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# Essays on Mergers and Acquisitions

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# Essays on Mergers and Acquisitions

by

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# Dedication

I dedicate this dissertation to my family.

## Acknowledgments

I would like to acknowledge my Committee Members for their constant encouragement, time and commitment to my work. A special thank you to Dr. Ninon Sutton and Dr. Jianping Qi who have guided me throughout the dissertation process.

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## Abstract

This dissertation includes two essays that examine mergers and acquisitions. In the first essay we examine how pay-for-performance influences the quality of merger decisions before and after Sarbanes-Oxley (SOX). Pay-for performance has a significant positive effect on acquirer returns of 0.9% pre-SOX and 1.1% post-SOX around the three day event window. Bidders with high pay-for-performance pay a 23.3% lower merger premium in listed target acquisitions. The positive effect of pay-for-performance is more important for public target acquisitions overall, for small acquirers pre-SOX, and for large acquirers post-SOX. In the long-run, bidders with high pre-merger pay-for-performance experience 27.6% higher returns after controlling for other merger characteristic.

In the second essay we investigate the value of customer/supplier relationships in mergers acquisitions. The findings show that targets (suppliers) with strong customer/supplier relationships obtain higher abnormal returns and higher merger premiums compared to targets with weak customer/supplier relationships. However, targets that have a strong connection with a customer have lower odds of being acquired. Acquirers that purchase targets with strong customer/supplier relationships have negative long-run abnormal returns, suggesting that the acquirers may have overpaid for such targets. Implications of customer/supplier relationships on customers, rivals and competing rivals are presented.

# Incentive Pay and Acquirer Returns – The Impact of Sarbanes-Oxley

## 1. Introduction

The alignment of interests between managers and shareholders is especially important in corporate decisions in which the potential for shareholder wealth destruction is large. As noted by Moeller et al. (2004) and others, mergers and acquisitions are one of these vulnerable decision areas for a number of reasons. For one, mergers typically reflect relatively large investments, and the bidder often pays too much for the target firm. In many cases, the anticipated synergies never evolve. In addition, by increasing the size of the firm, acquisitions may lead to higher pay for the CEO, regardless of the quality of the merger decision. Wessel (2006) notes, "it is obvious that the bigger the company, the more the CEO gets paid. That fact has inspired more than few big acquisitions. An old rule of thumb thus holds that for every 10% increase in company's size, the CEO's pay goes up 3%." Consistent with this point, Hallock (2011) finds that firm size is one of the most highly correlated factors with CEO pay.

Increasing the amount of equity holdings by managers presents one way to align the interests of managers and shareholders and to prevent mergers where the sole intent is to increase size. Datta et al. (2001) examine a sample of mergers from 1993 through 1998 and find a strong positive relation between acquiring managers' equity based compensation, EBC (i.e., the value of new stock options granted as a percentage of total compensation) and stock price performance around and following acquisition announcements. However, Hall and Leibman (1998) argue that examining changes in the value of CEO's equity holding (granted stock and stock option

holdings) is more relevant than the level of equity grants. They find that the elasticity of CEO compensation with respect to firm value is 3.3, which is 20 to 30 times larger than previous estimates that ignore the effects of changes in the value of stock and stock option holdings.

Using a sample of bank mergers from 1991 through 2005, Minnick et al. (2011) are the first to examine how pre-merger pay-for-performance affects bank acquirers. They find that higher pay-for-performance sensitivity in bank acquirers leads to better acquisitions. Further they demonstrate that after sector-specific deregulation (Gramm-Leach-Bliley Act of 1999), the impact of pay-for-performance has fallen. This paper extends the analysis beyond the banking sector by incorporating recent mergers in diverse, non-regulated industries in which the incentive effects of pay-for-performance may be more pronounced than in regulated industries. Furthermore, to examine how market regulation, across industries, influences the incentive effects of compensation, we evaluate whether the positive influence of pay-for-performance on merger decisions changes after the passage of Sarbanes-Oxley (SOX). The motivation for examining the pre and post-SOX periods is that there may be a partial substitution effect between the disciplinary influence of regulation and compensation. That is, the governance changes imposed by this regulation are intended to hold managers more accountable and, thus, may reduce the importance of incentive-based compensation. In the analysis, we consider the compensation-related incentive effects of mergers more/less prone to hubris by examining small versus large acquirers and acquirers of listed versus unlisted targets. In listed target acquisitions, we also examine the role of pay-for-performance on merger premiums. While the paper is similar in focus to Datta et al. (2001), the paper differs in three distinct ways. First, the paper utilizes a different, more complete, measure of the incentive effects of compensation, namely pay-for-performance sensitivity. For example, as noted in Minnick et al., the pay-for-

performance sensitivity of new option grants often only comprises a small percentage of total pay-for-performance. In the sample, pay-for-performance sensitivity from new option grants accounts for just 8% of total pay-for-performance. In addition, while Datta et al. examine the period from 1993 through 1998, the longer sample period from 1994 through 2010 enables us to examine the impact of regulatory changes on pay-for-performance sensitivity. Finally, we investigate how the impact of pay-for-performance differs in acquisitions of public targets, as opposed to unlisted targets, as well as across size categories both before and after the regulatory changes. These findings allow us to determine the importance of pay-for-performance in different types of mergers in different regulatory environments, which has not been previously examined in the literature.

Using a sample of 459 firm mergers from 1994 to 2010, the findings show that pre-merger pay-for-performance has a significant positive effect on acquirer returns of 1.1% around a three day event window. Furthermore, bidders with high pay-for-performance obtain 27.6% higher long run returns. These results are robust to controlling for important determinants of the market's reaction to acquisitions. Bidders with high pay-for-performance pay a 23.3% lower merger premium in listed target acquisitions, suggesting that these types of bidders are less likely to overpay.

We also examine the influence of SOX on the relationship between pay for-performance and the quality of the merger decision. Pay-for-performance has a similar significant positive effect on acquirer returns both before and after SOX. Thus, the value of this compensation-related incentive effect of merger decisions has persisted after the increase in regulation.

We further observe a size effect in pay-for-performance sensitivity both pre-and-post-SOX. Pay-for-performance is more important for small firms pre-SOX. While Moeller et al. (2004) suggest that large firms are more likely to make poor acquisitions due to hubris, they do not control for pay-for-performance sensitivity. We find that acquisitions by large firms with high pay-for-performance actually create value for shareholders post-SOX.

We also examine the incentive effects of compensation on merger decisions involving listed versus unlisted targets. Previous literature has suggested that agency problems may be less prevalent in acquisitions of unlisted targets, due to the lower likelihood of hubris-related merger motivations. Consistent with this line of literature, our findings show that pay-for-performance is more important in public target acquisitions, both pre-and-post-SOX.

Our paper contributes to the literature in the following ways. First, we show that managerial incentives in the form of higher pay-for-performance are important for maximizing shareholder wealth in a broad sample of acquisitions. Higher pay-for-performance leads to better stock announcement returns and lower premiums paid by acquirers. This finding broadens our understanding of the role of managerial incentives in acquisitions. Datta et al. (2001) examine EBC, which comprises only a small part of pay-for-performance. Minnick et al. examine banking acquirers only and do not assess the impact of pay-for-performance on merger premiums. Second, pay-for-performance is important even in the presence of higher regulation. While the aim of SOX was to enhance corporate governance and strengthen corporate accountability for the benefit of the shareholder, our results indicate that pay-for-performance is still used effectively. Third, we show that the effect of pay-for-performance is more prominent for acquisitions which are more susceptible to agency problems. For example, the positive effects of pay-for-performance are greater in acquisitions of listed as opposed to unlisted targets. While

Andrade et al. (2001) show that, on average, acquirers experience negative or insignificant abnormal returns on the announcement of acquisition of listed targets, in fact, acquisitions of listed targets by acquirers with high pay-for-performance can create value for shareholders. Finally, we indicate that the pay-for-performance impact varies across acquirer size categories with the introduction of regulation. This finding contributes to the literature that examines the impact of SOX on firms of different size.

The rest of the paper proceeds as follows. In Chapter 2, we provide background and develop testable hypothesis. In Chapter 3, we describe the data together with a univariate analysis. The main results appear in Chapter 4. Chapter 5 examines the long term performance of acquirers, and Chapter 6 concludes.

## 2. Background and Hypothesis Development

Previous studies have shown that compensation policy can provide value-increasing incentives to the CEO, as measured by better firm performance and better investment decisions.[1] For example, Mehran (1995) finds that return on assets and Tobin's Q are positively related to the fraction of total compensation that is equity based. In examining the incentive effects of compensation in mergers, Datta et al. (2001) examine equity-based-compensation (EBC) levels and find a strong positive relation between an acquiring manager's EBC and acquiring firm performance. Furthermore, Minnick et al. (2011) find that high pay-for performance sensitivity is associated with better bank mergers over the period from 1991 through 2005.

[1] We use CEO to proxy for a firm`s top-level management. The focus on the CEO is similar to several prior studies such as Brick et al. (2006, 2008), Coles et al. (2006), Core and Guay (1999), Cremers and Grinstein (2009), Denis et al. (2006), Gao (2010), Jin (2002), Rajgopal and Shevlin (2002), and Yermack (1995). Further Aggarwal and Smwick (2003) find that CEOs pay-for-performance sensitivity is highest relative to other firm executives and that CEOs are responsible for overall firm policies.

While a strong pay/performance link is generally observed as having positive effects on firm decisions, the relationship between pre-merger pay/performance and post-merger performance is not obvious. For example, Cornett, Marcus, and Tehranian (2007) provide evidence that option compensation may encourage earnings management, and after controlling for this link, the relationship between incentive-based pay and performance is weak. Also, Dow and Raposo (2005) find that CEO compensation can influence the kinds of strategies that firms adopt. The authors argue that performance-related compensation creates an incentive to look for overly ambitious and hard to implement strategies. Deckop et al. (1999) argue that a potential downside of pay-for-performance is that it may discourage employees from engaging in behaviors not linked to monetary rewards, including extrarole behaviors. One critical form of extrarole behavior is organizational citizenship behavior, which is employee behavior that goes above and beyond the call of duty, is discretionary and not explicitly recognized by the employing organization's formal reward system, and contributes to organizational effectiveness.[2]

While pay-for-performance may induce suboptimal behavior in some cases, we expect that, on average, pre-merger pay-for-performance positively influences the quality of merger decisions. This leads to our first hypothesis:

**H1:** CEOs with higher pay-for-performance sensitivity make better merger decisions, as reflected by higher returns both around the time of the merger announcement and following acquisition.

[2] The literature suggests several other factors in addition to pay-for-performance that should improve firm performance. Conventional wisdom suggests that a greater level of independence allows for more effective monitoring and thus improved firm performance. Several papers demonstrate that an outsider-dominated board makes better decisions related to hiring and firing CEOs (Weisbach (1998), Borokhovich et al. (1996)) and negotiating takeover premiums (Byrd and Hickman (1992), Cotter et al. (1997)). The literature also stresses size of the board as a determinant of performance. Lipton and Lorsh (1992) and Jensen (1993) argue that larger boards may be less effective than smaller boards due to the director free-rider problem. Yermack (1996) and Eisenber et al. (1998) provide evidence that firms with smaller boards have higher Tobin`s Q. Bebchuk et al. (2009) show that increases in the E-Index are monotonically associated with economically significant reductions in firm valuation as well as large negative abnormal returns during their examination period.

The literature examining the importance of compensation when governance is introduced varies. Hermalin (2005) argues that if there is a trend toward more vigilant governance, such as SOX, then the CEO effort should increase as monitoring increases, and the average CEO compensation should increase. Furthermore, in modeling the relationship between incentive compensation and governance, Dicks (2009) points out that, if forced to increase governance, firms will, in turn, lower incentive pay. Along similar lines, Chung (2006) has a theoretical prediction that board monitoring and CEO pay-for-performance are substitutes. Cohen et al. (2009) further argue that the passage of SOX resulted in a fall in compensation-based incentives to take risk, which is related to a decline in risky investments. They argue that two forces dominate CEO compensation post-SOX; the direct linkage effects causes CEOs to invest in less risky projects due to the increased personal costs of high risk projects. The compensation linkage predicts that boards anticipate the effect of the direct linkage on risk taking and increase incentive compensation to overcome this effect. Thus, this effect predicts an increase in risky investments. Cohen et al. (2009) find that post-SOX (until 2006), the standard deviation of stock returns fell, as did pay-for-performance, and they conclude that the direct linkage dominates the compensation linkage.

In the period following SOX, there should be increased vigilance by investors, regulators, and auditors. The SOX reforms also forced firms to spend more on internal controls. In return for these higher costs, shareholders should face lower risk of losses and benefit from greater accountability of management. Thus, the governance changes of SOX are likely to be associated with a reduction in importance of incentive-based compensation given that there is a regulatory framework which will hold mangers accountable. Therefore, based on the above, our second hypothesis can be expressed as follows:

**H2:** The impact of pay-for-performance should be lower post-SOX, given a negative relationship between incentive compensation and governance.

Kamar et al. (2007) find that small firms have historically been more prone to financial fraud than large firms: Enron, Tyco and WorldCom aside. Indeed, Nicholas (2006) finds that smaller companies spent more time evaluating their accounting post-SOX as opposed to large firms. Nicholas (2006) concludes that the difference in findings may indicate that large companies did not feel a need to reevaluate their accounting practices, being more confident in what they had been doing in the past. Thus, this logic suggests that increasing pay-for-performance in small firms, which are more subject to fraud and weaker reporting especially in absence of the external regulation, should result in higher quality mergers. Hence our third hypothesis:

**H3:** There is a size affect in pay-for-performance sensitivity. We hypothesize that pay-for-performance is more important for small acquirers' pre-SOX given that smaller companies had weaker accounting practices pre-SOX.

Previous literature has suggested greater likelihood of hubris-related merger motivations in listed target acquisitions. Listed targets face higher bidder competition as well as higher publicity around the acquisition as opposed to unlisted targets. In line with higher bidder competition, Ku et al. (2005) show that pre-merger publicity surrounding acquisitions of listed targets gives rise to bidding wars. In addition, Haunschild et al. (1994) show that the desire of acquiring managers not to lose credibility with others becomes more prominent in listed target acquisitions and leads to escalation of commitment. Our last hypothesis thus reflects the higher likelihood of hubris-related merger motivations in listed deals and is stated as follows:

**H4:** Pay-for-performance is more important in listed target acquisitions both pre and post-SOX as potential for hubris-motivated acquisitions is larger for acquirers of listed targets.

## 3. Data

The sample includes all completed US mergers with announcement dates between January 1st 1994 and December 31st 2010 as identified from the Mergers and Acquisitions database of Securities Data Company (SDC). We require that bidders have available stock price data from CRSP, accounting information from Compustat, executive compensation data from ExecuComp and, in a subsample analysis, governance data from Investor Responsibility Research Center (IRRC).

We also require that the ratio of transaction value relative to the bidder's value, as measured by the market value at fiscal year-end prior to the announcement, be at least 5%. To clearly delineate the effect of each acquisition on long run returns, we include only those acquisitions that do not overlap. We define an overlap to occur if the gap between the announcement of one merger and the announcement of a second is no greater than five years. Finally, we require that the CEO be the same both at one year before announcement to the first year after announcement. The final sample consists of 459 completed mergers made by 434 firms[3].

## 4. Results

Table 1.1 shows that acquisitions tend to be cyclical, as the total number of acquisitions closely follows the business cycle. Consistent with the merger activity reported in Masulis et al. (2007), the period between 1997 and 2000 was characterized by strong merger activity. Table

[3] We follow Harford and Li (2007) in the sample construction. Except that we use a 5% transaction value relative to the bidder's value and a five year overlap gap. They obtain 370 all completed mergers (public and non) between 1993 and 2000.

1.1 also gives the industry breakdown of corporate acquisitions in the sample. The industries with the largest number of transactions are banking and business services.

Table 1.2 presents the deal and acquirer characteristics both pre-and post-SOX one year before the announcement of the merger. The average deal has a transaction value of $1.3 billion pre-SOX, rising to $2.1 billion in the post-SOX period. The average acquirer market capitalization is $5.6 billion, and the median deal value is 16.9% of the acquirer market capitalization, consistent with Masulis et al. (2007). In the sample, 33.01% of the deals are financed with stock pre-SOX and 5.69% post-SOX, while 17.67% are tender offers pre-SOX and 11.97% are tender offers post-SOX. The percentage of focus increasing deals (defined as both the target and the acquirer having the same four digit SIC code) remains relatively steady throughout the sample period, at an average of 41.28% of deals. An examination of firm location shows that 77.63% of the targets are not located in the same state as the acquirer. In line with prior studies, bidding firms are performing well before the merger, although not as well in the post-SOX period, as the average ROA decreases from 12.14% to 9.84%.

An examination of bidder firm volatility over time shows that the standard deviation of returns increases in the post-SOX time period. The average standard deviation of stock returns (STD_RET) rises from 45% to 54%. The standard deviation of stock returns is consistent with Zhang (2007), who finds that the implied volatility index for the S&P 500 portfolio (VIX) estimated by the Chicago Board Options Exchange (CBOE) was 22% per year pre passage of SOX and increases to 34% per year post passage of SOX. She argues that failure to account for time-varying market volatility is likely to affect the reliability of the statistical tests of market returns. This suggests that the statistics based on VIX are underestimated. The rise in volatility

post-SOX is counter to Cohen et al. (2009), most likely since their sample stops in 2006 and avoids the financial crises years.

