BARGAINING POWER AND INDUSTRY DEPENDENCE IN MERGERS*

KENNETH R. AHERN†

Abstract

I propose a new hypothesis based on product market relationships to explain the division of gains between targets and bidders in mergers. In diversifying 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 2,603 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.

This Version: 25 October 2008

JEL Classification: G30, G34, C70

Keywords: Mergers and acquisitions, bargaining power, product market relationships

*I thank Alex Edmans, Han Kim, Michael Lemmon, Micah Officer, Aris Stouraitis, and seminar participants at the 2008 EFA meetings and at the University of Michigan.

† Assistant Professor of Finance, University of Michigan, Ross School of Business, 701 Tappan Street, Ann Arbor MI 48109-1234. Telephone: (734) 764-3196. Fax: (734) 936-8715. E-mail: kenahern@umich.edu.

Bargaining power and industry dependence in mergers

Abstract

I propose a new hypothesis based on product market relationships to explain the division of gains between targets and bidders in mergers. In diversifying 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 2,603 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 diversifying mergers where firms may have a supplier-customer relationship. Looking first at diversifying 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 diversifying 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 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. I contend that both the credibility and the magnitude of a price war threat will depend upon the degree of similarity, the market power, 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

[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.

smaller is the relative size of target to acquirer and the smaller is its market share, the less likely it is to be able to withstand predatory pricing.

To measure target-acquirer dependence in diversifying 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 use the difference between the target's dollar gain and the acquirer's dollar gain as a measure of the target's bargaining power.

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. However, when both firms have dollar losses from the announcement of the merger, targets only contribute 29.0% of the losses. 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 target purchases comprise a larger share of acquirer sales, targets command significantly higher premiums and have larger 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 and has stock returns that are less correlated with the acquirer's returns, the target receives a higher premium, also consistent with my hypothesis. Dollar returns are not affected however.

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 when targets are customers and acquirers are suppliers, my results hold using this direct measure of the division of gains. Relative size remains significant in horizontal mergers, but correlation of returns does not. Finally, 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.

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 4.4 percentage points lower. The decreases in dollar returns are between $105 to $141 million on average for the same change in dependency, controlling for multiple factors. In horizontal mergers, a change from the 25th to the 75th percentile of correlation in stock returns leads to premiums that are 8.9 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 new 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) is one of 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. 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. 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.

Next, my 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.[2] 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. This represents the relative gain of the target versus the acquirer without the concern that total gains may be

[2] 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.

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 gains captured by the target, without the distortions presented above.

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 diversifying and then measure the degree of vertical relations between firms. To measure vertical relations I identify both the industries of the target and bidder and also the product market relationships between these industries. To measure 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. This is a better definition of vertical relations than one based on existing trading partners as potential partners should be considered to be vertically related as well.

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 4 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 show 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 4 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.[3] 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.

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 misidentify many vertical relations as unrelated deals, especially for larger more diversified firms. Therefore, 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 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. Diversifying mergers are defined as all non-horizontal deals. I do not set an input-output cutoff to separately identify 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). Relevant vertical

[3]The data for 2002 is not yet available.

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. Identifying these industries allows us, for example, to more precisely measure a firm's market share for the industry or industries that are relevant to the merger and not unrelated industries.

2.3. Mitigating factors of product market dependence

As argued in the introduction, substitutability of suppliers and customers may mitigate dependence in diversifying mergers and relative size and similarity between targets and bidders may mitigate dependence in horizontal 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. 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.

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. I also calculate the relative value of the target to the acquirer as a second proxy. 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,

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

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).[4] 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.

2.4. 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.[5]

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

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

[5] 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 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).

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.

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). 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.

3. Results

The sample 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 1,692 horizontal deals versus 911 diversifying 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 are significantly different in horizontal compared to diversifying mergers. Horizontal mergers generate premiums of 71.6% on average, whereas premiums in diversifying mergers average 64.2%. 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).

In the sample of diversifying mergers, when targets are suppliers and acquirers are customers, for every dollar of acquirer industry output, the target industry supplied 3.8 cents of inputs,

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 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 4.25 cents of inputs. These customer-supplier relationships are substantial. Prior research considers industries to be vertically related if their ratios exceed 1% (Fan and Goyal, 2006).

Looking next at the characteristics of targets in the sample, I find that targets in horizontal mergers are significantly larger, both in absolute and relative size, than targets in diversifying acquisitions. 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 diversifying deals. Yet average correlations are still positive even in non-horizontal mergers, suggesting that firms in diversifying mergers are actually related.

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 diversifying acquisitions, though size, market share, and leverage are not significantly different. Termination fees are more common for both acquirers and targets in horizontal mergers than in diversifying mergers, though toeholds and the number of bidders in a merger do not differ significantly between the two subsamples.

Table 1 reports that the difference between target dollar returns and acquirer dollar returns is $313.6 million on average, implying that targets capture more of the gains and less of the losses from mergers. To better understand how merger gains and losses are divided between firms, I identify the cases where both target and bidder have either positive or negative gains. In 850 deals, both firms have positive dollar gains. In 251 deals, both have dollar losses, leaving 1,455 deals where the acquirer and target had returns of opposing signs. In the 850 deals with positive gains, targets captured 49.1% of the total dollar gains on average. In the 251 deals where both firms lost, targets only suffered 29.0% of the total loss. The complete distributions in these cases are presented in Figure 2. In the positive gains subsample, the distribution of

the target share of the dollar gains is close to uniformly distributed over the unit interval. In contrast, when both firms have dollar losses from the merger, targets suffer a much smaller percentage than do acquirers. On balance, these results imply that targets capture more of the gains overall and suffer less of the losses in mergers than do acquirers, though there is considerable variation across deals.

