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Strategic risk-taking and value creation: Evidence from the market for corporate control

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ABSTRACT

In a large sample of U.S. M & As over 1990–2007 we find that the bidders' poor governance leads to lower levels of internal and external risk-taking, but the risk propensity of target firms does not appear to be compromised by their governance structure. Further, value is created when risk-takers acquire risk-avoiding target firms, but it is destroyed when bidders with a conservative investment policy takeover risk-taking target firms. This value effect is particularly pronounced when bidders are relatively better governed. Thus, our study offers new direct evidence that strategic risk transfer is an important channel of value creation in M & As.

1. Introduction

An important finding from recent studies on agency frictions is that corporate managers tend to choose sub-optimal risk in investment to preserve their private benefits and appease creditors, government agencies and labor unions. This indicates that firms are characterized by varying degrees of risk avoidance in their operations. In this environment, what drives value creation is not simply the set of investment opportunities per se available to a firm but also the willingness and ability of its managers to exploit those growth options. We distinguish between two types of firms: a risk-taker who takes on positive-NPV projects even if they are risky, and a risk-avoider who rejects even positive-NPV projects because they are risky. In this setting, a risk-taker without rich investment prospects embedded in assets in place can divest them and acquire a firm that has a better endowment consisting of profitable but risky projects but has failed to exploit those opportunities. This intuition is in the spirit of (but distinct from) the neoclassical theory (also called the Q hypothesis) of takeovers which predicts that mergers create value when bidders with better investment opportunities or more efficient management acquire underperforming target firms or those with poor business opportunities and redeploy their assets to more productive uses. Motivated by this insight, we propose and test a novel and intuitive argument that the stock market reacts positively when a risk-taker announces the takeover of a risk-avoiding firm, anticipating that the corporate resources of the target firm would be reallocated to riskier and productive uses. In contrast, investors will be disappointed and react negatively when a risk-avoider in pursuit of private benefits seeks to acquire a risk-taker. Further, we expect this value effect to be stronger when the risk-taking acquirer is better governed than the risk-avoiding target firm. Our basic insight underlying this *risk transfer hypothesis* is that target firms which suffer from excess risk avoidance are worth more to acquirers that can potentially restructure the operations of conservative targets to generate value.

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Prior studies underscore that corporate insiders, dominant investors, and non-equity stakeholders have a natural preference for making suboptimal risk choices in corporate investment from the perspectives of equity investors. The underlying motives include preserving private benefits and the undiversified human capital of manages (Morck, Wolfezon, & Yeung, 2000; Stulz, 2005; John, Litov, & Yeung (2008)), reducing the risk of financial distress and adverse career prospects of managers including dismissal (Amihud & Lev, 1981; Hirshleifer & Thakor, 1992; Holmstrom & Ricart I Costa, 1986; May, 1995), safeguarding the interests of non-equity stakeholders such as organized labor, banks, and the government (Morck & Nakamura, 1999), and strengthening creditor rights by undertaking risk-reducing acquisitions which entail diversification across industries and target firms with high asset recovery values (Acharya, Amihud, & Litov, 2011).

Recent finance literature led by the seminal work of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998) highlights the role of investor protection in curbing the influence of the forces favoring reduced risk-taking in corporate capital structure and investment policies. Poor investor protection leads to the emergence of dominant stockholders to monitor managers (Burkart, Panunzi, & Shleifer, 2003), tends to increase cost of capital and lower investment (Shleifer & Wolfezon, 2002; Hail & Leuz, 2006), and is associated with low level of informed risk arbitrage resulting in poor resource allocation (Morck, Yeung, & Yu, 2000; Durnev, Morck, & Yeung, 2004). John et al. (2008) argue that corporate governance mechanisms that weaken investor protection can dampen corporate risk-taking in investment and growth. In a study of Chinese firms, Huang and Wang (2015) find that firms with smaller boards (good governance) are associated with higher risk taking.

In a related line of inquiry, several studies emphasize that the effectiveness of the market for corporate control in mitigating agency conflicts between stockholders and managers depends critically on the governance mechanisms chosen by firms (Gompers, Ishii, & Metrick, 2003; Cremers & Nair, 2005; Core, Guay, & Rusticus, 2006; Lai & Chen, 2014, Liang, Chen, & Chen, 2016; Chung, Hur, & Wang, 2017). Investigating the role of governance in the special case of mergers and acquisitions, Masulis, Wang, and Xie (2007) argue that higher takeover defenses allow bidders to indulge in value-destroying acquisitions, and find that the takeover announcement abnormal returns for bidders are negatively related to their ATPs. Wang and Xie (2009) examine the impact of governance transfer on merger synergy and report that acquisitions of poorly governed targets by well-governed acquirers create more value. However, little is known about the channels that underlie the link between merger synergy and takeover barriers. We extend this line of investigation by focusing on the role of risk-taking behavior of bidders and targets in creating or destroying value through mergers and acquisitions (M & A) and its interaction with corporate governance mechanisms.

The forgoing discussion suggests that firms taking more investment risk prior to merger are endowed with less entrenched managers, more stockholder-friendly governance rules, and less pressure from labor unions, creditors and government to undertake suboptimal risk, as compared to those taking less risk. This environment results in heterogeneous risk propensities across firms, creating rich opportunities for value creation through takeovers. As a first step in the investigation of our primary hypothesis on risk transfer in mergers, we study heterogeneity in operational risk-taking propensities of bidders and targets. Existing evidence indicates that younger, smaller and relatively underperforming firms are more likely to become takeover targets (e.g., Kadyrzhanova & Rhodes-Kropf, 2011). Prior studies suggest that due to these firm characteristics target firms on average are likely to have higher risk propensities as compared to bidders. Moreover, the decision to acquire a firm is exposed to the heightened scrutiny of the market for corporate control, whereas managers enjoy much more leeway in the decision to invest in a standard internal project. Therefore, external risk-taking (via takeovers) is likely to be less sensitive than internal risk-taking to the governance mechanisms of the bidders. To better understand these issues, we construct a widely used proxy for the riskiness of investment choices *(RISK1)* of bidding and target firms prior to bid announcement by measuring the variation (standard deviation) of annual firm-level cash flows scaled by total assets adjusted for contemporaneous corresponding market averages. We ask: (a) Are there systematic differences in risk propensities between bidders and targets prior to bid announcement, particularly with respect to their governance provisions? (b) Turning to external risk-taking (in takeovers), do bidders with more ATPs tend to acquire less risky targets? Next, we investigate the risk transfer hypothesis that investors react positively when a firm with an aggressive investment policy announces a bid for a target firm suffering from excess risk avoidance, but negatively when a conservative (risk-avoiding) bidder seeks to take over a firm with a history of strategic risk-taking.

We estimate risk transfer as the difference between acquirer *RISK1*and target *RISK1*, and governance transfer as the difference between target ATPs and bidder ATPs (consistent with Wang and Xie (2009)). Positive risk transfer reflects that the bidder pursues a strategic, aggressive investment policy relative to the target firm *before* entering the merger transaction, and positive governance transfer indicates that the bidder is better governed than the target. We emphasize that our measures of positive and negative risk transfer are conditioned on investment risk choices made by firms *prior to the takeover, not at the time of merger*.[1] In a merger marked by positive risk transfer, the bidder is a risk-taker (who undertakes a positive-NPV project even if it is risky) and the target is a risk-avoider (who rejects a positive-NPV project because it is risky). By contrast, the bidder is a risk-avoider and the target is a risk-taker in a deal characterized by negative risk transfer. We treat risk-taking and aggressive risk-taking as synonyms, similarly risk-avoider and conservative risk-taker. Further, we estimate cumulative abnormal returns over an 11-day window (event day -5 to $+5$) based on the market model and use the pre-bid market value of equity to construct the value-weighted bid announcement abnormal return of the acquirer and target firms to proxy for total value creation (merger synergy).

Based on a large sample of U.S. mergers completed between 1990 and 2007, our main findings on the determinants of investment risk-taking of bidders and targets are as follows. First, bidders, subject to pressures from creditors and labor unions and insulated by

[1] An alternative way to define risk-taking is to condition it on the level of operational risk chosen at the time of merger. Under this alternative, a bidder who seeks to take over a *riskier target firm* will be classified as a risk-taker. But the definition we employ in this study treats this bidder as a risk-avoider because he pursues a less risky investment policy prior to the merger event.

more anti-takeover provisions, take on significantly less (internal) investment risk prior to merger announcement. A one standard deviation (roughly three provisions) increase in the number of ATPs results in about 7.00% decline in average risk-taking. However, target firms' ATPs are unrelated to their operational risk-taking propensities. This surprising finding with respect to (primarily) internal risk-taking policies suggests that the average target firm's operations are not marred by excess risk avoidance due to governance provisions prior to merger episodes, in sharp contrast to those of the bidders. Second, with respect to external risk-taking we find that *high-ATP* bidders tend to takeover *low-RISK1* targets, but the strength of the evidence appears modest in comparison to internal risk-taking. The relatively weaker relation between ATPs and external risk-taking we observe is consistent with the general notion of growth by acquisition strategy in the sense that bidders tend to take relatively more risk in mergers to enhance their growth prospects.

Our multivariate tests of the impact of risk transfer on total synergistic gains indicate that a one standard deviation (equal to 10%) increase in risk transfer leads to a 63 basis point increase in the overall merger announcement abnormal returns (which has a median value of 2.07%) of both bidders and targets, after controlling for relative misevaluation, investment opportunities, and governance transfer. The incremental risk transfer effect on merger synergy is significantly more positive (2.33%) for deals involving strong governance transfer and negative (−2.50%) for mergers associated with weak governance transfer. Thus, our study offers new direct evidence demonstrating that risk transfer is an important channel underlying value creation via mergers and acquisitions. Further tests show that strategic risk-takers (i.e., firms with an aggressive investment policy) are significantly less acquisitive (i.e., they are selective and less likely to act as bidders).

One potential problem with our analysis of the value effects of risk transfer is the endogeneity bias due to the choice of risk-taking – our main test variable. It is worth emphasizing that the choice of operational risk is not entirely under the control of managers but is constrained by the creditors, unions, blockholders, and government. To address concerns about the partial endogeneity of risk choice, we use several corrective tools, such as, alternative measures of risk transfer, lagged measure of risk transfer, initial firm sizes of bidder and target as instruments for risk transfer, firm characteristics (control variables) dated as of the beginning of the 10-year risk estimation window, the average industry-year anti-takeover provisions, year fixed effects and industry fixed effects to account for the omitted variable bias. In addition, our use of ATPs as a test variable in the examination of the linkage between risk-taking and governance practices is vulnerable to endogeneity concerns. We repeat the initial tests by using governance index values taken from the initial year of the 10-year window over which we measure risk-taking instead of the final year of this window. Similar robustness checks have been employed by Masulis et al. (2007) and John et al. (2008). These additional tests show that our base-level main findings are robust to the endogeneity biases.

We make four contributions to the existing empirical literature on M & As. First, we provide new evidence to show that while weaker investor protection (i.e., more takeover defenses exhibit) reduces internal risk-taking in investment in the case of bidders, the targets' operations do not appear to be affected by suboptimal risk-taking attributable to anti-takeover provisions. Our analysis indicates that the relatively more aggressive risk profile of targets is due to their younger age, smaller size, and underperformance. Second, our finding that *high-ATP* acquirers persist in selecting *low-RISK1* targets indicates that the within-firm risk avoidance behavior of poorly-governed firms extends to takeovers as well. However, the sensitivity of external risk-taking to bidders' takeover barriers appears to be muted, perhaps due to their propensity to pursue the growth-by-acquisition strategy, or to the close scrutiny of managerial actions by the market for corporate control.

Third, we provide a novel risk-based explanation by identifying risk transfer as a primary channel of value creation or destruction via mergers and acquisitions. The risk transfer motive is distinct from the three widely discussed hypotheses of takeovers. Under the Q hypothesis, acquirers have superior investment opportunities or more efficient management relative to the target firms. The misevaluation hypothesis assumes that markets are inefficient and bidders tend to be overvalued relative to targets (see Shleifer and Vishny (2003), Rhodes-Kropf and Viswanathan (2004), and Rhodes-Kropf, Robinson, and Viswanathan (2005)). The governance transfer hypothesis predicts that value is created when a better governed bidder acquires a poorly governed target firm (see Wang and Xie (2009)). In contrast, our risk transfer hypothesis focuses on the investment risk-taking behavior of bidders and targets. We find that synergy as measured by the value-weighted abnormal returns of bidder and target firms is significantly increasing in strategic risk transfer. In other words, acquisitions in which a relatively risk-shy target firm is absorbed by a bidder with an aggressive investment policy generate significant value even after controlling for other traditional theories of mergers. On the other hand, we find significant value destruction in mergers involving negative risk transfer - when bidders with a proven record of a conservative investment policy seek to takeover targets with relatively higher risk-taking propensities. The evidence on negative risk transfer is in line with the wide-spread notion that firms tend to take excessive risk in mergers, resulting in value destruction.

This new risk-based evidence on value creation indicates that it is not just the *external* factors such as the difference in investment opportunities open to bidders and targets and investor misevaluation of these firms that enhance value creation in takeovers. In addition, the *internal* risk-bearing capability that firms develop to overcome forces that inhibit risk-taking in investment at the first-best level (such as managerial pursuit of private benefits and pressures from labor unions, government, and creditors) is a driver of merger synergy. Further, in general the often-cited growth by acquisition strategy as reflected in mergers associated with conservative bidders acquiring more risk-taking targets (i.e., negative risk transfer) tends to destroy value.