Similar to Gao (2010), we use two variables to measure CEO incentive pay. The first is Jensen and Murphy's (1990) pay-for-performance (PPS) statistic, defined as the dollar change in CEO wealth for a $1000 change in firm value. The second measure is the Core and Guay's (1999) portfolio equity incentive (PEI) defined as the dollar change in CEO wealth for a 1% change in firm value. In this measure, we follow Core and Guay (2002) and estimate option deltas using the Black-Scholes option valuation model as modified by Merton (1973) to adjust for dividend payouts. As Core and Guay (1999) point out, the PEI is equal to the PPS multiplied by the firm's market value of equity divided by $100,000. Our mean (median) PEI is $585,000 ($141,000), in comparison to $558,000 ($117,000) in Core and Guay (1999), and $389,000 ($112,000) for Gao (2010). Our mean (median) PPS is $33.01 ($9.43), in comparison to $25.00 ($5.29) for Hall and Liebman (1999) and $26.08 ($7.00) for Gao (2010). PPS is $31.82 ($9.73) pre-SOX and $34.65 ($8.78) in the post-SOX period. PEI is $635,000 ($124,000) pre-SOX and $516,000 ($179,000) post-SOX. There is no statistical difference in the PPS and the PEI, respectively, in the pre-and-post-SOX period.[4] Figure 1 presents the median PPS and PEI over the sample period.

Governance variables are collected from Investors Responsibility Research Center (IRRC). As the IRRC data starts from 1996, information before that period was collected from the original 10-K reports made available on the Securities and Exchange Commission (SEC) database. Many studies find that the size and composition of board of directors can influence the

[4] Following previous studies we use the natural logarithm of PPS and PEI instead of the raw value in our regressions, as the distribution is heavily skewed to the right.

effectiveness of internal monitoring (Yermack 1996; Hermalin and Weisbach 1998). The average board size is 10.4 with 7 independent directors. The average age of the CEO is 55 years and average E-Index of Bebchuck et al. (2009) at 2.6.

Table 1.3 reports the correlation matrix among variables. Acquirers with higher PPS and PEI tend to have older CEOs (Age). The correlation between PPS and PEI in log form is 0.59. In level form, the correlation is 0.46, same to that reported in Gao (2010).

Table 1.4 (Panel A) separates the firm characteristics of acquirers with high and low PPS. Acquirers with low PPS are larger, involved in larger deals relative to their market size and have lower discipline (higher E-Index). Table IV (Panel B) separates acquirers based on high and low PEI. Acquirers with low PEI are smaller, involved in larger deals relative to their market size, have lower discipline, and lower ROA.[5]

### 4.1. Univariate Analysis

We obtain announcement dates from SDC and compute the cumulative abnormal returns (CARs) in a five day window (-2 to +2), where day zero is the announcement day. We use the CRSP value-weighted returns as the benchmark returns for calculation of abnormal stock returns. Table 1.5 (Panel A) shows the five day acquirer CARs. High PPS acquirers have a mean CAR of 0.99%, while low PPS acquirers exhibit a mean CAR of -1.21%. The difference in mean is significant at the 1% level. When "Other deals" and "Unknown deals" as defined by SDC are removed ("Unknown deals" are deals with no payment information), the difference in CARs is stronger at 2.73%, significant at the 1% level. We find that acquisitions by high PPS firms have

[5]Some of the bidders with high PPS and PEI involve well known CEOs such as Gerdin Russell of Heartland Express, Warren Buffet from Berkshire Hathaway, Timothy Smucker from Smucker & Co, or Joe Ford from Alltel.

a positive difference in abnormal returns irrespective of how they are financed ("Other deals" and "Unknown deals" aside). The difference in CARs is higher than that reported in Datta et al., who report a CAR of -0.25% versus 0.30% for low and high equity-based compensation acquirers, respectively. This more pronounced difference may be because PPS is a more complete measure of managerial incentives.

Table 1.5 (Panel B) shows that high PEI acquirers have a mean CAR of 0.45%, while low PEI acquirers exhibit a mean CAR of -0.69%. The difference in mean is significant at the 10% level. When "Other deals" and "Unknown deals" are removed the difference in CARs is stronger at 1.62%, significant at the 5% level.

A breakdown based on whether the acquisition involves a listed versus unlisted target in Table 1.5 (Panel C and D) confirms that high PPS and PEI have a stronger positive effect in listed target acquisitions. Specifically, in takeovers of public targets, the CAR for high PPS bidders is, on average, 2.51% higher than the CAR for low PPS bidders. The comparisons in Table 1.5 ignore that firms and deals differ in other dimensions in addition to form of financing or target type. To take into account other determinants of abnormal returns, we estimate multivariate regressions.

### 4.2. Regression Analysis

Following Minnick et al. (2011), the following specification is used to test the hypothesis that pre-merger PPS improves the quality of merger decisions, as measured by bidder CAR.

$$CAR_{it} = \beta_0 + \beta_1 PPS_{it-1} + \beta_2 A_{it-1} + \beta_3 G_{it-1} + \beta_4 D_{it} + F_{it} + e_{it} \qquad (1)$$

The dependent variable, $CAR_{it}$, is the cumulative abnormal stock return around the announcement for acquirer i for a deal occurring at time t. The key explanatory variable is PPS sensitivity measured pre-merger or PEI of the acquiring CEO. We control for acquirer characteristics ($A_{it-1}$), other governance variables ($G_{it-1}$), and deal characteristics ($D_{it}$). We also include year and industry fixed effect ($F_{it}$), while $e_{it}$ is the error term.

For acquirer characteristics, we control for bidder size as Moeller et al. (2004) find that acquirer returns are negatively related to bidder size, regardless of the method of payment. Bidder size is the log of market value of assets (MVA), measured as the book value of total assets minus the book value of equity plus the market value of equity. Following Minnick et al. (2011), we also include a performance-based measure, return on assets (ROA). To control for firm governance, we include board structure variables commonly used in the literature: board size (BSizeD), proportion of independent directors (BIndepD), the strength of shareholder rights (E-IndexD), and CEO age (AgeD).

For deal characteristics, we control for method of payment (Stock), tender offer (Tender), focus increasing (Focus), and out-of-state deals (Out_State). Many studies report lower acquirer returns when acquisitions are paid for with stock, and higher returns when the merger is a tender offer or focus increasing. Interstate mergers are shown to offer fewer opportunities for increasing market power and fewer cost savings (Prager and Hannan 1998, Kedia et al. 2008).

Table 1.6 (Panel A) summarizes the regression results based on PPS. The results are further divided into the pre-and-post-SOX period, with the variable of interest being PPS. The findings show that a bidder's pre-merger PPS has a significant positive influence on the shareholder wealth effects of the merger announcement. In other words, after controlling for

other relevant merger characteristics, the results suggest that investors perceive that high PPS bidders make better merger decisions, on average. In particular, a one-unit increase in PPS (in the logarithm) increases bidder CARs by 1.1%. Similarly, a firm which has high PPS (above median) prior to the merger results in 2.1% higher CARs. The PPS effect is important in both the pre-and post-SOX periods. Specifically, pay-for-performance has a significant positive effect on acquirer returns of 0.9% pre-SOX and 1.1% post-SOX. The difference in the PPS effect between the two periods is not significant.

We also examine the influence of PPS in separate subsamples of listed and unlisted target acquisitions. The findings reveal that PPS is always more significant in listed target acquisitions both pre-and-post-SOX. This result suggests that PPS is important in acquisitions which are more susceptible to agency problems. Turning to the control variables, we find that large bidders are associated with lower announcement period returns, in line with prior research. Tender offers and focus-increasing deals benefit the shareholders, while stock and out-of-state deals are value destructive. The overall results are similar when we control for governance characteristics in Panel B of Table 1.6.

Table 1.6 (Panel C) summarizes the regression results based on PEI. The results are very similar to the PPS regressions, showing a positive significant relationship between PEI and bidder shareholder wealth effects around the merger announcement. An acquirer which has high PEI (above median) prior to the merger results in 1.2% higher CARs. The PEI effect is again important both in the pre-and-post-SOX periods. Among the other governance variables, we find that announcement returns are higher when acquiring firms have smaller boards, consistent with Yermack (1996). In sum, the regression results show that pay for performance sensitivity has a

positive influence on bidder shareholder wealth gains at the time of the merger, regardless of whether incentive pay is measured by PPS or PEI.

In Table 1.7, we examine if bidders with high incentive compensation pay a lower premium for listed targets after controlling for the same firm and deal characteristics as in the abnormal return regression.[6] We find that bidders with high PPS are negatively and significantly related to the level of takeover premiums, in line with Datta et al. (2001). A high level of PPS is associated with a 23.3% decrease in takeover premiums paid by acquirers, relative to the mean takeover premium of 74.1% for acquirers with low PPS. Hence, the lower takeover premiums observed in acquirers with high PPS suggests that these bidders are less prone to overpayment, which is a possible explanation for the higher acquirer announcement returns in such transactions.

According to Moeller et al., larger firms tend to be poor acquirers as they are more susceptible to value-decreasing motivations such as hubris. Thus, we predict that PPS is more important in larger firms. We divide the acquirers into three size categories. We define a small acquirer as a firm that has a market asset size in the bottom third of all acquirers, a medium acquirer as one that has a market asset size in the medium third, and a large acquirer as a firm that has asset size in the top third.

The results are reported in Table 1.8. The findings show that the market perceives that high PPS bidders make better acquisition decisions than low PPS bidders, for both large and small acquirers. When the sample period is divided into the pre-and-post-SOX era, we see that PPS is only significant for big firms post-SOX, and is more important for small acquirers pre-

[6] We follow Antoniou et al. (2013) and measure merger premium as the four-week pre-announcement premium. It equals the difference between the initial bid price and the target market price four weeks before the initial merger announcement divided by the same target price four weeks prior to the announcement.

SOX. This evidence pre-SOX is consistent with Kamar et al. (2007) and Nicholas (2006), who find that small firms are more subject to fraud and weaker reporting standards. With the passage of SOX, the level of reporting standards increased especially in small firms, decreasing the importance of PPS. The evidence post-SOX suggests that pay for performance is valuable for large firms, which previous studies indicate are more prone to hubris. The results in Tables 1.7 and 1.8 are qualitatively the same for PEI.

## 5. Long Term Performance

Next we examine the long term performance of acquirers using both the calendar time portfolio approach and the buy and hold (BHAR) methodology. The reason we use the two approaches is that each methodology has its pros and cons, and there is no consensus in the literature as to which method is preferred. The advantage of the BHAR method is that it tends to capture the returns that a typical investor can earn (Kothari and Warner 1996; Lyon et al. 1999). The main disadvantage of this approach is that is more sensitive to the cross sectional dependence among the sample firms (Fama 1998; Mitchell and Stafford, 2000). Additionally Mitchell and Stafford (2000) argue that the BHAR methodology increases the mis-specified model problem.

In order to mitigate these problems researchers recommend the use of calendar time methodology (Fama 1998). The disadvantage of this approach however, is lower power to detect abnormal performance because it averages over months of "hot" and "cold" event activity (Mitchell and Stafford, 2000). Since both the event time and calendar time methodology have their pros and cons, we utilize both methods.

We compute the five year buy and hold returns for high and low PPS firms. We compute the buy and hold returns as the difference between buy and hold returns of the sample firms and the benchmark portfolios. As such we calculate the buy and hold abnormal return (BHAR) for the sample of PPS firms as:

$$\text{BHAR}\ (t_1, t_2) = \prod_{t=t1}^{t2}[(1 + R_{it})] - \prod_{t=t1}^{t2}[(1 + R_{mt})] \qquad (2)$$

where $R_{it}$ is the return of the firm i on date t and $R_{mt}$ is the return on a benchmark such as the size and book to market control portfolio on the same month t. The date $t_1$ is the first trading month after the merger and $t_2$ is the end of the time window.

In the calendar time approach, we develop time series of monthly portfolio returns and estimate the three factor model of Fama and French (1993). Further, since momentum and liquidity have a significant influence on returns we add them to the Fama-French model. Specifically the Carhart (1997) and Pastor and Stambaugh (2003) liquidity factors are added. The dependent variable is the difference in returns between portfolios of high and low PPS firms. We estimate the five factor model as follows[7]:

$$R_{HPPS} - R_{LPPS} = a + b(R_{it} - R_{ft}) + cSMB_t + dHML_t + eUMD_t + fLIQ_t + e_t \qquad (3)$$

where $R_{HPPS}$ is the monthly return of the calendar-time portfolio for high PPS firm in month t, $R_{LPPS}$ is the monthly return of the calendar-time portfolio for low PPS firm in month t, $R_{mt}$ is the return on the CRSP value-weighted market index in month t, $R_{ft}$ is the monthly return on three month Treasury bill in month t, $SMB_t$ is the difference in the returns of small stock and big stocks in month t. $HML_t$ is the difference in returns of high book-to-market stocks and low

[7] We follow the approach of Loughran and Ritter (1995) where the dependent variable is the difference in returns between portfolios of two types of firms in order to compare the difference in performance between them.

book-to-market stocks in month t. $UMD_t$ is the momentum factor in month t, and $LIQ_t$ is the liquidity level in month. The intercept (a) provides an estimate of the difference in returns between portfolios of two types of firms. A positive and significant intercept can be interpreted as evidence to support the argument that firms with high PPS outperform those with low PPS in the long run.

Table 1.9 reports the regression results where the five year BHARs is the dependent variable. After controlling for other relevant merger characteristics, the regression results show that acquirers with high PPS earn abnormal returns that are 27.6% higher than acquirers with low PPS. When we decompose the acquisitions into pre-and-post-SOX, we observe that PPS effect is driven by listed target acquisitions. Acquirers of listed targets with high PPS earn 46.4% higher returns in the pre-SOX period, and 33.3% higher returns in the post-SOX period. These findings make sense in light of previous evidence highlighting the perils of listed target acquisitions. In particular, if acquirers of listed targets are more prone to overpayment, as compared to acquirers of unlisted targets, then pay-for-performance should play a more important role in influencing listed target acquisitions. The results suggest that this is the case.

Table 1.10 reports the results of calendar time series regressions based on a three and five factor model. The average abnormal monthly return for high PPS firms versus low PPS firms is 0.38% for three factor model and 0.41% for the five factor model, both significant at the 10% level. When we decompose the sample into pre-and-post-SOX, the results are only significant for the 3-factor model at the 10% level.

Overall, analysis of the post-merger performance, based on both BHAR methodology and factor regression models, provide moderate evidence of superior long-run performance for acquirers with high incentive pay.

## 6. Conclusion

This paper highlights the importance of pay-for-performance sensitivity in affecting the short and long-run wealth gains for acquirers. We find that acquirers with high pre-merger pay-for-performance sensitivity have significantly higher stock returns around the time of the acquisition announcements and pay lower merger premiums. The importance of incentive based compensation is significant in both the pre-and-post-SOX periods. Thus, an increase in regulation has not diminished the importance of pay-for-performance in mergers. The significance of pay-for-performance goes beyond the regular factors that have been found important in the acquisition literature as determinants of returns (e.g. tender offers, or focus increasing deals). It goes beyond the governance factors, such as board independence as well. Pay-for-performance affects small and large acquirers and acquirers of listed targets. We attribute the importance of pay-for-performance in listed target acquisitions to the literature that these mergers are more likely to be plagued by agency problems. We explain the importance of pay-for-performance for small acquirers due to their weaker accounting practices especially pre-SOX. The significance of pay-for-performance for large acquires indicates that it may be possible to increase shareholder value through incentive pay in these firms. In sum, we find that pay-for-performance provides managers with strong incentives to undertake value-maximizing acquisitions.

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# Inter-Firm Linkages and M&A Returns

## 1. Introduction

Extensive literature has examined M&A activity where firms acquire other firms for traditional motives, such as to improve efficiency and to promote growth. In this paper, we study an unconventional reason for takeovers, presumably to benefit from the supplier's relationships with major customers. A major customer/supplier relationship exists when a supplier sells a significant portion of its output to a customer. An example of this type of relationship involves Target and its major supplier, Mossimo, Inc. which was acquired by Iconix Brand in April 2006. On March 2000, Mossimo, Inc. announced a major, multi-product licensing agreement with Target under which Mossimo, Inc. would brand items sold exclusively at Target. In the acquisition of Mossimo, Inc. by Iconix Brand, the CEO of Iconix stated, "Mossimo is one of the largest apparel brands in the United States distributed exclusively through one of the biggest and most exciting retailers in the world (Target) and we are thrilled to be in a position to add it to our growing portfolio of strong consumer brands ..." In this example, Iconix did not have a major relationship with Target prior to the merger and, thus, could benefit from Mossimo's existing relationship with Target.

Strong customer/supplier relationships are often considered harmful for supplier performance. This view can be related to research conducted by Galbraith (1952), Scherer (1970), and Porter (1974), who note that major customers may bully their suppliers by pushing for lower prices. A case in point is Wal-Mart and its history of "squeezing out every penny from

suppliers" (PBS Frontline 2004). In particular, Porter (1974) argues that "where retailer power is high, the manufacturer's rate of return will be bargained down, certeris paribus." Stern and El-Ansary (1988) and O'Neal and Bertrand (1991) find that suppliers in strong customer relationships face higher inventory costs since often they are the ones responsible for holding the inventory. If this is the case, firms with strong customer/supplier relationships may be less attractive as targets, since these relationships may be less valuable to potential acquirers.