3.1. Target gains in diversifying mergers

The first tests of the inverse relationship between product market dependence and bargaining power are presented in Table 2. I use both the premium and the difference in abnormal dollar gains between acquirers and targets as dependent variables in least squares regressions in samples of diversifying 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 2 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.

Column 2 shows that the difference in dollar returns for targets is again negatively related to a target's usage of acquirer inputs, but positively related to the fraction of purchases by the target industry relative to the total sales in the acquirer's industry. This suggests that when acquirers are more dependent upon the purchases of target industries, targets gain more in merger dollars relative to acquirers. Between the measures of target gains in columns 1 and 2, three measures of dependence are significant and consistent with my hypothesis. Only the target's dependence on acquirer's purchases is insignificant.

Columns 3 through 8 in Table 2 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 dummy 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. Termination fees are generally insignificant as well.

In summary, in almost all regressions, at least one, and on average two of the industry dependence variables is significant and has a sign consistent with my hypothesis. The most robust result is when acquirers supply to targets. In these cases, I find a negative relationship between target gains and the percentage of acquirer industry inputs used in the target industry's output. Second, when targets supply to acquirers, I find a positive relationship between the ratio of target industry input to acquirer 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.

3.2. Horizontal mergers

Table 3 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). However, prior-year acquirer returns are positively related to premiums, but unrelated 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. Moreover, the higher the correlation between acquirer and target stock returns, the lower is the premium the target receives. These results are consistent with my argument that credible threats of a price war reduce a target firm's bargaining power.

Market share exhibits an insignificant direct effect but is significant in the interaction with relative value. In particular, the positive effect of relative value on premiums 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.

3.3. Economic magnitude of the results

The industry dependence relationships presented in Table 2 and 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 1.09 percentage points. To put this in context, the 25th and 75th percentiles of acquirer input to target output are 0.453% and 4.51%, respectively. This means that moving from the first quartile to the third in target industry dependence decreases premiums by an estimated 4.419 percentage points. This is equivalent to moving from the median premium of 51.23% down to 46.81%.

For the difference in abnormal dollar returns I find substantial impact as well. In columns 2 and 6 of Table 2, the significant marginal effect of acquirer input to target output is between −$34.77 million or −$25.82 million. Comparing the first to the third quartile of this dependency ratio, as above, target acquirer differences in dollar returns decline by between an estimated $104.69 to $140.95 million. These numbers are quite substantial, since the mean difference between target and acquirer dollar returns for this subsample is $272.33 million and the median is $24.71 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 −0.0087. 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 8.874 percentage points lower. 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.

3.4. Target share of total dollar gains

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, 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 this possibility to verify the robustness of my results by using the share of total abnormal dollar returns captured by the target. I restrict 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 Panel A of Figure 2.

In Table 4 I re-estimate the regressions on diversifying deals using the target share of total gains as the dependent variable. I find a significantly negative relationship between the target share of the gains and the percentage of acquirer industry input required for one dollar of target output. 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. Under this measure of target gains, this relationship is only significant, however, when targets are customers and acquirers are suppliers. In the opposite case, the results are insignificant. 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 5 reports that relative value and target market share 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. 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. 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 diversifying mergers are presented in Table 6. 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 all four measures of industry dependence in diversifying 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 1.3% greater chance of an upward revision in the offer. These results are robust to all the controls previously discussed.

Table 7 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. Though the direct effect of relative size and return correlation are statistically insignificant, the direction of the estimates is consistent with my hypothesis.

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 diversifying 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 diversifying 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, and acquirer-target correlation of 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 dollar gains, 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 and have returns that are less correlated with the acquirer's returns command significantly higher premiums. 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 unresolved subject.

References

Andrade, G., Mitchell, M., Stafford, 2001. New evidence and perspectives on mergers. The Journal of Economic Perspectives 15, 103–120.

Boone, A. L., Mulherin, J. H., 2006. Do termination provisions truncate the takeover bidding process?. The Review of Financial Studies 20, 461–489.

Boone, A. L., Mulherin, J. H., 2007. How are firms sold?. The Journal of Finance 62, 847–875.

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

Burns, M. R., 1986. Predatory pricing and the acquisition cost of competitors. The Journal of Political Economy 94, 266–296.

Campello, M., 2006. Debt financing: Does it boost or hurt firm performance in product markets?. Journal of Financial Economics 82, 135–172.

Carhart, M. M., 1997. On persistence in mutual fund performance. The Journal of Finance 52, 57–82.

Demsetz, H., 1973. Industry structure, market rivalry, and public policy. Journal of Law and Economics 16, 1–9.

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

Fan, J. P., Goyal, V. K., 2006. On the patterns and wealth effects of vertical mergers. Journal of Business 79, 877–902.

Fee, C. E., Hadlock, C. J., Thomas, S., 2006. Corporate equity ownership and the governance of product market relationships. The Journal of Finance 61, 1217–1251.

Field, L. C., Karpoff, J. M., 2002. Takeover defenses of IPO firms. The Journal of Finance 57, 1857–1889.

Fuller, K., Netter, J., Stegemoller, M., 2002. What do returns to acquiring firms tell us? Evidence from firms that make many acquisitions. The Journal of Finance 57, 1763–1793.

Hartzell, J. C., Ofek, E., Yermack, D., 2004. What's in it for me? CEOs whose firms are acquired. The Review of Financial Studies 17, 37–61.

