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Bad Corporate Marriages: Waking Up in Bed the Morning After

Ye Cai
Santa Clara University, ycai@scu.edu

Hersh Shefrin

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Ye Cai and Hersh Shefrin

Leavey School of Business, Santa Clara University, Santa Clara, CA 95053

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Abstract

This paper examines corporate risk taking behavior in the wake of unsuccessful merger activities. We find that relative to other firms, firms that made bad acquisitions take both more systematic risk and more idiosyncratic risk. Moreover, higher risk is associated with greater value destruction and stronger corporate governance. The increased risk can be traced to increased cash flow volatility, increased leverage, decreased asset liquidity, more investment in R&D, and more equity-based executive compensation. These findings are in line with the behavioral approach suggesting that in the domain of losses, decision makers generally become more tolerant of risk.

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1. Introduction

Proponents of behavioral finance emphasize that risk appetite is not time invariant, but instead varies by circumstance, both for individuals and for organizations. In particular, prior studies find that when people perceive themselves to be in the domain of losses, or below aspiration, they are more prone to take risk than otherwise, even to the point of becoming risk seeking (Kahneman and Tversky, 1979; Lopes, 1987; March and Shapira, 1987; Tversky and Kahneman, 1992). The propensity to take greater risk in adverse circumstances is related to the phenomenon "escalation of commitment" (Staw, 1981), which leads managers of losing projects to throw good money after bad. For investors, the behavioral response to losers is discussed as part of the disposition effect (Shefrin and Statman, 1985).

In this paper, we examine an important corporate event, mergers and acquisitions (M&A), and investigate the degree to which corporate risk taking is higher for acquiring firms that experienced unsuccessful merger activities than for other firms. We focus on M&A for two important reasons. First, M&A are among the largest and most visible forms of corporate investment that have a significant valuation impact on shareholder wealth. For example, in the year 2012, 37,923 M&A deals were announced worldwide totaling $2.6 trillion (Thomson Reuters, 2012). As we demonstrate, these M&A deals significantly alter managerial perspectives on risk taking. Second, announcement returns surrounding M&A transactions provide a good proxy for whether managers view themselves as being in the domain of gains or the domain of losses. Unlike annual or quarterly stock returns which for many reasons lie outside the control of managers, the short-window announcement return of an acquisition signals the market's immediate assessment of the quality of the managerial decision. A positive (negative) reaction by the market will place managers psychologically into the domain of gains (losses).

We find evidence to support our main hypothesis that acquiring firms that made bad acquisitions take on more risk than counterpart firms. The counterpart firms comprise acquirers engaged in either general acquisitions or good acquisitions and firms that did not make acquisitions. We follow the prior literature (Coles et al., 2006; Low, 2009; Cassell et al., 2012; Armstrong et al., 2012) and base our measure of firm risk on the volatility of daily stock returns. We evaluate the success of an acquisition deal by applying the event study methodology developed by Brown and Warner (1985), and define an acquisition to be unsuccessful if the three-day cumulative abnormal return around the deal announcement is less than or equal to -3%. We find that an acquiring firm's stock return volatility increases significantly following an unsuccessful acquisition: Engaging in a bad acquisition is associated with a 13.7% increase in the variance of daily stock returns in the next fiscal year. When we decompose total risk into its systematic and idiosyncratic components, we find that relative to their counterparts, acquiring firms that experienced bad acquisitions take on both more systematic risk and more idiosyncratic risk. Furthermore, in line with March and Shapira (1987), we find that the more negative the merger outcome, as perceived by managers, the more risk firms subsequently bear.

External and internal governance disciplines managers who make value-destroying acquisitions (Mitchell and Lehn, 1990; Lehn and Zhao, 2006). Stronger external and internal monitoring might exert more pressure on CEOs who make bad acquisitions, and exacerbate their tendency to seek risk. In addition, studies of group polarization in behavioral psychology suggest that groups tend to make decisions that are more extreme than the initial inclination of their members (Isenberg, 1986). Therefore, we predict that among acquiring firms that made bad acquisitions, those with stronger external and internal governance take more risk after the acquisition announcement than those with weaker external and internal governance. Consistent

with this prediction, we find that for acquirers that experienced bad acquisitions, the presence of a blockholder is associated with higher return volatility. A similar statement holds, when there is broader analyst coverage, when the CEO is younger and has shorter tenure, and when the acquiring firm has put fewer antitakeover provisions in place.

A typical concern for empirical corporate finance research is the issue of endogeneity, meaning that some omitted variables drive the observed findings. Our study is no exception. Although we have controlled for firm fixed effects in our model specifications, it remains possible that some time-varying firm characteristics, uncontrolled for in our regressions, are correlated with both the incidence of unsuccessful acquisitions and the increased firm risk. We further control for potential omitted variables such as CEO overconfidence and executive compensation incentives, and continue to find evidence supporting the notion that firm risk increases after unsuccessful acquisitions.