An alternative theory is provided by Jackson (1985) who demonstrates that stronger ties improve efficiencies. Kalwani and Narayands (1995) and Kinney and Wempe (2002) argue that relationships foster information sharing. Kinney and Wempe (2002) find that firms that adopt just-in-time production management are associated with improved return on assets relative to non-adopters, and partnerships between suppliers and their trusted major customers accelerate the just-in-time process. Kalwani and Narayands (1995) report higher levels of return on investment for a sample of 76 manufacturers in long-term relationship with major customers. Jackson (1985) suggests that increased customer-base concentration provides supplier firms with benefits such as decreased marketing and administrative expenses. He argues that suppliers may be able to exploit their major customers' reputations and brand names and use them as showcase accounts to attract other customers. Furthermore, Cowley (1988) examines a sample of strategic business units in the Profit Impact of Market Strategy (PIMS) database from 1973-1976 and finds that selling and advertising costs tend to be lower when there are fewer major customers to service. These reasons, namely improved efficiencies generated by information sharing and lower marketing expenses, would make suppliers with strong customer/supplier relationships more attractive as potential takeover targets.

To investigate whether strong customer/supplier relationships are valuable in takeovers, we examine how these relationships influence the shareholder wealth gains for targets. We focus on takeovers of suppliers with large customers for several reasons. First, large customers account for a substantial portion of a supplier's revenue. Secondly, US disclosure rules make the study of large customers more reliable, since suppliers must disclose the identities of major customers, but customers are not required to share such information about their major suppliers. The findings show that stronger ties between the target and the customer are associated with higher three day cumulative abnormal returns (CARs) (30.5% vs 19.5%) for the target. Stronger ties are also associated with 21% higher merger premium. Furthermore, the benefits that targets receive from strong customer relationships are apparent after controlling for other relevant factors in the multivariate analysis. The findings suggest that acquirers value strong ties, consistent with Patatoukas (2012), who shows that customer-base concentration has a net positive impact on supplier firm performance.

To gain further insight into these merger transactions involving strong customer/supplier relationships, we examine the effects of these deals on customers, rivals, and competing rivals (rivals with significant sales to the target customer). We find that customers associated with suppliers that deem them important report significant returns of -1.49% around the merger announcement date. These results suggest that customers lose bargaining power when an acquirer announces the takeover of an important supplier. Rivals of suppliers with strong customer ties experience positive abnormal returns of 0.62% around the merger announcement date, while competing rivals (rival firms that sell to the target customer prior to the merger) experience returns of -1.64% around the same time window. The positive returns to rivals may

reflect their increased probability of a takeover. The fall in returns to competing rivals may signal the perceived increased competitive threat from the merged firm.

Upon initial observation, a supplier with strong customer/supplier relationship would appear to be a good takeover target, based on the relatively high premiums paid for these targets. However, an examination of the post-merger performance of acquirers that have purchased targets with strong customer/supplier relationships shows that these acquirers perform poorly in the long run. In particular, the buy and hold returns on both the style-adjusted and market-adjusted basis are negative. An examination of the post-merger period reveals that most of the customer/supplier ties are terminated after the merger. After investigating deals in LexisNexis we attribute the termination of ties to the change in dynamics of the merged entity which distorts the supply chain process.

This paper contributes to the literature in the following ways. First, we show that acquirers value targets (suppliers) with strong customer/supplier ties. Acquirers pay a higher premium for targets with stronger ties, and these target firms experience better stock announcement returns around the time of the merger. This finding broadens our understanding of target ties in acquisitions. While Fee and Thomas (2004) examine targets which may or may not be customers of supplier firms; in our sample, targets are always suppliers. The focus of our target firms is thus different. Further we make an important distinction between targets with strong customer ties and those without, which Fee and Thomas (2004) do not. Second, while Fee and Thomas focus on customers associated with bidders, our results provide new evidence on how acquisitions of supplier targets impact rival, customer and competing rival firms of the target firm. Third, the findings reveal that acquirer ties with the customer are seldom maintained after the merger and that the acquirer fails to benefit from the merger resulting in poor long-run

performance. This finding suggests that acquirers overestimate the value of such ties prior to the merger. Finally, we show that the odds of being acquired fall as the customer/supplier ties increase. The targets that have strong ties are acquired by acquirers with high market-to-book ratios, suggesting that the merger may be driven by overconfidence on the part of the CEO.

The rest of the paper proceeds as follows. In Chapter 2, we provide background and develop testable hypothesis. In Chapter 3, we describe the data. In Chapter 4 we provide the univariate analysis. The main results appear in Chapter 5. Chapter 6 examines the long term performance of acquirers, and Chapter 7 concludes.

## 2. Hypothesis Development and Related Literature

Several studies investigate the influence of major customer/supplier relationships on various corporate policies including capital structure (Titman (1984), Maksimovic and Titman (1991)), corporate governance (Cremers et al. (2008)), and bankruptcy (Hertzel et al. (2008)). Fee and Thomas (2004) and Shahrur (2005) focus on customer/supplier relationships in mergers and acquisitions. In examining takeovers of target with strong customer ties, our study takes a new perspective by investigating how large customer/supplier relationships affect target (supplier) shareholders.

Relationships between individual suppliers and customers are major fixtures in business practice. These relationships are known to create operating interdependence across firms (Banerjee et al. (2008), Cremers et al. (2008)). Our focus is to examine customer/supplier relationships in a merger framework. Previous studies provide some limited evidence on how mergers affect customer/supplier relationships in industry specific case studies relating to antitrust. Mullin et al. (1995) examine the market reaction of customers to various events associated with the unsuccessful dissolution of US Steel that began in 1911. They find that

dissolution of US Steel would have lowered steel prices and raised output. The welfare consequences of the expanded output would have been substantial. Mullin and Mullin (1997) examine the reaction of customers to US Steel 1906 acquisition of Great Northern Railway iron ore properties. They find efficiency gains passed onto customers associated with the merger. Bittlingmayer and Hazlett (2000) examine the effects of antitrust actions against Microsoft on firms that produce complements or substitutes for Microsoft products. Government action against Microsoft appears to inflict capital losses on the computer sector as a whole. Hertzel et al. (2008) examine the extent to which bankruptcy has intra-industry consequences. Distress related to bankruptcy filing is associated with negative and significant effect for the suppliers. Ahern and Harford (2013) investigate how inter-industry relations affect merger waves. They show that there are more inter-industry mergers between two industries when they have strong customer/supplier relations. The strength of the relationship is based on the amount of trade between the groups. Further cross-industry mergers are more likely when industries have greater R&D expenditures.

Fee and Thomas (2004) construct a data set that identifies customers, suppliers, and rivals of the firms initiating the mergers. They find little evidence consistent with increased monopolistic collusion. They demonstrate that acquirers experience insignificant stock market reactions at announcement even in concentrated industries and for mergers that result in a significant increase in concentration. Further they find positive returns to rival firms and no evidence that customers experience negative stock market reactions at announcement. Shahrur (2005) performs a similar analysis to Fee and Thomas (2004) except that he uses benchmark input-output matrices for the US economy to identify upstream and downstream industries, while Fee and Thomas (2004) identify individual companies with actual product market relationships.

Similar to Fee and Thomas (2004), Shahrur (2005) finds little evidence in support of monopolistic collusion, except in cases where suppliers are in concentrated industries. Our paper differs from Fee and Thomas (2004) in that we examine supplier mergers, specifically focusing on suppliers (i.e., the targets) with major customer/supplier relationships to see if target and acquirer shareholders benefit from these relationships. Fee and Thomas (2004) examine targets which may or may not be customers of supplier firms. The focus of our target firms is thus different. Further we make an important distinction between targets with strong customer ties and those without. Target ties should have an impact not only on valuation but also on the probability of being acquired; issues not examined by Fee and Thomas (2004). Mergers also potentially have an impact on customers, rivals, and competing rivals associated with targets. Fee and Thomas (2004) examine the impact on customer and rival firms associated with the bidder only.

Our focus on supplier acquisitions stems from recent work conducted by Chu et al. (2013) and Patatoukas (2012) who examine the supplier and its improved efficiencies if involved in strong customer/supplier relationship. These suppliers could provide the acquirer with access to these improved efficiencies, thus making them potentially attractive takeover targets. Anderson et al. (2001) investigate to what extent these efficiencies are transferable, especially in mergers. They conclude by saying that the outcome of any acquisition depends on how well managers succeed in recognizing external relations and on whether established relationships can be retained. Finally, Fee et al. (2006) examine a unique data set on the level of equity ownership that a customer has in the supplier. They find that relationships accompanied by equity ownership last longer than other relationships, suggesting that ownership aids in bonding trading parties together.

Chu et al. (2013) show that increase in distance (a measure of information asymmetry) between supplier and major customer is associated with an increase in the supplier's R&D and performance. They attribute the rise in R&D with major customer to a more specialized product for the supplier, because a more specialized product could require more R&D input. Patatoukas (2012) also reports that suppliers with a more concentrated customer base report higher performance.

A supplier's relationship to a major customer also has implications for the likelihood of takeover of the supplier. Heeley et al. (2006) examine a sample of acquisitions between 1990 and 2000 and find that the size of the firm's R&D is positively related to the likelihood of being acquired. Furthermore, they show that the higher the target's operating performance in the year prior to the acquisition, the higher the probability of being acquired. They conclude that "by treating a target firm's R&D expenditures as possible objective indicator of deeper capabilities, acquiring firms may be able to identify potentially attractive acquisition targets more quickly." Our hypothesis is that, in addition to factors that have been found in the literature to determine the probability of being acquired, such as R&D or operating performance; suppliers with strong customer relationships should have a higher probability of being acquired.

Strong ties with customers also have positive value implications for target shareholders. Specifically, given that potential acquirers value strong, established customer relationships, targets that possess these strong connections should experience higher shareholder wealth gains upon the announcement of the merger. Acquirers should also pay a higher a merger premium for targets with strong ties.

The effect of mergers could have varying effects on customers, rivals and competing rivals that are associated with suppliers with strong customer/supplier relationships. The effect

on customer firms could be negative if the merger results in increased bargaining power on behalf of the merged entity. Fee and Thomas (2004) do not find this result but define customer firms as those of the merging firm rather than the target firm. In our paper, we define customer firms as those of the target firm given that the motivation for the merger is for the acquirer to develop a relationship with an existing customer of the supplier (i.e., target). The effect on rivals could be positive if the market believes that rivals might become takeover targets themselves, or that the rivals can benefit from improved efficiencies of the merged firm. The effect on rivals could also be negative if the acquiring firms gain a competitive advantage that would be difficult for rivals to imitate. The latter argument can be especially true of competing rivals when following the merger the merged firm gains ability to limit the rivals' access to key inputs.

The value of corporate relationships has been well documented in the finance literature. For example, Kalwani and Narayandas (1995) find that supplier firms in long-term relationships with select customers are able to retain and improve their profitability levels. Thus, we expect acquirers that have acquired targets with strong relationships to benefit from these ties in the long run. However, the benefits to the acquirer are expected only if the acquirer is able to retain the customer relationship in the post-merger period. If the customer ties are severed, then the acquirer's long-run performance may suffer as a result of an expensive merger in which the anticipated benefits did not materialize.

## 3. Data Description and Key Variables

Our initial sample includes U.S. suppliers and customers from Compustat Customer Segment database. Under FASB14, suppliers need to report the customer's name and sales to the customer in their annual report to SEC if sales to the customer account for more than 10% of the supplier's total sales. Note that firms often disclose information about customers that account for less than

10% of their sales if the customer is important to their business. However, Compustat does not report all customers' names. We clean up the data by first identifying the customer which is a "Company". Then we match customers' company names with Center for Research in Security Prices (CRSP) company names using word matching SAS code following Chu and Wang (2012). The program requires all of the letters in the reported customer name to be sequentially presented in the potential match. We also manually identify customers from the matched pairs of the text matching code. Following Chu and Wang (2012) if there are multiple matches we conservatively discard all these possible supplier-customer pairs. We include public firms listed on the three major stock exchanges including AMEX, NYSE, and NASDAQ. We exclude financial firms (SIC codes 6000-6999) and utilities (SIC Code 4900-4900) and also exclude REITs, closed-end funds, and ADRs. Our final sample contains suppliers and customers with relevant stock and financial information on CRSP/Computstat merged for the tests in our study. Our sample includes all completed US mergers of suppliers as identified from the Mergers and Acquisitions database of Securities Data Company (SDC) for the period 1988 to 2008. We require that bidders have available stock price from CRSP, and accounting information from Compustat.

We follow Johnson et al. (2011) and measure if a customer is important or not based on sales to that customer divided by the total sales of the supplier. An important customer, STRONG_SR, is a dummy which is one if the ratio is equal to or greater than 15% and zero otherwise. This measure is consistent with Johnson et al. (2011). The final sample results in 183 observations.

## 4. Univariate Analysis

Table 2.1 shows that acquisitions tend to be cyclical, as the total number of acquisitions closely follows the business cycle. The period between 1997 and 2000 was characterized by

strong merger activity. Table 2.1 also gives the industry breakdown of corporate acquisitions in the sample. The industries with the largest number of transactions are business services.

Table 2.2 summarizes the descriptive statistics of suppliers, customers and rivals partitioned by whether or not the supplier has an important relationship with a customer. Panel A provides the results for supplier firms (targets). Those with important customers experience higher Tobin's q and R&D. One key component is that customers are bigger than suppliers. This asymmetry potentially reflects the bias embedded in the data-generating process – namely, that by definition suppliers are reliant on their major customers whereas as major customers need not be reliant on their suppliers. This hypothesis is also demonstrated by Patatoukas (2012).

Lee and Masulis (2009) use the stock volatility of the suppliers as a measure of information asymmetry. We see that suppliers with an important customer display greater information asymmetry than suppliers with weak customer relationships. The mean annual stock volatility of suppliers with no big customer is 18.47% versus 21.62% with an important customer (significant at the 10% level). Thus suppliers with important customers display greater volatility.

Panel B shows that customers associated with suppliers that deem them important are less efficient in terms of research dollars spent to result in innovation. On average such customers spend $46 million dollars more per patent development than customers associated with suppliers who do not regard them as important. This result supports Das et al. (2006) who find that "rigidities, inflexibilities, and coordination issues that can affect (innovation) performance negatively" as supplier involvement in customer innovation increases. Von and Tunalv (2002) find similar results. Panel C demonstrates that rivals display characteristics that are similar to those of the suppliers with whom they are contending.

We measure the acquirer, supplier (target), customer and rival announcement returns using the market model, 252 trading days are used prior to the event. We obtain the announcement dates from SDC and compute the CARs in a three day window (-1, +1) where day zero is the announcement date. We use CRSP value-weighted returns as the benchmark returns for calculations of abnormal stock returns and beta. Table III (Panel A) shows that there is no statistical difference in acquirer announcement CARs. Acquirers that acquired suppliers with strong (weak) relationship received -2.49% (-2.26%) abnormal return. Panel B shows that a three day target CARs are widely spread, ranging from -32.88% to 77.50% for targets with no big customers and from -38.11% to 146.81% for targets with big customers. The average five day CARs for targets with no big customers is 19.5% and 30.5% for suppliers with a big customer. The difference is statistically significant. Thus, targets together with shareholders benefit from strong customer/supplier relationships at the merger announcement[8].

Panel C shows that customers associated with suppliers who believe them to be important have a significant mean CAR of -0.91% upon the announcement of the merger. Customers associated with suppliers that deem them unimportant don't display a significant market reaction. The difference in mean is -1.12% and significant at the 10% level. Such market reaction provides initial evidence that customers that are associated with suppliers with strong customer/supplier relationships could potentially be hurt by increased bargaining power on behalf of the larger merged entity. This result is different to Fee and Thomas (2004). The difference lies in the fact that Fee and Thomas (2004) define customers as firms associated with bidders.

Panel D provides CAR results for rivals. We define rival firms as those with the same four-digit SIC code as the supplier. On average each target firm has 48 rival firms. In univariate

[8] In thirteen mergers the acquirer has a major relationship with the target customer prior to the merger (It is a competing supplier). In three cases the acquirer was a major customer of the supplier. These cases are not driving our results.

results, rivals associated with suppliers that have strong customer/supplier relationships exhibit similar CARs to those with weak customer relationships.