Hotchkiss, E., Qian, J., Song, W., 2005. Holdups, renegotiation, and deal protection in mergers. Boston College Working Paper, July.

Kaufman Jr., D. J., 1988. Factors affecting the magnitude of premiums paid to target-firm shareholders in corporate acquisitions. The Financial Review 23, 465–482.

Kim, E. H., McConnell, J. J., 1977. Corporate mergers and the co-insurance of corporate debt. The Journal of Finance 32, 349–365.

Klein, B., Crawford, R. G., Alchian, A. A., 1978. Vertical integration, appropriable rents, and the competitive contracting process. Journal of Law and Economics 21, 297–326.

Lewellen, W. G., 1971. A pure financial rationale for the conglomerate merger. The Journal of Finance 26, 521–537.

MacKay, P., Phillips, G. M., 2005. How does industry affect firm financial structure. The Review of Financial Studies 18, 1433–1466.

Maksimovic, V., Phillips, G., 2001. The market for corporate assets: Who engages in mergers and asset sales and are there efficiency gains?. The Journal of Finance 56, 2019–2065.

Malatesta, P. H., 1983. The wealth effect of merger activity and the objective functions of merging firms. Journal of Financial Economics 11, 155–181.

Moeller, S. B., Schlingemann, F. P., Stulz, R. M., 2004. Firm size and the gains from acquisitions. Journal of Financial Economics 73, 201–228.

Moeller, T., 2005. Let's make a deal! how shareholder control impacts merger payoffs. Journal of Financial Economics 76, 167–190.

Nash, J., 1953. Two-person cooperative games. Econometrica 21, 128–140.

Officer, M. S., 2003. Termination fees in mergers and acquisitions. Journal of Financial Economics 69, 431–467.

Officer, M. S., 2004. Collars and renegotiation in mergers and acquisitions. The Journal of Finance 59, 2719–2743.

Perry, M. K., 1989. *Handbook of Industrial Organization*, vol. I . chap. 4: Vertical Integration: Determinants and Effects, pp. 185–255 (Elsevier Science Publishers).

Povel, P., Singh, R., 2006. Takeover contests with asymmetric bidders. The Review of Financial Studies 19, 1399–1431.

Saloner, G., 1987. Predation, mergers, and incomplete information. RAND Journal of Economics 18, 165–186.

Schwert, G. W., 1996. Markup pricing in mergers and acquisitions. Journal of Financial Economics 41, 153–192.

Shahrur, H., 2005. Industry structure and horizontal takeovers: Analysis of wealth effects on rivals, suppliers, and corporate customers. Journal of Financial Economics 76, 61–98.

Song, M. H., Walkling, R. A., 1993. The impact of managerial ownership on acquisition attempts and target shareholder wealth. The Journal of Financial and Quantitative Analysis 28, 439–457.

Stulz, R., 1988. Managerial control of voting rights. Journal of Financial Economics 20, 25–54.

Stulz, R., Walkling, R. A., Song, M. H., 1990. The distribution of target ownership and the division of gains in successful takeovers. The Journal of Finance 45, 817–833.

Subramanian, G., 2003. Bargaining in the shadow of takeover defenses. The Yale Law Journal 113, 621–686.

Varaiya, N. P., 1987. Determinants of premiums in acquisition transactions. Managerial and Decision Economics 7, 175–184.

Williamson, O. E., 1979. Transaction-cost economics: The governance of contractual relations. Journal of Law and Economics 22, 233–261.

Wulf, J., 2004. Do CEOs in mergers trade power for premium? Evidence from "Mergers of Equals". Journal of Law, Economics, & Organization 20, 60–101.