We consider several alternative reasons for our findings, such as

- increased risk generally follows any type of acquisition;
- increased risk after bad acquisitions stems mainly from risk differences in target firms; and
- increased risk occurs largely because of debt-equity risk shifting.

We find that none of these alternatives explain away our main finding that acquiring firms associated with bad acquisitions take on more risk than their counterparts.

We investigate potential channels through which firms can increase their risk profiles. These channels include the adoption of both more aggressive financial policies and riskier investment projects. We find that the risk profiles of firms experiencing unsuccessful acquisitions are reflected in their cash flows, not just their stock returns. We find consistent

evidence that these profiles feature both greater financial risk and greater investment risk, as reflected in higher financial leverage, lower asset liquidity, and greater investment in R&D. In addition, we also find that the compensation structure for acquiring firm CEOs associated with bad mergers tilts more towards equity-based pay.

The behavioral literature on M&A activities began with Roll's hubris hypothesis (Roll, 1986). Roll argues that overconfidence, or hubris, explains why acquiring firms tend to suffer from the winner's curse, in the sense of overpaying for their targets. Subsequently, Malmendier and Tate (2008) develop two metrics for measuring CEO overconfidence, and provide evidence that overconfident CEOs complete more mergers than their less confident counterparts, especially diversifying mergers. They also find that overconfident CEOs of the least equity dependent firms are more apt to engage in acquisitions, perhaps because they are least concerned about financing the acquisition with equity they believe to be underpriced.

Shefrin (2007) suggests that other behavioral phenomena, besides overconfidence, explain aspects of the winner's curse. In line with the main issue discussed within this paper, he describes several case studies in which acquirers with a history of underperformance make high risk, value destructive bets in their choice of targets.

The preceding studies tend to focus on value destructive decisions by managers in an efficient market environment. Notably, another strand of the behavioral literature on M&A focuses on the role of mispricing. In this respect, managers might use M&A to cater to investor sentiment, perhaps by using the overvalued stock of their own firms to acquire less overvalued targets, or by engaging in a combination for which sentiment is positive (Shleifer and Vishny, 2003). This theory offers some insight into why cash acquirers subsequently outperform stock

acquirers who earn negative long-run returns (Loughran and Vijh, 1997; Rau and Vermaelen, 1998).

The approach in this paper focuses mostly on the risk and value characteristics of acquiring firm managers, and less on issues pertaining to sentiment. In this regard, our working hypothesis is that markets efficiently price both targets and acquirers, although we do discuss the implications of relaxing this assumption in Section 5.

The rest of this paper is organized as follows. We develop hypotheses in Section 2. In Section 3 we describe our sample and variable construction. In Section 4, we test the hypotheses and present empirical results. In Section 5, we discuss caveats, and we provide concluding remarks in Section 6.

2. Hypotheses

When a publicly traded acquiring firm announces a proposed acquisition, the market reaction can vary from positive to negative. It seems reasonable to suggest that the firm's managers will view a positive reaction by the market as confirming evidence of their good judgment, thereby placing them, psychologically, into the domain of gains. On the other hand, a negative reaction by the market will place them, psychologically, into the domain of losses. The question we address in this paper is how the risk profiles of acquiring firms that experienced bad acquisitions differ from their counterparts, subsequent to observing the market's reaction to the acquisition announcement.

The psychological literature suggests that people who perceive themselves to be in the domain of losses are more prone to take risk than otherwise (Kahneman and Tversky, 1979; Lopes, 1987; March and Shapira, 1987; Tversky and Kahneman, 1992). Therefore, all else being

the same,[1] negative reactions by the market to acquisition announcements lead executives, and perhaps board members, to make corporate decisions that increase the risk profiles of their firms. Following prior studies (Coles et al., 2006; Low, 2009; Cassell et al., 2012; Armstrong et al., 2012), we measure firm risk using the variance of its stock returns, as a firm's risk profile will get reflected in the volatility of its stock. This discussion leads to our first hypothesis, which we state as follows:

H1a: Relative to the stocks of counterparts, the stocks of acquiring firms that have made bad acquisitions exhibit higher return volatility after the announcement of the acquisition deal.

H1b: Relative to its own stock before the announcement of the acquisition deal, the stocks of acquiring firms that have made bad acquisitions exhibit higher return volatility after the announcement.