## 5. Main Results

The comparisons in Table 2.3 ignore that firms and deals differ in other dimensions in addition to customer/supplier relationships. To take into account other determinants of abnormal returns, we estimate multivariate regressions. Table 2.4 tests the hypothesis in a multivariate setting. The dependent variable is the CARs return around the announcement for suppliers, customers and rivals associated with suppliers that demonstrate strong/weak customer/supplier relationships. Our key explanatory variable is the STRONG_SR dummy. We control for firm characteristics and include firm age (AGE), the amount of research and development expense scaled by total assets (R&D), the log number of patents (LNPAT), the Herfindahl Index (HHI), the amount of free cash flow (FCF), the log distance between the supplier and customer (rival) (LNDIST), the log of market value (LNMKTCAP), a performance measure (TOBIN), and past returns (PRET). A measure of firm volatility is also included (RETVOL). For deal characteristics, we control for method of payment (STOCK), focus-increasing versus decreasing mergers (FOCUS), tender offers (TENDER) and the use of a defensive tactic during the acquisition process (DEFENSE). A supplier which has had strong customer/supplier relationships prior to the merger experiences a 10.17% higher CAR than targets without strong customer ties (Model 1). Thus the univariate statistics are supported in a multivariate setting. Model 2 reaches a similar conclusion to Model 1 that is a strong relationship prior to merger results in 10.53% higher CAR on behalf of the target. In Model 3 the thirteen mergers where the acquirer was a competing supplier are excluded from the sample to examine if the results are driven by these deals; the variable of interest continues to be significant. In Model 4 we include

a control if the acquirer had a strong relationship with a customer other than the target customer but our results persist. Consistent with previous studies, our findings show lower returns when acquisitions are paid for with stock, and higher returns when the merger is a tender offer. Suppliers with higher free cash flow and those located closer to the customer also generate higher CARs. [9]

As in the descriptive statistics, we also examine the influence of important customer/supplier relationships on customers and rivals (Table 2.5). Many of the results are similar to the descriptive evidence. Namely, the CAR around the three day announcement window for customers with important suppliers is 1.49% lower than the CAR for customers without important suppliers. The reason for this is attributed to the greater pricing power that the larger supplier will now have on the customer. The multivariate findings add to the descriptive evidence showing that the size of the customer firm has a positive influence (0.72%) on the CAR. This might indicate that the loss of bargaining power is less prevalent in a larger customer.

In Table 2.5 (Model 2), we see that the rivals of suppliers with strong ties experience significantly higher CAR's than rivals of suppliers without strong customer ties. We attribute the higher CARs to rivals to increased probability that they will be taken over. Song and Walkling (2000) assert that rivals of acquisition targets earn abnormal returns because of the increased probability that they will be target themselves. Rivals with higher free cash flows experience higher CARs, while those with higher return volatility experience lower CARs. An interesting finding is when the target uses a defensive tactic to prevent the merger, rival firms fall by 0.73%. In 28 mergers the defensive tactic was used. Such finding could possibly indicate that when there is a danger of the merger not being completed, rival firm experience lower abnormal returns as a result of being taken over might not materialize. In Model 3 (Table 2.5) we see that competing

[9] In all model specification the Variance Inflation Factor (VIF) factor on the variable of interest is below 2.

rivals, that is those rivals which are also important suppliers to the customer prior to the merger, exhibit significant lower abnormal returns upon the announcement of the merger. This finding gives support to the notion that following the merger, the combined firm gains ability to limit the rivals' access to key inputs.

Given that our merger sample is relatively small we run a bootstrap experiment. The reported statistics illustrate the significance of the relations described in Table 2.4 and 2.5. The bootstrap methodology that we use is the resampling residual method based on raw residuals. This method has the advantage that it retains the information in the explanatory variables. Table 2.6 presents the results of the bootstrap based on 1000 iterations. The first row gives the 95% percentile interval while the second presents the mean of the iterations. Our results are very similar to those reported in Table 2.4 and Table 2.5, namely a supplier with important customer/supplier relationships prior to the merger results in 10.38% higher CARs. Customers associated with suppliers who deem them important fall by 1.49%.

Table 2.7 presents the results on the relation between suppliers with strong customer/supplier relationships and takeover premium after controlling for the same firm and deal characteristics as in the abnormal return regression.[10] We find that targets with strong customer/supplier relationships are positively and significantly related to the level of take-over premiums. A strong relationship is associated with a 21% increase in takeover premiums paid by acquirers, relative to the mean takeover premium of 65.19% (Table 2.2 Panel E) in targets with no such relationships. Hence, the higher takeover premiums observed in targets with strong customer/supplier relationships are consistent with the target CAR results in the previous tables. The negative sign on stock deals is consistent with Rappaport and Sirower (1999) who show that

[10] We follow Antoniou et al. (2013) and measure merger premium as the four-week pre-announcement premium. It equals the difference between the initial bid price and the target market price four weeks before the initial merger announcement divided by the same target price four weeks prior to the announcement.

in stock transactions, the synergy risk is shared in proportion to the percentage of the combined company acquiring and selling shareholders each will own.

Next we seek to determine what factors acquirers deem important when acquiring a supplier controlling for customer/supplier relationships; we do this to make sure that our findings correspond to the findings of past literature. Table 2.8 estimates the logit model to find out what determines the suppliers odds of being acquired. The dependent variable takes a value of one if a supplier was acquired from the entire sample of suppliers; zero otherwise. Suppliers with important customers are less likely to be acquired, as the STRONG_SR is negative and significant. Thus, for suppliers with strong customer/supplier relationships, the odds of being acquired are 0.71 times as large as the odds for a supplier with weak relationships.[11] The coefficient on R&D is positive and significant. This signifies that suppliers with a large amount of R&D have larger odds of being acquired. The coefficient on LNPAT is negative and significant indicating that suppliers with lower amount of patent growth have higher odds of being acquired. Heeley et al. (2006) demonstrates that the size of the firm's R&D is positively related to the likelihood of being acquired. Similarly Bena and Li (2012) show that targets with high R&D and low innovation are more likely to be acquired. They interpret this result as targets are very active in R&D but they are not successful innovators since they are not converting their R&D expenditures into patents at the time of the merger. Our paper provides further evidence that this is true of supplier firms.

Further, the coefficient on FCF is positive and significant. Thus suppliers with higher free cash flow have larger odds of being acquired; this evidence is consistent with Leeb (2012). LNMKTCAP is positive and significant supporting the notion that large suppliers are more likely to be acquired. The estimated change in the odds of being acquired for a one unit increase in

[11] Exp (-0.35) = 0.71

LNMKTCAP is 1.21.[12] This evidence is consistent with Hannan and Rhoades (1987) who find that targets with larger maker capitalizations and operations in urban areas are more likely to be acquired.

Having established that stronger ties deter acquisitions; we next seek to determine what types of acquirers acquire suppliers with strong ties. We find that acquirers that do make acquisitions of targets with strong relationships demonstrate a higher market-to-book-ratio. The median market-to-book ratio of acquirers that purchase suppliers with weak relationships is 2.43, and 3.31 for those acquirers that purchase targets with strong relationships (significant at the 10% level). This finding provides preliminary evidence that these mergers could possibly be motivated by hubris.

## 6. Long Term Performance

Next we compute the five year buy and hold returns for acquirers that have acquired targets with strong customer/supplier relationships. We report the BHAR results on the basis of two alternative benchmarks. Specifically, we utilize the CRSP value-weighted index and a size and book-to-market Fama-French portfolios as benchmarks. We compute the buy and hold returns as the difference between buy and hold returns of the sample firms and the benchmark portfolios. As such we calculate the buy and hold abnormal return (BHAR) for the sample of firms as:

$$\text{BHAR}\ (t_1, t_{60}) = \prod_{t=t1}^{t60}[(1 + R_{it})] - \prod_{t=t1}^{t60}[(1 + R_{mt})] \qquad (1)$$

where $R_{it}$ is the return of the firm i on date t and $R_{mt}$ is the return on a benchmark such as the CRSP value weighted index or size and book to market control portfolio in the same month t. The date $t_1$ is the first trading month after the merger and $t_{60}$ is the end of the time window. We compute the mean and median BHARs for portfolios of acquirers that have acquired targets with

[12] Exp (0.19) = 1.21

strong and weak customer/supplier relationships and report the results of parametric t-tests of differences in mean and median.

Table 2.9 reports the five year mean and median BHARs. The BHARs are either market adjusted or style adjusted (using size and book-to-market benchmarks). We find that mergers which include an important customer/supplier relationship perform poorly at the mean and median in the long run. The mean five year market adjusted return is -15.56% and style adjusted return -16.76%. The median stands at -27.46% and -24.85% on the market and style adjusted method respectively.

Table 2.10 examines the determinants of customer retention following a merger using a logit model. The dependent variable takes a value of one if the combined firm is a supplier to the customer following the merger; zero otherwise. All else equal, a supplier having major customer/supplier relationship pre-merger does not have a significant impact on the combined firm being retained as a supplier following an acquisition. Next, we examine acquirer ties with the target customer in Model 2 (STRONG_AR), or another customer (other than the target customer) in Model 3 (STRONG_ACR). It is of interest to note that in most cases the acquirer does not have ties with an important customer. More specifically, the acquirer has major ties with the target customer in only 13 deals, and the acquirer has major ties with another customer (but not the target customer) in only 24 deals. All else equal, an acquirer having a major relationship with the same customer with whom the target has ties has a positive and significant impact on the likelihood that the customer tie is maintained in the post-merger period. The odds also rise when the acquirer has a larger patent growth as well as a smaller market capitalization. Fee and Thomas (2004) reach a similar finding for suppliers, showing that suppliers to both the acquirer and target are more likely to be retained by the acquirer following the acquisition. In

Model 3 we demonstrate that when the acquirer has a major customer relationship with another customer (other than the target customer) the relationship is not likely to be retained with the customer.

Table 2.11 decomposes the long run returns (on both a style adjusted and market adjusted basis) of terminated and retained firms based on either the target or the acquirer having a strong relationship with the customer (i.e., the target's customer) prior to the merger. We are able to observe that most of the poor long run returns occur in mergers where the target has strong relationships with the customer prior to merger. These mergers, as shown before, are conducted by acquirers with high market-to-ratio, which suggests that hubris may have played a role in the merger motivation, if the market-to-book ratio is used as a measure of overconfidence. Graham et al. (2013) show that growth companies (high-market-to-book) are run by more confident and more risk tolerant CEOs; hence our measure. In contrast, acquirers that have strong relationships prior to merger have significantly lower book-to-market ratios (1.31) versus acquirers that do not have strong relationships (2.74) (significant at the 1% level). Further, we see that acquirers that have strong relationships with customers and are retained perform significantly better than those which are terminated. The difference is 17.82% and significant on a five year basis. This result would suggest that acquirer pre-merger relationships with the customer are more important than target relationships for determining long run success. The possible reason for this is that acquirer/customer relationships generate greater likelihood of retention and retention leads to higher abnormal long run returns. Acquirers that have a strong relationship with another customer (other than the target customer) and are not retained by the customer observe 18.11% abnormal performance, with those that are retained by the customer observing a 29.32% fall.

However, we are hesitant to draw any strong conclusions because of the small sample size of such deals.

An interesting question that arises is why so many acquirer relationships are terminated following a merger, especially those relationships where the acquirer is not a competing supplier. Anderson et al. (2001) postulate that a relationship with a customer can end for several reasons: 1) Following the acquisition the customer does not feel that the new firm will give the same priority to their orders and thus seeks a new supplier. 2) The new supplier charges a higher price to the customer due to the fact that there are fewer competitors. 3) The customer firm acquires a similar supplier. Calisir and Gumussoy (2009) find that the main reason why supplier relationships are terminated is "supplier firms do not make product deliveries in agreed time." Similarly, Mitchell (2008) finds that the main reasons why supplier relationships end are: 1) Changing focus of the customer. 2) Supplier cannot accommodate needs. 3) Relationship just not "working" because of corporate cultures that don't blend well with the customer. The majority of the papers seem to overlap on the inability of the supplier to accommodate the needs of the customer. In order to investigate reasons for termination, we examine news reports from LexisNexis. Although few news articles were found regarding supplier termination, the ones found matched the reasons postulated in the literature. For example, in April 1999 Richfood Holdings (after the acquisition of Super Rite Corp - which was a major supplier to Giant Food prior to the acquisition by Richfood) was dealt a major blow when Giant Food said it would not renew its $600 million supply contract. Two main reasons were stated. First, Richfood Holdings added a new customer, which now became Richfood's largest customer; with a higher level of importance. Second, Giant developed a relationship with another supplier given the "shifting focus" of Richfoods. We thus reason that in the event that the acquirer (Richfood) does not have

prior ties with the customer (Giant Food), the acquisition of the original supplier (Super Rite Corp) changes the dynamics of the merged entity which distorts the supply chain process.

## 7. Conclusion

This study examines whether strong customer relationships are valuable to targets and acquirers in mergers and acquisitions. We find that suppliers with strong customer/supplier relationships obtain higher abnormal returns and higher merger premiums compared to targets with weak customer/supplier relationships. Customers and competing rivals demonstrate significantly negative returns upon the announcement of the merger. The evidence for customer firms can provide support for the loss of bargaining power on behalf of the customer. The result for competing rival suppliers provides evidence that the merged firm gains ability to limit the competing rivals' access to key inputs.

We document that the odds of being acquired fall as the customer/supplier ties increase. The targets that have strong ties are acquired by acquirers with high market-to-book ratios, suggesting that their CEOs may be overconfident. The existence of strong customer/supplier relationship on behalf of the supplier pre-merger does not guarantee retention post-merger. The presence of strong customer/supplier relationship on behalf of the acquirer suggests greater retention post-merger by the customer.

Finally, the long term performance of the acquirers that purchase suppliers with strong customers/supplier relationship is poor. This finding suggests that acquirers overestimate the value of such ties prior to the merger.

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# Appendices

## Appendix 1: Variable Definition

AGE: The number of years since a firm's founding date.

DEFENSE: is an indicator variable set equal to one if the target used a defensive tactic.

DIST: The distance in miles from supplier.

FCF: The free cash flow (Income Before Extraordinary Items + Depreciation and Amortization – Cash Dividend- CAPEX)/Total Assets)) of a firm.

FOCUS: is an indicator variable set equal to one if the merger was focus increasing (same four digit SIC code).

HHI: The Herfindahl Index calculated as the sum of the squared industry market shares using sales data for all firms in the same two-digit SIC code from Compustat.

LNDIST: the natural log of distance.

LNMKTCAP: The natural log of the market value of equity.

LNPAT: the natural log of patents.

PATE: The average dollar amount (in millions) spent for patent development.

PREMIUM: The difference between the initial bid price and the target market price four weeks before the initial merger announcement divided by the same target price four weeks prior to the announcement.

PRET: Annual stock returns

R&D: The amount of R&D expenditures divided by the amount of total assets.

RETVOL: The standard deviation of monthly stock returns in the last 12 months.

STOCK: is an indicator variable set equal to one if the deal was financed with stock.

STRONG_AR: An indicator variable equal to one if the acquirer sales to a target customer divided by the total sales of the acquirer is equal to or greater than 15% and zero otherwise (WEAK_AR).

STRONG_ARC: An indicator variable equal to one if the acquirer sales to a non-target customer divided by the total sales of the acquirer is equal to or greater than 15% and zero otherwise (WEAK_ARC).

STRONG_RR: An indicator variable equal to one if the rival sales to a target customer divided by the total sales of the rival is equal to or greater than 15% and zero otherwise (WEAK_RR).

STRONG_SR: An indicator variable equal to one if the supplier (target) sales to a customer divided by the total sales of the supplier is equal to or greater than 15% and zero otherwise (WEAK_SR).

TENDER: is an indicator variable set equal to one if the deal was a tender offer.

TOBIN: The ratio of market value to book value of assets.

## Appendix 2: Tables and Figures

Table 1.1: Acquisitions by Year and Industry

The sample consists of 459 completed acquisitions announced during 1994 to 2010. The bidders are listed on SDC database and have the required executive compensation data in ExecuComp. Panel A breaks the sample by year. Panel B breaks the sample by industry.

| **Panel A : Distribution by Year** | | |
|---|---|---|
| **Year** | **Frequency** | **Percent** |
| 1994 | 14 | 3.05 |
| 1995 | 36 | 7.84 |
| 1996 | 31 | 6.75 |
| 1997 | 42 | 9.15 |
| 1998 | 30 | 6.54 |
| 1999 | 42 | 9.15 |
| 2000 | 33 | 7.19 |
| 2001 | 20 | 4.36 |
| 2002 | 24 | 5.23 |
| 2003 | 23 | 5.01 |
| 2004 | 31 | 6.75 |
| 2005 | 40 | 8.71 |
| 2006 | 24 | 5.23 |
| 2007 | 29 | 6.32 |
| 2008 | 21 | 4.58 |
| 2009 | 14 | 3.05 |
| 2010 | 5 | 1.09 |
| | 459 | 100.00 |

Table 1.1: Acquisitions by Year and Industry (Continued)

| **Panel B : Distribution by Industry** | | |
|---|---|---|
| Aircraft | 5 | 1.09 |
| Apparel | 6 | 1.31 |
| Automobiles and Trucks | 10 | 2.18 |
| Banking | 31 | 6.75 |
| Business Services | 46 | 10.02 |
| Business Supplies | 8 | 1.74 |
| Candy & Soda | 1 | 0.22 |
| Chemicals | 17 | 3.70 |
| Communication | 5 | 1.09 |
| Computers | 18 | 3.92 |
| Construction | 5 | 1.09 |
| Construction Materials | 10 | 2.18 |
| Consumer Goods | 7 | 1.53 |
| Defense | 1 | 0.22 |
| Electrical Equipment | 6 | 1.31 |
| Electronic Equipment | 41 | 8.93 |
| Entertainment | 4 | 0.87 |
| Food Products | 11 | 2.40 |
| Healthcare | 8 | 1.74 |
| Insurance | 20 | 4.36 |
| Machinery | 20 | 4.36 |
| Measuring and Control Equipment | 15 | 3.27 |
| Medical Equipment | 17 | 3.70 |
| Other | 4 | 0.87 |
| Personal Services | 6 | 1.31 |
| Petroleum and Natural Gas | 23 | 5.01 |
| Pharmaceutical Products | 13 | 2.83 |
| Precious Metals | 2 | 0.44 |
| Printing and Publishing | 9 | 1.96 |
| Recreation | 1 | 0.22 |
| Restaurants, Hotels, Motels | 7 | 1.53 |
| Retail | 20 | 4.36 |
| Rubber and Plastic Products | 2 | 0.44 |
| Shipbuilding, Railroad Equipment | 1 | 0.22 |
| Steel Works Etc. | 8 | 1.74 |
| Textiles | 2 | 0.44 |
| Trading | 16 | 3.49 |
| Transportation | 10 | 2.18 |
| Utilities | 13 | 2.83 |
| Wholesale | 10 | 2.18 |
| | 459 | 100 |