Finally, our analysis contributes to the recent literature on the influence of different managerial traits on corporate decisions. Malmendier and Tate (2008) find that overconfident CEOs undertake value-destroying mergers and investors react more negatively to bid announcements made by overconfident CEOs.[2] While Ederer and Manso (2013), Manso (2011), and Tian and Wang (2014) find

[2] In addition, Malmendier and Tate (2005a, 2005b) study the effects of managerial overconfidence on firm value, investment and financing decisions.

that tolerance for short-term failure spurs successful innovation. In Hirshleifer, Low, and Teoh (2012), overconfident chief executive officers (CEOs) undertake riskier projects, exploit growth options and achieve greater innovation productivity. In contrast, we focus on risk taking behavior and find a positive relation between risk transfer and combined merger announcement returns of bidder and target firms. Our point is that managerial risk-taking is a broader trait that covers both rational and overconfident risk choices, and we present a more comprehensive analysis of both positive and negative risk transfer that subsumes risk propensity correlated with managerial overconfidence.

The rest of the paper is organized as follows. We discuss the key research questions and develop our risk transfer and differential risk propensities hypotheses in the next section. Section III describes the data and the test, control and outcome variables, and Section IV presents descriptive statistics. We examine the link between risk-taking and governance mechanisms in Section V. Our multivariate tests on the effects of risk and governance transfers on merger synergy as well as on deal structures are included in Section VI, and we discuss additional robustness tests in Section VII. Section VIII concludes the paper.

2. Empirical predictions

In this section, we examine first how differences in firm characteristics influence the risk-taking behavior of bidders and targets, and whether the antitakeover provisions of bidding firms lower their choice of target firms' operational riskiness. Then we develop our primary hypothesis that strategic risk-taking by bidders and targets is an important as source of value creation and destruction in mergers.

There is a vast literature on conflicts of interest among shareholders, bondholders and managers devoted to why firms deviate from stockholder wealth maximizing investment and financing decisions.[3] It points out that firms face many hurdles to optimal risk-taking in investment from different stakeholders. First, John et al. (2008) argue that insiders are likely to follow more conservative investment policies in order to protect their self-interest, and may even pass up value-enhancing risky ventures, (also see May (1995), Morck, Stangeland, and Yeung (2000), and Stulz (2005)). Second, non-equity stakeholders such as unionized workers, banks, and government agencies may seek to safeguard their self-interest by constraining firms from undertaking value-enhancing risky investment projects. Third, agency models of Amihud and Lev (1981), Holmstrom and Ricart I Costa (1986), and Hirshleifer and Thakor (1992) posit that managers may diversify firm's activities and avoid risk taking (including sacrificing positive-NPV but risky projects) to protect their career. Acharya et al. (2011) argue that stronger creditor rights tend to reduce risk-taking in investment. Drawing on the seminal work of La Porta, Lopez-de-Silanes, Shleifer, and Vishny (1997, 1998), John et al. (2008) argue that legal structures and corporate governance mechanisms designed to strengthen investor protection can mitigate excess risk-avoidance by managers and lead them to undertake riskier but value-enhancing investments. However, a negative association between corporate governance and risk-taking is also possible because stronger investor protection is likely to dampen the monitoring role of dominant outside shareholders, leading to greater managerial discretion to implement conservative investment policies.

These forces create a fertile environment for heterogeneity in operational risk-taking cultures across the corporate landscape with some firms engaging in more sub-optimal risk-taking while others exhibit less. To illustrate, consider the simple (binomial) corporate world of risk-takers and risk-avoiders. We define risk-takers as those firms that have developed effective checks and balances, organizational structures and the capability to successfully manage numerous conflicts of interest and capital market frictions that hamper optimal capital investment. In other words, risk-takers have put in place stronger investor protection mechanisms and managerial ownership and compensation structures which enable them to overcome pressures from insiders and non-equity stakeholders to undertake value-destructive projects and operate closer to the first-best level of investment. In contrast, risk-avoiders choose to act conservatively in directing their corporate investment policy, reflecting their propensity to pass up risky yet value-enhancing projects, due to weak governance and poor managerial incentive structures.

This environment affords the market for corporate control an opportunity to alleviate excess risk avoidance by enabling risk-taking bidders to takeover conservative target firms and redeploy their assets to more productive uses. For instance, major corporate events like mergers can alter the bargaining power and allow bidders and targets saddled with excessive debt and labor costs to take up strategic renegotiation of existing contracts with labor unions and creditors to render themselves more stockholder-favorable operations (Roberts & Sufi, 2009; Nikolaev, 2016).[4] At the same time, takeovers also create opportunities for less risk-taking firms to absorb more aggressive firms, perhaps because of bidders' overconfidence (Malmendier & Tate, 2008) or to consume more private benefits or to appease other stakeholders (John et al., 2008). These arguments are similar in spirit to the basic premise of neoclassical theory of mergers that differences in investment opportunities or managerial skills drive mergers and acquisitions (see Lang, Stultz, and Walking (1989), Morck, Shleifer, and Vishny (1990), Servaes (1991), Martin (1996), Jovanovic and Rousseau (2002), Shleifer and Vishny (2003), Rhodes-Kropf et al. (2005), and Dong, Hirshleifer, Richardson, and Teoh (2006)).

We expect risk-taking propensities to vary between internal (organic) and external (acquisition) capital projects as well as

[3] This literature covers wealth expropriation from dispersed owners by managers (Berle & Means, 1933), managerial consumption of perquisites (Jensen & Meckling, 1976), managerial effort (Holmstrom, 1979), over-investment in pursuit of growth (e.g., Baumol, 1959; Jensen, 1986), wealth transfers from dispersed minority shareholders by controlling shareholder(s) (Shleifer & Vishny, 1997), and diversion of corporate wealth by insiders (Dyke & Zingales, 2004; Grossman & Hart, 1988; Hart, 1995; Zingales 1994). Recent papers on corporate governance emphasize the role of takeover defenses in weakening investors' ability to protect themselves against such agency conflicts. Gompers et al. (2003), Cremers and Nair (2005), Core et al. (2006), and other researchers find that firms with more ATPs generate lower long-run stock returns.

[4] A recent case in point is American Airlines which filed for bankruptcy and negotiated concessions from its pilots, flight attendants, maintenance workers and other unionized employees to streamline its declining operations and make itself more attractive as a takeover candidate (Zhang, 2012).

between bidding and target firms for several reasons. First, a salient feature of conventional capital expenditure projects is that they can be executed quietly, out of the public view (i.e., direct investor monitoring). In contrast, takeover bids are exposed to intense scrutiny of merger advisors of bidders and targets, potential criticism by shareholders of the merging firms of the ability of the management and of the board to pursue value enhancing growth opportunities, and the disciplinary force of the market for corporate control, including negative reactions leading to sharp drops in stock prices. Second, a typical merger deal entails a far larger bet on growth than a standard capital project.[5] We expect the added scrutiny of the takeover market and the larger deal size to dampen the negative effects of antitakeover provisions in the context of mergers and acquisitions (as compared to the case of organic growth projects). Third, prior studies indicate that bidders and targets have distinctly different value and growth characteristics. For example, Rhodes-Kropf and Viswanathan (2004), Rhodes-Kropf et al. (2005), and Dong et al. (2006) find that bidders are on average overvalued relative to targets. Finally, the merger literature indicates that younger, smaller and relatively underperforming firms are more likely to become targets (e.g., Morck, Shleifer, & Vishny, 1988; Comment & Schwert, 1995; Bebchuk, Coates IV, & Subramanian, 2002; Kadyrzhanova & Rhodes-Kropf, 2011). These sharp differences in firm characteristics are likely to induce target firms to pursue a more aggressive investment policy prior to merger as compared to those of their suitors.

The forgoing discussion leads us to make the following predictions regarding heterogeneity in risk-taking behavior in mergers:

2.1. Empirical Prediction 1 (a) – Differential risk-taking propensities of bidder and target

Bidders with more antitakeover provisions tend to take less investment risk prior to merger as compared to targets.

2.2. Empirical Prediction 1 (b) – Choice of acquisition risk

Bidders with more ATPs tend to choose targets with conservative investment policies.

In this environment of heterogeneous risk-taking propensities, target firms with excess risk aversion suffer from underinvestment and undervaluation and thus are worth more to acquirers that can restructure them. Therefore, we expect investors to react positively when an aggressive (risk-taking) bidder seeks to takeover a target firm pursuing a conservative investment policy. This is the case of a positive (efficient) risk transfer. Conversely, market response would be negative if the bid entails negative (inefficient) risk transfer, that is, when a conservative bidder (risk-avoider) seeks to take over a risk-taking firm. A conservative bidder more likely exposed to more entrenched managers, less stockholder-friendly governance rules, and more pressure from labor unions, creditors and government to undertake suboptimal risk. So investors are likely to view this type of merger as value-destructive because they suspect that entrenched bidding managers are reckless, or would dumb down the risk profile of the target after the merger by reallocating its resources to less risky and less productive uses.

These arguments lead us to the following predictions regarding risk transfer in mergers, out primary hypothesis:

2.3. Empirical Prediction 2 (a) – Risk transfer and value creation

Investors react positively when a bidder with an aggressive investment policy seeks to acquire a conservative target firm.

2.4. Empirical Prediction 2 (b) – Interaction between risk transfer and governance transfer

Investor reaction will be more positive when the aggressive (risk-taking) *bidder has relatively more stockholder-friendly governance mechanisms.*

We emphasize that our risk transfer hypothesis is quite distinct from the following two classical agency views of risk-taking. The first agency view posits that self-centered managers tend to takeover *less risky* target firms to preserve their private benefits and to accommodate non-equity stakeholders (in the face of weak investor protections, which implies negative investor reaction. In contrast, our risk transfer hypothesis predicts a positive market reaction when an acquirer announces a bid for a relatively less risky target firm. Second, Jensen and Meckling (1976) point out that equityholders in leveraged firms have an incentive to undertake *riskier* investment projects to expropriate wealth from debtholders. This well-known asset substitution problem corresponds to our arguments about negative risk transfer, in which less risky bidders takeover more risky target firms. Notice that our risk transfer hypothesis predicts negative risk transfer leads to negative stock returns, which is distinct from the prediction that stockholders gain under asset substitution.

[5] For instance, in a sample of 3333 completed U.S. mergers and acquisitions between 1990 and 2003, Masulis et al. (2007) report annual mean (median) relative deal size, defined as the ratio of deal value to bidder market value of equity, of 0.16 (0.06). In contrast, based on a large sample of firms from 2001–2008, Phan and Hegde (2013) find mean and median annual capital expenditures to book asset ratios close to 0.05 and 0.03, respectively.

It is also worth noting the distinction between our value creation through risk transfer hypothesis and two primary theories of mergers. The neo-classical theory predicts that firms with better investment opportunities takeover those with poor opportunities, and the relative misevaluation theory posits that firms that find themselves more overvalued takeover others that are relatively less misvalued. Our basic insight is that differences in risk propensities of bidders and targets are an important source of value creations and destruction in addition to disparities in investment opportunities and market valuations.

3. Data

We use M & As announced between January 1990 to December 2007 available in Securities Data Corporation's (SDC) platinum U.S. mergers and acquisitions database. Following Masulis et al. (2007), and Wang and Xie (2009), we start with all completed disclosed-value M & A deals involving bidders and targets domiciled in the U.S, excluding those classified as acquisitions of remaining interests, exchange offers, minority stake purchases, privatizations, recapitalizations, repurchases, self-tenders, or spin-offs. Our choice of 1990–2007 is limited by the availability of anti-takeover provisions to estimate GIM index. Only those bidders with less than 50% ownership of the targets before announcement but own 100% of targets' equity after the merger are retained. Bidders and targets included in our sample have annual financial statement data available from Compustat, their stocks are classified as U.S. Common stocks in the Center for Research in Security Prices (CRSP) database (i.e., securities whose CUSIPs end with 10 and 11), and they have anti-takeover provisions available for at least one year preceding merger announcement. We disregard financial firms (i.e. those with primary SIC codes between 6000–6999). Further, we require that both bidders and targets have cumulative abnormal returns based on a window of 11 days (five days before and after the event day) surrounding the merger announcement day, at least 100 valid daily returns in the estimation window of 200 days, measures of risk-taking, and key control variables for risk-taking (as described later and in the Appendix). Our sample selection process is similar to that employed by Wang and Xie (2009) who study 396 completed US M & As (listed in SDC) between 1990 and 2004. The final sample includes 414 U.S. mergers and acquisitions completed over 1990–2007.

3.1. Dependent and key test variables

We use individual stock and the CRSP equal-weighted market index returns for 200 days over 11 to 210 days preceding the takeover announcement day to estimate cumulative abnormal returns for both targets and bidders for the 11-day event window, denoted as *CAR11*.[6] In addition, we construct *PCAR11* as the value-weighted portfolio of acquirer CAR and Target CAR over the 11 day event window (consistent with Bradley, Desai, and Kim (1988), Lang et al. (1989), and Wang and Xie (2009). We select only those mergers for which there is no missing observation during the event window and which are within the 99.5 and 0.5 percentile ranges of the distribution of *CAR11*.

In line with by Gompers et al. (2003), antitakeover provision (ATP) indices are derived from the Investor Responsibility Research Center's (IRRC) database maintained by Andrew Metrick at http://faculty.som.yale.edu/andrewmetrick/.[7] IRRC reports ATP data for the following subset of sample years: 1990, 1993, 1995, 1998, 2000, 2002, 2004, and 2006. Consistent with past studies, we assume that takeover defenses remain unchanged between the two consecutive IRRC publications years. For 1993 and 1998, the gap from the immediately preceding IRRC publication year is three years, and for the rest of the sample it is two years. For the years other than the publication years, we use ATP indices published in the year preceding the non-publication year.[8] *GIM* is an ATP index based on all 24 antitakeover provisions described in Appendix A of Gompers et al. (2003), with values ranging from 0 to 24 governance provisions.