Managers could face serious market penalties following destructive acquisitions. For example, Mitchell and Lehn (1990) show that firms which engage in value-decreasing takeovers tend to become takeover targets themselves, and Lehn and Zhao (2006) suggest that CEOs who make poor acquisition decisions are more likely to get fired. They conclude that internal governance, takeovers, and bankruptcies discipline managers who make value-destroying acquisitions. Therefore, stronger external and internal monitoring might put more pressure on CEOs who make bad acquisitions, and amplify their already shifted appetite for risk due to poor acquisition outcomes. In addition, studies on group polarization in behavioral psychology suggest that groups tend to arrive at decisions about risk exposure that are more extreme than the initial inclination of its members (Isenberg, 1986). These considerations lead us to expect that among acquiring firms that made bad acquisitions, those with stronger external and/or internal

[1] Of course, all else might not be the same. For example, we also recognize that executives' incentives might change as a result of a merger not being positive, a point we discuss later in the paper.

governance will feature higher risk. Our prediction of the governance effect on the amplified risk attitude is summarized in the following hypothesis:

H2: Among acquiring firms that have made bad acquisitions, stock return volatility is more pronounced in the presence of stronger external/internal monitoring.

March and Shapira (1987) propose a theory in which firms' risk taking increases with the magnitude of subpar performance, meaning performance below some reference target. In line with March and Shapira (1987), we expect that the more negative the merger outcome, the more risk firms subsequently bear. This leads to our third hypothesis, which we state as follows:

H3: Among acquiring firms that have made bad acquisitions, there is a negative relationship between the announcement return and the risk choices of the firm, including the reflection of a firm's risk profile in the volatility of its stock return.

We expect that that increased stock return volatility for a firm's stock reflects investors' aggregate beliefs about the riskiness of the firm's cash flows. Managers who seek to increase the volatility of future firm performance are likely to prefer riskier investment and financial policies. For example, CEOs might adopt more aggressive financial policies and increase their risk exposures by taking on more debt and/or by holding less liquid assets. Meanwhile, CEOs can increase the riskiness of their firms by investing in riskier investment projects. Compared to other investment vehicles, R&D expenditures tend to be riskier given the high degree of uncertainty related to their future payoffs (Coles et al., 2006). Therefore, we expect that firms that have made bad acquisitions will have higher leverage, lower asset liquidity, and more investment in R&D. Our predictions of a firm's financial and investment risk profile, after a bad acquisition, are summarized in the following three sub-hypotheses:

H4a: Relative to counterparts, cash flow volatility is higher for firms that have made bad acquisitions.

H4b: Relative to counterparts, firm leverage is higher and asset liquidity is lower for firms that have made bad acquisitions..

H4c: Relative to counterparts, R&D investment is higher for firms that have made bad acquisitions.

In addition, executive compensation structure might also be related to whether the firm has made a bad acquisition. Due to their increased risk tolerance in the domain of (psychological) losses, boards of directors might prefer more equity-based compensation contracts to motivate CEOs to take higher levels of risk. Some CEOs of firms that have made bad acquisitions might effectively determine their own pay structure and prefer riskier compensation packages. Therefore, in firms that have made bad acquisitions, we expect CEO compensation to tilt towards more equity-based pay. This discussion leads to our fifth hypothesis, which we state as follows:

H5: For firms that have made bad acquisitions, CEO compensation is more equity-based than in counterpart firms.

3. Variable construction and sample selection

3.1. Measurement of bad acquisition

We obtain a sample of completed acquisitions from Securities Data Company's (SDC) U.S. Mergers and Acquisitions database. We follow the prior literature and exclude small deals which have a deal value lower than $5 million, and lower than 5% of the acquirer's market capitalization prior to the announcement date. For each firm-year observation in our sample, we

examine whether the firm has made any acquisitions in that fiscal year which could have a significant negative impact on the firm value.

To measure the effect of an acquisition on the value of an acquiring firm, we obtain cumulative abnormal returns (CARs) using the standard event study method developed by Brown and Warner (1985). We use the CRSP value-weighted return as the market return and estimate the market model parameters over the 200 trading days ending two months before the merger announcement. Our choice of the estimation period is motivated by Schwert (1996) who finds that on average, target firm stock price starts to rise about two months before the initial bid announcement. Hence, our estimation procedure is likely to minimize potential bias in announcement returns due to investor anticipation or information leakage before the deal announcement. We calculate three-day CARs over the event window (-1, +1) where the event day 0 is the acquisition announcement date.

We define an indicator variable *Bad acquisition* as one if the firm has engaged in an acquisition in fiscal year t which has a three-day CAR less than or equal to -3%, and zero otherwise. We choose this -3% as the cutoff point because a three percent abnormal drop in shareholder wealth is significant: for an average firm in our sample with $2.2 billion market capitalization, shareholders lose $66 million around the deal announcement.[2]

3.2. Measurement of future stock return volatility

Following the prior literature (Coles et al., 2006; Low, 2009; Cassell et al., 2012; Armstrong et al., 2012), our main measure of firm risk is based on the volatility of future stock returns. High risk projects will increase the volatility of firm's future cash flows, which in turn

[2] Our findings are robustness if we use alternative cutoff values such as -2% or -4%.

will make firm's stock returns more volatile. We calculate total risk (*TotRisk*) as the annualized variance of daily stock returns in fiscal year t+1.