Table 1.2: Summary Statistics by Pre and Post SOX

The sample consists of mergers announced during the period January 1, 1994 to December 31, 2010. All variable values are obtained at the fiscal year end before the merger announcement. MVE is the product number of shares outstanding and the stock price (in millions). TV is the transaction value of the merger (in millions). PROP is the TV divided by MVE. MVA is the book value of total assets minus the book value of equity plus market value of equity (in millions). ROA is the accounting return on assets, obtained as the ratio of earnings before interest and taxes to total assets. STD_RET is the standard deviation of stock return over the prior five years. PEI (in thousand) is the sensitivity of the total value of stock and options held by a CEO to a 1% change in stock price. PPS is calculated as the dollar value change of stock and options held by a CEO per $1000 shareholder return. BSize is the size of the board of directors. BIndep is the amount of independent directors. E-Index is the entrenchment index based on Bebchuck et al. (2009). Age is the age of the CEO.

| **Panel A** | **ALL** | **ALL** | **Pre-SOX** | **Pre-SOX** | **Post-SOX** | **Post-SOX** |
|---|---|---|---|---|---|---|
| | Mean | Median | Mean | Median | Mean | Median |
| MVE | 5567 | 1385 | 4725 | 1199 | 6727 | 1790 |
| TV | 1633 | 270 | 1256 | 204 | 2152 | 359 |
| PROP | 33.33% | 16.90% | 31.61% | 16.11% | 35.69% | 17.91% |
| MVA | 14163 | 2297 | 11012 | 1897 | 18472 | 2876 |
| ROA | 11.10% | 10.20% | 12.14% | 10.91% | 9.84% | 9.39% |
| STD_RET | 49.41% | 36.47% | 45.85% | 34.48% | 54.24% | 39.99% |
| PEI | 585 | 141 | 635 | 124 | 516 | 179 |
| PPS | 33.01 | 9.43 | 31.82 | 9.73 | 34.65 | 8.78 |
| %Stock | 21.57% | 0% | 33.01% | 0% | 5.69% | 0% |
| %Tender | 15.35% | 0% | 17.67% | 0% | 11.97% | 0% |
| %Focus | 41.28% | 0% | 40.23% | 0% | 42.71% | 0% |
| %Out_State | 77.63% | 100% | 75.44% | 100% | 79.17% | 100% |
| E-Index | 2.57 | 3 | 2.28 | 2 | 2.89 | 3 |
| Bsize | 10.41 | 10 | 10.72 | 10 | 10.05 | 10 |
| BIndep | 7.25 | 7 | 7.19 | 7 | 7.31 | 7 |
| Age | 55 | 55 | 55 | 54.5 | 54.7 | 55 |

Table 1.3: Correlation of Variables

The table shows the correlation matrix of the explanatory variables. MVA is the book value of total assets minus the book value of equity plus market value of equity. ROA is the accounting return on assets, obtained as the ratio of earnings before interest and taxes to total assets. PEI (in thousand) is the sensitivity of the total value of stock and options held by a CEO to a 1% change in stock price (natural logarithm is used). PEI (in thousand) is the sensitivity of the total value of stock and options held by a CEO to a 1% change in stock price (natural logarithm is used). PPS is calculated as the dollar value change of stock and options held by a CEO per $1000 shareholder return (natural logarithm is used). BSizeD is an indicator variable set equal to one if the board size is higher than the median. BIndepD is an indicator variable set equal to one if the percentage of independent directors on board is higher than the median. E-IndexD is an indicator variable set equal to one if it is higher than the median. AgeD is an indicator variable if the CEO older than 60. $^{*}$, $^{**}$ and $^{***}$ denote significance at the 10%, 5% and 1% level, respectively.

| | BSizeD | BIndepD | E-IndexD | AgeD | MVA | ROA | Stock | Tender | Focus | Out_State | PPS | PEI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BSizeD | 1 | **0.69**$^{***}$ | **0.16**$^{***}$ | **0.11**$^{**}$ | **0.45**$^{***}$ | **-0.10**$^{*}$ | -0.07 | 0.03 | -0.05 | 0.03 | **-0.28**$^{***}$ | 0.06 |
| BIndepD | | 1 | **0.19**$^{***}$ | 0.07 | **0.39**$^{***}$ | **-0.11**$^{*}$ | **-0.09**$^{**}$ | 0.05 | -0.11 | 0.03 | **-0.25**$^{***}$ | 0.04 |
| E-IndexD | | | 1 | -0.04 | 0.01 | -0.10 | -0.08 | 0.06 | -0.07 | 0.11 | -0.07 | **-0.09**$^{*}$ |
| AgeD | | | | 1 | 0.04 | 0.02 | -0.01 | -0.02 | 0.01 | -0.06 | **0.17**$^{***}$ | **0.21**$^{***}$ |
| MVA | | | | | 1 | **-0.14**$^{***}$ | -0.08 | 0.07 | -0.07 | -0.03 | **-0.31**$^{***}$ | **0.44**$^{***}$ |
| ROA | | | | | | 1 | 0.04 | **0.11**$^{*}$ | -0.01 | 0.03 | -0.02 | 0.01 |
| Stock | | | | | | | 1 | **-0.19**$^{***}$ | 0.05 | **-0.15**$^{***}$ | **0.13**$^{**}$ | 0.09 |
| Tender | | | | | | | | 1 | -0.03 | **0.13**$^{**}$ | -0.03 | 0.04 |
| Focus | | | | | | | | | 1 | -0.01 | -0.01 | -0.06 |
| Out_State | | | | | | | | | | 1 | 0.05 | 0.03 |
| PPS | | | | | | | | | | | 1 | **0.59**$^{***}$ |
| PEI | | | | | | | | | | | | 1 |

Table 1.4: Summary Statistics by PPS and PEI

The sample consists of mergers announced during the period January 1, 1994 to December 31, 2010. All variable values are obtained at the fiscal year end before the merger announcement. MVE is the product number of shares outstanding and the stock price. TV is the transaction value of the merger. PROP is the TV divided by MVE. MVA is the book value of total assets minus the book value of equity plus market value of equity. ROA is the accounting return on assets, obtained as the ratio of earnings before interest and taxes to total assets. STD_RET is the standard deviation of stock return over the prior five years. PEI (in thousand) is the sensitivity of the total value of stock and options held by a CEO to a 1% change in stock price. PPS is calculated as the dollar value change of stock and options held by a CEO per $1000 shareholder return. BSize is the size of the board of directors. BIndep is the amount of independent directors. E-Index is the entrenchment index based on Bebchuck et al. (2009). Age is the age of the CEO. Where low PPS group is one where the pay-for-performance is below the median and high where it's above.

| **Panel A** | **High PPS** | **High PPS** | **Low PPS** | **Low PPS** |
|---|---|---|---|---|
| | Mean | Median | Mean | Median |
| MVE | 2815 | 848 | 8308 | 2587 |
| TV | 659 | 129 | 2602 | 533 |
| PROP | 29.28% | 13.76% | 37.35% | 19.31% |
| MVA | 5712 | 1393 | 22577 | 4861 |
| ROA | 8.16% | 10.81% | 10.82% | 9.62% |
| STD_RET | 67.35% | 45.46% | 37.87% | 28.61% |
| PEI | 921 | 246 | 250 | 70 |
| PPS | 62.48 | 25.89 | 3.66 | 3.25 |
| %Stock | 24.89% | 0% | 18.26% | 0% |
| %Tender | 13.11% | 0% | 16.95% | 0% |
| %Focus | 41.04% | 0% | 41.74% | 0% |
| %Out_State | 79.48% | 100% | 75.21% | 100% |
| E-Index | 2.41 | 2 | 2.68 | 3 |
| BSize | 9.38 | 9 | 11.14 | 11 |
| BIndep | 6.45 | 6 | 7.83 | 8 |
| Age | 55 | 55 | 55 | 55 |

Table 1.4: Summary Statistics by PPS and PEI (Continued)

| **Panel B** | **High PEI** | **High PEI** | **Low PEI** | **Low PEI** |
|---|---|---|---|---|
| | Mean | Median | Mean | Median |
| MVE | 9433 | 2042 | 1684 | 884 |
| TV | 2642 | 361 | 619 | 213 |
| PROP | 29.21% | 13.55% | 37.47% | 20.42% |
| MVA | 24330 | 3276 | 3951 | 1575 |
| ROA | 11.87% | 10.91% | 10.47% | 9.65% |
| STD_RET | 55.47% | 39.41% | 43.36% | 33.11% |
| PEI | 1106 | 381.64 | 61.58 | 56.11 |
| PPS | 56.14 | 20.71 | 9.77 | 4.63 |
| %Stock | 22.27% | 0% | 20.86% | 0% |
| %Tender | 14.78% | 0% | 15.28% | 0% |
| %Focus | 42.17% | 0% | 40.61% | 0% |
| %Out_State | 79.56% | 100% | 75.11% | 100% |
| E-Index | 2.43 | 2 | 2.71 | 3 |
| BSize | 10.53 | 10 | 10.28 | 10 |
| BIndep | 7.41 | 7 | 7.09 | 7 |
| Age | 55 | 56 | 54 | 54 |

Table 1.5: Summary Statistics on Acquirer Returns

The table summarizes acquirer returns, CAR over a five day period (-2 to +2) for different PPS and PEI groups. Where low PPS group is one where the pay-for-performance is below the median and high where it's above. Where low PEI group is one where portfolio equity incentive is below the median and high where it's above T and signed rank tests are performed to examine whether the mean or median returns are significantly different between positive and negative PPS acquirer. $^{*}$, $^{**}$ and $^{***}$ denote significance at the 10%, 5% and 1% level, respectively.

| **Panel A** | | **Low PPS** | | **High PPS** | |
|---|---|---|---|---|---|
| | N | Mean | N | Mean | Diff. |
| Stock Deals | 42 | -3.96% | 57 | 1.11% | **5.07%**$^{***}$ |
| Cash Deals | 90 | -0.01% | 80 | 1.07% | 1.08% |
| Mix Deals | 63 | -2.39% | 54 | 2.17% | **4.56%**$^{***}$ |
| Other Deals | 9 | -1.38% | 12 | -1.75% | -0.37% |
| Unknown Deals | 26 | 1.99% | 26 | 1.41% | -0.58% |
| All Deals | 230 | -1.21% | 229 | 0.99% | **2.20%**$^{***}$ |

| **Panel B** | | **Low PEI** | | **High PEI** | |
|---|---|---|---|---|---|
| | N | Mean | N | Mean | Diff. |
| Stock Deals | 51 | -2.43% | 48 | -0.78% | 1.65% |
| Cash Deals | 87 | -0.46% | 83 | 1.51% | **1.97%**$^{*}$ |
| Mix Deals | 55 | -0.88% | 62 | 0.25% | 1.13% |
| Other Deals | 9 | -0.37% | 12 | -2.51% | -2.14% |
| Unknown Deals | 27 | 2.12% | 25 | 1.26% | -0.86% |
| All Deals | 229 | -0.69% | 230 | 0.45% | **1.14%**$^{*}$ |

| **Panel C** | | **Low PPS** | | **High PPS** | |
|---|---|---|---|---|---|
| | N | Mean | N | Mean | Diff. |
| Listed Targets | 161 | -2.31% | 112 | 0.20% | **2.51%**$^{***}$ |
| Non-Listed Targets | 69 | 1.34% | 117 | 1.75% | 0.41% |
| All Deals | 230 | -1.21% | 229 | 0.99% | **2.20%**$^{***}$ |

| **Panel D** | | **Low PEI** | | **High PEI** | |
|---|---|---|---|---|---|
| | N | Mean | N | Mean | Diff. |
| Listed Targets | 136 | -1.88% | 137 | -0.68% | 1.20% |
| Non-Listed Targets | 93 | 1.06% | 93 | 2.13% | 1.07% |
| All Deals | 229 | -0.69% | 230 | 0.45% | **1.14%**$^{*}$ |

## Table 1.6: Acquirer Returns – Regression Analysis

The dependent variable is the CAR over a three day period (-1 to +1). All independent variables are measured one year before the announcement. BSizeD is an indicator variable set equal to one if the board size is higher than the median. BIndepD is an indicator variable set equal to one if the percentage of independent directors on board is higher than the median. E-IndexD is an indicator variable set equal to one if it is higher than the median. AgeD is an indicator variable if the CEO older than 60. MVA is the log of market value of assets. ROA is EBIT over total assets. D_Stock is an indicator variable set equal to one if the deal was financed with stock. T_Offer is an indicator variable set equal to one if the deal was a tender offer. Focus is an indicator variable set equal to one if the merger was focus increasing. Out_State is a dummy variable equal to one if the target was listed in a different state to the bidder. PPS is the log of pay-for-performance sensitivity. PPS_D is a dummy variable if the acquirer had above the median log of PPS sensitivity. PEI is the log of portfolio equity incentives. PEI_D is a dummy variable if the acquirer had above the median log of PEI sensitivity. Year dummies (Y Dum) and industry dummies (I Dum) are employed. P-values are reported in brackets are adjusted for heteroscedasticity. Boldface indicates significance level at 10% or better. Panel A includes no governance variables. Panel C includes PEI which is the log of portfolio equity incentives. Panel B and Panel D includes governance variables for PPS and PEI respectively.

| **Panel A** | **1994-2010** | | **1994-2010** | | | **1994-07.2002** | | | **08.2002-2010** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | All Deals | All Deals | Listed Targets | Non-Listed Targets | All Deals | Listed Targets | Non-Listed Targets | All Deals | Listed Targets | Non-Listed Targets |
| MVA | -0.005 | -0.005 | -0.001 | -0.005 | -0.004 | 0.003 | 0.0151 | -0.004 | -0.002 | 0.017 |
| | **[0.053]** | **[0.081]** | [0.735] | [0.237] | [0.203] | [0.389] | **[0.021]** | [0.271] | [0.605] | [0.137] |
| ROA | 0.084 | 0.089 | 0.127 | 0.076 | -0.061 | -0.015 | -0.059 | 0.124 | 0.198 | 0.342 |
| | **[0.046]** | **[0.035]** | **[0.022]** | [0.261] | [0.349] | [0.876] | [0.481] | **[0.071]** | **[0.011]** | **[0.002]** |
| Stock | -0.025 | -0.027 | -0.025 | -0.021 | -0.015 | -0.006 | -0.008 | -0.031 | -0.021 | -0.053 |
| | **[0.004]** | **[0.003]** | **[0.051]** | [0.141] | [0.183] | [0.701] | [0.606] | **[0.052]** | [0.242] | **[0.044]** |
| Tender | 0.025 | 0.026 | 0.035 | 0.025 | 0.019 | 0.031 | 0.032 | 0.034 | 0.019 | 0.171 |
| | **[0.001]** | **[0.005]** | **[0.004]** | [0.625] | [0.139] | **[0.051]** | [0.661] | **[0.034]** | [0.211] | **[0.021]** |
| Focus | 0.014 | 0.015 | 0.013 | 0.025 | 0.018 | 0.021 | 0.031 | 0.015 | -0.022 | 0.032 |
| | **[0.041]** | **[0.027]** | [0.112] | **[0.021]** | **[0.056]** | **[0.077]** | **[0.047]** | [0.146] | [0.791] | **[0.027]** |
| Out_State | -0.018 | -0.017 | -0.015 | -0.027 | -0.015 | -0.011 | -0.038 | -0.016 | -0.009 | -0.038 |
| | **[0.017]** | **[0.022]** | [0.132] | **[0.031]** | [0.145] | [0.478] | **[0.026]** | [0.201] | [0.494] | **[0.043]** |
| PPS | | 0.011 | 0.012 | 0.008 | 0.009 | 0.013 | 0.008 | 0.011 | 0.013 | 0.006 |
| | | **[0.003]** | **[0.003]** | **[0.047]** | **[0.011]** | **[0.011]** | [0.121] | **[0.011]** | **[0.011]** | [0.319] |
| PPS_D | 0.021 | | | | | | | | | |
| | **[0.005]** | | | | | | | | | |
| Y Dum | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| I Dum | YES | YES | YES | NO | YES | YES | NO | YES | NO | NO |
| $R^2$ | 21.61% | 23.09% | 22.74% | 18.83% | 23.25% | 37.88% | 20.23% | 39.63% | 33.24% | 42.31% |
| N | 459 | 459 | 273 | 186 | 266 | 160 | 106 | 193 | 113 | 80 |