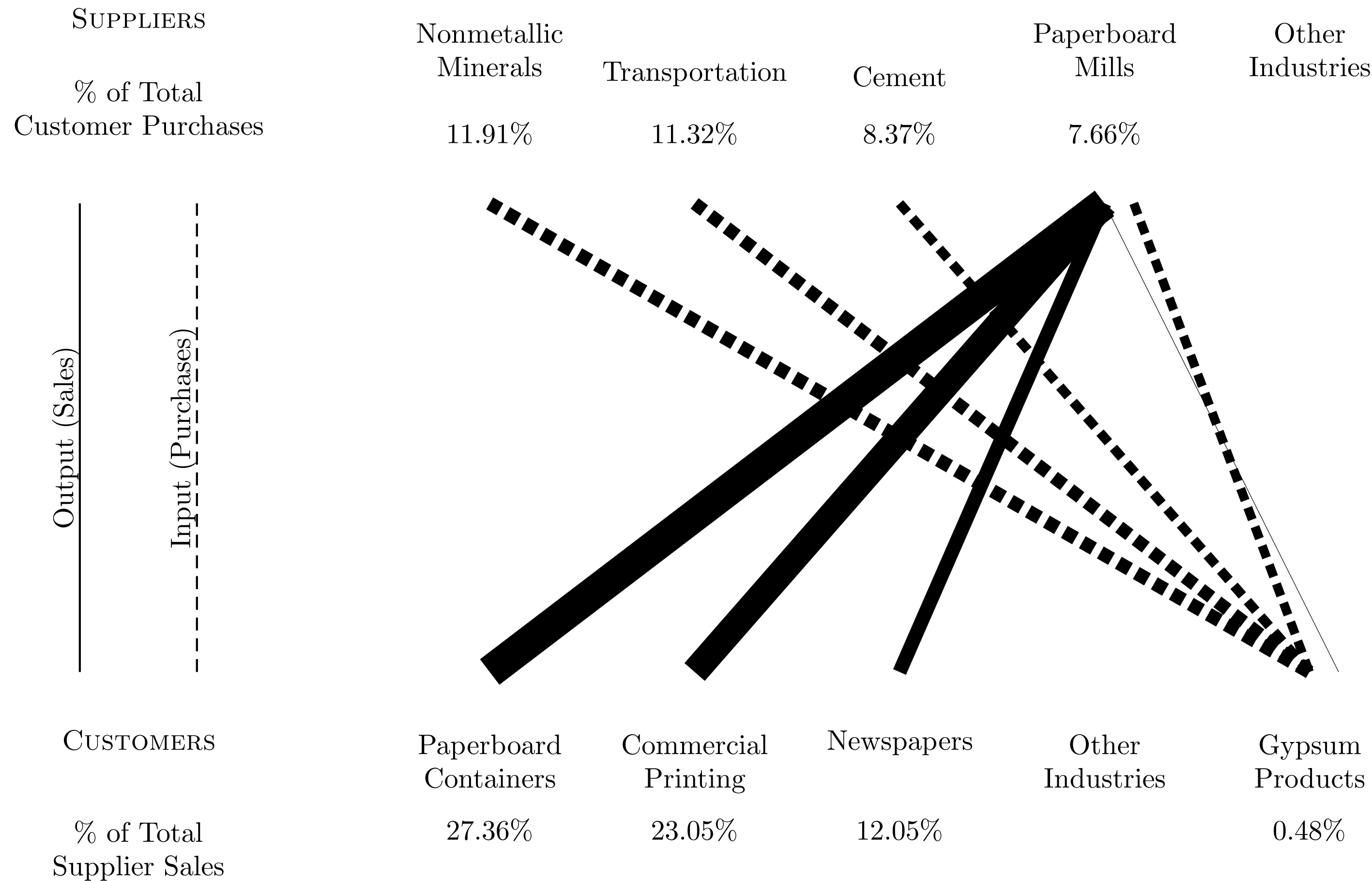

Figure 1
Input/Output relationship between the paper mill industry and the gypsum products industry
This figure depicts the customers of the paper mill industry on the bottom row and the suppliers of the gypsum products industry on the top row, arranged from left to right in descending order of the percent 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.

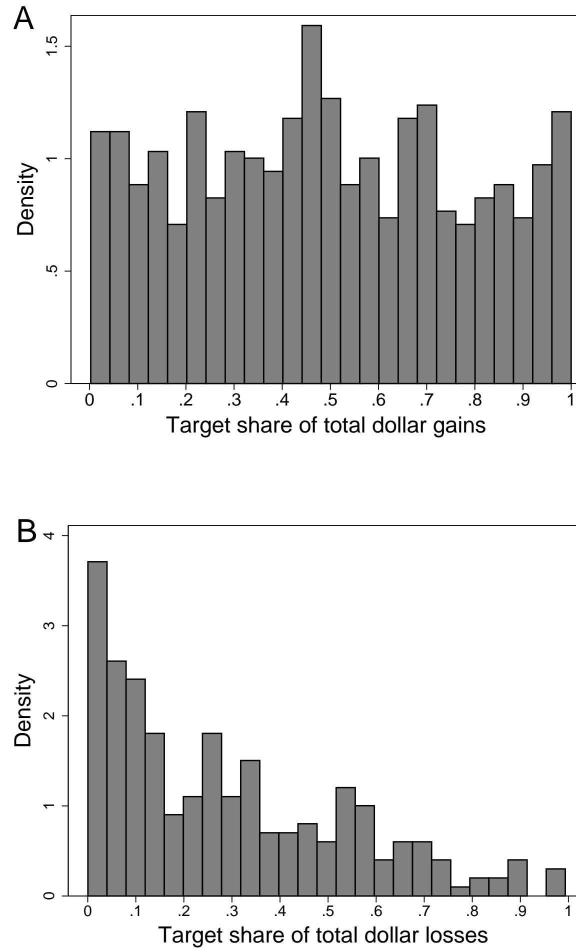

Figure 2
Distribution of the target share of the total merger gain or loss
I divide my sample into mergers in which both the target and bidder have either positive (Panel A) or negative (Panel B) three-day abnormal dollar announcement returns. There are 850 observations in the positive-subsample and 251 observations in the negative subsample over the period 1985 to 2004. Target share of gains (losses) is the ratio of target dollar gains (losses) to target plus acquirer dollar gains (losses).

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. 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. Target input in acquirer output is the industry-level percentage of dollars of target industry input for each acquirer industry output dollar. Target purchases of all acquirer sales is the percentage of all acquirer industry sales purchased by the target industry. 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. 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. The sample period is 1985 to 2004.

	All (1)	Horizontal (2)	Diversifying (3)	Difference (2) − (3)
Performance Measures				
Target premium	1.690	1.716	1.642	0.073***
Target \$CAR - Acquirer \$CAR	313.614	335.950	272.332	63.619
Target $CAR_{(-1,+1)}$	0.200	0.200	0.201	−0.001
Target Dollar $CAR_{(-1,+1)}$	140.653	151.805	120.042	31.762
Acquirer $CAR_{(-1,+1)}$	−0.016	−0.015	−0.018	0.003
Acquirer Dollar $CAR_{(-1,+1)}$	−169.380	−179.893	−149.854	−30.039
Industry Relations in Diversifying Mergers				
% Target input in acquirer output			3.809	
% Acquirer input in target output			4.250	
% Target purchases of all acquirer sales			4.598	
% Acquirer purchases of all target sales			4.409	
Target Characteristics				
NYSE percentile market equity	27.031	28.927	23.521	5.406***
NYSE percentile prior returns	52.871	51.243	55.883	−4.640***
Market share (%)	1.690	1.264	2.619	−1.356***
Leverage	0.163	0.169	0.150	0.019***
Relative value to acquirer (%)	29.042	32.724	22.202	10.522***
Return correlation with acquirer	0.048	0.058	0.030	0.028***
Acquirer Characteristics				
NYSE percentile market equity	55.348	55.851	54.413	1.438
NYSE percentile prior returns	61.907	60.863	63.847	−2.985**
Market share (%)	3.366	3.149	3.793	−0.644
Leverage	0.145	0.144	0.146	−0.002

