0.918)
A mkt share × return corr.			0.0073	0.0008	0.0204	0.0002
			(0.734)	(0.836)	(0.244)	(0.948)
Relative value × return corr.			0.6169	0.1375^{**}	0.7383^{**}	0.1630^{***}
			(0.104)	(0.018)	(0.016)	(0.004)

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Table 4 - *Continued*

	Premium (1)	Δ$CAR (2)	Premium (3)	Δ$CAR (4)	Premium (5)	Δ$CAR (6)
Relative value × A mkt share			0.0537**	0.0037*	0.0503***	0.0046**
			(0.010)	(0.089)	(0.005)	(0.022)
Relative value × T mkt share			−0.0087	−0.0092***	−0.0066	−0.0106***
			(0.523)	(0.000)	(0.619)	(0.000)
Acquirer ROA			0.1219*	−0.0070	0.0541	−0.0153
			(0.079)	(0.652)	(0.498)	(0.373)
Target ROA			−0.1897	0.0767**	−0.0123	0.0758*
			(0.242)	(0.038)	(0.939)	(0.065)
Wave dummy					0.0373	0.0020
					(0.467)	(0.805)
Prior year industry deal volume					0.0003	0.0000
					(0.451)	(0.547)
Acquirer termination fee dummy					−0.0634	−0.0333***
					(0.234)	(0.005)
Target termination fee dummy					0.0401	0.0041
					(0.300)	(0.589)
Collar dummy					0.0623	−0.0090
					(0.378)	(0.448)
Toehold (%)					−0.0170***	−0.0019
					(0.000)	(0.121)
Tender offer					0.0524	0.0199
					(0.245)	(0.110)
Number of bidders					0.0499	−0.0032
					(0.381)	(0.762)
Target leverage					0.8888***	0.0251
					(0.000)	(0.311)
Acquirer leverage					−0.0189	−0.0103
					(0.929)	(0.797)
Constant	1.5856***	−0.0871***	1.4119***	0.0258	0.8232***	0.0435
	(0.000)	(0.007)	(0.000)	(0.534)	(0.005)	(0.426)
Year effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry effects	Yes	Yes	Yes	Yes	Yes	Yes
N	1677	1553	1152	1140	1020	1017
Adjusted R^2	0.142	0.070	0.194	0.178	0.230	0.182

TABLE 5

Determinants of target share of combined dollar gains in non-horizontal mergers

This table presents estimates from ordinary least squares regressions. The dependent variable is the ratio of target abnormal dollar returns to target plus acquirer abnormal dollar returns in the three days surrounding the announcement. Only deals in which both the target and acquirer had positive abnormal dollar returns are included in the regression sample. Dollar returns are in millions of 2005 dollars. Target input/Acquirer output (%) is the industry-level percentage of dollars of target industry input for each acquirer industry output dollar. Target purchases/Acquirer sales (%) is the percentage of all acquirer industry sales purchased by the target industry. 'A' and 'T' indicate acquirer and target, respectively. NYSE percentile refers to a variable that is a percentile in relation to the distribution of the NYSE firms. Prior returns are buy-and-hold returns over the year prior to the announcement. Market share (%) is the percentage of all net sales in the relavent three-digit SIC code in the most recent fiscal year. Industry merger waves identified similar to Harford (2005). Prior year industry deal volume is the total number of completed acquisitions above $1 million in the acquirers Fama-French 49 Industry. Transaction value is all consideration paid in a deal minus the costs and fees as reported by SDC. Majority cash (stock) dummy equals one if cash (stock) is the largest component of payment form. Majority Other is the unincluded dummy. Year effects are dummies for each year in the sample 1985 to 2004. Industry effects are dummies for Fama French 49 industry classifications of the acquirer. Standard errors are clustered by the Acquirer-Target industries match. $p-$values in parantheses. Asterisks indicate significance at 10%, 5%, and 1% levels.