If a firm chooses risky operations and invests in risky projects, it is expected to have volatile earnings. We follow John et al. (2008) and Acharya et al. (2011) and develop *RISK1* as our proxy for corporate risk-taking in investment. Such proxy is also used in recent studies, such as Faccio, Marchica, and Mura (2016) and *RISK1* is defined as the standard deviation of firm-level annual earnings before interest tax and depreciation scaled by total assets' (EBITDTA) adjusted for the mean EBITDTA of all Compustat firms for that particular year. Unlike the cross-sectional analysis of John et al. (2008) who use EBITDTA for all available years over 1992–2002, we utilize 10 years of EBITDTA preceding the event year to estimate our corporate risk-taking proxy to suit our event study methodology.[9] As merger events are observed subsequent to the window over which our risk- taking proxy is estimated, biases due to spurious relations and endogeneity of risk-taking are substantially reduced. As noted in the opening section, we distinguish between two types of investment activities in our analysis of risk-taking, within-firm capital projects and acquisitions of firms. The focus of prior work is on overall risk-taking. Since we do not screen for merger events over the 10-year window, our *RISK1* proxies for *total* firm-level risk-taking in investment, both *within-firm* (internal or organic) and *between-firm* (external or acquisition). However, for

[6] We also repeat our analysis using CRSP value- weighted portfolio returns and find that our results are practically the same using either of these indices.

[7] We use the *GIM* index throughout our main analysis because this index provides greater variability across firms. In addition, we use the BCF index of Bebchuk, Cohen, and Ferrell (2009) for robustness purpose, the results of which are briefly described below in robustness section. The *BCF* is an ATP index based on a subset of six IRRC provisions and is dubbed as a management entrenchment index. These entrenchment provisions include (i) staggered or classified board, (ii) limits to amend by-laws, (iii) supermajority requirement for mergers, (iv) supermajority requirement for charter amendments, (v) poison pills, and (vi) golden parachutes.t

[8] Gompers et al. (2003, see pages 116–117) note that "*At the firm level, G is relatively stable. For individual firms the mean (absolute) change in G between publication dates (1990, 1993, 1995, 1998) is 0.60, and the median (absolute) change between publication dates is zero.*" Given this infrequent change in ATPs over time, we expect that approximating missing firm-year values of *GIM* and *BCF* Indices for a firm with the corresponding prior year values will introduce little bias, if any. Accordingly, we use values from the prior year for any missing values of ATPs.

[9] In addition to the *market-adjusted RISK1*, we construct an alternative *industry-adjusted* estimate of risk-taking based on the deviation of firm-level EBITDTA from the corresponding Fama-French 48 industry average EBITDTA. And dub it as *RISK2*. Our untabulated robustness tests that use *RISK2* provide support for our key findings.

most cases this measure is likely to be driven by organic risk-taking. Moreover, excluding observations which involve some merger activity within the 10-year estimation window is likely to leave us with a much smaller sample consisting of predominantly new firms. For these reasons we interpret *RISK1* as a proxy for internal as well as external risk-taking in our analyses of within and between-firm risk choices.

3.2. Firm and deal characteristics

Consistent with the prior literature (see Palepu (1986) and Wang and Xie (2009), for example), we use accounting and industry information available from Compustat and merger information from SDC Platinum: Global Mergers and Acquisitions databases to compile several industry, firm, and deal characteristics. For the fiscal year-end preceding the merger announcement year, we estimate natural log of the firm's total assets (*LogASSETS), Market to Book, Return on Assets (ROA)* and *Leverage* for both targets and acquirers. Using the date the firm was included in CRSP databases, we estimate *Firm Age* for each firm. In addition, we construct other firm and deal characteristics, such as, *MCAP Ratio (Target MCAP* divided by *Acquirer MCAP)*, diversifying merger (*Diversifying*), *Hostile* takeover, *Merger of Equals*, *Tender Offer, High_Tech and Allcash* using SDC Platinum along with Compustat variables. The details of construction of these variables are included in the Appendix. We expect all these control variables to follow the signs as predicted in Wang and Xie (2009).

3.3. Control variables for corporate risk-taking

In our regressions on the relation between internal corporate risk-taking and ATPs, we follow essentially the specifications used in John et al. (2008) by measuring the control variables as of the beginning of the 10-year *RISK1* estimation window (i.e., event year -10). We define these control variables in the Appendix. *Initial Size* is the natural log of total assets, *Initial Leverage* is the ratio of book value of debt divided by total market value of the firm, *Initial Bank Power* is the level of bank financing of the firm, and *Initial Profitability* is EBITDTA, all as of event year-10. *Sales Growth* is the average annual percent increase in sales over 10 years preceding the event year. To estimate *Earnings Smoothing* over the prior 10 years, we follow Ball, Kothari and Robin (2000), Bhattacharya, Daouk, and Welker (2005), Leuz, Nanda and Wysocki (2003), and John et al. (2008). *Initial Leverage* is the ratio of book debt to total assets estimated as of event year-10. *Union Membership* is measured at two digit SIC code, which is compiled by Barry Hirsh and David Macpherson and made available at www.unionstats.com. *Observations in Risk-Taking* is the number of observations used in estimating our proxy for risk-taking, which ranges between a minimum of 5 and a maximum of 10 observations. *Inside Ownership* is the total of percentage ownership of officers and directors of the firm collected from Compact Disclosure. This variable is used from the nearest year preceding the merger announcement date. Selecting these control variables from the initial year of the 10-year risk-taking estimation window should help us mitigate concerns about reverse causality with respect to *RISK1*. Since the literature indicates that takeover targets tend to be younger relative to the acquiring firms (see Kadyrzhanova and Rhodes-Kropf (2011)), we use the age of the firm, *Firm Age*, as an added control variable.

4. Descriptive statistics

Table 1 provides descriptive statistics and Person's correlation coefficients for the dependent and explanatory variables for our acquirer and target samples of 414 firms each.[10] In Panels A and B, acquirers have a mean (median) cumulative abnormal return over 11 business days surrounding bid announcement of −2.05% (−1.40%) and the corresponding figures for the target sample are 22.43% (20.56%). These numbers are well in parity with the existing literature, which reports negative announcement returns for acquirers and large positive announcement abnormal returns for targets (e.g. Bradley, Desai, & Kim, 1988; Dong et al., 2006; Fuller, Netter, & Stegemoller, 2002; Kadyrzhanova & Rhodes-Kropf, 2011; Lang et al., 1989; Masulis et al., 2007; Moeller, Schlingemann, & Stulz, 2004, 2005; Wang & Xie, 2009). The mean (median) ATPs as proxied by the GIM index for acquirers are higher at 9.42 (9.50), while those for the targets are 8.96 (9.00). This suggests bidders are slightly more insulated against the discipline of the market for corporate control than the target firms. Our proxies for risk-taking in investment (computed as the volatility of annual cash flows over 10 years preceding bid announcement) have lower means at 6% (7%) for bidders (*ACQRISK1 (ACQRISK2*)), as compared with 8% (9%) for the target sample (*TGTRISK1 (TGTRISK2*)). These estimates indicate that there are substantial differences in investment risk choices across bidders and targets. Also, there is far more heterogeneity in the risk-taking behavior of target firms than in the acquirer sample as reflected by the standard deviations of *RISK1* for the two groups of 10% and 4%, respectively. These preliminary estimates support our target firms tend to follow a relatively more aggressive operational risk-taking strategy prior to mergers. Further, since firm-level risk-taking and growth rates are positively correlated (see John et al. (2008)), these summary statistics are consistent with the popular notion that bidders with relatively low investment risk-taking seek to accelerate their low (predominantly organic) growth rates by adopting a growth by acquisition strategy (i.e., by bidding for targets characterized by high risk-taking propensities).

We proxy for governance transfer by *DGIM*, computed for each pair of merger partners by subtracting the number of ATPs of the *target from those of the bidder*. In addition, we construct a proxy for risk transfer labeled as *DRISK1*, constructed as the excess of *RISK1*

[10] We winsorize firm characteristics (*MCAP Ratio, Market to Book, Leverage, and ROA)* at 99 and 1 percentiles of the distribution, and also, for a small number of firms for some variables if merger year −1 value was unavailable, we have included a value from prior years, e.g. ROA.

Table 1
Statistical Properties of Key Variables.

This table presents descriptive statistics on the key variables used in the study. The sample covers 414 completed mergers over 1990–2007. *GIM* is an index of anti-takeover provisions (ATPs) based on Gompers et al. (2003). Risk-taking measures (*RISK1* and *RISK2*) are estimated following John et al. (2008), where *RISK1* is the standard deviation of market-adjusted annual EBITD scaled by total assets (EBITDTA) and *RISK2* is the standard deviation of industry-adjusted annual EBITD scaled by total assets (EBITDTA) over 10 years prior to merger announcement. *PCAR* is the value-weighted cumulative abnormal return of the bidder and target. *DRISK1* is defined as *ACQRISK1* less *TGTRISK1*. *DGIM* is defined as *ACQGIM* less *TGTGIM*. Other variables are defined in the Appendix. The last panel presents pairwise correlation coefficients between key variables. Correlations for other variables are suppressed for brevity. Bold faced correlation coefficients are significant at better than 10% level using two sided tests.

Panel A: Descriptive Statistics-Acquirers

Variable	Mean	STDEV	Q1	Median	Q3	N
ACQCAR11 (%)	−2.05%	9.32%	−6.46%	−1.40%	3.02%	414
ACQGIM	9.42	2.73	7.00	9.50	11.00	414
ACQRISK1	0.06	0.04	0.04	0.05	0.08	414
ACQRISK2	0.07	0.04	0.03	0.06	0.09	414
Initial Size	7.18	1.96	5.99	7.42	8.50	414
Initial Bank Power	0.24	0.20	0.10	0.20	0.32	414
Initial Profitability	0.16	0.11	0.11	0.16	0.20	414
Sales Growth	0.16	0.20	0.05	0.11	0.22	414
Earnings Smoothing	0.23	0.37	0.03	0.24	0.47	414
Initial Leverage	0.54	0.20	0.40	0.55	0.66	414
Union Membership	0.17	0.12	0.08	0.13	0.25	414
Observations in Risk Taking	9.48	1.36	10.00	10.00	10.00	414
Inside Ownership	0.04	0.08	0.00	0.02	0.04	414
Log Assets	8.41	1.46	7.41	8.35	9.46	414
Leverage	0.14	0.11	0.05	0.11	0.22	414
Market to Book	2.49	1.79	1.48	1.94	2.84	414
Return on Assets (ROA)	0.16	0.14	0.10	0.15	0.22	414

Panel B: Descriptive Statistics-Targets

Variable	Mean	STDEV	Q1	Median	Q3	N
TGTCAR11 (%)	22.43%	22.61%	9.26%	20.56%	33.20%	414
TGTGIM	8.96	2.62	7.00	9.00	11.00	414
TGTRISK1	0.08	0.10	0.04	0.06	0.10	414
TGTRISK2	0.09	0.10	0.04	0.06	0.10	414
Initial Size	5.42	1.97	4.04	5.45	6.92	414
Initial Bank Power	0.27	0.28	0.05	0.21	0.39	414
Initial Profitability	0.10	0.28	0.08	0.14	0.20	414
Sales Growth	0.15	0.22	0.03	0.10	0.23	414
Earnings Smoothing	0.26	0.38	0.02	0.26	0.53	414
Initial Leverage	0.52	0.23	0.35	0.53	0.67	414
Union Membership	0.16	0.12	0.05	0.13	0.24	414
Observations in Risk Taking	9.20	1.59	9.00	10.00	10.00	414
Inside Ownership	0.06	0.11	0.00	0.02	0.07	414
Log Assets	6.68	1.40	5.70	6.57	7.58	414
Leverage	0.16	0.15	0.02	0.14	0.25	414
Market to Book	2.09	1.34	1.30	1.68	2.38	414
Return on Assets (ROA)	0.10	0.16	0.06	0.11	0.17	414

Panel C: Descriptive Statistics-Combined

Variable	Mean	STDEV	Q1	Median	Q3	N
PCAR11 (%)	2.07%	9.12%	−2.99%	2.07%	6.67%	414
DGIM	−0.46	3.57	−3.00	0.00	2.00	414
DRISK1	−0.02	0.10	−0.04	−0.01	0.01	414

Panel D: Pair wise correlation coefficients

Variables	PCAR11	ACQCAR11	TGTCAR11	DGIM	ACQGIM	TGTGIM	DRISK1	ACQRISK1
ACQCAR11	**0.783**							
TGTCAR11	**0.394**	**0.115**						
DGIM	**0.095**	0.045	**0.085**					
ACQGIM	−0.016	−0.047	−0.004	**−0.683**				
TGTGIM	**0.113**	0.012	**0.112**	**0.651**	**0.110**			
DRISK1	0.063	0.013	−0.018	0.029	0.026	0.066		
ACQRISK1	−0.037	−0.071	−0.013	0.051	**−0.186**	**−0.124**	**0.106**	
TGTRISK1	−0.075	−0.039	0.013	−0.009	**−0.095**	**−0.111**	**−0.926**	**0.276**
N	414	414	414	414	414	414	414	414

of the *bidder over that of the target*. We posit that a positive value of *DRISK1* represents a risk-taking bidder (who undertakes a positive-NPV project even if it is risky) and a risk-avoider (who rejects a positive-NPV project because it is risky). By contrast, the bidder is a risk-avoider and the target is a risk-avoider in a deal characterized by a negative value of *DRISK1*. Our estimates suggest that the

targets in our sample have fewer ATPs on average (mean *DGIM* equals −0.46), the average bidder follows a more conservative investment policy (mean *DRISK1* equals −0.02), and the mean merger synergy (*PCAR11*) is equal to 2.07%. The positive value for combined merger synergy is consistent with the prior literature, such as, Andrade, Mitchell, and Stafford (2001), Moeller, Schlingemann, and Stulz (2004), Bhagat, Dong, Hirshleifer, and Noah (2005) and Wang and Xie (2009).

The above aggregate results suggest that the typical takeover deal involves negative risk transfer with mean *DRISK1* equal to −2%; that is, a conservative (risk-avoiding) bidder armed with marginally higher ATPs acquires a target pursuing an aggressive investment policy. On announcement, the average bidder incurs a negative abnormal return of 2.05% as compared to a positive mean abnormal return of 22.43% for our target sample. It seems as though the hither-to risk-shy average bidder is overpaying for the target in chasing growth by acquisition, resulting in a large positive mean abnormal return for the target firms. Furthermore, the negative mean abnormal return seems to indicate that the market anticipates that the risk-averse average bidder would redeploy the target assets to less productive uses after the merger. This overview suggests that excess risk avoidance on the part of bidders leading to negative risk transfer is an important driver of the widely documented average negative investor response to bid announcement.