Stock returns could be driven by market fluctuations as well as firm specific risk factors. To control for market fluctuations, we follow the standard procedure of decomposing total risk into two parts: systematic risk and idiosyncratic risk. To estimate the market model, we use daily stock return data 36 months prior to the beginning of the fiscal year t+1 with CRSP value-weighted market portfolio as our proxy for the market portfolio. Using the estimated parameters, we construct daily expected stock returns as well as daily residual returns in fiscal year t+1. Systematic risk (*SysRisk*) is measured as the annualized variance of these expected daily stock returns, and idiosyncratic risk (*IdioRisk*) is measured as the annualized variance of the residual daily stock returns. Consistent with the prior literature (Core and Guay, 1999; Xu and Malkiel, 2003), we take the natural logarithm of all three risk measures to mitigate the concern that our inferences might be affected by the skewness in the distribution of these risk measures. All risk measures are calculated with at least 60 days of stock returns data. For robustness, we also construct these risk measures using daily stock return data over the fiscal years t+1 to t+3.

3.3. Measurement of future cash flow volatility

An alternative proxy for firm risk is the volatility of future cash flows. Estimating firm risk using yearly cash flow volatility is problematic as most firms do not have long enough time-series cash flow data (Shin and Stulz, 2000). To address this feature of the data, we use quarterly Compustat data, and calculate quarterly earnings as the sum of net income before extraordinary items (IBQ), income taxes (TXTQ), and interest and related expense (XINTQ). Cash flow volatility (*CFVol*) is calculated as the standard deviation of quarterly earnings in the next fiscal

year. For robustness, we also calculate cash flow volatility using quarterly earnings data in the three fiscal years from t+1 to t+3.[3]

3.4. Measurement of future financial and investment risk

Managers have two primary means of increasing firm risk: They can invest in riskier investment projects, or they can take on larger financial risk. To distinguish between investment and financial risk, we construct several proxies. We measure the riskiness of a firm's investment policies by the R&D expenditures variable *R&D/Sales*, which is defined as the ratio of R&D expenditures to total sales measured in fiscal year t+1. Compared to other investments, R&D expenditures tend to be riskier given the high degree of uncertainty related to their future payoffs (Coles et al., 2006).

To capture the riskiness of firm financial policies, we follow Cassell et al. (2012) and examine firms' capital structures and the liquidity of their assets. Our first measure of financial risk is based on the debt burden in firms' capital structures, as more levered firms are associated with higher financial risk. We define *Lev* as the ratio of total debt to total assets in the fiscal year t+1. We also examine asset liquidity of a company, as firms that hold more liquid assets are perceived to have a lower level of financial risk. We measure *AssetLiq* as the difference between current assets and current liabilities in fiscal year t+1, scaled by total assets at the beginning of the period.

[3] We acknowledge that even with quarterly earnings data, we still have very limited time-series quarterly earnings to estimate the cash flow volatility. Our measure of $CFVol_{t+1}$ is calculated based on four quarterly earnings numbers, and $CFVol_{t+1\sim t+3}$ is calculated based on twelve quarterly earnings numbers. Therefore, throughout the analyses, we focus on daily stock return volatility as our main measure of firm risk, and use this cash flow volatility measure as a robustness check.

For robustness, we also calculate these three measures (*R&D/Sales, Lev, AssetLiq*) over the fiscal years t+1 to t+3 by taking the annual average to examine whether firms take on more financial risk or investment risk.

3.5. Measurement of executive compensation

To explore differences in executive compensation structure between firms that made bad acquisitions and their counterparts, we obtain CEO compensation data from ExecuComp database. Starting from 1992, ExecuComp provides detailed information for CEO salary, bonus, stocks, and option grants for S&P 1500 firms. To measure CEO incentives, we calculate a ratio of CEO's equity-based compensation (stock and option values) to CEO's base salary, *EquityRatio*, in fiscal year t+1. For robustness, we also calculate *EquityRatio* over the fiscal years t+1 to t+3 by taking the annual average to examine whether CEO pay structure is more tilted towards equity-based compensation for firms that have made bad acquisitions.

3.6. Sample selection and summary statistics

In order to be able to calculate stock return volatility for fiscal year t+1, our sample includes only firms for which we can obtain stock return data from the Center for Research in Security Prices (CRSP). We also require firms to have financial statement information from Compustat as of fiscal year t and t+1. In line with prior literature, we exclude financial firms (SIC 6000-6999) and utilities (SIC 4900-4999). Our final sample contains an unbalanced panel of 87,518 firm-year observations from 11,130 firms between fiscal year 1990 and 2010. Panel A of Table 1 provides the distribution of the sample firms across fiscal years, and our sample is

evenly distributed over time. Panel B presents the Fama-French twelve industry classification; and as can be seen, our sample covers a broad spectrum of industries.