continued on next page

Table 1 - *Continued*

	All (1)	Horizontal (2)	Diversifying (3)	Difference (2) − (3)
Deal Characteristics				
Acquirer termination fee dummy	0.189	0.215	0.141	0.074***
Target termination fee dummy	0.557	0.583	0.510	0.073***
Toehold (%)	0.684	0.692	0.668	0.023
Days to completion	143.886	144.021	143.636	0.385
Number of bidders	1.069	1.074	1.060	0.014
Observations	2,603	1,692	911	

TABLE 2

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

This table presents 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 the three days surrounding the announcement). 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. Time 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. Heteroskedasticity-robust $p-$values are reported in parantheses.

	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***	−3.2155	0.0204**	−6.0384	0.0197***	−24.4683	0.0189*	−33.0754
	(0.003)	(0.875)	(0.038)	(0.874)	(0.002)	(0.184)	(0.053)	(0.238)
Acquirer input/Target output (%)	−0.0126**	−34.7661***	−0.0162**	−28.3953*	−0.0109**	−25.6066***	−0.0135**	−19.8783
	(0.015)	(0.000)	(0.018)	(0.066)	(0.039)	(0.004)	(0.043)	(0.206)
Target purchases/Acquirer sales (%)	0.0023	12.8257**	0.0030	−1.3886	0.0020	14.2509***	0.0027	7.9877
	(0.462)	(0.012)	(0.658)	(0.912)	(0.542)	(0.005)	(0.700)	(0.458)
Acquirer purchases/Target sales (%)	−0.0029	8.3065	−0.0061	9.0422	−0.0070	17.3918	−0.0075	14.8585
	(0.497)	(0.547)	(0.286)	(0.624)	(0.105)	(0.253)	(0.170)	(0.296)
Target market share (%)			−0.0030	16.7364			−0.0028	21.2208
			(0.368)	(0.430)			(0.416)	(0.352)
Acquirer market share (%)			0.0027	−5.1025			0.0024	−5.4740
			(0.330)	(0.431)			(0.457)	(0.558)
T Input/A output × T mkt share			−0.0002	0.6010			−0.0004	2.5378
			(0.726)	(0.693)			(0.616)	(0.281)
A Input/T output × A mkt share			0.0008	0.4867			0.0007	−0.0725
			(0.144)	(0.597)			(0.166)	(0.956)
Acquirer termination fee dummy					0.0354	−7.8321	0.1411*	−158.2586
					(0.591)	(0.977)	(0.091)	(0.611)
Target termination fee dummy					0.0516	167.7907	−0.0169	244.3252
					(0.341)	(0.448)	(0.822)	(0.517)
Collar dummy					0.0045	−148.2258	−0.0482	−262.8564
					(0.943)	(0.216)	(0.542)	(0.161)
Toehold (%)					−0.0161***	5.3373	−0.0154***	−8.3039
					(0.000)	(0.549)	(0.000)	(0.681)

continued on next page

Table 2 - *Continued*

	Premium (1)	Δ$CAR (2)	Premium (3)	Δ$CAR (4)	Premium (5)	Δ$CAR (6)	Premium (7)	Δ$CAR (8)
Number of bidders					0.0120	−170.7989	0.0011	−389.4578
					(0.862)	(0.197)	(0.987)	(0.134)
Relative value					0.1088***	−118.3398*	0.1190**	−142.8406
					(0.005)	(0.086)	(0.023)	(0.120)
Target leverage					1.0384***	1,526.8112	0.7648***	2,280.1634
					(0.000)	(0.219)	(0.003)	(0.328)
Acquirer leverage					−0.2122	401.2032	−0.2909	−100.9537
					(0.278)	(0.300)	(0.260)	(0.846)
Target NYSE percentile market equity	−0.0029***	24.2262***	−0.0023	29.5940***	−0.0038***	24.7854***	−0.0033**	28.2852***
	(0.007)	(0.000)	(0.101)	(0.002)	(0.001)	(0.001)	(0.030)	(0.007)
Target NYSE percentile prior returns	−0.0000	−3.2101	−0.0001	−4.9160	−0.0007	−4.4925*	−0.0001	−6.6547
	(0.953)	(0.112)	(0.907)	(0.203)	(0.342)	(0.071)	(0.901)	(0.120)
Acquirer NYSE percentile market equity	0.0031***	−0.6593	0.0022*	−1.9932	0.0042***	−2.1582	0.0035**	−3.9307
	(0.000)	(0.523)	(0.066)	(0.472)	(0.000)	(0.223)	(0.012)	(0.304)
Acquirer NYSE percentile prior returns	0.0004	2.0602	−0.0006	5.2611	0.0004	1.8290	−0.0012	6.7795
	(0.568)	(0.249)	(0.554)	(0.210)	(0.621)	(0.360)	(0.270)	(0.231)
Majority cash dummy	−0.4379***	−114.7556	−0.4493**	187.8733	−0.2382	396.0920	−0.3193	638.6984
	(0.003)	(0.356)	(0.033)	(0.508)	(0.102)	(0.194)	(0.107)	(0.311)
Majority stock dummy	−0.4520***	−49.1156	−0.4874**	118.5367	−0.2903**	403.9840	−0.3429*	601.4256
	(0.002)	(0.669)	(0.020)	(0.677)	(0.042)	(0.240)	(0.082)	(0.417)
Constant	2.1039***	216.9480	3.1836***	−14,847.8627***	2.0560***	3.7348	2.3038***	−720.1806
	(0.000)	(0.385)	(0.000)	(0.000)	(0.000)	(0.993)	(0.000)	(0.239)
n	849	840	462	459	634	630	399	397
Adjusted R^2	0.160	0.192	0.217	0.219	0.288	0.186	0.291	0.216