The last panel shows that the pairwise correlation between the key variables of interest. Consistent with the evidence in past studies on the positive relation between *within-firm* risk choice and investor protection, we find that the number of ATPs both bidders and targets are negatively correlated (−0.186 and −0.111, both significant at better than 10%) with their respective measures of *RISK1*. Turning to between-firm risk choices, *ACQGIM* is negatively correlated with *TGTRISK1* (−0.095, significant at better than 10%) consistent with our claim that on average acquirers with more ATPs tend to bid for less risky targets. The correlation between *PCAR11* and *DGIM* (0.095) is positive and significant, confirming the findings of Wang and Xie (2009) in our sample that investors are pleased when a poorly-governed target is absorbed by a bidder with stronger shareholder rights. Moreover, *DRISK1* is positively but insignificantly correlated with *DGIM* (0.029), implying our measure of risk transfer (*DRISK1*) is virtually unrelated to the measure of governance transfer (*DGIM*). Finally, the simple correlation between *DRISK1* and *PCAR11* is positive (0.063), thus providing weak initial support for our risk transfer hypothesis that takeover transactions in which aggressive bidders acquire conservative targets enhance synergy. However, this preliminary evidence is weak because the pair-wise correlation is insignificant.

5. Heterogeneity in risk-taking in mergers and acquisitions

In this section we conduct tests on our first empirical prediction that (a) both the bidder and the target will indulge in suboptimal risk-taking prior to merger, but the target firm is likely to pursue a relatively more aggressive investment policy, and (b) a bidder armed with more antitakeover provisions will seek to acquire a target pursuing a conservative risk-taking policy in investment.

5.1. Internal risk-taking by acquirers and targets

We begin by examining the determinants of bidders' operational risk-taking (i.e., within-firm risk-taking, *ACQRISK1*). Our test specifications are basically similar to those in prior studies with the exception that we additionally control for firm age.[11] As reported in column 2 of Table 2, the estimated coefficient on the acquirer *GIM* index (*ACQGIM*) is significantly negative −0.0015 (controlling for industry and year fixed effects). Its magnitude is very close to −0.0015 that John et al. (2008) report for their entire U.S. sample (see column 2 of Table 4: Panel A, p. 1709)). Based on this coefficient estimate, one standard deviation (approximately 2.73) increase in the number of anti-takeover provisions decreases bidder risk-taking by 6.81% of its mean. Thus, the economic significance of the negative effects of ATPs on risk-taking behavior appears to be substantial in our bidder subsample.

Turning to other regressors, we find that *ACQRISK1* is negatively associated with *Initial Size, Initial Profitability,* and *Earnings Smoothing*, consistent with the existing evidence. Prior studies imply that non-equity stakeholders and insiders with large undiversified ownership are likely to curtail corporate risk taking. Accordingly, we find *Inside Ownership* and Union Membership (Faleye, Mehrotra, & Morck, 2006) are also negatively associated with acquirer risk-taking, but with weaker significance.

There are two key endogeneity concerns in these regressions that relate to the adoption of ATPs and the choice of inside ownership. To address the potential inside ownership choice bias, we use the industry mean inside ownership as a surrogate for firm-level inside ownership. In addition, we repeat the tests by using the GIM index values taken from the initial year of the 10-year window over which we measure risk-taking instead of the final year of this window to account for endogeneity concerns due the choice of ATPs. Similar robustness checks have been employed by Masulis et al. (2007) and John et al. (2008). The coefficient estimates on the bidder ATPs presented in columns 3 (−0.0014) and 4 (−0.0014), respectively, show that our base-level negative relation is robust to these endogeneity treatments. There might also be concerns that causality runs from acquirer ATPs to their risk-taking behavior because firms could adopt stronger takeover defenses in anticipation of a strategic takeover of less risk-taking targets to advance their private benefits. We follow Masulis et al. (2007) and use a subsample of firms that were incorporated before 1990 to ensure that most of their ATPs were adopted before the start of our study period. The results reported in the last column indicate that our sample size drops from 414 to 343 firms, but the negative relation between bidder internal risk-taking and ATPs remains intact.

Finally, to further address the endogeneity concern we adopt 2SLS regressions using the Fama-French 48 industry-year means of acquirer GIM as instruments for the firm-level takeover barriers. We present results of these tests in the last two columns labeled

[11] Another difference is that John et al. (2008) use large shareholder ownership but lacking that data we use inside ownership instead. In unreported tests we use cash holdings (which might also imply potential for expropriation of minority shareholders) in place of inside ownership and find that our results remain robust. We also control for industry effects in our regressions which largely take care of any industry variation in ownership structures (e.g., younger industries are likely to have more concentrated equity ownership).

Table 2
Operational Risk-Taking by Acquirers.

The table presents results from regressing acquirer anti -takeover provisions (*ACQGIM*) and control variables on acquirer risk-taking (*ACQRISK1*, dependent variable). The sample covers 414 mergers from January 1990 to December 2007. *ACQRISK1* is estimated as the standard deviation of market-adjusted annual EBITD scaled by assets (EBITDTA) over 10 years prior to merger announcement. Size is natural log of total assets, Bank Power is bank loans scaled by total assets, Profitability is EBITD scaled by total assets (EBITDTA), Leverage is total debt scaled by total assets, and sales growth is the average of the annual sales growth (percent change in sales) over the sample period, observations in risk taking is the number of observations used in estimating risk-taking, union membership is percent of members unionized by industry at two digit SIC codes, and earnings smoothing is estimated as defined in the Appendix. 'Initial' refers to the values of those variables in the first year of a firm's entry into our risk taking estimation window over 10 years prior to bid announcement. All other control variables are defined in the Appendix. T-statistics based on robust standard errors are presented inside the parenthesis, *,**, and *** refer to significance at 10%, 5% and 1% level respectively.

Model	(1) ACQRISK1	(2) ACQRISK1	(3) ACQRISK1	(4) ACQRISK1	(5) ACQRISK1	**2SLS** ACQGIM	ACQRISK1
ACQGIM	−0.0022***	−0.0015***	−0.0014***		−0.0015***		
	(−3.460)	(−2.907)	(−2.726)		(−3.181)		
Initial ACQGIM				−0.0014**			
				(−2.313)			
Industry ACQGIM						0.6838***	
						(3.617)	
Instrumented ACQGIM							−0.0092***
							(−2.798)
Acquirer Characteristics							
Initial Size		−0.0056***	−0.0053***	−0.0054***	−0.0033***	−0.0319	−0.0058***
		(−4.926)	(−4.732)	(−4.550)	(−2.718)	(−0.329)	(−4.560)
Initial Bank Power		0.0003	0.0012	0.0037	−0.0045	−1.1277	−0.0127
		(0.020)	(0.091)	(0.277)	(−0.390)	(−1.298)	(−0.943)
Initial Profitability		−0.1223***	−0.1218***	−0.1315***	−0.0706*	1.2543	−0.1130***
		(−4.254)	(−4.298)	(−4.265)	(−1.840)	(0.997)	(−4.441)
Sales Growth		0.0058	0.0040	0.0048	−0.0069	0.4610	0.0086
		(0.434)	(0.310)	(0.274)	(−0.461)	(0.588)	(0.608)
Earnings Smoothing		−0.0178***	−0.0182***	−0.0173***	−0.0198***	−0.2658	−0.0207***
		(−4.016)	(−4.004)	(−3.747)	(−4.698)	(−0.794)	(−4.269)
Initial Leverage		−0.0097	−0.0107	−0.0155	−0.0064	0.1859	−0.0057
		(−0.594)	(−0.659)	(−0.899)	(−0.396)	(0.183)	(−0.357)
Union Membership		−0.0052	−0.0138	−0.0036	−0.0089	0.1111	−0.0025
		(−0.362)	(−0.992)	(−0.245)	(−0.750)	(0.091)	(−0.176)
Observations in Risk Taking		0.0024	0.0026	0.0032*	0.0040	0.1526	0.0040**
		(1.513)	(1.628)	(1.739)	(1.489)	(1.323)	(2.294)
Inside Ownership		−0.0262		−0.0290*	−0.0084	−4.5266**	−0.0595**
		(−1.538)		(−1.755)	(−0.474)	(−2.425)	(−2.154)
Log Age		−0.0015	−0.0017	−0.0022	−0.0073***	0.4656**	0.0025
		(−0.499)	(−0.587)	(−0.714)	(−2.797)	(2.030)	(0.652)
Industry Ownership			−0.0532				
			(−1.629)				
Constant	0.0758***	0.1231***	0.1334***	0.1191***	0.1053***	1.0632	0.1697***
	(7.775)	(6.778)	(6.796)	(5.582)	(3.348)	(0.560)	(5.441)
Observations	414	414	412	399	343	414	414
Adjusted R-squared	0.191	0.417	0.420	0.418	0.372	0.087	
Other Effects							
Industry Effects	Yes	Yes	Yes	Yes	Yes	NO	NO
Before 1990 Incorporation	NO	NO	NO	Yes	NO	NO	NO
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Regression F-Stat						3.29	
P-Value F-Stat						0.0000	
Predictive Power of Excluded Instruments & Under/Weak Identification							
Partial R Square						0.0321	
Angrist-Pischke multivariate F test of excluded instruments (Weak Identification):						13.08	
P-Value						0.0003	
Kleibergen Paap- LM Test (Chi-Square) of Under-identification						12.84	
P-Value						0.0003	
Second Stage Tests							
Second Stage Regression F-Statistics							6.92
P-Value							0.0000
Wu-Hauseman Test of Endogeneity							
F-Statistics							8.27095
P-Value							0.0043

2SLS. As expected, the first-stage results show that ACQGIM is significantly correlated with the mean Industry ACQGIM, our instrument. Most of the control variables in the first-stage regression are insignificant, except Inside Ownership and Firm Age. The instrument has significant predictive power, as it explains 3.21% of the variation in ACQGIM (partial-R2). The F-test rejects the null hypothesis that the coefficient on the instrument is zero. As weak instrumental variables can cause inconsistency and imprecision in

the 2SLS estimators, the above test gives us the comfort that such concerns are not serious in our sample. The second-stage results (in column (4)) indicate that the instrumented ACQGIM is negatively related to ACQRISK1 with a coefficient estimate of −0.0092, significant at 1%. The Wu-Hausman test rejects the null hypothesis that the 2SLS and OLS coefficients on ACQGIM are the same, thus confirming our endogeneity concern.

In Table 3, we analyze the link between own risk-taking, ATPs, and other regressors for our sample of targets. Although we find a negative relation in the simple regression estimate with year effects reported in column 1 (−0.0045 significant at 1%), the estimated coefficients presented in the next column is much smaller (−0.0006, insignificant at 10%), indicating that the negative association between target risk-taking and target GIM index disappears after we add the full set of controls. The endogeneity corrections for the choice of inside ownership as well as ATPs presented in columns 3 and 4 fail to alter this finding. Finally, to further address the endogeneity concern we adopt 2SLS regressions using the Fama-French 48 industry-year means of target GIM as instruments (similar to our approach in Table 2). In untabluated results, we continue to find that the instrumented TGTGIM loads with coefficient that is not significant. Recall from the summary statistics presented in Table 1 that in comparison to bidders targets have on average 0.46 fewer number of takeover defenses and they follow a more aggressive investment policy (as reflected by their higher mean and median *RISK1* measures). The insignificant relation suggests that targets' risk-taking behavior is not on average distorted by their takeover defenses and they do not, in general, indulge in excess risk avoidance. This is an important finding, although we are unable to articulate a clear explanation for why targets on average are a different breed with regard to the link between internal risk-taking and ATPs.

One plausible explanation lies in the evidence commonly highlighted by prior studies that younger, smaller and relatively underperforming firms are more likely to become targets (e.g., Morck et al., 1988; Comment & Schwert, 1995; Bebchuk et al., 2002;

Table 3
Operational Risk-Taking by Targets.

The table presents results from regressing target anti -takeover provisions (*TGTGIM*) and control variables on acquirer risk-taking (*TGTRISK1*, dependent variable). The sample covers all mergers from January 1990 to December 2007. *TGTRISK1* is estimated as the standard deviation of market-adjusted annual EBITD scaled by assets (EBITDTA) over 10 years prior to merger announcement. Size is natural log of total assets, Bank Power is bank loans scaled by total assets, Profitability is EBITD scaled by total assets (EBITDTA), Leverage is total debt scaled by total assets, and sales growth is the average of the annual sales growth (percent change in sales) over the sample period, observations in risk taking is the number of observations used in estimating risk-taking, union membership is percent of members unionized by industry at two digit SIC codes, and earnings smoothing is estimated as defined in the Appendix. 'Initial' refers to the values of those variables in the first year of a firm's entry into our risk taking estimation window over 10 years prior to bid announcement. All other control variables are defined in the Appendix. T-statistics based on robust standard errors are presented inside the parenthesis, *, **, and *** refer to significance at 10%, 5% and 1% level respectively.