Table 2 presents the descriptive statistics of various firm characteristics. We report the full sample mean, median, standard deviation, along with bottom and top quartiles. The average firm in our sample has a book value of $2.0 billion and a market capitalization of $2.2 billion. The sample medians are much smaller than the sample means, namely $178 million in total assets and $174 million in market capitalization. The median firm in our sample is 10 years old, has a market-book ratio of 1.9, and sales growth rate of 8.8%. The mean (median) stock return over the prior fiscal year is 15.5% (2.3%), the debt-equity ratio is 58.6% (16.5%), and the cash surplus is 2.7% (4.5%), respectively. Detailed definitions for each of the variables are provided in the Appendix.

Table 2 also reports the summary statistics of our risk measures. The mean (median) value of $TotRisk_{t+1}$ is 8.132 (8.080), while the mean (median) value of $SysRisk_{t+1}$ is 4.474 (4.820), and the mean (median) value of $IdioRisk_{t+1}$ is 8.002 (7.955). The magnitude is comparable to the levels reported in Low (2009). The cash flow volatility in the next fiscal year has a mean of 0.031, and a median of 0.013. An average firm has a leverage ratio of 22.3%, an asset liquidity ratio of 25.7%, and an R&D/sales ratio of 19%. For the average CEO in our sample, equity-based compensation is 3.784 times base salary.

In our sample of 87,518 firm-year observations from 1990 to 2010, about 9.7% of firm-year observations feature acquisition deals, and 2.5% of them are associated with bad acquisitions which significantly reduced shareholder value around the deal announcement. We also provide summary statistics for external and internal governance measures. Among our sample, 50.5% of firm-years have blockholders, and an average firm is covered by four financial

analysts. The mean CEO age is 55 years, and he has served in this role for 11 years. On average, a firm has nine antitakeover provisions in place.

4. Hypothesis Tests and Results

4.1. Bad acquisition and stock return volatility

4.1.1. Baseline results

Decision makers who view themselves in the domain of losses are more prone to accept risks than agents who view themselves in the domain of gains. We measure firm's risk-taking behaviors using the volatility of future stock returns. Consider hypothesis H1a which states that higher stock return volatility is associated with firms that made bad acquisitions than with their counterparts. To test this hypothesis, we follow the prior literature and estimate the following multivariate model to examine the impact of a bad acquisition on the firm's risk-taking behaviors:

(1)

We examine future stock return volatility using *TotRisk* in fiscal year t+1. We expect the coefficient of *Bad acquisition* on *TotRisk*, β, to be positive, as firms who experience significant negative wealth changes after acquisitions are more likely to view themselves in the domain of losses, and therefore prone to take on greater risk.

We follow Cassell et al. (2012) and control for a set of variables that have been shown to have a significant impact on firms' risk taking behaviors. We control for firm size by using the natural logarithm of total assets since larger firms are less likely to make risky investments (Pastor and Veronesi, 2003). We include the natural logarithm of firm age to control for the life cycle of the firm, as firms might display systematic differences in their risk levels during different phases of their life cycles. We further include market-to-book ratio and sales growth to

control for investment and growth opportunities. In addition, we control for past stock returns, leverage, and cash surplus (Coles et al., 2006). In all regressions we include a fiscal-year fixed effect to control for time-series variation over time. We report OLS coefficients and t-statistics adjusted for heteroskedasticity and firm clustering.

Table 3 presents the regression results for equation (1). Panel A reports firm risk measures with daily stock returns in fiscal year t+1. In Column (1), we control for Fama-French 48 industry fixed effect, and find supporting evidence for H1a that firms experienced bad acquisitions are associated with higher stock return volatility than their counterparts. The coefficient estimate of *Bad acquisition* on *TotRisk* is 0.137 and significant at the 1% level. Since *TotRisk* is a logarithmic variable, the coefficient estimate of *Bad acquisition* measures the semi-elasticity of a firm's stock return variance with respect to whether or not the firm engaged in a bad acquisition. The magnitude of the *Bad acquisition* coefficient estimate in Column (1) suggests that engaging in a bad acquisition is associated with a 13.7% increase in the variance of daily stock returns in next fiscal year, a magnitude we would deem to be economically significant.

To test hypothesis H1b, we add a firm fixed effect to control for any time-invariant firm characteristics and to examine within firm variation in Column (2). In this regard, we continue to observe a positive and significant coefficient on *Bad acquisition*, which supports H1b that the risk profiles of firms that made bad acquisitions are higher after the announcement of the acquisition than before.

When we separate total risk into a systematic component and an idiosyncratic component (*SysRisk* and *IdioRisk*), we find that the coefficient estimates of *Bad acquisition* on *SysRisk* are positive and significant (see Columns (3) and (4)), and the coefficient estimates of *Bad*

acquisition on *IdioRisk* are also positive and significant (see Columns (5) and (6)). These findings suggest that after bad acquisitions firms take on more systematic risk as well as more idiosyncratic risk.