Table 1.6: Acquirer Returns – Regression Analysis (Continued)

| **Panel B** | **1994-2010** | | **1994-2010** | | | **1994-07.2002** | | | **08.2002-2010** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | All Deals | All Deals | Listed Targets | Non-Listed Targets | All Deals | Listed Targets | Non-Listed Targets | All Deals | Listed Targets | Non-Listed Targets |
| BSizeD | -0.019 | -0.018 | -0.002 | -0.039 | -0.025 | -0.005 | -0.055 | -0.006 | 0.017 | -0.015 |
| | **[0.044]** | **[0.061]** | [0.901] | **[0.016]** | **[0.026]** | [0.729] | **[0.006]** | [0.629] | [0.284] | [0.537] |
| BIndepD | 0.011 | 0.011 | 0.013 | 0.014 | 0.091 | 0.005 | 0.012 | 0.011 | 0.016 | 0.007 |
| | [0.213] | [0.203] | [0.256] | [0.412] | [0.395] | [0.694] | [0.561] | [0.379] | [0.312] | [0.749] |
| E-IndexD | 0.003 | 0.003 | -0.001 | -0.001 | 0.007 | -0.001 | 0.024 | -0.001 | 0.001 | 0.004 |
| | [0.751] | [0.694] | [0.883] | [0.923] | [0.461] | [0.884] | [0.243] | [0.993] | [0.947] | [0.817] |
| AgeD | -0.003 | -0.007 | -0.013 | -0.017 | -0.014 | -0.021 | -0.014 | 0.007 | -0.001 | 0.018 |
| | [0.669] | [0.427] | [0.266] | [0.222] | [0.144] | **[0.100]** | [0.388] | [0.581] | [0.961] | [0.389] |
| MVA | -0.004 | -0.004 | -0.005 | 0.002 | -0.002 | -0.003 | 0.011 | -0.004 | -0.007 | -0.001 |
| | [0.159] | [0.192] | [0.115] | [0.633] | [0.644] | [0.321] | [0.193] | [0.256] | **[0.096]** | [0.996] |
| ROA | 0.114 | 0.122 | 0.109 | 0.167 | -0.053 | -0.099 | 0.031 | 0.169 | 0.165 | 0.261 |
| | **[0.008]** | **[0.005]** | **[0.035]** | **[0.034]** | [0.353] | [0.136] | [0.768] | **[0.001]** | **[0.009]** | **[0.031]** |
| Stock | -0.156 | -0.018 | -0.017 | -0.019 | -0.007 | -0.006 | 0.019 | -0.044 | -0.032 | -0.063 |
| | **[0.100]** | **[0.071]** | [0.145] | [0.231] | [0.487] | [0.601] | [0.281] | **[0.005]** | **[0.096]** | **[0.034]** |
| Tender | 0.024 | 0.022 | 0.027 | 0.042 | 0.016 | 0.023 | -0.002 | 0.017 | 0.026 | 0.097 |
| | **[0.013]** | **[0.017]** | **[0.009]** | [0.421] | [0.118] | **[0.022]** | [0.971] | [0.231] | **[0.098]** | [0.219] |
| Focus | 0.009 | 0.009 | 0.008 | 0.024 | 0.011 | 0.009 | 0.034 | 0.011 | 0.008 | 0.026 |
| | [0.213] | [0.151] | [0.342] | **[0.041]** | [0.143] | [0.371] | **[0.031]** | [0.278] | [0.482] | [0.123] |
| Out_State | -0.011 | -0.011 | -0.006 | -0.021 | -0.016 | -0.008 | -0.041 | -0.002 | -0.012 | 0.001 |
| | [0.161] | [0.173] | [0.481] | [0.145] | **[0.074]** | [0.438] | **[0.019]** | [0.833] | [0.409] | [0.959] |
| PPS | | 0.010 | 0.012 | 0.009 | 0.008 | 0.011 | 0.009 | 0.012 | 0.012 | 0.005 |
| | | **[0.003]** | **[0.005]** | **[0.056]** | **[0.018]** | **[0.018]** | [0.104] | **[0.001]** | **[0.061]** | [0.396] |
| PPS_D | 0.016 | | | | | | | | | |
| | **[0.029]** | | | | | | | | | |
| Y Dum | YES | YES | YES | YES | YES | NO | NO | YES | NO | NO |
| I Dum | YES | YES | YES | NO | NO | NO | NO | NO | NO | NO |
| $R^2$ | 31.33% | 32.42% | 42.11% | 29.51% | 18.92% | 16.38% | 22.83% | 29.63% | 28.11% | 23.87% |
| N | 336 | 336 | 207 | 129 | 173 | 108 | 65 | 163 | 99 | 64 |

Table 1.6: Acquirer Returns – Regression Analysis (Continued)

| **Panel C** | **1994-2010** | | **1994-2010** | | | **1994-07.2002** | | | **08.2002-2010** | |
|---|---|---|---|---|---|---|---|---|---|---|
| | All Deals | All Deals | Listed Targets | Non-Listed Targets | All Deals | Listed Targets | Non-Listed Targets | All Deals | Listed Targets | Non-Listed Targets |
| MVA | -0.011 | -0.012 | -0.009 | -0.012 | -0.013 | -0.006 | -0.022 | -0.012 | -0.008 | 0.006 |
| | **[0.002]** | **[<0.001]** | **[0.071]** | **[0.015]** | **[0.001]** | [0.209] | **[0.001]** | **[0.003]** | **[0.021]** | [0.409] |
| ROA | 0.076 | 0.076 | 0.114 | 0.057 | -0.076 | -0.036 | -0.074 | 0.115 | 0.177 | 0.323 |
| | **[0.078]** | **[0.071]** | **[0.035]** | [0.396] | [0.243] | [0.715] | [0.389] | **[0.093]** | **[0.003]** | **[0.003]** |
| Stock | -0.024 | -0.026 | -0.021 | -0.021 | -0.015 | -0.005 | -0.009 | -0.031 | -0.021 | -0.051 |
| | **[0.006]** | **[0.003]** | **[0.056]** | [0.125] | [0.191] | [0.721] | [0.583] | **[0.056]** | [0.267] | **[0.039]** |
| Tender | 0.025 | 0.026 | 0.036 | 0.021 | 0.019 | 0.029 | 0.035 | 0.036 | 0.021 | 0.167 |
| | **[0.011]** | **[0.006]** | **[0.001]** | [0.684] | [0.134] | **[0.056]** | [0.675] | **[0.028]** | [0.166] | **[0.023]** |
| Focus | 0.012 | 0.015 | 0.014 | 0.025 | 0.018 | 0.021 | 0.031 | 0.016 | -0.004 | 0.031 |
| | **[0.065]** | **[0.031]** | [0.112] | **[0.023]** | **[0.061]** | **[0.089]** | **[0.046]** | [0.141] | [0.711] | **[0.034]** |
| Out_State | -0.018 | -0.017 | -0.015 | -0.027 | -0.015 | -0.009 | -0.036 | -0.016 | -0.008 | -0.039 |
| | **[0.021]** | **[0.028]** | [0.147] | **[0.035]** | [0.178] | [0.521] | **[0.035]** | [0.201] | [0.551] | **[0.036]** |
| PEI | | 0.008 | 0.008 | 0.007 | 0.008 | 0.011 | 0.007 | 0.009 | 0.006 | 0.006 |
| | | **[<0.001]** | **[0.002]** | **[0.047]** | **[0.001]** | **[0.011]** | [0.141] | **[0.011]** | **[0.100]** | [0.231] |
| PEI_D | 0.012 | | | | | | | | | |
| | **[0.082]** | | | | | | | | | |
| Y Dum | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| I Dum | YES | YES | YES | NO | YES | YES | NO | YES | NO | NO |
| $R^2$ | 20.69% | 23.06% | 31.67% | 18.43% | 23.53% | 38.30% | 20.13% | 39.99% | 30.35% | 42.97% |
| N | 459 | 459 | 273 | 186 | 266 | 160 | 106 | 193 | 113 | 80 |

Table 1.6: Acquirer Returns – Regression Analysis (Continued)

| **Panel D** | **1994-2010** | **1994-2010** | | | **1994-07.2002** | | | **08.2002-2010** | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | All Deals | All Deals | Listed Targets | Non-Listed Targets | All Deals | Listed Targets | Non-Listed Targets | All Deals | Listed Targets | Non-Listed Targets |
| BSizeD | -0.021 | -0.018 | -0.003 | -0.037 | -0.025 | -0.009 | -0.053 | -0.006 | 0.017 | 0.002 |
| | **[0.029]** | **[0.055]** | [0.786] | **[0.021]** | **[0.023]** | [0.535] | **[0.008]** | [0.651] | [0.294] | [0.738] |
| BIndepD | 0.011 | 0.011 | 0.011 | 0.013 | 0.007 | 0.007 | 0.013 | 0.011 | 0.013 | 0.001 |
| | [0.226] | [0.231] | [0.231] | [0.417] | [0.388] | [0.635] | [0.522] | [0.441] | [0.391] | [0.845] |
| E-IndexD | 0.004 | 0.003 | 0.001 | -0.002 | 0.007 | 0.001 | 0.022 | 0.001 | 0.004 | 0.001 |
| | [0.654] | [0.621] | [0.971] | [0.872] | [0.485] | [0.997] | [0.241] | [0.933] | [0.775] | [0.383] |
| AgeD | -0.004 | -0.008 | -0.012 | -0.011 | -0.019 | -0.021 | -0.146 | [0.009] | 0.004 | 0.003 |
| | [0.592] | [0.357] | [0.271] | [0.414] | [0.111] | [0.111] | [0.397] | [0.469] | [0.822] | [0.603] |
| MVA | -0.007 | -0.009 | -0.011 | -0.003 | -0.004 | -0.005 | 0.002 | -0.011 | -0.013 | 0.001 |
| | **[0.008]** | **[0.002]** | **[0.006]** | [0.651] | [0.123] | [0.171] | [0.807] | **[0.007]** | **[0.006]** | [0.604] |
| ROA | 0.097 | 0.107 | 0.098 | 0.148 | -0.074 | -0.111 | 0.009 | 0.154 | 0.144 | 0.015 |
| | **[0.026]** | **[0.011]** | **[0.061]** | **[0.056]** | [0.196] | [0.112] | [0.924] | **[0.004]** | **[0.021]** | **[0.043]** |
| Stock | -0.015 | -0.017 | -0.016 | -0.015 | -0.007 | -0.004 | 0.018 | -0.044 | -0.031 | 0.017 |
| | **[0.100]** | **[0.061]** | [0.168] | [0.367] | [0.498] | [0.716] | [0.316] | **[0.005]** | **[0.100]** | **[0.032]** |
| Tender | 0.028 | 0.025 | 0.031 | 0.039 | 0.018 | 0.028 | -0.002 | 0.019 | 0.031 | 0.001 |
| | **[0.013]** | **[0.014]** | **[0.006]** | [0.395] | [0.168] | **[0.036]** | [0.969] | [0.201] | **[0.058]** | [0.237] |
| Focus | 0.007 | 0.009 | 0.009 | 0.023 | 0.011 | 0.008 | 0.035 | 0.011 | 0.007 | 0.009 |
| | [0.273] | [0.154] | [0.354] | **[0.041]** | [0.146] | [0.395] | **[0.028]** | [0.275] | [0.511] | [0.237] |
| Out_State | -0.009 | -0.011 | -0.008 | -0.019 | -0.015 | -0.007 | -0.038 | -0.003 | -0.012 | 0.001 |
| | [0.208] | [0.178] | [0.455] | [0.153] | **[0.092]** | [0.481] | **[0.028]** | [0.754] | [0.408] | [0.987] |
| PEI | | 0.007 | 0.009 | 0.008 | 0.006 | 0.004 | 0.008 | 0.007 | 0.006 | 0.003 |
| | | **[0.008]** | **[0.055]** | **[0.038]** | **[0.084]** | [0.271] | [0.111] | **[0.041]** | [0.225] | [0.365] |
| PEI_D | 0.015 | | | | | | | | | |
| | **[0.046]** | | | | | | | | | |
| Y Dum | YES | YES | YES | YES | YES | NO | NO | YES | NO | NO |
| I Dum | YES | YES | YES | NO | NO | NO | NO | NO | NO | NO |
| $R^2$ | 31.11% | 31.91% | 40.43% | 27.87% | 17.53% | 12.45% | 28.81% | 28.38% | 28.11% | 23.99% |
| N | 336 | 336 | 207 | 129 | 173 | 108 | 65 | 163 | 99 | 64 |

Table 1.7: Acquirer Premium – Regression Analysis

The dependent variable is the merger premium. The merger premium is defined as the four-week pre-announcement premium. It equals the difference between the initial bid price and the target market price four weeks before the initial merger announcement divided by the same target price four weeks prior to the announcement. BSizeD is an indicator variable set equal to one if the board size is higher than the median. BIndepD is an indicator variable set equal to one if the percentage of independent directors on board is higher than the median. E-IndexD is an indicator variable set equal to one if it is higher than the median. AgeD is an indicator variable if the CEO older than 60. MVA is the log of market value of assets. ROA is EBIT over total assets. D_Stock is an indicator variable set equal to one if the deal was financed with stock. T_Offer is an indicator variable set equal to one if the deal was a tender offer. Focus is an indicator variable set equal to one if the merger was focus increasing. Out_State is a dummy variable equal to one if the target was listed in a different state to the bidder. PPS_D is a dummy variable if the acquirer had above the median log of pay-for-performance sensitivity. Year dummies (Y Dum) and industry dummies (I Dum) are employed. P-values are reported in brackets are adjusted for heteroscedasticity. Boldface indicates significance level at 10% or better.

| | **1994-2010** | **1994-07.2002** | **08.2002-2010** |
|---|---|---|---|
| | Listed Targets | Listed Targets | Listed Targets |
| BSizeD | 0.151 | 0.298 | 0.033 |
| | [0.262] | [0.198] | [0.859] |
| BIndepD | -0.208 | -0.258 | -0.274 |
| | [0.108] | [0.259] | [0.131] |
| E-IndexD | -0.122 | -0.267 | -0.126 |
| | [0.291] | [0.151] | [0.505] |
| AgeD | 0.179 | 0.228 | 0.356 |
| | [0.147] | [0.244] | [0.101] |
| MVA | -0.037 | -0.061 | -0.048 |
| | [0.393] | [0.395] | [0.446] |
| ROA | -0.505 | 1.614 | -2.497 |
| | [0.391] | [0.237] | [0.781] |
| Stock | -0.166 | -0.457 | 0.017 |
| | [0.222] | **[0.039]** | [0.973] |
| Tender | 0.101 | 0.012 | 0.415 |
| | [0.387] | [0.948] | **[0.059]** |
| Focus | 0.115 | 0.061 | 0.139 |
| | [0.229] | [0.691] | [0.366] |
| Out_State | 0.101 | 0.01 | 0.168 |
| | [0.367] | [0.961] | [0.342] |
| PPS_D | -0.233 | -0.043 | -0.413 |
| | **[0.033]** | [0.791] | **[0.048]** |
| Y Dum | YES | YES | YES |
| I Dum | YES | YES | YES |
| $R^2$ | 53.46% | 59.99% | 70.61% |
| N | 207 | 108 | 99 |

Table 1.8: Acquirer Returns: Regression Analysis (Robustness Checks)

The dependent variable is the CAR over a three day period (-1 to +1). All independent variables are measured one year before the announcement. Small, Medium and Large are indicator variables and equal to one if an acquirer is in low, mid- or top third based on market value of assets. ROA is EBIT over total assets. D_Stock is an indicator variable set equal to one if the deal was financed with stock. T_Offer is an indicator variable set equal to one if the deal was a tender offer. Focus is an indicator variable set equal to one if the merger was focus increasing. Out_State is a dummy variable equal to one if the target was listed in a different state to the bidder PPS is the log of pay-for-performance sensitivity. Year dummies (Y Dum) and industry dummies (I Dum) are employed. P-values are reported in brackets are adjusted for heteroscedasticity. Boldface indicates significance level at 10% or better.

| | **1994-2010** | **1994-07.2002** | **08.2002-2010** |
|---|---|---|---|
| | All Deals | All Deals | All Deals |
| Medium | 0.027 | 0.043 | -0.016 |
| | [0.158] | **[0.091]** | [0.647] |
| Large | 0.003 | 0.016 | -0.038 |
| | [0.901] | [0.523] | [0.268] |
| PPS*Small | 0.018 | 0.019 | 0.009 |
| | **[<0.001]** | **[0.008]** | [0.359] |
| PPS*Medium | 0.004 | 0.001 | 0.005 |
| | [0.511] | [0.986] | [0.451] |
| PPS*Large | 0.011 | 0.007 | 0.013 |
| | **[0.047]** | [0.369] | **[0.061]** |
| ROA | 0.086 | -0.053 | 0.139 |
| | **[0.041]** | [0.408] | **[0.048]** |
| D_Stock | -0.025 | -0.015 | -0.031 |
| | **[0.004]** | [0.171] | **[0.061]** |
| T_Offer | 0.024 | 0.015 | 0.031 |
| | **[0.011]** | [0.258] | **[0.051]** |
| Focus | 0.013 | 0.018 | 0.018 |
| | **[0.043]** | **[0.061]** | **[0.100]** |
| Out_State | -0.016 | -0.014 | -0.016 |
| | **[0.034]** | [0.183] | [0.201] |
| Y Dum | YES | YES | YES |
| I Dum | YES | YES | YES |
| $R^2$ | 24.61% | 25.51% | 41.45% |
| N | 459 | 266 | 193 |