Model	(1) TGTRISK1	(2) TGTRISK1	(3) TGTRISK1	(4) TGTRISK1	(5) TGTRISK1
TGTGIM	−0.0045***	−0.0006	−0.0007		0.0003
	(−3.997)	(−0.693)	(−0.776)		(0.388)
Initial TGTGIM				−0.0003	
				(−0.364)	
Target Characteristics					
Initial Size		−0.0083***	−0.0085***	−0.0082***	−0.0070***
		(−4.300)	(−4.488)	(−3.868)	(−3.013)
Initial Bank Power		−0.0024	−0.0023	0.0011	0.0209*
		(−0.198)	(−0.192)	(0.090)	(1.726)
Initial Profitability		−0.2707***	−0.2758***	−0.2666***	−0.1167***
		(−8.519)	(−7.817)	(−6.741)	(−3.558)
Sales Growth		−0.0042	−0.0063	−0.0019	0.0317
		(−0.280)	(−0.418)	(−0.103)	(1.154)
Earnings Smoothing		−0.0389***	−0.0393***	−0.0385***	−0.0212***
		(−4.866)	(−4.685)	(−4.482)	(−2.952)
Initial Leverage		−0.0244	−0.0246	−0.0259	−0.0452**
		(−1.320)	(−1.334)	(−1.347)	(−2.002)
Union Membership		0.0240	0.0415*	0.0289	0.0266
		(1.076)	(1.908)	(1.301)	(1.214)
Observations in Risk Taking		0.0038	0.0038	0.0017	0.0012
		(1.641)	(1.617)	(0.771)	(0.321)
Inside Ownership		0.0513		0.0563	−0.0321
		(1.206)		(1.392)	(−1.214)
Log Age		−0.0077*	−0.0083*	−0.0049	−0.0048
		(−1.834)	(−1.966)	(−1.245)	(−1.128)
Industry Ownership			0.1020**		
			(2.179)		
Constant	0.0991***	0.1663***	0.1437***	0.1723***	0.1332***
	(6.004)	(6.147)	(4.703)	(5.737)	(3.293)
Observations	414	414	414	376	287
Adjusted R-squared	0.067	0.746	0.745	0.745	0.311
Other Effects					
Industry Effects	NO	Yes	Yes	Yes	Yes
Year 1990 Incorporation	NO	NO	NO	NO	Yes
Year Effects	Yes	Yes	Yes	Yes	Yes

Kadyrzhanova & Rhodes-Kropf, 2011). We know from the literature that it is precisely these firm characteristics (i.e., smaller, younger and relatively less profitable) which increase managerial incentives to undertake more-risky investments, and we control for these variables. To elaborate, the coefficient estimates on *Initial Size* are negative and significant in both the acquirer and target regressions, confirming the standard result that small firms take more risk in investment. But notice that the coefficient in column 2 of Table 3 is −0.0083 as compared to −0.0056 in column 2 of Table 2. These estimates indicate that target risk-taking is far more sensitive to firm size as compared to acquirer risk-taking. Similarly, the coefficient on Initial Profitability is negative and significant in both sets of regressions, confirming the standard result that underperforming firms take more risk in investment. Again notice that the coefficient in Table 3 is −0.2707 as compared to −0.1223 in Table 2, indicating that target risk-taking is far more sensitive to firm profitability. As yet another example, *Firm Age* is insignificant in most specifications on ACQRISK1, but typically negative and significant in the TGTRISK1 regressions. These increased risk sensitivities reported in Table 3 seem to diminish the link between risk-taking by target firms and their ATPs. Despite just o.46 fewer number of ATPs on average, the types of ATPs targets adopt do not seem to constrain their investment policy as much, with the result that their risk-taking behavior seems to be primarily governed by the economic fundamentals of shareholder value maximization in capital project evaluation.[12] In sum, our regression estimates indicate significant heterogeneity in the risk-taking behavior of bidders and targets.

Our finding that targets, unlike bidders, are risk-efficient on average is somewhat different from Mitchell and Lehn (1990) who report that bad bidders tend to become good targets. Based on acquisition announcement abnormal returns for a sample of 1158 target and non-target firms during 1982–1986, they find that target firms, especially hostile targets, had systematically made acquisitions that reduced their equity values, whereas non-target firms had made acquisitions that increased their equity values. They conclude that the market for corporate control disciplines the inefficient target management.

5.2. External risk-taking and acquirer ATPs

Having established that acquirers with more anti-takeover provisions tend to follow a conservative investment policy with respect to internal operations, now we examine whether such excess risk avoidance extends to their merger activities. In column 1 of Table 4, the coefficient on *ACQGIM* is negative (−0.0031) and significant (in the conventional two-sided test) after controlling for all other variables that influence risk-taking by acquirers as shown in Table 2, thus confirming the univariate results reported earlier.

To address the potential endogeneity bias due to the choice of governance mechanisms by bidders in anticipation of a takeover transaction, we perform the following robustness check. The reverse causality between the choice of target risk-taking and bidder *ATPs* is less likely if we pick the acquirer governance index from the first year the corresponding firm enters our study period. This proxy has been used by John et al. (2008). Accordingly, in column 2 we replace the firm-level *ACQGIM* with the corresponding *Initial ACQGIM* to address concerns about potential reverse causality. The coefficient on *Initial ACQGIM* is similar in magnitude and sign to the original estimate and significant at 10% level using conventional two sided tests. To further scrutinize the endogeneity issue, we resort to instrumental variable 2SLS regressions by using the Fama-French 48 industry-year means of the ACQGIM as instruments. In the results reported in last two columns of Table 4 we find that our results are robust (even stronger) to using 2SLS. Overall, we find modest support for the argument that bidders armed with more ATPs tend to acquire targets with less investment risk while accounting for the potential endogeneity bias. However, the negative effect of bidder ATPs on external risk-taking appears weaker as compared to the case of internal risk-taking analyzed in Table 2. A plausible explanation for the weak evidence is that the heightened public scrutiny and market discipline surrounding mergers constrains high ATP bidders from excess risk avoidance, as contrasted with their suboptimal within-firm risk-taking behavior.

In summary, our results on internal risk-taking suggest that acquirers facing pressures from creditors and labor unions and insulated by more ATPs exhibit excess risk avoidance, more so in internal operations than in takeovers. But the investment risk-taking behavior of target firms does not seem to be influenced by the number of takeover defenses they adopt. Further, relative to the bidders, the risk-taking sensitivities of target firms are substantially larger (in absolute value) with respect to firm size, age and profitability. Together, these estimates imply that the potential for beneficial (value-enhancing) risk transfer may be limited because while a typical bidder exhibits reduced risk-taking in investment, target firms on average do not appear to suffer from risk inefficiency wrought by antitakeover provisions. These differential risk propensities shed light on the link between risk transfer and value creation. They imply that there is potential for value enhancement when an aggressive bidder takes over a conservative target firm. But value is likely to be destroyed when a risk-avoiding bidder seeks to merge with a relatively risk-efficient target firm, particularly in cases where the bidder is insulated by more antitakeover provisions.

[12] Another potential concern is that our selection of mergers in which bidders and targets both have necessary test and control variables effectively leaves us with a relatively small sample of 414 bidders and targets. To address this concern, in unreported analysis, we repeat the tests on the risk-taking behavior in larger samples of bidders and targets. First, we reproduce the main results in model 2 of Table 2 in a sample of 3764 bidders (including financial and non-financial firms) with sufficient data on all test and control variables, while ignoring whether targets meet these criteria or not. The coefficient on ACQGIM is negative and significant at 1% level (TSTAT −3.98) and it continues to be negative and significant at 1% level (t-statistic of −3.36) in a sub-sample of 2637 non-financial bidders. Second, we replicate the main results in model 2 of Table 3 in a sample of 1116 target firms (both financial firms and non-financial) with sufficient data on all test and control variables, while ignoring whether the corresponding bidders meet these criteria or not. The coefficient on *TGTGIM* is negative but not significant (t-statistic of −1.19). It continues to be negative but insignificant in a sub-sample of 760 targets involving non-financial firms only. These additional tests address the concern that the differential risk-taking behavior we observe between the bidders and targets may be biased or spurious.

Table 4
Risk Taking in Mergers by Acquirers.

The table presents results from regressing acquirer anti -takeover provisions (ACQGIM) and control variables on target risk-taking (TGTRISK1, dependent variable), including treatments for potential endogeneity bias of risk-taking. The sample covers all mergers from January 1990 to December 2007 TGTRISK1 is estimated as the standard deviation of market-adjusted annual EBITD scaled by assets (EBITDTA) over 10 years prior to merger announcement. Size is natural log of total assets, Bank Power is bank loans scaled by total assets, Profitability is EBITD scaled by total assets (EBITDTA), Leverage is total debt scaled by total assets, and sales growth is the average of the annual sales growth (percent change in sales) over the sample period, observations in risk taking is the number of observations used in estimating risk-taking, union membership is percent of members unionized by industry at two digit SIC codes, and earnings smoothing is estimated as defined in the Appendix. 'Initial' refers to the values of those variables in the first year of a firm's entry into our risk taking estimation window over 10 years prior to bid announcement. All other control variables are defined in the Appendix. T-statistics based on robust standard errors are presented inside the parenthesis, *, **, and *** refer to significance at 10%, 5% and 1% level respectively.

	(1)	(2)	**2SLS**	
Model	TGTRISK1	TGTRISK1	ACQGIM	TGTRISK1
ACQGIM	−0.0031*			
	(−1.896)			
Initial ACQGIM		−0.0035*		
		(−1.695)		
Industry ACQGIM			0.6838***	
			(3.617)	
Instrumented ACQGIM				−0.0182**
				(−2.092)
Other Characteristics				
Initial Acquirer Size	0.0004	0.0012	−0.0319	0.0001
	(0.138)	(0.370)	(−0.329)	(0.027)
Initial Acquirer Bank Power	0.0083	0.0088	−1.1277	−0.0188
	(0.238)	(0.230)	(−1.298)	(−0.517)
Initial Acquirer Profitability	−0.0600	−0.0755	1.2543	−0.0337
	(−0.912)	(−1.034)	(0.997)	(−0.531)
Acquirer Sales Growth	0.0380	0.0496	0.4610	0.0442
	(1.127)	(1.096)	(0.588)	(1.270)
Acquirer Earnings Smoothing	0.0087	0.0081	−0.2658	0.0042
	(0.966)	(0.834)	(−0.794)	(0.388)
Initial Acquirer Leverage	−0.0897**	−0.0899*	0.1859	−0.0935**
	(−2.100)	(−1.916)	(0.183)	(−2.207)
Observations in Risk Taking	−0.0047*	−0.0054*	0.1526	−0.0016
	(−1.672)	(−1.864)	(1.323)	(−0.417)
Acquirer Union Membership	−0.0619	−0.0574	0.1111	−0.0391
	(−1.646)	(−1.460)	(0.091)	(−1.233)
Acquirer Inside Ownership	−0.0857**	−0.0800**	0.4656**	0.0198**
	(−2.156)	(−1.990)	(2.030)	(2.015)
Acquirer Firm Age	0.0077	0.0093	−4.5266**	−0.1346**
	(1.181)	(1.222)	(−2.425)	(−2.195)
Constant	0.1801***	0.1790***	1.0632	0.3381***
	(5.678)	(5.807)	(0.560)	(4.403)
Observations	414	399	414	414
Adjusted R-squared	0.120	0.117	0.087	
Other Effects				
Industry Effects	Yes	Yes	NO	NO
Year Effects	Yes	No	Yes	Yes
Regression F-Stat			3.29	
P-Value F-Stat			0.0000	
Predictive Power of Excluded Instruments & Under/Weak Identification				
Partial R Square			0.0321	
Angrist-Pischke multivariate F test of excluded instruments (Weak Identification):			13.08	
P-Value			0.0003	
Kleibergen Paap- LM Test (Chi-Square) of Under-identification			12.84	
P-Value			0.0003	
Second Stage Tests				
Second Stage Regression F-Statistics				6.92
P-Value				0.0000
Wu-Hauseman Test of Endogeneity				
F-Statistics				8.27095
P-Value				0.0043

6. Risk transfer and merger synergy

This section presents tests of our second empirical prediction that investors react positively when a bidder with an aggressive investment policy seeks to acquire a conservative target firm. This reaction will be more positive when the aggressive bidder has relatively more stockholder-friendly governance mechanisms.

6.1. Merger announcement abnormal returns

Our risk transfer hypothesis predicts positive market reaction to a transaction involving positive risk transfer (i.e., a deal in which a bidder with an aggressive investment policy seeks to take over a target firm suffering from excess risk avoidance). In these instances, our proxy for risk transfer (*DRISK1*, defined as acquirer risk-taking less target risk-taking) assumes a positive value. Conversely, we expect investors to react negatively to bid announcements associated with a negative risk transfer in which a sub-optimal risk-taking acquirer tries to absorb a target firm with an aggressive investment program. These value effects of risk transfer are expected to be more pronounced when accompanied by positive governance transfer. We regress our proxies for governance and risk transfers (*DGIM* and *DRISK1*, respectively) along with a set of control variables on our proxy for (*PCAR11)* and report the results in Table 5.[13] In addition to year and industry fixed effects, we control for acquirer clustering to account for multiple acquisitions by bidders.[14] Our tests on statistical significance use robust clustered standard errors adjusted for nonindependence of observations within industries (Petersen, 2009).

One potential concern is that both *PCAR* and *DRISK1* are affected by (omitted) unobservable factors. To address this issue, our baseline specifications include an array of controls, guided by the closely-related studies of Palepu (1986), Dong et al. (2006), Masulis et al. (2007), John et al. (2008), and Wang and Xie (2009), for acquirer characteristics, target characteristics and deal structure. We use Relative Size (defined as the ratio of target to acquirer market capitalizations, estimated as of the fiscal year-end prior to merger announcement) to control for the effect bidder and target firm size differences.[15] The binary variable *Diversifying* controls for potential risk reduction effects of diversification, and *Return on Assets* accounts for the effects of managerial quality (a frequent omitted variable concern). Our prior arguments with respect to risk-taking propensities of bidders and targets suggests that firm age might influence merger synergy, although prior studies donot include it as a control variable. To address this issue, we replicate all regressions in Table 5 by adding (the log of) bidder age and target age. In untabulated results, we find that the coefficient estimates on these two added controls are insignificant and our key test results remain practically similar. Marginal effects of other control variables are generally consistent with those of prior studies.