	(1)	(2)	(3)
Target input/Acquirer output (%)	0.0088	0.0401**	0.0186
	(0.293)	(0.022)	(0.310)
Acquirer input/Target output (%)	−0.0157**	−0.0184*	−0.0205**
	(0.020)	(0.066)	(0.020)
Target purchases/Acquirer sales (%)	0.0052	−0.0086**	−0.0044
	(0.234)	(0.032)	(0.303)
Acquirer purchases/Target sales (%)	−0.0028	−0.0216**	−0.0084
	(0.614)	(0.047)	(0.516)
Acquirer market share (%)		−0.0049*	−0.0035
		(0.090)	(0.275)
Target market share (%)		−0.0008	0.0079
		(0.836)	(0.413)
T Input/A output × T mkt share		0.0003	−0.0001
		(0.676)	(0.917)
A input/T output × A mkt share		−0.0001	0.0000
		(0.802)	(0.967)
Wave dummy			−0.1418
			(0.146)
Prior year industry deal volume			0.0018*
			(0.052)
Acquirer termination fee dummy			−0.0192
			(0.709)
Target termination fee dummy			0.0601
			(0.238)
Collar dummy			−0.1411
			(0.128)
Toehold (%)			−0.0091**
			(0.032)

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Table 5 - *Continued*

	(1)	(2)	(3)
Tender offer			−0.0616
			(0.343)
Number of bidders			−0.0404
			(0.711)
Relative value			−0.0672
			(0.276)
Transaction value			0.0000
			(0.153)
Target leverage			−0.3096
			(0.129)
Acquirer leverage			−0.0526
			(0.902)
Acquirer NYSE percentile market equity	−0.0034***	−0.0024**	−0.0038**
	(0.000)	(0.024)	(0.022)
Acquirer NYSE percentile prior returns	0.0004	0.0007	0.0005
	(0.485)	(0.409)	(0.539)
Target NYSE percentile market equity	0.0043***	0.0049**	0.0088***
	(0.000)	(0.018)	(0.000)
Target NYSE percentile prior returns	−0.0009	−0.0007	−0.0010
	(0.154)	(0.502)	(0.398)
Majority cash dummy	−0.0745	−0.2962***	−0.2891**
	(0.464)	(0.000)	(0.029)
Majority stock dummy	−0.1171	−0.3354***	−0.3594***
	(0.256)	(0.000)	(0.006)
Constant	0.7023***	0.9692***	1.1495***
	(0.000)	(0.000)	(0.000)
Industry effects	Yes	Yes	Yes
N	265	145	119
Adjusted R^2	0.109	0.169	0.254

TABLE 6

Determinants of target share of combined dollar gains in horizontal mergers

This table presents estimates from ordinary least squares regressions. The dependent variable is the ratio of target abnormal dollar returns to target plus acquirer abnormal dollar returns in the three days surrounding the announcement. Only deals in which both the target and acquirer had positive abnormal dollar returns are included in the regression sample. Dollar returns are in millions of 2005 dollars. NYSE prcnt refers to a variable that is a percentile in relation to the distribution of the NYSE firms. Prior returns are buy-and-hold returns over the year prior to the announcement. Market share (%) is the percentage of all net sales in the relavent three-digit SIC code in the most recent fiscal year. Acquirer & target return corr. is the OLS estimate of the coefficient on target returns in a regression of acquirer returns controlling for the Carhart four factors (Carhart, 1997). Industry merger waves identified similar to Harford (2005). Prior year industry deal volume is the total number of completed acquisitions above $1 million in the acquirers Fama-French 49 Industry. Transaction value is all consideration paid in a deal minus the costs and fees as reported by SDC. Majority cash (stock) dummy equals one if cash (stock) is the largest component of payment form. Majority Other is the unincluded dummy. Year effects are dummies for each year in the sample 1985 to 2004. Industry effects are dummies for Fama French 49 industry classifications of the acquirer. Standard errors clustered by the deals' Fama-French 49 industry. $p-$values in parantheses. Asterisks indicate significance at 10%, 5%, and 1%.