*** Statistical significance at the 1% level.
** Statistical significance at the 5% level.
* Statistical significance at the 10% level.

Table 3

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

This table presents 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 the three days surrounding the announcement). 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). Time 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. Heteroskedasticity-robust $p-$values are reported in parantheses.

	Premium (1)	Δ$CAR (2)	Premium (3)	Δ$CAR (4)	Premium (5)	Δ$CAR (6)
Target NYSE percentile market equity	-0.0042^{***}	28.0972^{***}	-0.0071^{***}	29.4520^{***}	-0.0070^{***}	32.4591^{***}
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Target NYSE percentile prior returns	-0.0013^{***}	-1.3652	-0.0009	-1.9788^{**}	-0.0003	-2.1401^{*}
	(0.006)	(0.210)	(0.119)	(0.038)	(0.634)	(0.065)
Acquirer NYSE percentile market equity	0.0041^{***}	-1.3473	0.0069^{***}	-3.8812^{*}	0.0067^{***}	-5.1793^{*}
	(0.000)	(0.380)	(0.000)	(0.068)	(0.000)	(0.055)
Acquirer NYSE percentile prior returns	0.0023^{***}	0.4605	0.0015^{**}	-0.5552	0.0019^{***}	-0.3899
	(0.000)	(0.752)	(0.016)	(0.738)	(0.004)	(0.842)
Majority cash dummy	-0.5886^{***}	-166.4495^{*}	-0.5412^{***}	-171.5425	-0.4847^{***}	-248.7971
	(0.000)	(0.078)	(0.000)	(0.134)	(0.000)	(0.134)
Majority stock dummy	-0.6966^{***}	-13.1978	-0.6203^{***}	-45.6516	-0.5485^{***}	-4.8227
	(0.000)	(0.875)	(0.000)	(0.649)	(0.000)	(0.971)
Acquirer market share (%)			0.0047	4.1060	0.0031	7.2880
			(0.236)	(0.559)	(0.409)	(0.419)
Target market share (%)			-0.0030	4.2024	-0.0012	3.1552
			(0.308)	(0.493)	(0.662)	(0.662)
Relative value			0.1918^{***}	-134.3330	0.1971^{***}	-152.0887
			(0.000)	(0.147)	(0.000)	(0.173)
Acquirer & target return correlation			-0.8765^{***}	461.5368	-0.8310^{***}	454.8162
			(0.000)	(0.450)	(0.000)	(0.524)
T mkt share × return corr.			-0.0234	74.7414	-0.0582	51.1922
			(0.645)	(0.720)	(0.221)	(0.813)
A mkt share × return corr.			0.0064	19.2107	0.0208	19.6754
			(0.784)	(0.801)	(0.377)	(0.824)
Relative value × return corr.			0.6327^{**}	-300.7139	0.7478^{**}	-143.2464
			(0.034)	(0.793)	(0.011)	(0.904)

continued on next page

Table 3 - *Continued*

	Premium (1)	Δ$CAR (2)	Premium (3)	Δ$CAR (4)	Premium (5)	Δ$CAR (6)
Relative value × A mkt share			−0.0088	−18.9205	−0.0063	−20.1503
			(0.460)	(0.112)	(0.603)	(0.191)
Relative value × T mkt share			0.0550***	−34.8034	0.0505***	−41.0718
			(0.000)	(0.131)	(0.000)	(0.105)
Acquirer termination fee dummy					−0.0681	−225.6133
					(0.172)	(0.342)
Target termination fee dummy					0.0442	−56.8284
					(0.361)	(0.693)
Toehold (%)					0.0591	−164.3739
					(0.278)	(0.246)
Number of bidders					−0.0166***	−2.9256
					(0.000)	(0.683)
Collar dummy					0.0539	209.1286
					(0.374)	(0.493)
Target leverage					0.8745***	146.3224
					(0.000)	(0.548)
Acquirer leverage					−0.0199	−816.8833**
					(0.914)	(0.024)
Constant	1.5856***	−345.0315**	1.4089***	−938.1110**	0.8611***	−1,217.4173**
	(0.000)	(0.024)	(0.000)	(0.013)	(0.001)	(0.044)
Industry Effects						
Year Effects						
n	1677	1658	1168	1164	1020	1017
Adjusted R^2	0.142	0.089	0.195	0.121	0.232	0.118

*** Statistical significance at the 1% level.
** Statistical significance at the 5% level.
* Statistical significance at the 10% level.

TABLE 4
Cross-sectional determinants of target share of combined dollar gains in diversifying 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. Time 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. Heteroskedasticity-robust $p-$values are reported in parantheses.