We add *Market to Book* ratios of bidders and targets to control for the Q and the misevaluation theories of mergers. Under the misvaluation hypothesis, overvalued bidders seek to profit by acquiring relatively less overvalued target firms, and the market reacts negatively as the bid announcement triggers a more careful valuation of the bidders. The Q hypothesis predicts that acquisition of less productive target firms by bidders with better investment opportunities creates value. It implies a positive (negative) relation between total gains from takeovers and bidder (target) valuation as indicated by their respective *Market to Book* ratios (see Dong et al. (2006)). However, our estimates of the coefficients are consistently negative and significant for bidders and insignificant for targets. These findings indicate that high bidder valuation is associated with lower announcement abnormal returns, which is contrary to the prediction of the Q theory. The significant negative relation between *PCAR11* and bidder *Market to Book* ratio is consistent with the prior evidence (see Dong et al. (2006)) and suggests that the bid announcement alerts investors to preexisting mispricing.

The OLS estimates in column 1 indicate that the coefficient on *DGIM* is positive and significant at 10% level using conventional two tailed tests, thus confirming the findings of Wang and Xie (2009) on the role of governance transfer in generating merger synergy. Moreover, in column 2 the coefficient on *DRISK1* is also positive and significant at 5% level. According to Table 1, a median firm has a *PCAR11* value of 2.07%, and the standard deviations of *DGIM* and *DRISK1* are, respectively, 3.6 and 0.10. The coefficient of 0.0023 on *DGIM* and 0.0642 on *DRISK1* suggest that a one standard deviation increase in *DRISK1* (*DGIM*) increases *PCAR11* by approximately 64 (83) basis points (bps) on average. These marginal effects account for roughly 30% and 40%, respectively, of the median *PCAR11* of 2.07%. Thus, the value impact of risk transfer and governance transfer seem to be economically significant.

In terms of magnitudes, although the marginal effect of risk transfer (64 bps) is somewhat lower than that of governance transfer (83 bps), the former is statistically more significant (5% level) as compared to the latter (10%). Given no change in the coefficients of DGIM from column 1 (that does not include DRISK1) to column 2 (that includes DRISK1), these findings imply that the risk and governance transfer measures in our sample are virtually uncorrelated, thus confirming our insignificant simple correlation estimate reported in Panel C of Table 1. We surmise that the incremental value effects of risk transfer originate from sources of conflicts of interest other than ATPs such as organized labor and creditor rights. Firms may undertake some value-destroying deals or forgo some value-creating acquisitions due to pressures from their banks and labor unions.

One potential problem with the above analysis is endogeneity bias due to the choice of risk transfer – our main test variable. To control for this bias, we have so far used *DRISK1* constructed as of event year (T-1). As an additional precaution, we lag this proxy by one more year and use *DRISK1* (T-2) instead. The revised results presented in column 3 indicate that the estimated coefficient on the lagged risk transfer proxy is 0.785 (significant at 1% level) and the governance transfer proxy coefficient becomes slightly smaller. Therefore, endogeneity due to the choice of risk transfer does not seem to bias our estimates of synergy.[16]

[13] Our results in Table 5 are practically the same when we construct *PCAR11* as an asset-weighted average of 11-day cumulative abnormal returns of bidders and targets.

[14] After accounting for more than one acquisition by the same bidders, our sample size drops from 414 merger events to 308 clusters. Our standard errors are corrected for both unknown heteroskesdasticity and acquirer clustering.

[15] We use relative size to capture the effect of target and acquirer size differences. We thank an anonymous referee for this suggestion. In untabulated results, however, we find that adding the proxies of target size and acquirer size (e.g. target and acquirer size ranks) to the set of control variables in Table 5 does not materially change our key predictions. While we note that the significance of *DRISK1* drops, we find that risk transfer continues to enhance (destroy) value when accompanied by strong (weak) governance transfer. The marginal effects and statistical significance levels of these interaction terms remain essentially unchanged from those reported, thus increasing our confidence in the role of risk-taking propensities.

[16] In order to further address the endogeneity issue, we instrument DRISK1 with the difference in initial firm size of bidders and targets (*DInitial Size = ACQ Initial*

Table 5
Takeover Announcement Abnormal Returns, Risk-Taking and Governance Transfer.

The table presents results from regressing the difference between acquirer and target risk-taking (DRISK1 = ACQRISK1 less TGTRISK1) and control variables on the combined bid announcement abnormal returns (PCAR11). The sample covers 414 mergers completed over January 1990 to December 2007. Risk- taking proxies (ACQRISK1 and TGTRISK1) are estimated as the standard deviations of market-adjusted EBITD scaled by total assets (EBITDTA). We define four indicator variables: strong governance transfer (SDGIM) if DGIM > 1, weak governance transfer (WDGIM) if DGIM < −1, GDGIM if DGIM > 0, and BDGIM if DGIM < 0. Cumulative abnormal returns are estimated using the standard event study methodology over an event window of 11days surrounding bid announcement. PCAR11 is a value-weighted average of acquirer and target CAR11. Target and Acquirer characteristics are measured as of fiscal year ending before bid announcement. Deal characteristics are extracted from SDC Platinum and are defined in the Appendix, proxy of Relative Size refers to target market cap divided by bidder market cap as of the fiscal year ending before the merger announcement. T-statistics based on robust standard errors (corrected for heteroskedasticity (White (1980) and acquirer clustering (where stated)) are presented inside the parenthesis, *, **, and *** refer to significance at 10%, 5% and 1% level respectively.

Model	(1) pcar11	(2) pcar11	(3) pcar11	(4) pcar11	(5) pcar11	(6) pcar11	(7) pcar11
DRISK1		0.0642**		0.0232	0.1104***	−0.0592	0.1168***
		(2.016)		(0.626)	(2.968)	(−0.834)	(3.042)
DRISK1 (T-2)			0.0785***				
			(2.651)				
SDGIM*DRISK1				0.3831**			
				(2.364)			
SDGIM				0.0223**			
				(2.251)			
WDGIM*DRISK1					−0.3505**		
					(−2.399)		
WDGIM					−0.0250**		
					(−2.330)		
GDGIM*DRISK1						0.2017**	
						(2.216)	
GDGIM						0.0186**	
						(2.020)	
BDGIM*DRISK1							−0.3261**
							(−2.432)
BDGIM							−0.0311***
							(−3.024)
Target & Acquirer Combined Characteristics							
DGIM	0.0023*	0.0023*	0.0021				
	(1.780)	(1.764)	(1.645)				
Relative Size	−0.0003	−0.0003	−0.0004*	−0.0003	−0.0003	−0.0003	−0.0003
	(−1.197)	(−1.238)	(−1.899)	(−1.237)	(−1.234)	(−1.333)	(−1.285)
Acquirer Characteristics							
Market to Book	−0.0098***	−0.0104***	−0.0129***	−0.0110***	−0.0100***	−0.0099***	−0.0093***
	(−2.855)	(−3.021)	(−3.776)	(−2.983)	(−2.900)	(−2.785)	(−2.632)
Leverage	0.0862	0.0880	0.0555	0.0759	0.0749	0.0752	0.0764
	(1.348)	(1.377)	(0.857)	(1.203)	(1.248)	(1.217)	(1.268)
Return on Assets	0.0255	0.0305	0.0356	0.0223	0.0176	0.0145	0.0102
	(0.564)	(0.680)	(0.802)	(0.499)	(0.424)	(0.327)	(0.217)
Target Characteristics							
Market to Book	−0.0059	−0.0046	−0.0043	−0.0040	−0.0060	−0.0061	−0.0065
	(−1.514)	(−1.163)	(−1.149)	(−1.003)	(−1.436)	(−1.456)	(−1.546)
Leverage	−0.0779	−0.0791	−0.0896	−0.0886	−0.0730	−0.0831	−0.0743
	(−1.433)	(−1.460)	(−1.616)	(−1.621)	(−1.393)	(−1.523)	(−1.408)
Return on Assets	0.0056	−0.0001	0.0080	0.0041	0.0254	0.0162	0.0220
	(0.213)	(−0.003)	(0.297)	(0.158)	(0.868)	(0.556)	(0.756)
Deal Characteristics							
Diversifying	0.0019	0.0017	−0.0030	0.0029	−0.0006	0.0000	0.0002
	(0.172)	(0.156)	(−0.265)	(0.259)	(−0.057)	(0.000)	(0.018)
Merger of Equals	−0.0458	−0.0456	−0.0445	−0.0462	−0.0475	−0.0475	−0.0449
	(−1.182)	(−1.177)	(−1.153)	(−1.192)	(−1.185)	(−1.227)	(−1.162)
Tender Offer	0.0084	0.0098	0.0075	0.0092	0.0103	0.0106	0.0109
	(0.554)	(0.642)	(0.493)	(0.605)	(0.675)	(0.701)	(0.721)
All Cash	−0.0161	−0.0162	−0.0144	−0.0154	−0.0144	−0.0160	−0.0158
	(−1.343)	(−1.353)	(−1.208)	(−1.334)	(−1.220)	(−1.373)	(−1.361)
Hostile	0.0178	0.0160	−0.0007	0.0156	0.0140	0.0156	0.0129
	(0.782)	(0.698)	(−0.031)	(0.694)	(0.593)	(0.674)	(0.562)
High Tech	−0.0240*	−0.0233*	−0.0287**	−0.0243**	−0.0206*	−0.0256**	−0.0225*
	(−1.959)	(−1.909)	(−2.259)	(−2.016)	(−1.689)	(−2.100)	(−1.890)
Constant	0.0554*	0.0536*	0.0716**	0.0591*	0.0616**	0.0511	0.0655**
	(1.772)	(1.711)	(2.273)	(1.810)	(2.078)	(1.600)	(2.161)
Observations	414	414	394	414	414	414	414
Adjusted R-squared	0.048	0.049	0.050	0.061	0.063	0.054	0.071
Other Effects							
Year Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes

(continued on next page)

Table 5 *(continued)*

Model	(1) pcar11	(2) pcar11	(3) pcar11	(4) pcar11	(5) pcar11	(6) pcar11	(7) pcar11
Industry Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Clustering	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Our risk transfer hypothesis predicts the value effects of risk transfer would be stronger when accompanied by strong governance transfer. To test for this contingent effect, one option is to use the standard interaction term, *DRISK1*DGIM*. This product is positive when both variables have the same sign (i.e., both are either positive or negative), and negative when they have opposite signs (i.e., one positive while the other is negative). Since this product is positive even when both governance and risk transfers are weak, we cannot predict that value creation increases as the product increases. Therefore, to capture strong governance transfer we construct an indicator variable, *SDGIM*, which take a value of 1 if *DGIM* > 1, zero otherwise. In addition, we represent weak governance transfer by W*DGIM*, which take a value of 1 if *DGIM* < −1, zero otherwise (i.e., the acquirer has at least one more ATP than the target firm). In column 4, we replace the continuous variable with *SDGIM* and its interaction with risk transfer, *SDGIM*DRISK1*. The interaction coefficient estimate suggests that a one standard deviation increase in risk transfer increases value by 3.831% (= 0.3831*0.10) in the presence of strong governance transfer as compare to the baseline estimate of 64 bps.

By contrast, an equivalent increase in risk transfer leads to value destruction on the order of 3.505% (= −0.3505*0.10) when accompanied by weak governance transfer (i.e., the bidding firm is poorly governed – has at least one more ATP - relative to the target firm). These findings suggest that investors suspect an increase in risk-transfer as value destroying when bidders are shielded from takeover threats through more ATPs. To scrutinize the robustness of these estimates, we use an alternative partition of the cross-section by defining good governance transfer *GDGIM* which takes a value of 1 if *DGIM* > 0, zero otherwise, and bad governance transfer *BDGIM,* which takes a value of 1 if *DGIM* < 0, zero otherwise. The revised estimates show that our interaction results are qualitatively similar, see columns 6 and 7. In sum, these estimates highlight that the interaction between risk and governance transfers is economically significant, in relation to the median synergy of 2.07% in our sample. Further, the fact that we document a strong link between *PCAR11* and *DRISK1* even after controlling for governance transfer, the neoclassical hypothesis of mergers, the misevaluation hypothesis, and a battery of firm and deal characteristics highlights the incremental role of risk transfer in value creation in mergers and acquisitions.

Is our risk transfer proxy picking up a managerial overconfidence effect? Malmendier and Tate (2008) find that investors react more negatively to merger announcements made by overconfident CEOs. Hirshleifer, Low, and Teoh (2012) report that overconfident CEOs undertake riskier projects, exploit growth options and achieve greater innovation productivity. By contrast, we concentrate on managerial risk-taking, a broader trait that covers both rational and overconfident risk choices. Our comprehensive analysis of the risk transfer hypothesis indicates that the overall announcement abnormal returns of bidder and target firms are positive when an aggressive bidder takes over a less risky target (which we interpret as 'good', judicious or prudential risk-taking). Such positive risk transfer accounts for roughly 40% of our sample. But the combined abnormal returns are negative when a conservative bidder makes a risky bet on a target firm (i.e., 'bad' or excess risk-taking). Such deals entailing negative risk transfer (i.e., those in which risk-avoiding bidders bid for a more risk-taking target firm) constitute about 60 percent of our sample. Our risk transfer hypothesis posits that conservative bidders (who are insulated by stronger antitakeover provisions and who face pressures from labor unions and creditors to undertake sub-optimal risk) would redeploy the assets of the target firms to less risky and productive uses to preserve their private benefits. It is only the deals with negative risk transfer that appear to be correlated with managerial overconfidence. Since we donot have access to CEO option exercise data for constructing proxies for managerial overconfidence, we are unable to conduct tests to discriminate between these two alternative explanations for negative risk transfer.