	(1)	(2)	(3)
Target NYSE percentile market equity	−0.0449	0.0041***	0.0029**
	(0.430)	(0.001)	(0.033)
Target NYSE percentile prior returns	−0.0221*	0.0005	0.0001
	(0.063)	(0.320)	(0.754)
Acquirer NYSE percentile market equity	−0.0005	−0.0028***	−0.0025**
	(0.973)	(0.003)	(0.028)
Acquirer NYSE percentile prior returns	−0.0040	−0.0010**	−0.0007
	(0.670)	(0.024)	(0.245)
Majority cash dummy	0.4284	0.0282	0.0352
	(0.442)	(0.651)	(0.670)
Majority stock dummy	0.3608	−0.0437	−0.0663
	(0.565)	(0.516)	(0.413)
Acquirer market share (%)		−0.0034	−0.0030
		(0.188)	(0.336)
Target market share (%)		0.0059*	0.0053
		(0.052)	(0.149)
Relative value		0.1463**	0.2195***
		(0.034)	(0.001)
Acquirer & target return correlation		−0.2276	−0.2090
		(0.178)	(0.352)
T mkt share × return corr.		0.0423	0.0749**
		(0.178)	(0.030)
A mkt share × return corr.		0.0038	−0.0011
		(0.814)	(0.945)
Relative value × return corr.		−0.5933	−0.8068*
		(0.152)	(0.074)
Relative value × A mkt share		0.0198**	0.0202*
		(0.035)	(0.055)
Relative value × T mkt share		−0.0205***	−0.0292***
		(0.010)	(0.000)

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Table 6 - *Continued*

	(1)	(2)	(3)
Acquirer ROA		−0.0719	−0.0413
		(0.314)	(0.622)
Target ROA		0.2336***	0.2421***
		(0.010)	(0.003)
Wave dummy			−0.0052
			(0.797)
Prior year industry deal volume			0.0004
			(0.271)
Acquirer termination fee dummy			−0.0378
			(0.331)
Target termination fee dummy			0.0237
			(0.502)
Collar dummy			0.0538
			(0.262)
Toehold (%)			−0.0010
			(0.718)
Tender offer			0.0181
			(0.721)
Number of bidders			−0.0593
			(0.379)
Target leverage			−0.0063
			(0.960)
Acquirer leverage			−0.1731
			(0.115)
Constant	2.4829	0.7071***	0.8501***
	(0.406)	(0.000)	(0.000)
Year Effects	Yes	Yes	Yes
Industry Effects	Yes	Yes	Yes
N	1658	385	336
Adjusted R^2	−0.014	0.242	0.242

TABLE 7
Determinants of combined abnormal returns in non-horizontal mergers
Coefficient estimates from ordinary least squares regressions. The dependent variable is the combined three-day abnormal announcement return, where acquirer and target CARs are weighted by their market value five days prior to the announcement. Target input/Acquirer output (%) is the industry-level percentage of dollars of target industry input for each acquirer industry output dollar. Target purchases/Acquirer sales (%) is the percentage of all acquirer industry sales purchased by the target industry. 'A' and 'T' indicate acquirer and target. NYSE percentile refers to a variable that is a percentile in relation to the distribution of the NYSE firms. Prior returns are buy-and-hold returns over the year prior to the announcement. Market share (%) is the percentage of all net sales in the relavent three-digit SIC code in the most recent fiscal year. Industry merger waves identified similar to Harford (2005). Prior year industry deal volume is the total number of completed acquisitions above $1 million in the acquirers Fama-French 49 Industry. Transaction value is all consideration paid in a deal minus the costs and fees as reported by SDC. Majority cash (stock) dummy equals one if cash (stock) is the largest component of payment form. Majority Other is the unincluded dummy. Year effects are dummies for each year in the sample 1985 to 2004. Industry effects are acquirer Fama French 49 industry codes. Standard errors are clustered by the Acquirer-Target industries match. $p-$values in parantheses. Asterisks indicate significance at 10%, 5%, and 1% levels.