Table 1.9: Acquirer Buy-and-Hold Returns – Regression Analysis

The dependent variable is the BHAR over a five year period. The benchmark return adjustments are based on style-matched firms according to size and book to market ratio. MVA is the log of market value of assets. ROA is EBIT over total assets. D_Stock is an indicator variable set equal to one if the deal was financed with stock. T_Offer is an indicator variable set equal to one if the deal was a tender offer. Focus is an indicator variable set equal to one if the merger was focus increasing. Out_State is a dummy variable equal to one if the target was listed in a different state to the bidder. PPS_D is a dummy variable if the acquirer had high pay-for-performance sensitivity. Year dummies (Y Dum) and industry dummies (I Dum) are employed. P-values are reported in brackets are adjusted for heteroscedasticity. Boldface indicates significance level at 10% or better.

| | **1994-2010** | | | **1994-07.2002** | | | **08.2002-2010** | | |
|---|---|---|---|---|---|---|---|---|---|
| | All | Listed | Non-Listed | All | Listed | Non-Listed | All | Listed | Non-Listed |
| | Deals | Targets | Targets | Deals | Targets | Targets | Deals | Targets | Targets |
| MVA | 0.016 | 0.027 | 0.009 | 0.037 | 0.065 | 0.091 | 0.015 | -0.052 | -0.071 |
| | [0.688] | [0.569] | [0.901] | [0.542] | [0.369] | [0.453] | [0.757] | [0.297] | [0.461] |
| ROA | 1.088 | 0.674 | 1.054 | 1.598 | 0.915 | 1.127 | 0.815 | 0.901 | 0.101 |
| | **[0.087]** | [0.408] | [0.312] | [0.129] | [0.559] | [0.436] | [0.336] | [0.244] | [0.947] |
| Stock | 0.019 | -0.071 | 0.286 | -0.031 | -0.037 | 0.401 | 0.313 | 0.456 | -0.078 |
| | [0.882] | [0.673] | [0.192] | [0.874] | [0.881] | [0.153] | [0.121] | **[0.061]** | [0.834] |
| Tender | -0.093 | -0.088 | -0.632 | 0.086 | 0.068 | -1.885 | -0.407 | -0.424 | -0.583 |
| | [0.513] | [0.591] | [0.431] | [0.683] | [0.783] | [0.144] | **[0.047]** | **[0.042]** | [0.565] |
| Focus | 0.258 | 0.371 | 0.041 | 0.411 | 0.521 | 0.254 | -0.036 | -0.011 | -0.289 |
| | **[0.012]** | **[0.004]** | [0.805] | **[0.011]** | **[0.008]** | [0.323] | [0.783] | [0.939] | [0.164] |
| Out_State | 0.041 | -0.011 | 0.035 | -0.038 | -0.075 | -0.302 | 0.264 | 0.155 | 0.673 |
| | [0.732] | [0.944] | [0.858] | [0.824] | [0.739] | [0.298] | [0.105] | [0.412] | **[0.011]** |
| PPS_D | 0.276 | 0.326 | 0.145 | 0.312 | 0.464 | 0.001 | 0.359 | 0.333 | 0.499 |
| | **[0.026]** | **[0.028]** | [0.497] | **[0.100]** | **[0.044]** | [0.984] | **[0.021]** | **[0.061]** | **[0.052]** |
| Y Dum | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| I Dum | YES | YES | NO | YES | YES | NO | YES | NO | NO |
| $R^2$ | 22.38% | 31.45% | 19.99% | 27.55% | 42.11% | 24.94% | 36.41% | 19.19% | 42.97% |
| N | 459 | 273 | 186 | 266 | 160 | 106 | 193 | 113 | 80 |

Table 1.10: Acquirer Factor Regressions

Factor regressions for return difference between acquirers with high PPS and low PPS. The calendar-time period considered in this analysis represents a maximum of 60 months for each acquisition. The dependent variable is the difference in returns between portfolios of high and low PPS:

$$R_{HPPS} - R_{LPPS} = a + b(R_{mt} - R_{ft}) + cSMB_t + dHML_t + eUMD_t + fLIQ_t + e_t$$

where $R_{mt}$ is the return on the CRSP value-weighted market index in month t, $R_{ft}$ is the monthly return on three month Treasury bill in month t, $SMB_t$ is the difference in the returns of small stock and big stocks in month t. $HML_t$ is the difference in returns of high book-to-market stocks and low book-to-market stocks in month t. $UMD_t$ is the momentum factor in month t, and $LIQ_t$ is the liquidity level in month t. P-values are reported in brackets. Boldface indicates significance level at 10% or better.

| | **1994-2010** | **1994-2010** | **1994-07.2002** | **1994-07.2002** | **08.2002-2010** | **08.2002-2010** |
|---|---|---|---|---|---|---|
| Variable | 3-Factor | 5-Factor | 3-Factor | 5-Factor | 3-Factor | 5-Factor |
| Intercept | 0.0038 | 0.0041 | 0.0052 | 0.0047 | 0.0053 | 0.0049 |
| | **[0.083]** | **[0.082]** | **[0.091]** | [0.147] | **[0.092]** | [0.115] |
| MKTRF | 0.148 | 0.131 | 0.123 | 0.273 | 0.066 | -0.017 |
| | **[0.003]** | **[0.016]** | [0.133] | **[0.001]** | [0.415] | [0.842] |
| SMB | 0.298 | 0.301 | 0.286 | 0.273 | 0.394 | 0.403 |
| | **[<0.001]** | **[<0.001]** | **[0.008]** | **[0.001]** | **[0.011]** | **[0.008]** |
| HML | -0.338 | -0.348 | -0.425 | -0.429 | -0.202 | -0.201 |
| | **[<0.001]** | **[<0.001]** | **[0.002]** | **[0.003]** | **[0.136]** | [0.164] |
| UMD | | -0.037 | | 0.037 | | -0.164 |
| | | [0.397] | | [0.525] | | **[0.011]** |
| LIQ | | 0.016 | | 0.036 | | 0.077 |
| | | [0.766] | | [0.677] | | [0.324] |
| Adj $R^2$ | 29.89% | 28.49% | 34.72% | 34.11% | 7.37% | 11.11% |

Table 2.1: Acquisitions by Year and Industry

The sample consists of 183 completed acquisitions announced during 1988 to 2008. The bidders are listed on SDC database. Panel A breaks the sample by year. Panel B breaks the sample by industry.

**Panel A : Distribution by Year**

| Year | Frequency | Percent |
|---|---|---|
| 1988 | 5 | 2.73 |
| 1989 | 4 | 2.19 |
| 1990 | 4 | 2.19 |
| 1993 | 3 | 1.64 |
| 1994 | 5 | 2.73 |
| 1995 | 2 | 1.09 |
| 1996 | 10 | 5.46 |
| 1997 | 14 | 7.65 |
| 1998 | 21 | 11.48 |
| 1999 | 31 | 16.94 |
| 2000 | 15 | 8.20 |
| 2001 | 15 | 8.20 |
| 2002 | 5 | 2.73 |
| 2003 | 12 | 6.56 |
| 2004 | 9 | 4.92 |
| 2005 | 12 | 6.56 |
| 2006 | 11 | 6.01 |
| 2007 | 3 | 1.64 |
| 2008 | 2 | 1.09 |
| TOTAL | 183 | 100.00 |

Table 2.1: Acquisitions by Year and Industry (Continued)

| Panel B : Distribution by Industry | Frequency | Percent |
|---|---|---|
| Aircraft | 1 | 0.55 |
| Apparel | 1 | 0.55 |
| Automobiles and Trucks | 5 | 2.73 |
| Business Services | 31 | 16.94 |
| Candy & Soda | 1 | 0.55 |
| Chemicals | 3 | 1.64 |
| Communication | 8 | 4.37 |
| Computers | 22 | 12.02 |
| Construction | 3 | 1.64 |
| Construction Materials | 1 | 0.55 |
| Consumer Goods | 2 | 1.09 |
| Defense | 1 | 0.55 |
| Electronic Equipment | 25 | 13.66 |
| Entertainment | 3 | 1.64 |
| Fabricated Products | 1 | 0.55 |
| Food Products | 3 | 1.64 |
| Healthcare | 2 | 1.09 |
| Insurance | 2 | 1.09 |
| Machinery | 5 | 2.73 |
| Measuring and Control Equipment | 6 | 3.28 |
| Medical Equipment | 8 | 4.37 |
| Personal Services | 1 | 0.55 |
| Petroleum and Natural Gas | 10 | 5.46 |
| Pharmaceutical Products | 18 | 9.84 |
| Printing and Publishing | 2 | 1.09 |
| Recreation | 3 | 1.64 |
| Retail | 2 | 1.09 |
| Shipbuilding, Railroad Equipment | 1 | 0.55 |
| Steel Works Etc. | 3 | 1.64 |
| Textiles | 1 | 0.55 |
| Trading | 1 | 0.55 |
| Transportation | 1 | 0.55 |
| Utilities | 1 | 0.55 |
| Wholesale | 5 | 2.73 |
| TOTAL | 183 | 100 |

Table 2.2: Summary Statistic by Weak and Strong Customer/Supplier Relationship

The table presents summary statistics. Panel A presents summary statistics for suppliers that have a strong/weak relationship with a customer. Panel B presents the summary statistics of customers that are associated with suppliers that demonstrate strong/weak relationships. Panel C presents the summary statistics of rivals that are associated with suppliers that demonstrate strong/weak relationships. Rivals are firms whose primary four-digit SIC code is equal to the target (supplier) firms. All variables are defined in Appendix A. To control for the possible effect of outliers, all variables are winsorized at the 1% and 99% level. $^{*}$, $^{**}$ and $^{***}$ denote significance at the 10%, 5% and 1% level, respectively.

| Panel A Suppliers | | **Strong_SR** | | | **Weak_SR** | | **Diff.** |
|---|---|---|---|---|---|---|---|
| Variables | N | Mean | STD | N | Mean | STD | Mean |
| AGE | 74 | 12.73 | 11.35 | 109 | 14.85 | 16.51 | -2.12 |
| R&D | 74 | 15.45% | 19.06% | 109 | 6.14% | 8.57% | 9.31%*** |
| PATE | 74 | 10.14 | 22.03 | 109 | 8.36 | 20.78 | 1.78 |
| HHI | 74 | 6.31 | 7.49 | 109 | 5.86 | 5.31 | 0.45 |
| FCF | 74 | -17.61% | 37.27% | 109 | -4.82% | 19.11% | -12.79%*** |
| DIST | 74 | 1042 | 873 | 109 | 903 | 810 | 139 |
| TOBIN | 74 | 3.07 | 2.55 | 109 | 2.22 | 1.99 | 0.85*** |
| PRET | 74 | 2.08% | 8.07% | 109 | 2.38% | 6.66% | -0.30% |
| RETVOL | 74 | 21.62% | 14.03% | 109 | 18.47% | 18.47% | 3.15%* |
| DEFENSE | 74 | 17.56% | 38.31% | 109 | 13.76% | 34.61% | 3.80% |
| FOCUS | 74 | 35.14% | 48.07% | 109 | 28.44% | 45.32% | 6.70% |
| STOCK | 74 | 43.24% | 49.88% | 109 | 30.27% | 46.16% | 12.97%*** |
| TENDER | 74 | 17.57% | 38.34% | 109 | 21.11% | 40.99% | -3.54% |

| Panel B Customers | | **Strong_SR** | | | **Weak_SR** | | Diff. |
|---|---|---|---|---|---|---|---|
| Variables | N | Mean | STD | N | Mean | STD | Mean |
| AGE | 74 | 24.86 | 17.18 | 109 | 25.62 | 16.11 | -0.76 |
| R&D | 74 | 3.36% | 6.02% | 109 | 2.18% | 4.26% | 1.18% |
| PATE | 74 | 58.58 | 196 | 109 | 11.88 | 29.65 | 46.7** |
| HHI | 74 | 5.41 | 4.41 | 109 | 5.95 | 5.82 | -0.54 |
| FCF | 74 | -0.51% | 12.58% | 109 | 0.92% | 8.67% | -1.43% |
| DIST | 74 | 1041 | 873 | 109 | 903 | 810 | 138 |
| TOBIN | 74 | 2.09 | 2.22 | 109 | 2.01 | 2.31 | 0.08 |
| PRET | 74 | 1.56% | 45.41% | 109 | 4.27% | 41.46% | -2.71% |
| RETVOL | 74 | 11.39% | 7.82% | 109 | 11.44% | 7.76% | -0.05% |
| DEFENSE | 74 | 17.56% | 38.31% | 109 | 13.76% | 34.61% | 3.80% |
| FOCUS | 74 | 35.14% | 48.07% | 109 | 28.44% | 45.32% | 6.70% |
| STOCK | 74 | 43.24% | 49.88% | 109 | 30.27% | 46.16% | 12.97%*** |
| TENDER | 74 | 17.56% | 38.34% | 109 | 21.11% | 40.99% | -3.55% |

Table 2.2: Summary Statistic by Weak and Strong Customer/Supplier Relationship (Continued)

| Panel C Rivals | | **Strong_SR** | | | **Weak_SR** | | Diff. |
|---|---|---|---|---|---|---|---|
| Variables | N | Mean | STD | N | Mean | STD | Mean |
| AGE | 3988 | 12.42 | 10.44 | 4856 | 12.05 | 10.19% | 0.37* |
| R&D | 3988 | 14.32% | 18.68% | 4856 | 11.39% | 13.82% | 2.93%*** |
| PATE | 3988 | 7.09 | 31.51 | 4856 | 6.38 | 29.32 | 0.71 |
| HHI | 3988 | 4.19 | 2.19 | 4856 | 4.38 | 1.93 | -0.19 |
| FCF | 3988 | -17.18% | 38.84% | 4856 | -14.34% | 36.73% | -2.84%*** |
| DIST | 3988 | 1005 | 966 | 4856 | 1058 | 970 | -53 |
| TOBIN | 3988 | 1.81 | 2.29 | 4856 | 1.84 | 2.31 | -0.03 |
| PRET | 3988 | 0.01% | 71.21% | 4856 | -10.77% | 80.67% | 10.78%*** |
| RETVOL | 3988 | 18.33% | 12.79% | 4856 | 20.27% | 14.34% | -1.94%*** |
| DEFENSE | 3988 | 16.11% | 36.76% | 4856 | 15.34% | 36.05% | 0.77% |
| FOCUS | 3988 | 52.88% | 49.99% | 4856 | 41.41% | 49.27% | 11.47%*** |
| STOCK | 3988 | 51.11% | 49.98% | 4856 | 39.66% | 48.93% | 11.45%*** |
| TENDER | 3988 | 11.97% | 32.46% | 4856 | 11.64% | 32.09% | 0.33% |

Table 2.3: Summary Statistics on Acquirer Returns

The table summarizes acquirer, target (supplier), customer and rival returns, CAR over a three day period (-1 to +1) for different groups. It also presents the merger premiums. Panel A presents CARs for acquirers that acquire suppliers with strong/weak relationship with a customer. Panel B presents CARs for suppliers that have a strong/weak relationship with a customer. Panel C presents CARs of customers that are associated with suppliers that demonstrate strong/weak relationships. Panel D presents CARs of rivals that are associated with suppliers that demonstrate strong/weak relationships. Panel E presents merger premiums. Rivals are firms whose primary four-digit SIC code is equal to the target (supplier) firms. All independent variables are as defined in Appendix A. To control for the possible effect of outliers, CARs are winsorized at the 1% and 99% level. P-values are reported in brackets. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

| **Panel A** | | Acquirer CARs (-1,+1) | | | | |
|---|---|---|---|---|---|---|
| | n | Mean | STD | Min | Max | p-value |
| WEAK_SR | 109 | -2.26% | 10.23% | -39.84% | 21.48% | **[0.02]** ** |
| STRONG_SR | 74 | -2.49% | 9.86% | -39.10% | 23.04% | **[0.03]** ** |
| T-Test | | -0.23% | | | | |
| | | [0.88] | | | | |

| **Panel B** | | Supplier CARs (-1,+1) | | | | |
|---|---|---|---|---|---|---|
| | n | Mean | STD | Min | Max | p-value |
| WEAK_SR | 109 | 19.54% | 21.82% | -32.88% | 77.50% | **[0.01]** *** |
| STRONG_SR | 74 | 30.45% | 32.83% | -38.11% | 146.81% | **[0.01]** *** |
| T-Test | | 10.91% | | | | |
| | | **[0.01]** *** | | | | |

| **Panel C** | | Customer CARs(-1,+1) | | | | |
|---|---|---|---|---|---|---|
| | n | Mean | STD | Min | Max | p-value |
| WEAK_SR | 109 | 0.21% | 4.99% | -17.59% | 22.30% | [0.65] |
| STRONG_SR | 74 | -0.91% | 3.98% | -17.31% | 6.76% | **[0.05]** ** |
| T-Test | | -1.12% | | | | |
| | | **[0.09]** * | | | | |

| **Panel D** | | Rival CARs (-1,+1) | | | | |
|---|---|---|---|---|---|---|
| | n | Mean | STD | Min | Max | p-value |
| WEAK_SR | 4856 | 0.03% | 10.08% | -149.17% | 158.84% | [0.86] |
| STRONG_SR | 3988 | 0.29% | 9.21% | -68.13% | 142.61% | **[0.04]** ** |
| T-Test | | 0.26% | | | | |
| | | [0.19] | | | | |

Table 2.3: Summary Statistics on Acquirer Returns (Continued)

| **Panel E** | | | Merger Premium | | | |
|---|---|---|---|---|---|---|
| | n | Mean | STD | Min | Max | p-value |
| WEAK_SR | 109 | 65.19% | 60.47% | -27.79% | 374.62% | **[0.01]** *** |
| STRONG_SR | 74 | 80.62% | 80.89% | -94.17% | 434.86% | **[0.01]** *** |
| T-Test | | 15.43% | | | | |
| | | [0.14] | | | | |