To sum up, our analysis offers significant support for our risk transfer hypothesis that acquisitions that mitigate sub-optimal risk-taking enhance value creation. Correcting for potential endogeneity bias, we find that merger synergy, proxied by the announcement-period abnormal return of a value-weighted portfolio of the acquirer and the target, is increasing in risk transfer, defined as the difference in risk-taking between the bidder and the target. In other words, the market reacts favorably when high risk-taking firms acquire firms with excess risk avoidance in investment. But investors seem disappointed with inefficient (negative) risk transfer in which conservative bidders seek to take over targets with an aggressive investment policy. These value effects are stronger when the

(*footnote continued*)

Size *less* TGT Initial Size*). Since we pick initial firm size as far back as ten years before the merger, we expect that there is little causality between this instrument and the dependent variable. In addition, based on the evidence in Table 2 on the impact of labor unions on risk-taking, we rationalize that bidders with strong unions are likely to receive support for their takeover bids for lower-risk targets. By supporting the acquisition of targets with lower than bidder's own risk, strong unions are likely to promote greater risk transfer in mergers. Accordingly, we create a dummy variable called* ACQ Hi-Union Membership *which is set equal to 1 if the bidder belongs to an industry that is at or above the 75th percentile by union membership in our sample, zero otherwise. In untabulated analysis, as expected, the first-stage results show that DRISK1 is significantly correlated with both the instruments, negatively with* DInitial Size *and positively with* Hi-Union Membership. *The two instruments have significant predictive power, as they explain 7.2% of the variation in* DRISK1 *(partial-R2). The F-test rejects the null hypothesis that the coefficients on both instruments are jointly zero. As weak instrumental variables can cause inconsistency and imprecision in the 2SLS estimators, the above set of tests gives us the comfort that such concerns are not serious in our sample. Further, the overidentification test (Hansen-J test) returns a p-value of 0.73 giving us confidence that our choice of instruments is valid (it fails to reject the joint null hypothesis that the two instruments are not correlated with the error term and are therefore correctly left out of the second-stage regression). The second-stage results indicate that the instrumented* DRISK1 *is positively related to PCAR11 (significant at 5% level). The Wu-Hausman test rejects the null hypothesis that the 2SLS and OLS coefficients on* DRISK1 *are the same, thus confirming our endogeneity concern.*

Table 6
Anti-takeover Provisions, Risk Taking and Likelihood to being a Bidder.

The table presents probit regressions to test the likelihood of a firm being involved as an acquirer (or a target) with its anti-takeover provisions (*GIM*) and risk-taking (*RISK1*) as test variables. The estimates are presented as odds-ratios. The dependent variable (Bidder) is an indicator variable taking a value of 1 if a firm is a bidder, 0 if it is a target. The sample covers 414 mergers completed over January 1990 to December 2007. Risk- taking (*RISK1*) is estimated as the standard deviation of market-adjusted annual EBITD scaled by assets (EBITDTA). Market-to-Book value is estimated as of the fiscal year ending before the bid announcement date. T-statistics based on robust standard errors are presented inside the parenthesis, *, **, and *** refer to significance at 10%, 5% and 1% level respectively.

	Probit		
	(1)	(2)	(3)
VARIABLES	bidder	bidder	bidder
GIM	1.011		1.009
	(0.552)		(0.459)
Risk Taking		0.253**	0.262**
		(−1.975)	(−1.965)
Market to Book Value	1.096**	1.108**	1.108**
	(2.320)	(2.489)	(2.493)
Firm Age	0.998	0.998	0.998
	(−0.665)	(−0.574)	(−0.683)
Log Assets	1.808***	1.784***	1.785***
	(11.796)	(11.383)	(11.433)
Leverage	0.201***	0.201***	0.197***
	(−3.282)	(−3.292)	(−3.311)
ROA	0.969	0.906	0.893
	(−0.044)	(−0.134)	(−0.154)
Constant	0.0113***	0.0151***	0.0139***
	(−10.631)	(−10.067)	(−9.837)
Observations	828	828	828
Pseudo R-Square	0.274	0.276	0.276
Wald (Regression) X^2	210.8	209.3	212.7
P-value	0.000	0.000	0.000
Year Dummies	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes

bidder is better governed than the target firm. These findings are robust to controls for governance transfer, investment opportunities, misevaluation, and a broad array of firm and deal characteristics.

6.2. Risk-taking, acquisitiveness, and deal characteristics

Malmendier and Tate (2008) find that overconfident CEOs are more likely to conduct mergers, especially when their firms are cash-rich (i.e., donot need to access external capital markets to finance the deal). On the other hand, the existing evidence implies that firms taking more investment risk prior to merger are endowed with less entrenched managers, more stockholder-friendly governance rules, and less pressure from labor unions, creditors and government to undertake suboptimal risk. This suggests that those who take more operational risk are likely to be selective in acquisitions and search for value-enhancing merger opportunities. Against this backdrop, we study how strategic risk-taking behavior as well as governance structures influence the probability that a firm participates in a merger transaction as a bidder rather than as a target as well as their impact on deal structures. We adapt the methodology of Rhodes-Kropf et al. (2005) and Dong et al. (2006) and perform probit regressions in which the dependent variable is one if the firm is an acquirer and zero if a target. Market-to-book value ratio, *firm age* and *firm size* serve as control variables. In addition, we use year and industry fixed effects to control for time and industry-wide trends in takeover activity. Our test variables are *GIM* and *RISK1*. To mitigate concerns about spurious relations and reverse causality, all our regressors are taken from the year preceding bid announcement date.

The coefficient estimates are reported as odds ratios in Table 6. An estimate greater (less) than 1 indicates a positive (negative) effect on acquisitiveness. Beginning with the control variables, firms with higher market-to-book ratios are more acquisitive, consistent with both the neoclassical synergy and relative misvaluation hypotheses (conditional odds ratio is 1.096 in column (3), significant at 5%). These results are consistent with the findings of Rhodes-Kropf et al. (2005). Further, firm size increases acquisitiveness (i.e., larger firms are significantly more acquisitive with a conditional odds ratio of 1.808, significant at 1%). More importantly, the conditional ratio associated with RISK1 (column 2) is 0.253, that is, the odds of being a bidder over the odds of being a target are 0.253. This indicates that we will see 74.7% (= - (0.253–1)) *decrease* in the odds of being a bidder for a one-unit increase in *RISK1*. In column 3, the conditional ratio associated with *RISK1* in the presence of *GIM* is 0.262, significant at 5%. Thus, we consistently find that aggressive firms (those with higher *RISK1*) are less acquisitive. This result is intuitive because firms with less risky operations tend to follow the growth-by-acquisition strategy, thus indulging in more merger activity. It is also consistent with the idea that firms taking more investment risk prior to merger are endowed with less entrenched managers, more stockholder-friendly governance rules, and less pressure from non-equity stakeholders and are more likely to be selective in acquisitions. In contrast, the conditional odds ratios on *GIM* in column 1 (1.011) is insignificant, indicating that the number of takeover defenses have

little effect on the probability that a firm is involved as a bidder. Both of these are important findings because they are contrary to the popular notion that risk-takers are more acquisitive and antitakeover provisions lead to more merger activity. Moreover, our finding that risk-takers are less acquisitive is inconsistent with the result in Malmendier and Tate (2008) that overconfident CEOs are more likely to conduct mergers. This inconsistency suggests that our measure of risk-taking captures a broader managerial trait that captures not simply managerial overconfidence but also rational risk-taking. Thus, we identify risk-taking behavior as an important driver of takeover dynamics in addition to investment opportunities and relative misevaluation which have been highlighted by prior studies.

Next we ask: how do governance structures and risk-taking propensities of bidders and targets influence deal characteristics, such as, all-cash bids, all-stock bids, hybrid offers, hostile bids, and tender offers? The untabulated univariate results (see Table A1) show that of the 414 total deals in our sample, 146 are all-cash, 124 all-stock, 144 hybrid, 82 tender offers and 20 hostile bids. In Panel A, we report mean ATPs for bidders and targets, as well as for our proxy for governance transfer, *DGIM,* defined as target *GIM* less bidder *GIM*. We note that acquirers are on average armed with 0.459 more anti-takeover provisions than target firms (indicating negative governance transfer), significant at 1%. Further, bidders have on average 1.194 (1.159) significantly more takeover defenses than their counterparts in all-stock offers (tender offers). We note that an average bidder takes significantly less investment risk, 2.42%, than the target firm, which is in line with the prior result that a firm is more likely to be involved as an acquirer if it has been taking less investment risk and the univariate result presented in Table 1 that a typical merger transaction entails negative risk transfer. Similarly, bidders making all-cash, all-stock, and tender offers take significantly less operational risk than their counterparts.

We follow Dong et al. (2006) to perform multivariate probit regressions to evaluate the impact of risk-taking and governance profiles of bidders and targets on their choice of deal characteristics. In each regression the dependent variable is a binary variable equal to 1 if the corresponding term of the transaction is present, 0 otherwise. To mitigate concerns about spurious relations and reverse causality, all our regressors come from the year preceding the bid announcement date. The coefficient estimates are presented as odds ratios in Table 7. Similar to our regression specifications in Table 6, we use year and industry fixed effects to control for time and industry-wide trends in takeover activity.

Table 7
Anti-takeover Provisions, Risk-Taking and Deal Characteristics.

The table presents probit regressions to assess the likelihood of choosing specific deal characteristics with the difference between target and acquirer anti-takeover provisions (*DGIM = TGTGIM less ACQGIM*) and the difference between acquirer and target risk-taking (*DRISK1 = ACQRISK1 less TGTRISK1*) as test variables. The estimates are presented as odds-ratios. The dependent variables are all indicator variables taking a value of 1 if a specific deal characteristic is adopted, 0 otherwise. The sample covers all mergers from January 1990 to December 2007. Risk- taking proxies (*ACQRISK1* and *TGTRISK1*) are estimated as the standard deviation of market-adjusted EBITD scaled by assets (EBITDTA). Deal characteristics are extracted from SDC Platinum and are defined in the Appendix. *MCAP* Raito is market value of acquirer divided by market value of target as of the fiscal year ending before the bid announcement date. A merger is defined as diversifying if the acquirer and target are not in the same Fama-French 48 industry groups. Log of Target Assets, Acquirer Leverage, Acquirer & Target Price to Book are estimated as of the fiscal year ending before the bid announcement date. T-statistics based on robust standard errors are presented inside the parenthesis, *, **, and *** refer to significance at 10%, 5% and 1% level respectively.

Model	(1) All-cash	(2) All-stock	(3) Hybrid	(4) Tender offer	(5) Hostile
DGIM	1.031	0.946***	1.010	0.952**	1.021
	(1.468)	(2.776)	(0.498)	(2.142)	(0.633)
DRISK1	0.495	1.038	6.299	0.246*	442.8*
	(0.760)	(0.050)	(1.403)	(1.665)	(1.823)
Control Variables					
MCAP Ratio	0.998	1.030**	0.958	0.991	0.568***
	(0.197)	(2.312)	(0.777)	(1.043)	(2.969)
Target Firm Size	0.744***	1.028	1.262***	0.910	1.289**
	(4.572)	(0.451)	(3.565)	(1.460)	(2.223)
Diversifying Merger	1.156	0.842	1.036	1.407**	1.679*
	(0.959)	(1.079)	(0.225)	(2.014)	(1.833)
Acquirer Leverage	2.137	0.164**	2.110	2.096	0.300
	(0.915)	(2.018)	(0.921)	(0.872)	(1.221)
Acquirer Price to Book	1.017	1.088	0.884**	1.004	0.919
	(0.330)	(1.610)	(2.175)	(0.063)	(0.835)
Target Price to Book	0.760***	1.156*	1.092	0.794***	1.065
	(3.484)	(1.848)	(1.225)	(2.650)	(0.483)
Acquirer Firm Age	1.011***	0.998	0.993**	1.010***	0.999
	(3.069)	(0.710)	(2.043)	(2.807)	(0.141)
Target Firm Age	1.005	1.000	0.996	1.005	1.022***
	(1.046)	(0.079)	(0.780)	(0.969)	(2.733)
Constant	3.096**	0.411*	0.131***	0.616	0.00016***
	(2.204)	(1.683)	(3.749)	(0.937)	(8.384)
Observations	414	414	414	414	414
Chi Square	116.2	88.51	79.89	83.39	447.6
Pseudo R-squared	0.232	0.186	0.171	0.222	0.280
Year Dummies	Yes	Yes	Yes	Yes	Yes
Industry Dummies	Yes	Yes	Yes	Yes	Yes

Our findings concerning the control variables are generally comparable to those reported by Dong et al. (2006) and Rhodes-Kropf et al. (2005). Turning to our test variables, the conditional odds ratios on *DGIM* are 0.946 and 0.952 in the 'All-stock' and 'Tender offer' regressions, respectively. Both estimates are significant at 1%. These results suggest that poorly governed bidders (i.e., those associated with low *DGIM*,) are significantly more likely to make all-stock and tender offers. In the 'Tender offer' regression, the conditional odds ratio on *DRISK1* is 0.246, significant at 10%. This evidence suggests that bidders that are relatively aggressive (those with higher *DRISK1*) are less likely to make tender offers. In contrast, in the 'Hostile' regression, the conditional odds ratio on *DRISK1* is 442.8, significant at 10%, suggesting that these aggressive bidders are more likely to make hostile offers. Moreover, we fail to find any evidence to suggest that aggressive bidders prefer all-cash (or all-stock) offers. Despite the insignificance of the coefficient, it is an interesting finding in light of the evidence in Malmendier and Tate (2008) that overconfident CEOs are more acquisitive, especially when associated with cash-rich firms. We view this disparity as further indication that our proxy for risk transfer is quite different from managerial overconfidence.[17]

To sum up, we present new evidence which indicates that risk-taking behavior of firms is important in shaping merger dynamics even after controlling for investment opportunities and market misevaluation. In particular, firms following a strategic risk-taking policy in investment are less acquisitive and less (more) likely to make tender (hostile) offers. Moreover, firms insulated by more takeover defenses are more likely to make all-stock and tender offers.

7. Additional robustness tests

An important concern with our analysis is that risk-taking in investment (including acquisitions) is inherently endogenous to the firm, although the firm's risk choice is constrained by its own managers pursuing their self-interest as well as its non-equity stakeholders. Mindful of this problem, we have so far used a range of tools to mitigate endogeneity bias, such as, instruments for endogenous test variables, industry surrogates, firm characteristics (control variables) dated as of the beginning of the 10-year risk estimation window, year fixed effects and industry fixed effects to account for potential omitted variable bias. Below we discuss additional sensitivity tests of our core findings with respect to our choice of proxies for risk-taking and anti-takeover provisions.