	(1)	(2)
Target input/Acquirer output (%)	−31.3048	15.7925
	(0.323)	(0.315)
Acquirer input/Target output (%)	20.8335	19.5223
	(0.109)	(0.234)
Target purchases/Acquirer sales (%)	20.1779	−10.8722
	(0.328)	(0.465)
Acquirer purchases/Target sales (%)	1.7546	−10.6806
	(0.887)	(0.333)
Acquirer market share (%)	−10.2638	−25.0588*
	(0.298)	(0.090)
Target market share (%)	−13.1348	−4.3315
	(0.219)	(0.663)
T Input/A output × T mkt share	2.1971**	1.7174
	(0.044)	(0.399)
A input/T output × A mkt share	0.2808	0.3909
	(0.774)	(0.726)
Wave dummy		49.1832
		(0.808)
Prior year industry deal volume		−2.9034*
		(0.070)
Acquirer termination fee dummy		−144.4397
		(0.601)
Target termination fee dummy		−262.1861*
		(0.087)
Collar dummy		207.5131
		(0.254)
Toehold (%)		3.1366
		(0.886)
Tender offer		44.0031
		(0.804)

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Table 7 - *Continued*

	(1)	(2)
Number of bidders		47.5750
		(0.728)
Relative value		46.3306
		(0.596)
Transaction value		0.1846*
		(0.088)
Target leverage		−1136.6960
		(0.268)
Acquirer leverage		1523.6220**
		(0.012)
Acquirer NYSE percentile market equity	−2.3771	3.9052
	(0.402)	(0.134)
Acquirer NYSE percentile prior returns	−1.5175	−3.8829
	(0.672)	(0.188)
Target NYSE percentile market equity	−0.6711	−21.7065**
	(0.944)	(0.033)
Target NYSE percentile prior returns	1.2797	4.1012**
	(0.527)	(0.031)
Majority cash dummy	11.4766	−314.5603
	(0.966)	(0.243)
Majority stock dummy	−4.5424	−347.1781
	(0.987)	(0.223)
Constant	−437.2357	257.3837
	(0.625)	(0.513)
Year effects	Yes	Yes
Industry effects	Yes	Yes
N	459	397
Adjusted R^2	0.106	0.384

TABLE 8
Renegotiation in non-horizontal mergers
This table presents estimates from an ordered logistic regression where the dependent variable takes the value of -1 if there was a downward revision in the target price, 0 if there was no revision, and +1 if there was an upward revision in the target price. Only non-horizontal mergers are included in the regressions. The last three columns present the estimated change in the probability of each of the three outcomes of the dependent variable for a one standard deviation change in an independent variable centered at its mean (or a change from 0 to 1 for dummy variables), with all other variables held constant at their mean (0 for dummy variables). Target input/Acquirer output (%) is the industry-level percentage of dollars of target industry input for each acquirer industry output dollar. Target purchases/Acquirer sales (%) is the percentage of all acquirer industry sales purchased by the target industry. 'A' and 'T' indicate acquirer and target, respectively. NYSE percentile refers to a variable that is a percentile in relation to the distribution of the NYSE firms. Prior returns are buy-and-hold returns over the year prior to the announcement. Market share (%) is the percentage of all net sales in the relavent three-digit SIC code in the most recent fiscal year. Industry merger waves identified similar to Harford (2005). Prior year industry deal volume is the total number of completed acquisitions above $1 million in the acquirers Fama-French 49 Industry. Transaction value is all consideration paid in a deal minus the costs and fees as reported by SDC. Majority cash (stock) dummy equals one if cash (stock) is the largest component of payment form. Majority Other is the unincluded dummy. Year effects are dummies for each year in the sample 1985 to 2004. Industry effects are acquirer Fama French 49 industry codes. Standard errors are clustered by the Acquirer-Target industries match. $p-$values in parantheses. Asterisks indicate significance at 10%, 5%, and 1% levels.