	(1)	(2)	(3)
Target input/Acquirer output (%)	0.0074	0.0395	0.0368
	(0.498)	(0.168)	(0.209)
Acquirer input/Target output (%)	−0.0168**	−0.0150	−0.0275**
	(0.019)	(0.254)	(0.043)
Target purchases/Acquirer sales (%)	0.0065	−0.0081	−0.0093
	(0.167)	(0.280)	(0.241)
Acquirer purchases/Target sales (%)	−0.0027	−0.0238	−0.0259
	(0.744)	(0.200)	(0.221)
Target NYSE percentile market equity	0.0049***	0.0053***	0.0068**
	(0.000)	(0.010)	(0.019)
Target NYSE percentile prior returns	−0.0012*	−0.0011	−0.0008
	(0.056)	(0.268)	(0.578)
Acquirer NYSE percentile market equity	−0.0035***	−0.0034**	−0.0057***
	(0.000)	(0.014)	(0.007)
Acquirer NYSE percentile prior returns	0.0003	0.0006	−0.0009
	(0.621)	(0.588)	(0.444)
Majority cash dummy	−0.1339	−0.3776***	−0.5111**
	(0.240)	(0.003)	(0.017)
Majority stock dummy	−0.1827	−0.4029***	−0.5248**
	(0.113)	(0.001)	(0.013)
Target market share (%)		0.0056	0.0080
		(0.394)	(0.296)
Acquirer market share (%)		−0.0000	0.0045
		(0.996)	(0.792)
T Input/A output × T mkt share		0.0003	0.0014
		(0.751)	(0.220)
A Input/T output × A mkt share		−0.0007	−0.0003
		(0.397)	(0.686)
Acquirer termination fee dummy			−0.1149
			(0.402)
Target termination fee dummy			0.2470*
			(0.070)
Collar dummy			−0.0948
			(0.604)

continued on next page

Table 4 - *Continued*

	(1)	(2)	(3)
Toehold (%)			−0.0077
			(0.330)
Number of bidders			−0.0838
			(0.508)
Relative value			−0.1261
			(0.332)
Target leverage			−0.4395
			(0.267)
Acquirer leverage			−0.1781
			(0.526)
Constant	1.0068***	2.4198**	0.5258
	(0.000)	(0.018)	(0.355)
n	265	145	119
Adjusted R^2	0.080	0.038	0.041

*** Statistical significance at the 1% level.
** Statistical significance at the 5% level.
* Statistical significance at the 10% level.

TABLE 5
Cross-sectional 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). Time 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. Heteroskedasticity-robust $p-$values are reported in parantheses.

	(1)	(2)	(3)
Target NYSE percentile market equity	0.0059***	0.0039***	0.0025**
	(0.000)	(0.000)	(0.028)
Target NYSE percentile prior returns	0.0004	0.0007	0.0006
	(0.266)	(0.175)	(0.290)
Acquirer NYSE percentile market equity	−0.0044***	−0.0025***	−0.0020**
	(0.000)	(0.003)	(0.029)
Acquirer NYSE percentile prior returns	−0.0010**	−0.0010**	−0.0009*
	(0.015)	(0.049)	(0.098)
Majority cash dummy	−0.0090	0.0238	0.0539
	(0.867)	(0.710)	(0.480)
Majority stock dummy	−0.0819	−0.0638	−0.0835
	(0.131)	(0.327)	(0.273)
Acquirer market share (%)		0.0081***	0.0102***
		(0.006)	(0.008)
Target market share (%)		−0.0042	−0.0028
		(0.168)	(0.411)
Relative value		0.1628***	0.2282***
		(0.004)	(0.000)
Acquirer & target return correlation		−0.1827	−0.1681
		(0.429)	(0.563)
T mkt share × return corr.		0.0353	0.0864*
		(0.410)	(0.089)
A mkt share × return corr.		0.0064	−0.0086
		(0.786)	(0.744)
Relative value × return corr.		−0.5834	−0.7941*
		(0.160)	(0.090)
Relative value × A mkt share		−0.0213***	−0.0357***
		(0.004)	(0.000)
Relative value × T mkt share		0.0194*	0.0221
		(0.067)	(0.106)
Acquirer termination fee dummy			−0.0266
			(0.518)
Target termination fee dummy			0.0251
			(0.519)

continued on next page

Table 5 - *Continued*

	(1)	(2)	(3)
Toehold (%)			0.0764
			(0.145)
Number of bidders			0.0003
			(0.915)
Collar dummy			−0.0474
			(0.394)
Target leverage			−0.1547
			(0.206)
Acquirer leverage			−0.0964
			(0.484)
Constant	0.1975**	0.0991	0.1949
	(0.025)	(0.521)	(0.328)
Industry Effects			
Year Effects			
n	572	393	336
Adjusted R^2	0.201	0.227	0.251

*** Statistical significance at the 1% level.
** Statistical significance at the 5% level.
* Statistical significance at the 10% level.

Table 6
Renegotiation in diversifying 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 diversifying 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. Time 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. Heteroskedasticity-robust $p-$values are reported in parantheses.