Our analysis thus far has relied on *RISK1* as a proxy for acquirer and target risk-taking. *RISK1* is based on firm-level EBITDTA adjusted for *market average* EBITDTA for each year. However, variation in firm-level EBITDTA is quite likely to be industry-specific, given the evidence that merger waves tend to be concentrated in specific industries (see for example Rhodes-Kropf et al. (2005)). Therefore, the market-adjusted *RISK1* is likely to miss variation due to industry economic conditions. We attempt to address this concern either by using fixed industry effects or by presenting test statistics using industry cluster-corrected standard errors. In order to mitigate this concern further, we use an alternative risk-taking proxy (*RISK2*) based on firm-level EBITDTA adjusted for Fama-French 48 *industry average* EBITDTA. In the robustness tests (untabulated) our core findings are robust and often stronger in using *RISK2* as a proxy for acquirer and target risk-taking.

Similar to the analyses of investor protection and governance transfer in the literature, our main tests rely on the GIM index of anti-takeover provisions developed by Gompers et al. (2003) as a proxy for lack of investor protection. One key reason for using this index is that it offers greater variability across firms and over time as it is based on 24 anti-takeover provisions. However, some studies (e.g., Bebchuk et al., 2009) argue that not all ATPs effectively increase managerial entrenchment. In other words, some proxies included in GIM index are not effective as takeover defenses. In order to mitigate this concern, we replicate our results using the E-index of Bebchuk et al. (2009) and Faccio et al. (2016), which comprises six major anti-takeover provisions. According to these researchers, the E-index provisions are important for valuation purposes as they transfer real power from shareholders to managers, making the later more powerful. In untabulated results, we replicate the main results in Tables 2 and 3 and find that the acquirer E-index is significantly negatively related to acquirer risk-taking, but the target E-index remains insignificant in the regression on target risk-taking. In replicating main results in Table 4, although the E-index loads with a negative coefficient against *TGTRISK1*, it is insignificant. However, in replicating the main tests in Table 5, we find *PCAR11* is positively associated with the difference between the target and the acquirer E-indices, but it is not significant. In particular, the difference between bidder and target ATPs using the E-index (similar to *DGIM*) turns out to be a poor proxy because it captures little variability (i.e., the range of the E-index itself is limited, from 0 to 6).

8. Conclusion

Firms may face many obstacles from ill-diversified insiders pursuing private benefits, dominant investors, overconfident managers, and non-equity stakeholders (such as creditors and labor unions) to optimal risk-taking in investment required to maximize shareholder value. Recent studies show that suboptimal investment choices of insiders can be mitigated by better investor protection and more effective monitoring by dominant insiders. They suggest that the investment risk choice made by corporate decision makers serves as a reliable overall indicator of the risk culture (i.e., risk-taking vs. risk avoidance) of the firm and of their preference for firm value-maximization over their pursuit of self-interest. Specifically, aggressive (internal) risk-taking in operations by a firm reveals that it has developed the organizational capability to successfully mitigate conflicts of interest and operate closer to

[17] Our test variables *DGIM* and *DRISK1* are vulnerable to endogeneity bias. To mitigate this concern, we also use instrumental variable probit (IVPROBIT) tests. In these tests we instrument *DGIM* on industry average *DGIM* and log of bidder age minus log of target age, and *DRISK1* on industry average *DRISK1* and log of bidder age minus log of target age. In unreported results we find that instrumented *DGIM* is not significant for all-cash, all-stock, and hybrid mergers, and significantly negative for tender offers. However, instrumented *DRISK1* is significant for all-cash mergers at 10% level, and for hybrid and tender offers at 1% level. The model that uses hostile takeovers fails to converge while using instrumental variable probit tests.

the first-best level of investment. In contrast, the management of a firm that acts conservatively in directing its corporate investment policy reflects its ability and propensity to pass up value-enhancing risky projects. Motivated by these arguments, we advance our risk transfer hypothesis which posits that investors react positively to a takeover bid by an aggressive bidder, anticipating that it will redeploy the assets of a conservative target firm after the merger to value-enhancing risky uses. Conversely, the market response will be negative when a conservative bidder seeks to take over another firm pursuing an aggressive risk-taking policy. This reaction will be more positive when the aggressive bidder has more stockholder-friendly governance mechanisms as compared to those of the target firm. Moreover, bidders insulated by antitakeover provisions and subject to pressures from creditors and labor unions will indulge in suboptimal risk-taking, whereas target firms, which are typically younger, smaller and less profitable, are likely to pursue a relatively more aggressive investment policy.

Our main findings, based on a sample of 414 U.S. M & As over 1990–2007, are as follows. First, the combined abnormal returns of both bidders and targets are significantly higher when a risk-taking acquirer announces a bid for a (relatively) risk-avoiding target firm, after controlling for relative misevaluation, investment opportunities, and governance transfer. The incremental risk transfer effect on merger synergy is significantly more positive for deals involving strong governance transfer but negative for mergers associated with weak governance transfer. Further, (strategic) risk-takers are less acquisitive but are more (less) likely to make hostile (tender) offers. Finally, bidders subject to pressures from creditors and labor unions and armed with more antitakeover provisions tend to take on significantly less (internal) investment risk prior to merger announcement, but their risk choice in mergers is much less sensitive to takeover defenses. The weak relation between antitakeover provisions and external risk-taking is consistent with the argument that bidders are subject to the disciplinary power of the market for corporate control. It is also in line with the general notion of growth by acquisition in the sense that bidders tend to take relatively more risk in mergers to enhance their growth prospects. In contrast, the operational risk of target firms shows little sensitivity to their antitakeover provisions, perhaps due to their increased risk appetite induced by relatively young age, small size, and poor profitability. These results appear to be robust to potential bias due to endogeneity of risk-taking as well as alternative explanations attributable to managerial overconfidence and the asset substitution problem. Thus, our study offers new direct evidence demonstrating that strategic risk transfer is an important channel of value creation in mergers and acquisitions after controlling for investment opportunities, relative misvalutaion, and governance transfer.

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Appendix. Variable definitions

Variable	Definition	Source
CAR11	Cumulative abnormal returns over an 11 day window (event day −5 to +5) estimated using the market model based on the Centre for Research in Stock Prices (CRSP) equally weighted index, see Masulis et al. (2007) and Wang and Xie (2009).	Authors' computation
ACAR11, TCAR11 & PCAR11	ACAR11 is acquirer CAR11, TCAR11 target CAR11 and PCAR11 is the value weighted average of ACAR11 and TCAR11.	Authors' computation
GIM	Gompers et al. (2003) governance index is based on 24 anti-takeover provisions compiled by IRRS, which takes a value of 0 to 24, lower value indicating better corporate governance, available for years 1990, 1993, 1995, 1998, 2000, 2002, 2004 and 2006.	Andrew Metrick 's website
DGIM	*TGTGIM* less *ACQGIM*	Authors' computation
Log Assets	Natural log of total assets of the firm (data6) as of fiscal year- end prior to merger announcement. Acquirer and target size is labeled accordingly.	Compustat
Firm Age	Natural log of number of years from the firm's initial coverage in CRSP database. Acquirer and target age is labeled accordingly.	CRSP/Authors' computation
Leverage	Book value of debt (data34 + data9) over market value of firm (data6-data60 + data25 X data199).	Compustat
Log *MCAP*	Natural log of MCAP, where MCAP = (closing stock price multiplied by numbers shares outstanding - data25 x data199, estimated as of the fiscal year-end prior to merger announcement).	Compustat
Price to Book	Market value of equity divided by book value of equity estimated as of the	Compustat/Authors' compu-

/Market to Book	fiscal year- end prior to merger announcement.	tation
Relative Size	Target MCAP divided by acquirer MCAP	Compustat/Authors' computation
Return on Assets (*ROA*)	Operating Income (data13) (divided by book value of total assets (data6).	Compustat/Authors' computation
High Tech	Indicator variable, that takes a value of 1 if bidder and target are both from high tech industries, as defined in Loughran and Ritter (2004), 0 otherwise.	SDC Platinum & Compustat
Diversifying	Indicator variable that takes a value of 1 if acquirer and target both are from different Fame French 48 industry groups.	SDC Platinum & Compustat & Authors' computation
Merger of Equals	Dummy variable that takes a value of 1 if SDC classifies the deal as merger of equals.	SDC Platinum
Tender Offer	Dummy variable that takes a value of 1 if SDC states the deal as tender offer.	SDC Platinum
Hostile Takeover	Dummy variable that takes a value of 1 if SDC classifies the deal attitude as hostile.	SDC Platinum
All-cash	Dummy variable that takes a value of 1 if SDC reports consideration type is cash only.	SDC Platinum
All-stock	Dummy variable that takes a value of 1 if SDC reports consideration type is shares only.	SDC Platinum
Hybrid	Dummy variable that takes a value of 1 if SDC reports consideration type is both cash and shares.	SDC Platinum
RISK1	Following John et al. (2008) we assess firm-level risk taking behavior by first computing EBITDTA (Earnings before interest, taxes and depreciation (EBITD) scaled by Total Assets (TA). Our main proxy for risk-taking is the standard deviation of EBITDTA in excess of annual average EBITDTA for all Compustat firms. We denote this proxy as '***ACQRISK1***' for acquirers and '***TGTRISK1***' for targets. We use annual data over 10 years preceding bid announcement, requiring at least four valid observations in this window.	Compustat, Authors' computation
RISK2	Our second proxy of risk- taking is estimated as standard deviation of EBITDTA in excess of industry – year average EBITDTA, where industries are classified as Fama-French 48 industries. We denote this proxy as '**ACQRISK2**' for acquirers and '***TGTRISK2***' for targets. We use annual data over 10 years preceding bid announcement, requiring at least four valid observations in this window.	Compustat, Authors' computation
DRISK1	ACQ*RISK1* less *TGTRISK1*.	Authors' computation
Earnings Smoothing	Following John et al. (2008) first we estimate standard deviation of operating income scaled by beginning total assets (OPI), and standard deviation of operating cash flow scaled by beginning total assets (OCF). Then we estimate Earnings Smoothing (ES1) as the ratio of OPI to OCF. We subtract ES1 from 1 in order to obtain ES2. Higher values of ES2 resemble greater firm-level earnings smoothing. Operating cash flow is estimated as Operating Income less Accruals, where Accruals = (□*Current Assets*-□*Cash and Equivalents* - □*Current Liabilities* + □*Debt in Current Liabilities* + □*Taxes Payable*) - *Depreciation and Amortization*. We use annual data over 10 years preceding bid announcement, requiring at least four valid observations in this window.	Compustat, Authors' computation
Initial Size	Log of Total Assets for the 10th year preceding bid announcement where available, otherwise for the next available year.	Compustat
Initial Bank Power	We measure Bank Power as the ratio of bank debt to total assets for the 10th year preceding bid announcement where available, otherwise for the next available year.	Compustat
Initial Profitability	Earnings before interest, tax and depreciation divided by total assets for the 10th year preceding bid announcement where available, otherwise for the next available year.	Compustat
Sales Growth	Average annual Sales Growth over 10 years preceding the event year.	Compustat
Initial Leverage	Firm's book leverage estimated as book debt divided by total assets for the 10th year preceding bid announcement where available, otherwise for the next available year.	Compustat
Insider Ownership	Total percentage equity ownership of officers and directors of the firm.	Compact Disclosure
Union Membership	We use two-digit SIC code union membership data as a proxy for firm-level labor union influence on corporate risk-taking. Union membership by industry	Barry Hirsh and David Macpherson

	is extracted from Barry Hirsh and David Macpherson (www.unionstats.com). As detailed coverage by industry codes is available only from 1992, we use 1992 as the initial year for this data.	
Observations in Risk-Taking	Number of observations used to estimate our proxy of firm-level risk-taking.	Authors' computation

See Table A1.

Table A1
Antitakeover provisions and risk-taking by deal characteristics. The table presents summary statistics on anti-takeover provisions (*ACQGIM* and *TGTGIM*) and risk-taking (*ACQRISK1* and *TGTRISK1)* by deal characteristics for both bidders and targets. The sample covers 414 mergers from January 1990 to December 2007. *ACQRISK1* and *TGTRISK1* are estimated as the standard deviation of market-adjusted annual EBITD scaled by assets (EBITDTA) consistent with John et al. (2008). Deal characteristics are extracted from SDC Platinum and are defined in the Appendix.

Variable		All-cash	All-stock	Hybrid	Tender offer	Hostile	ALL
Anti-takeover provisions							
ACQGIM	Mean	9.27	9.31	9.66	10.13	9.80	9.42
	Stdev	2.81	2.66	2.70	2.68	3.19	2.73
	Median	9.00	9.00	10.00	10.00	9.50	9.50
	N	146	124	144	82	20	414
TGTGIM	Mean	9.22	8.11	9.42	8.98	10.00	8.96
	Stdev	2.57	2.58	2.56	2.81	1.95	2.62
	Median	9.00	8.00	10.00	9.00	9.50	9.00
	N	146	124	144	82	20	414
DGIM (=TGTGIM - ACQGIM)		−0.048	−1.194	−0.243	−1.159	0.200	−0.459
T-Stat		−0.15	−3.58	−0.78	−2.70	0.24	−2.47
Risk-Taking (*RISK1*)							
ACQRISK1	Mean	0.059	0.060	0.059	0.056	0.060	0.059
	Stdev	0.035	0.043	0.034	0.037	0.026	0.037
	Median	0.051	0.054	0.051	0.045	0.057	0.052
	N	146	124	144	82	20	414
TGTRISK1	Mean	0.098	0.086	0.067	0.091	0.055	0.084
	Stdev	0.134	0.092	0.043	0.154	0.023	0.098
	Median	0.064	0.059	0.055	0.060	0.052	0.060
	N	146	124	144	82	20	414
DRISK1 (=ACQRISK1- TGTRISK1)		−3.87%	−2.57%	−0.83%	−3.45%	0.46%	−2.42%
T-Stat		−3.37	−2.81	−1.81	−1.97	0.58	−4.69

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