		Change in probability of outcome (%)		
	Coefficient	Downward Revision	No Revision	Upward Revision
Target input/Acquirer output (%)	0.0345	−0.1382	−0.1639	0.3022
	(0.328)			
Acquirer input/Target output (%)	−0.0879***	0.3442	0.4078	−0.7520
	(0.002)			
Target purchases/Acquirer sales (%)	0.0953***	−0.4537	−0.5371	0.9907
	(0.004)			
Acquirer purchases/Target sales (%)	−0.0328	0.1738	0.2061	−0.3799
	(0.122)			
Acquirer market share (%)	−0.0547***	0.3390	0.4016	−0.7406
	(0.006)			
Target market share (%)	−0.0130	0.0624	0.0740	−0.1364
	(0.527)			
T Input/A output × T mkt share	−0.0074**	0.1445	0.1714	−0.3159
	(0.029)			
A input/T output × A mkt share	0.0011	−0.0467	−0.0554	0.1022
	(0.689)			
Acquirer $CAR_{(-1,+1)}$	4.0475	−0.1780	−0.2111	0.3891
	(0.285)			
Target $CAR_{(-1,+1)}$	−1.3511	0.1734	0.2055	−0.3789
	(0.357)			
Wave dummy	0.2343	−0.1351	−0.1871	0.3222
	(0.775)			
Prior year industry deal volume	−0.0118	0.5638	0.6668	−1.2306
	(0.186)			

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Table 8 - *Continued*

		Change in probability of outcome (%)		
	Coefficient	Downward Revision	No Revision	Upward Revision
Acquirer termination fee dummy	1.2047***	−0.4857	−2.1217	2.6074
	(0.005)			
Target termination fee dummy	−0.7561	0.4547	0.5837	−1.0384
	(0.194)			
Collar dummy	−0.4564	0.3297	0.1789	−0.5086
	(0.719)			
Toehold (%)	0.1064*	−0.2169	−0.2571	0.4741
	(0.096)			
Number of bidders	−0.0073	0.0015	0.0017	−0.0032
	(0.989)			
Relative value	0.0060	−0.0023	−0.0027	0.0050
	(0.982)			
Transaction value	0.0000	0.0227	0.0269	−0.0496
	(0.809)			
Target leverage	0.0770	−0.0068	−0.0081	0.0149
	(0.966)			
Acquirer leverage	−5.5689*	0.3971	0.4703	−0.8675
	(0.066)			
Acquirer NYSE percentile market equity	−0.0057	0.1036	0.1228	−0.2264
	(0.741)			
Acquirer NYSE percentile prior returns	0.0038	−0.0598	−0.0710	0.1308
	(0.691)			
Target NYSE percentile market equity	0.0240	−0.3529	−0.4180	0.7709
	(0.120)			
Target NYSE percentile prior returns	0.0026	−0.0495	−0.0587	0.1083
	(0.785)			
Majority cash dummy	−0.7096	0.4866	0.3652	−0.8517
	(0.866)			
Majority stock dummy	−1.2724	0.6961	1.3797	−2.0758
	(0.781)			
Intercept 1	−5.4290*			
	(0.065)			
Intercept 2	3.9779*			
	(0.098)			
Year effects	Yes			
Industry effects	Yes			
N	396			
Pseudo R^2	0.368			