The coefficients on the other control variables are consistent with the findings in the literature. In line with Low (2009) and Cassell et al. (2012), we find that larger, older firms, firms with better recent stock performance and lower debt-equity ratios, and firms with more available funds are associated with significantly lower stock return volatility.

In Panel B of Table 3, we use a longer three-year window as an alternative to calculate stock return volatilities, and continue to find robust evidence that firms that made bad acquisitions engage in more risk-taking behaviors than their counterparts. In later analyses, we focus primarily on risk measures calculated using daily stock returns in the next fiscal year; however, all our results are robust to using the longer-window volatility measures.

4.1.2. Effect of external and internal governance

External and internal governance disciplines managers who make value-destroying acquisitions (Mitchell and Lehn, 1990; Lehn and Zhao, 2006). These findings suggest that stronger governance and monitoring might put more pressure on CEOs who make bad acquisitions, and exacerbate the psychological tendency to become more risk seeking in the domain of losses. In this section, we investigate hypothesis H2 to examine whether among firms that made bad acquisitions, those with stronger external and internal governance feature higher stock return volatility. In this regard, we examine the role of external governance as measured by the presence of large shareholders and analyst coverage, and internal governance as measured by CEO's age, tenure, and firm's antitakeover provisions.

Shleifer and Vishny (1986, 1997) suggest that large shareholders (blockholders) have sufficient incentives to engage in costly monitoring of managers. To construct a measure that captures the presence of large shareholders, we create an indicator variable *Blockholder*, which equals one if there exists an institutional holder with at least 5% of the share holdings, and zero otherwise. We obtain institutional ownership data from Thomson's CDA/Spectrum Database (form 13F). Panel A of Table 4 reports results for the regression used to test H2. Since we are interested in the cross-sectional variation, we control for Fama-French 48 industry fixed effects. We find that the existence of blockholders is associated with lower firm risk, especially idiosyncratic risk, as the coefficients of *Blockholder* are both negative and significant in Columns (1) and (3). We also find that a firm's systematic risk is higher when there is a large shareholder, as the coefficient of *Blockholder* in Column (2) is positive and significant. More importantly, the coefficient estimates on the interaction term *Bad acquisition* * *Blockholder* are positive and significant at the 1% level in both Column (1) and (3), suggesting that in the presence of blockholders, a firm's total risk as well as its idiosyncratic risk are higher for firms that made bad acquisitions.

Financial analysts serve as external monitors of firms' managers (Yu, 2008; Ellul and Panayides, 2009). In a survey of US CFOs, Graham, Harvey, and Rajgopal (2005) show that due to their own wealth, career, and reputation concerns, a majority of CFOs are willing to sacrifice long-term firm value to meet the desired short-term earnings targets. This finding leads us to conjecture that analysts might increase pressure on CEOs who made bad acquisitions, and amplify their risk seeking attitude. Panel B of Table 4 presents evidence to support this conjecture. We obtain analyst coverage data from the Institutional Brokers' Estimate System (I/B/E/S) Database. For each fiscal year of a firm, we take the average of the 12 monthly

numbers of earnings forecasts given by the summary file as our measure of number of analysts, compute the natural logarithm of (one plus) this measure, and then construct a term to measure its interaction with *Bad acquisition*. The interaction term *Bad acquisition * Log(no. of analysts)* shows up positively and significantly in Column (1) and (3), and negatively and significantly in Column (2), suggesting that when there is a broader analyst coverage, firms that made bad acquisitions feature both higher total risk and higher idiosyncratic risk, but lower systematic risk.

We next turn to a few measures of internal firm governance. Our first measure is CEO age. Younger CEOs do not have a long track record to back them up, and they are less likely to be entrenched. They will face higher risk and pressure from the labor market after unsuccessful acquisitions. Using U.S. plant-level data, Li, Low, and Makhija (2011) show that younger CEOs undertake more active and bolder investment activities. We collect CEO age from ExecuComp which covers S&P1500 firms starting from 1992, and interact *Bad acquisition* and *Log(CEO age)* in Panel C of Table 4. We note that data availability restrictions in ExecuComp data reduce the size of our sample. The coefficient estimates on the interaction term *Bad acquisition * Log(CEO age)* are all negative and significant across three columns, consistent with our conjecture that younger CEOs of firms that made bad acquisitions take on larger risk than their older counterparts.

Our second internal governance measure is CEO tenure. Dikolli et al. (2013) find that the negative relation between CEO turnover and firm performance monotonically declines with CEO tenure. This finding is consistent with Hermalin and Weisbach (1998) who report that board independence declines over a CEO's tenure because longer tenured CEOs acquire greater negotiating power resulting in less independent boards. We obtain CEO tenure data from both ExecuComp and Risk Metrics Director Database, and present our results in Panel D of Table 4.

The coefficient estimates on the interaction term *Bad acquisition * Log(CEO tenure)* are negative and significant in both Columns (1) and (3), suggesting that, shorter tenured CEOs who have made bad acquisitions take both larger total risk and larger idiosyncratic risk.