Table 2.4: Supplier Returns – Regression Analysis

The dependent variable is the CAR over a three day period (-1 to +1). In Model 1-3 the information relates to the supplier firms. All independent variables are as defined in Appendix A. To control for the possible effect of outliers, all variables are winsorized at the 1% and 99% level. P-values are reported in brackets. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

| Variable | Supplier 1 | Supplier 2 | Supplier 3 | Supplier 4 |
|---|---|---|---|---|
| STRONG_SR | 10.17 | 10.53 | 12.34 | 12.56 |
| | **[0.046]** ** | **[0.036]** ** | **[0.019]** ** | **[0.018]** ** |
| STRONG_ARC | | | | 3.58 |
| | | | | [0.618] |
| AGE | -0.41 | -0.36 | -0.51 | -0.52 |
| | **[0.017]** ** | **[0.037]** ** | **[0.011]** ** | **[0.009]** *** |
| R&D | -0.01 | 0.04 | -0.02 | -0.02 |
| | [0.996] | [0.871] | [0.935] | [0.941] |
| LNPAT | 0.92 | 0.42 | 0.219 | 0.18 |
| | [0.86] | [0.939] | [0.961] | [0.978] |
| HHI | -0.39 | -0.35 | -0.45 | -0.44 |
| | [0.38] | [0.429] | [0.338] | [0.343] |
| FCF | 0.25 | 0.23 | 0.21 | 0.21 |
| | **[0.041]** ** | **[0.049]** ** | **[0.091]** * | [0.103] |
| LNDIST | -2.27 | -2.22 | -2.21 | -2.21 |
| | **[0.091]** * | **[0.089]** * | [0.109] | [0.108] |
| LNMKTCAP | 0.18 | -0.41 | -0.63 | -0.81 |
| | [0.923] | [0.841] | [0.781] | [0.723] |
| TOBIN | -0.96 | -0.52 | -0.85 | -0.79 |
| | [0.431] | [0.676] | [0.497] | [0.535] |
| PRET | -0.14 | -0.17 | -0.06 | -0.09 |
| | [0.714] | [0.651] | [0.885] | [0.832] |
| RETVOL | 0.35 | 0.39 | 0.41 | 0.41 |
| | [0.151] | [0.109] | [0.109] | [0.111] |
| FOCUS | | -2.67 | -1.73 | -2.01 |
| | | [0.591] | [0.748] | [0.713] |
| STOCK | | -10.79 | -8.63 | -8.33 |
| | | **[0.042]** ** | [0.131] | [0.148] |
| TENDER | | 10.18 | 12.44 | 12.81 |
| | | **[0.100]** * | **[0.061]** * | **[0.056]** * |
| DEFENSE | | 3.93 | 6.17 | 5.88 |
| | | [0.556] | [0.368] | [0.393] |
| FIXED EFFECTS (YEAR, INDUSTRY) | YES | YES | YES | YES |
| $R^2$ | 39.86% | 44.79% | 47.66% | 47.78% |
| N | 183 | 183 | 170 | 170 |

Table 2.5: Customer, Rival and Competing Rival Returns – Regression Analysis

The dependent variable is the CAR over a three day period (-1 to +1). In Model 1 the information relates to the customer firms around important suppliers, Model 2 the rival firms around important suppliers and Model 3 for competing rivals. All independent variables are as defined in Appendix A. To control for the possible effect of outliers, all variables are winsorized at the 1% and 99% level. P-values are reported in brackets. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

| Variable | Customer 1 | Rival 2 | Rival 3 |
|---|---|---|---|
| STRONG_RR | | | -1.64 |
| | | | **[0.069]** * |
| STRONG_SR | -1.49 | 0.62 | |
| | **[0.091]** * | **[0.004]** *** | |
| AGE | -0.05 | -0.01 | -0.01 |
| | [0.151] | [0.898] | [0.858] |
| R&D | -0.09 | 0.01 | 0.01 |
| | [0.418] | [0.441] | [0.661] |
| LNPAT | -0.61 | 0.08 | 0.08 |
| | **[0.071]** * | [0.399] | [0.425] |
| HHI | -0.09 | -0.04 | -0.02 |
| | [0.395] | [0.712] | [0.859] |
| FCF | 0.02 | 0.01 | 0.01 |
| | [0.666] | **[0.002]** *** | **[0.001]** *** |
| LNDIST | -0.37 | -0.02 | -0.01 |
| | [0.153] | [0.619] | [0.717] |
| LNMKTCAP | 0.72 | 0.04 | 0.03 |
| | **[0.037]** ** | [0.381] | [0.519] |
| TOBIN | -0.48 | 0.03 | 0.04 |
| | **[0.051]** * | [0.489] | [0.362] |
| PRET | -0.01 | -0.02 | -0.01 |
| | [0.471] | **[0.001]** *** | **[0.001]** *** |
| RETVOL | 0.03 | -0.02 | -0.02 |
| | [0.667] | **[0.035]** ** | **[0.013]** ** |
| FOCUS | 0.71 | -0.33 | -0.18 |
| | [0.431] | [0.126] | [0.393] |
| STOCK | -1.24 | 0.14 | 0.27 |
| | [0.216] | [0.517] | [0.259] |
| TENDER | -0.94 | -0.21 | -0.09 |
| | [0.391] | [0.633] | [0.757] |
| DEFENSE | 0.77 | -0.73 | -0.67 |
| | [0.514] | **[0.019]** * | **[0.031]** ** |
| FIXED EFFECTS (YEAR, INDUSTRY) | YES | YES | YES |
| $R^2$ | 28.13% | 3.01% | 2.96% |
| N | 183 | 8844 | 8844 |

Table 2.6: Bootstrapped Supplier and Customer Returns

The table presents the results of the bootstrap using the resampling residual method based on 1000 iterations of the model presented in Table 3. The first number is the 95% percentile interval from the 2.5$^{th}$ percentile to the 97.5$^{th}$ percentile. The second number is the mean. In Model 1 the information relates to the supplier firms, in Model 2 to the customer firms around important suppliers. All independent variables are as defined in Appendix A. To control for the possible effect of outliers, all variables are winsorized at the 1% and 99% level. $^{*}$, $^{**}$ and $^{***}$ denote significance at the 10%, 5% and 1% level, respectively.

| Variable | Supplier<br>1 | Customer<br>2 |
|---|---|---|
| STRONG_SR | (2.82, 17.79)<br>**10.38**$^{***}$ | (-3.01, -0.02)<br>**-1.47**$^{***}$ |
| AGE | (-0.61, -0.08)<br>-0.36$^{***}$ | (-0.12, 0.01)<br>-0.06$^{***}$ |
| R&D | (-0.38, 0.42)<br>0.03$^{***}$ | (-0.26, 0.09)<br>-0.09$^{***}$ |
| LOGPAT | (-7.87, 9.72)<br>0.69$^{***}$ | (-1.18, 0.08)<br>-0.61$^{***}$ |
| HHI | (-1.01, 0.35)<br>0.35$^{***}$ | (-0.29, 0.09)<br>-0.09$^{***}$ |
| FCF | (0.05, 0.42)<br>0.23$^{***}$ | (-0.05, 0.09)<br>0.02$^{***}$ |
| LNDIST | (-4.28, -0.17)<br>-2.21$^{***}$ | (-0.81, 0.05)<br>-0.37$^{***}$ |
| LNMKTCAP | (-3.71, 2.86)<br>-0.48$^{***}$ | (0.09, 1.26)<br>0.71$^{***}$ |
| TOBIN | (-2.51, 1.43)<br>-0.53$^{***}$ | (-0.85, -0.06)<br>-0.47$^{***}$ |
| PRET | (-0.76, 0.47)<br>0.18$^{***}$ | (-0.02, 0.01)<br>-0.01$^{***}$ |
| RETVOL | (0.03, 0.77)<br>0.39$^{***}$ | (-0.11, 0.15)<br>0.03$^{***}$ |
| FOCUS | (-11.19, 4.92)<br>-2.74$^{***}$ | (-0.77, 2.17)<br>0.74$^{***}$ |
| STOCK | (-19.19, -2.29)<br>-10.87$^{***}$ | (-2.83, 0.37)<br>-1.24$^{***}$ |
| TENDER | (1.01, 20.62)<br>10.13$^{***}$ | (-2.75, 0.85)<br>-0.99$^{***}$ |
| DEFENSE | (-5.67, 13.94)<br>4.05$^{***}$ | (-1.39, 2.71)<br>0.74$^{***}$ |
| FIXED EFFECTS (YEAR, INDUSTRY) | YES | YES |
| N | 1000 | 1000 |

Table 2.7: Acquirer Premium – Regression Analysis

The dependent variable is the merger premium. The merger premium is defined as the four-week pre-announcement premium. It equals the difference between the initial bid price and the target market price four weeks before the initial merger announcement divided by the same target price four weeks prior to the announcement. All independent variables are as defined in Appendix A. To control for the possible effect of outliers, all variables are winsorized at the 1% and 99% level. P-values are reported in brackets. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

| Variable | Premium<br>(1) |
|---|---|
| STRONG_SR | 20.75 |
| | **[0.084]** * |
| AGE | -0.22 |
| | [0.591] |
| R&D | -1.14 |
| | **[0.061]** * |
| LNPAT | 10.06 |
| | [0.441] |
| HHI | -1.38 |
| | [0.195] |
| FCF | -0.39 |
| | [0.156] |
| LNDIST | -7.14 |
| | **[0.023]** ** |
| LNMKTCAP | -2.26 |
| | [0.587] |
| TOBIN | 0.51 |
| | [0.868] |
| PRET | -0.07 |
| | [0.938] |
| RETVOL | 0.69 |
| | [0.227] |
| FOCUS | 6.14 |
| | [0.607] |
| STOCK | -27.82 |
| | **[0.029]** ** |
| TENDER | -18.94 |
| | [0.201] |
| DEFENSE | 8.09 |
| | [0.612] |
| FIXED EFFECTS (YEAR, INDUSTRY) | YES |
| $R^2$ | 49.14% |
| N | 183 |

Table 2.8: Logit Regression Explaining Strength of Supplier Ties

The table shows the results from the multinomial logit model. The dependent variable takes a value of one if a supplier was acquired; zero otherwise. All independent variables are as defined in Appendix A. To control for the possible effect of outliers, all variables are winsorized at the 1% and 99% level. P-values are reported in brackets. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

| Variable | Supplier (1) |
|---|---|
| STRONG_SR | -0.35 |
| | **[0.041]** ** |
| AGE | -0.01 |
| | [0.169] |
| R&D | 0.02 |
| | **[0.009]** *** |
| LNPAT | -0.87 |
| | **[0.001]** *** |
| HHI | 0.04 |
| | [0.338] |
| FCF | 0.01 |
| | **[0.100]** * |
| LNDIST | -0.03 |
| | [0.519] |
| LNMKTCAP | 0.19 |
| | **[0.001]** *** |
| TOBIN | -0.05 |
| | [0.265] |
| PRET | 0.03 |
| | **[0.061]** * |
| RETVOL | -0.01 |
| | [0.839] |
| FIXED EFFECTS (YEAR, INDUSTRY) | YES |
| $R^2$ | 12.77% |
| N | 3868 |

Table 2.9: Acquirer Buy-and-Hold Returns

The table reports the aggregate mean and median buy-and hold abnormal returns, BHARs (over five years) for firms that have acquired suppliers that have a strong relationship with a customer versus ones that did not. The benchmark return adjustments are based on either the CRSP value-weighted index (Panel A - Market Adjusted) or style-matched firms according to size and book to market ratio (Panel B - Style Adjusted). To control for the possible effect of outliers, BHARs are winsorized at the 1% and 99% level. P-values are reported in brackets. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

| **Panel A- Market** | | | BHAR (1,60) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | n | Mean | Median | STD | Min | Max | p-value (Mean) | p-value (Median) |
| WEAK_SR | 109 | 1.66% | -0.01% | 22.48% | -68.36% | 85.49% | [0.447] | [0.989] |
| STRONG_SR | 74 | -15.56% | -27.46% | 76.19% | -166.39% | 194.22% | **[0.083]** * | **[0.011]** ** |
| T-Test | | -17.22% | | | | | | |
| | | **[0.032]** ** | | | | | | |
| Signed-Rank | | | -27.45% | | | | | |
| | | | **[0.001]** *** | | | | | |

| **Panel B- Style** | | | BHAR (1,60) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | n | Mean | Median | STD | Min | Max | p-value (Mean) | p-value (Median) |
| WEAK_SR | 109 | -0.50% | -0.05% | 24.25% | -111.23% | 76.45% | [0.813] | [0.634] |
| STRONG_SR | 74 | -16.76% | -24.85% | 77.71% | -170.58% | 213.92% | **[0.067]** * | **[0.015]** ** |
| T-Test | | -16.26% | | | | | | |
| | | **[0.049]** ** | | | | | | |
| Signed-Rank | | | -24.80% | | | | | |
| | | | **[0.001]** *** | | | | | |

Table 2.10: Logit Regressions Explaining Retention of Suppliers

The table shows the results from the multinomial logit model. The dependent variable takes a value of one if the combined firm is a supplier to the customer following the merger; zero otherwise. All independent variables are as defined in Appendix A. To control for the possible effect of outliers, all variables are winsorized at the 1% and 99% level. P-values are reported in brackets. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

| Variable | Supplier (1) | Acquirer (2) | Acquirer (3) |
|---|---|---|---|
| STRONG_ARC | | | 6.89 |
| | | | [0.111] |
| STRONG_AR | | 3.15 | |
| | | **[0.001]** *** | |
| STRONG_SR | 0.44 | | |
| | [0.441] | | |
| AGE | 0.01 | 0.02 | 0.02 |
| | [0.813] | [0.554] | [0.529] |
| R&D | 0.02 | -0.01 | -0.01 |
| | [0.553] | [0.931] | [0.867] |
| LOGPAT | 0.211 | 0.27 | -0.01 |
| | [0.644] | **[0.084]** * | [0.967] |
| HHI | -0.02 | -0.03 | 0.18 |
| | [0.722] | [0.679] | [0.198] |
| FCF | 0.01 | -0.02 | -0.04 |
| | [0.868] | [0.367] | [0.143] |
| LNDIST | -0.04 | 0.08 | 0.519 |
| | [0.824] | [0.382] | **[0.061]** * |
| LNMKTCAP | -0.18 | -0.31 | -0.33 |
| | [0.356] | **[0.091]** * | [0.157] |
| TOBIN | -0.23 | 0.03 | 0.05 |
| | [0.331] | [0.881] | [0.931] |
| PRET | 0.08 | -0.01 | 0.17 |
| | **[0.028]** ** | [0.881] | [0.267] |
| RETVOL | -0.05 | -0.04 | -0.04 |
| | **[0.041]** ** | [0.221] | [0.516] |
| FOCUS | 0.63 | 0.49 | 1.43 |
| | [0.245] | [0.448] | [0.291] |
| STOCK | -0.37 | -0.17 | 0.05 |
| | [0.567] | [0.801] | [0.978] |
| TENDER | -0.89 | -0.78 | 2.69 |
| | [0.308] | [0.351] | [0.312] |
| DEFENSE | 0.19 | 0.79 | 1.11 |
| | [0.819] | [0.435] | [0.491] |
| FIXED EFFECTS (YEAR, INDUSTRY) | NO | NO | NO |
| $R^2$ | 12.97% | 31.13% | 20.56% |
| N | 183 | 183 | 170 |

Table 2.11: Difference in Performance between Retained and Terminated Suppliers

The table reports median buy-and hold abnormal returns (over five years) for combined firms that have acquired suppliers that did have a strong customer relationship (STRONG_SR) versus ones that did not (WEAK_SR). The groups are further subdivided on the basis of combined firm retention (retained) versus termination (terminated) post-merger. The benchmark return adjustments are based on either the CRSP value-weighted index (Market Adjusted) or style-matched firms according to size and book to market ratio. The analysis is repeated for acquires that had strong relationship with customers (STRONG_AR) versus ones that did not (WEAK_AR). P-values are reported in brackets. $^{*}$, $^{**}$ and $^{***}$ denote significance at the 10%, 5% and 1% level, respectively.

| | STRONG_SR | | | STRONG_AR | | |
|---|---|---|---|---|---|---|
| | Terminated | Retained | Diff. | Terminated | Retained | Diff. |
| Market Adj. | -24.70% | -30.74% | -6.04% | -15.26% | 2.56% | **17.82%**$^{*}$ |
| Style Adj. | -23.32% | -31.67% | -8.35% | -9.48% | 1.65% | 11.13% |
| N | 65 | 9 | | 5 | 8 | |
| | WEAK_SR | | | WEAK_AR | | |
| | Terminated | Retained | Diff. | Terminated | Retained | Diff. |
| Market Adj. | -1.56% | 0.13% | 1.69% | -2.88% | -2.76% | 0.12% |
| Style Adj. | -0.78% | 0.50% | 1.28% | -3.23% | -7.49% | -4.26% |
| N | 98 | 11 | | 158 | 12 | |

Figure 1: PPS and PEI Over Time

The figure represents the pay-for-performance, PPS ((the change in CEO wealth (in dollars) for a $1000 change in firm value)) and portfolio equity incentive, PEI ((the change in CEO wealth (in thousands) for a 1% change in firm value)) through time.