TABLE 9
Renegotiation in horizontal mergers

This table presents estimates from an ordered logistic regression where the dependent variable takes the value of -1 if there was a downward revision in the target price, 0 if there was no revision, and +1 if there was an upward revision in the target price. Only horizontal mergers are included in the regressions. The last three columns present the estimated change in the probability of each of the three outcomes of the dependent variable for a one standard deviation change in an independent variable centered at its mean (or a change from 0 to 1 for dummy variables), with all other variables held constant at their mean (0 for dummy variables). NYSE prcnt refers to a variable that is a percentile in relation to the distribution of the NYSE firms. Prior returns are buy-and-hold returns over the year prior to the announcement. Market share (%) is the percentage of all net sales in the relavent three-digit SIC code in the most recent fiscal year. Relevant industries are where acquirers and targets share four-digit SIC codes. Acquirer & target return corr. is the OLS estimate of the coefficient on target returns in a regression of acquirer returns controlling for the Carhart four factors (Carhart, 1997). Industry merger waves similar to Harford (2005). Prior year industry deal volume is the number of completed acquisitions ($\geq$ \$1 mil.) in the acquirers Fama-French 49 Industry. Majority cash (stock) dummy is 1 if cash (stock) is the largest component of payment form. Majority Other is the unincluded dummy. Year effects are dummies for each year in the sample 1985 to 2004. Industry effects are dummies for Fama French 49 industry of the acquirer. Standard errors clustered by the deals' Fama-French 49 industry. $p-$values in parantheses. Asterisks indicate significance at 10%, 5%, and 1%.

		Change in probability of outcome (%)		
	Coefficient	Downward Revision	No Revision	Upward Revision
Target NYSE percentile market equity	0.0041	−0.2623	−0.0416	0.3039
	(0.632)			
Target NYSE percentile prior returns	−0.0002	0.0127	0.0020	−0.0148
	(0.965)			
Acquirer NYSE percentile market equity	−0.0009	0.0664	0.0105	−0.0769
	(0.900)			
Acquirer NYSE percentile prior returns	−0.0001	0.0046	0.0007	−0.0054
	(0.990)			
Majority cash dummy	0.5012	−1.1005	−0.4044	1.5049
	(0.512)			
Majority stock dummy	0.3460	−0.8580	−0.0547	0.9127
	(0.570)			
Target market share (%)	−0.0023	0.0208	0.0033	−0.0241
	(0.932)			
Acquirer market share (%)	0.0298	−0.5436	−0.0863	0.6299
	(0.222)			
Relative value	−0.0265	0.0289	0.0046	−0.0335
	(0.937)			
Acquirer & target return correlation	−0.6944	0.2125	0.0337	−0.2463
	(0.549)			
T mkt share × return corr.	−0.1844	0.2125	0.0337	−0.2462
	(0.686)			
A mkt share × return corr.	0.1479	−0.3633	−0.0577	0.4209
	(0.338)			
Relative value × return corr.	3.8745***	−0.7624	−0.1210	0.8834
	(0.002)			

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Table 9 - *Continued*

	Coefficient	Change in probability of outcome (%)		
		Downward Revision	No Revision	Upward Revision
Relative value × T mkt share	−0.0159	0.1001	0.0159	−0.1159
	(0.764)			
Relative value × A mkt share	−0.0046	0.0216	0.0034	−0.0251
	(0.982)			
Acquirer $CAR_{(-1,+1)}$	1.4077	−0.2631	−0.0418	0.3048
	(0.389)			
Target $CAR_{(-1,+1)}$	0.4821	−0.3024	−0.0480	0.3504
	(0.270)			
Wave dummy	−0.1292	0.3121	0.0352	−0.3473
	(0.669)			
Prior year industry deal volume	−0.0005	0.0730	0.0116	−0.0846
	(0.885)			
Acquirer ROA	0.9485	−0.3253	−0.0516	0.3769
	(0.155)			
Target ROA	0.4478	−0.1829	−0.0291	0.2120
	(0.410)			
Acquirer termination fee dummy	−0.2347	0.5923	0.0132	−0.6055
	(0.460)			
Target termination fee dummy	−0.0605	0.1424	0.0244	−0.1668
	(0.819)			
Collar dummy	−0.6460	1.9727	−0.5623	−1.4103
	(0.137)			
Toehold (%)	0.0767***	−0.7168	−0.1138	0.8306
	(0.000)			
Tender offer	0.0719	−0.1667	−0.0346	0.2013
	(0.889)			
Number of bidders	1.7519***	−1.3194	−0.2091	1.5285
	(0.000)			
Target leverage	2.0308**	−0.7719	−0.1225	0.8944
	(0.040)			
Acquirer leverage	−1.6652*	0.5363	0.0851	−0.6214
	(0.087)			
Intercept 1	−0.9152	0.0000	0.0000	0.0000
	(0.469)			
Intercept 2	6.3196***	0.0000	0.0000	0.0000
	(0.000)			
Year effects	Yes			
Industry effects	Yes			
N	1012			
Pseudo R^2	0.177			