We also examine the effect of antitakeover provisions which firms have put in place. Gompers et al. (2003) document negative relations between antitakeover provisions and firm value. Masulis et al. (2007) find that acquirers with more antitakeover provisions experience significantly lower announcement returns, suggesting that managers at firms protected by more antitakeover provisions are less subject to the disciplinary power of the market for corporate control. Therefore, the fewer antitakeover provisions firms have in place, the more pressure managers who have made bad acquisitions will feel to increase their firms' risk exposures. We collect antitakeover provisions data from Risk Metrics Governance Database. The Risk Metrics publications cover 24 unique antitakeover provisions, from which GIM construct their governance index by adding one point for each provision that enhances managerial power. Firms with higher GIM indices are associated with more entrenched managers. Panel E of Table 4 presents the interaction results of *Bad acquisition* and *GIM index.* The coefficient estimates on the interaction term are all negative and significant, supporting our conjecture that stronger governance and monitoring puts more pressure to increase risk exposure on CEOs who have made bad acquisitions.

4.1.3. Magnitude of bad acquisition

We next turn our attention to hypothesis H3, which states that the lower the announcement returns associated with bad acquisitions, the more likely are firms to engage in greater risk-taking. In the discussion above, we report evidence consistent with risk being higher

for that firms that made bad acquisitions. In this subsection, we demonstrate that the magnitude of bad acquisitions is also germane.

We proxy for the magnitude of bad acquisitions by using the announcement return ACAR of acquirers. Moreover, instead of an indicator variable *Bad acquisition*, we study the level of ACARs of bad acquisitions. Based on our hypothesis, the lower the ACAR, the more likely are the firm and its managers to perceive themselves as being in the domain of losses, and the more likely is the firm to engage in greater risk-taking. Therefore we expect to observe a negative relation between the level of ACARs and firm's future stock return volatilities.

Table 5 presents the results. We find that the lower the ACAR associated with bad acquisitions, the higher the total risk. The coefficient of *ACAR of bad acquisition* in Column (1) is -0.016 and significant at the 1% level, suggesting that a one percentage points reduction in ACAR is associated with a 1.6% increase in the variance of daily stock returns in the next fiscal year. When we further decompose total risk into systematic and idiosyncratic components in Columns (3)-(6), we find that both systematic risk and idiosyncratic risk are negatively associated with the magnitude of ACARs. Overall, these results suggest firms' risk-taking behaviors depend not only on the dichotomous variable measuring whether or not firms engaged in bad acquisitions, but also on the magnitude of these bad acquisitions.

4.1.4. Endogeneity concerns and alternative explanations

Omitted variables: One concern with our baseline finding is that there exist omitted variables that might drive both the incidence of unsuccessful acquisitions and the higher firm risk subsequent to the merger announcement. In our earlier regressions, we include firm fixed effects to control for any time-invariant firm characteristics, and continue to find significantly higher

firm risks following bad acquisitions. In this section, we also control for CEO overconfidence and executive compensation structure, and continue to find supporting evidence for the finding that risk is higher for firms that made bad acquisitions than for their counterparts.

Malmendier and Tate (2005) show that some personal characteristics of CEOs, most notably overconfidence, lead to distortions in corporate investment policies. Malmendier and Tate (2008) find that overconfident CEOs also overpay for targets and undertake value-destroying mergers. As a result, we consider the possibility that firms with overconfident CEOs are more simultaneously likely to engage in bad acquisitions, and also to be more likely to take higher firm risk. To address this possibility, we include an executive option-based CEO overconfidence measure as an additional control variable in our baseline regression.

Our CEO overconfidence measure is constructed from the ExecuComp database. Following Malmendier and Tate (2005, 2008), the variable *Confident CEO* takes a value one if a CEO postpones the exercise of vested options that are at least 67% in the money, and zero otherwise. If a CEO is identified as overconfident by this measure, she remains so for the rest of the sample period. As we do not have detailed data on a CEO's options holdings and exercise prices for each option grant, we follow Campbell et al. (2011) and Hirshleifer et al. (2012) to calculate the average moneyness of the CEO's option portfolio for each year.[4] As shown in Campbell et al. (2011), this measure of overconfidence generates results similar to those in Malmendier and Tate (2005). Panel A of Table 6 presents the regression results with the additional *Confident CEO* control variable. We find that *Confident CEO* measure shows up positively and significantly, suggesting that overconfident CEOs do take on more firm risk. More

[4] First, for each CEO-year, we calculate the average realizable value per option by dividing the total realizable value of the options by the number of options held by the CEO. The strike price is calculated as the fiscal year-end stock price minus the average realizable value. The average moneyness of the options is then calculated as the stock price divided by the estimated strike price minus one. As we are only interested in options that the CEO can exercise, we include only the vested options held by the CEO.

importantly, we continue to observe positive and significant coefficients on *Bad acquisition*, and the economic and statistical magnitudes do not differ much from Table 3. Therefore, CEO overconfidence is unlikely to be the main driver for the observed relation between bad acquisitions and higher firm risk.