		Change in probability of outcome		
	Coefficient	Downward Revision	No Revision	Upward Revision
Target input/Acquirer output (%)	0.0619*	−0.0044	−0.0055	0.0099
	(0.091)			
Acquirer input/Target output (%)	−0.0745***	0.0051	0.0064	−0.0115
	(0.006)			
Target purchases/Acquirer sales (%)	0.0695**	−0.0058	−0.0072	0.0130
	(0.012)			
Acquirer purchases/Target sales (%)	−0.0368*	0.0035	0.0043	−0.0077
	(0.075)			
Acquirer market share (%)	−0.0491***	0.0054	0.0066	−0.0120
	(0.002)			
Target market share (%)	−0.0213	0.0018	0.0022	−0.0041
	(0.237)			
T input/A output × T mkt share	−0.0049	0.0017	0.0021	−0.0038
	(0.171)			
A input/T output × A mkt share	0.0010	−0.0008	−0.0010	0.0017
	(0.612)			
Acquirer $CAR_{(-1,+1)}$	3.8796	−0.0030	−0.0037	0.0068
	(0.155)			
Target $CAR_{(-1,+1)}$	−0.9599	0.0022	0.0027	−0.0049
	(0.419)			
Acquirer termination fee dummy	1.0043*	−0.0076	−0.0279	0.0355
	(0.067)			
Target termination fee dummy	−0.4305	0.0046	0.0059	−0.0105
	(0.380)			
Collar Dummy	−0.5579	0.0074	0.0035	−0.0109
	(0.526)			
Toehold (%)	0.0957***	−0.0035	−0.0043	0.0077
	(0.008)			

continued on next page

Table 6 - *Continued*

	Coefficient	Change in probability of outcome: Downward Revision	No Revision	Upward Revision
Number of bidders	0.3640	−0.0013	−0.0016	0.0029
	(0.536)			
Relative value	−0.0857	0.0006	0.0007	−0.0013
	(0.687)			
Target leverage	0.5256	−0.0008	−0.0010	0.0018
	(0.761)			
Acquirer leverage	−4.9379**	0.0062	0.0077	−0.0139
	(0.035)			
Target NYSE percentile market equity	0.0270**	−0.0071	−0.0087	0.0158
	(0.027)			
Target NYSE percentile prior returns	0.0014	−0.0005	−0.0006	0.0010
	(0.848)			
Acquirer NYSE percentile market equity	−0.0090	0.0029	0.0036	−0.0065
	(0.498)			
Acquirer NYSE percentile prior returns	0.0048	−0.0013	−0.0016	0.0030
	(0.622)			
Majority cash dummy	−0.0651	0.0007	0.0008	−0.0015
	(0.979)			
Majority stock dummy	−0.2186	0.0023	0.0031	−0.0054
	(0.933)			
Intercept 1	−4.3056			
Intercept 2	3.9027			
Industry effects	Yes			
n	396			
Pseudo R^2	0.2634			

*** Statistical significance at the 1% level.
** Statistical significance at the 5% level.
* Statistical significance at the 10% level.

Table 7
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 diversifying 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). Time 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. Heteroskedasticity-robust $p-$values are reported in parantheses.

		Change in probability of outcome		
	Coefficient	Downward Revision	No Revision	Upward Revision
Target NYSE percentile market equity	0.0054	−0.0041	−0.0006	0.0047
	(0.506)			
Target NYSE percentile prior returns	0.0004	−0.0004	−0.0001	0.0005
	(0.913)			
Acquirer NYSE percentile market equity	0.0006	−0.0005	−0.0001	0.0006
	(0.936)			
Acquirer NYSE percentile prior returns	0.0005	−0.0004	−0.0001	0.0005
	(0.912)			
Majority cash dummy	0.3427	−0.0091	−0.0026	0.0118
	(0.569)			
Majority stock dummy	0.2375	−0.0069	−0.0006	0.0075
	(0.699)			
Target market share (%)	0.0058	−0.0006	−0.0001	0.0007
	(0.785)			
Acquirer market share (%)	0.0235	−0.0051	−0.0008	0.0058
	(0.300)			
Relative value	0.0130	−0.0002	0.0000	0.0002
	(0.971)			
Acquirer & target return corr.	−1.0251	0.0037	0.0006	−0.0043
	(0.435)			
T mkt share × return corr.	−0.1191	0.0016	0.0002	−0.0019
	(0.730)			
A mkt share × return corr.	0.1336	−0.0039	−0.0006	0.0045
	(0.426)			
Relative value × return corr.	3.6014**	−0.0084	−0.0013	0.0097
	(0.038)			
Relative value × T mkt share	−0.0177	0.0013	0.0002	−0.0015
	(0.782)			
Relative value × A mkt share	−0.0022	0.0001	0.0000	−0.0001
	(0.990)			

continued on next page

Table 7 - *Continued*

	Coefficient	Change in probability of outcome		
		Downward Revision	No Revision	Upward Revision
Acquirer $CAR_{(-1,+1)}$	1.3103	−0.0029	−0.0004	0.0033
	(0.525)			
Target $CAR_{(-1,+1)}$	0.3995	−0.0030	−0.0005	0.0034
	(0.261)			
Acquirer termination fee dummy	−0.2777	0.0084	0.0000	−0.0084
	(0.358)			
Target termination fee dummy	0.1860	−0.0053	−0.0006	0.0059
	(0.509)			
Collar Dummy	−0.4921	0.0167	−0.0033	−0.0134
	(0.242)			
Toehold (%)	0.0776***	−0.0086	−0.0013	0.0099
	(0.000)			
Number of bidders	1.5316***	−0.0137	−0.0021	0.0157
	(0.000)			
Target leverage	1.6039*	−0.0072	−0.0011	0.0083
	(0.063)			
Acquirer leverage	−1.7869*	0.0068	0.0010	−0.0079
	(0.089)			
Intercept 1	−1.4486			
Intercept 2	5.4283			
Industry effects	Yes			
n	1012			
Pseudo R^2	0.1397			

*** Statistical significance at the 1% level.
** Statistical significance at the 5% level.
* Statistical significance at the 10% level.