TABLE 10

Determinants of acquirer abnormal returns in non-horizontal mergers

Coefficient estimates from ordinary least squares regressions. The dependent variable is the acquirer's three-day abnormal announcement return. Target input/Acquirer output (%) is the industry-level percentage of dollars of target industry input for each acquirer industry output dollar. Target purchases/Acquirer sales (%) is the percentage of all acquirer industry sales purchased by the target industry. 'A' and 'T' indicate acquirer and target. NYSE percentile refers to a variable that is a percentile in relation to the distribution of the NYSE firms. Prior returns are buy-and-hold returns over the year prior to the announcement. Market share (%) is the percentage of all net sales in the relavent three-digit SIC code in the most recent fiscal year. Industry merger waves identified similar to Harford (2005). Prior year industry deal volume is the total number of completed acquisitions above $1 million in the acquirers Fama-French 49 Industry. Transaction value is all consideration paid in a deal minus the costs and fees as reported by SDC. Majority cash (stock) dummy equals one if cash (stock) is the largest component of payment form. Majority Other is the unincluded dummy. Year effects are dummies for each year in the sample 1985 to 2004. Industry effects are acquirer Fama French 49 industry codes. Standard errors are clustered by the Acquirer-Target industries match. $p-$values in parantheses. Asterisks indicate significance at 10%, 5%, and 1% levels.

	(1)	(2)
Target input/Acquirer output (%)	-0.0007^{**}	-0.0008^{**}
	(0.044)	(0.044)
Acquirer input/Target output (%)	0.0005^{**}	0.0007^{**}
	(0.011)	(0.011)
Target purchases/Acquirer sales (%)	-0.0004	-0.0004
	(0.127)	(0.110)
Acquirer purchases/Target sales (%)	0.0002	0.0002
	(0.296)	(0.489)
Acquirer termination fee dummy		-0.0075
		(0.514)
Target termination fee dummy		-0.0014
		(0.811)
Collar dummy		0.0033
		(0.687)
Toehold (%)		0.0009^{*}
		(0.088)
Tender offer		0.0196^{**}
		(0.029)
Number of bidders		-0.0183^{**}
		(0.012)
Relative value	0.0217^{***}	0.0199^{***}
	(0.001)	(0.004)
Transaction value	0.0000	0.0000
	(0.788)	(0.568)
Acquirer NYSE percentile market equity	-0.0004^{***}	-0.0005^{***}
	(0.000)	(0.000)
Acquirer NYSE percentile prior returns	-0.0003^{***}	-0.0004^{***}
	(0.000)	(0.000)
Public target dummy	-0.0327^{***}	-0.0413^{***}
	(0.000)	(0.000)

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Table 10 - *Continued*

	(1)	(2)
Private target dummy	−0.0081**	−0.0115**
	(0.030)	(0.032)
Majority cash dummy	0.0061	0.0082
	(0.224)	(0.160)
Majority stock dummy	0.0196***	0.0217***
	(0.002)	(0.003)
Constant	0.0128	0.0471***
	(0.265)	(0.001)
Year effects	Yes	Yes
Industry effects	Yes	Yes
N	6555	4665
Adjusted R^2	0.054	0.060