Another potential omitted variable is CEO compensation incentives. More equity-based compensation might induce CEOs to make more bad acquisitions as well as take greater firm risk. Coles et al. (2006) and Low (2009) provide empirical evidence that equity-based compensation affects managers' risk-taking behaviors. To alleviate the concern that CEO compensation structure drives both bad acquisitions and greater firm risk, we include the ratio of equity-based compensation to base salary in fiscal year t, *EquityRatio*, in our baseline regression. Panel B of Table 6 presents the results of the regression to test the equity-based compensation explanation. We find that *Bad acquisition* continues to have a positive and significant effect on firm risk measures, and the economic magnitudes are similar to Table 3. Notably, if we instead include delta (sensitivity of CEO wealth to stock price) and vega (sensitivity of CEO wealth to stock volatility) as additional control variables, our key findings remain unchanged. We conclude that potential omitted variables such as CEO overconfidence and executive compensation structure do not explain the observed higher firm risk following bad acquisitions.

Alternative interpretations: Here we consider three additional explanations for our findings that firms that made bad acquisitions take on higher risk than their counterparts. The first potential explanation is that acquisition deals, both good and bad, will increase firm size and improve a firm's ability to take on more risk. In other words, firm risk might increase after acquisitions generally, not just after bad acquisitions. To address this issue, we regress our risk measures on

an indicator variable, *Acquisition*, which equals one if the firm has engaged in acquisitions in fiscal year t, and 0 otherwise. Panel C of Table 6 reports the results of the regression used to test the size explanation. Notably, none of the coefficient estimates of *Acquisition* is significant, suggesting that general acquisitions do not induce firms to take on higher risk. We also create another indicator variable, *Good acquisition*, which equals one if the firm has engaged in acquisitions which has a three-day ACAR greater or equal to 3% in fiscal year t, and 0 otherwise. Again, none of the coefficient estimates of this good acquisition indicator are significant. Collectively, these results suggest that higher firm risk is not associated with either general acquisition deals or good acquisition deals, but is associated with bad acquisitions.

The second alternative explanation for our main finding is that bad acquisitions were actually intended as investments to increase risk, so that their failure led firms to seek increase risk by other means. If this explanation were to be valid, then we would expect target firms to have significantly higher risk profiles in bad acquisitions than in other acquisitions. To test whether this might be the case, we examine target firm's idiosyncratic volatility during the one-year period prior to the deal announcement. Notably, we find no significant difference in the riskiness of the target firms, whether the acquisition was good or bad. Therefore, we conclude that this alternative explanation is unlikely to drive our finding that firms that made bad acquisitions take on higher risk than their counterparts.

The third alternative explanation for our finding is that a failed acquisition might cause the firm to end up with more leverage, because the firm used debt to fund the acquisition. In this regard, when leverage is higher, firms are more likely to take on riskier projects because shareholders enjoy the upside associated with the risk while debt holders bear the downside (Galai and Masulis, 1976; Jensen and Meckling, 1976). To address this possibility, we focus on

all-equity financed acquisitions where leverage does not increase. Panel D of Table 6 reports our regression results. Notably, we find that even when acquisitions are purely financed by equity, firms that made bad acquisitions are still riskier than their counterparts.

The above discussions support the robustness of our main finding that firms that made bad acquisitions perceive themselves in the domain of losses and take on more risk than their counterparts. In the following section, we investigate potential channels through which a firm can increase its risk profile.

4.2. Potential channels of increased firm risk

The higher risk associate with firms that made bad acquisitions should be reflected in their cash flows. In this regard, we test hypothesis H4a to examine whether cash flow volatility is higher for firms that made bad acquisitions. We measure a firm's risk-taking behaviors by using the volatility of its future cash flows. As discussed earlier, we calculate the standard deviation of quarterly earnings in the fiscal year t+1, as well as in the fiscal years t+1 to t+3. Although we still have a relatively short time-series quarterly earnings data, this is the best we can do to study the cash flow volatility after bad acquisitions. We estimate equation (1) where we proxy for firm risk with future cash flow volatility, and report the regression results in Table 7.

Consistent with our results on stock return volatility, we find that cash flow volatility is significantly higher for firms that made bad acquisitions. The coefficient estimate of *Bad acquisition* on $CFVol_{t+1}$ is 0.007 and significant at the 10% level in Column (1), while the coefficient estimate of *Bad acquisition* on $CFVol_{t+1\sim t+3}$ is 0.004 and significant at the 5% level in Column (2). These magnitudes are economically significant as the sample means of $CFVol_{t+1}$ and $CFVol_{t+1\sim t+3}$ are 0.031 and 0.044, respectively, suggesting that firms which made bad

acquisitions increase their cash flow volatility by 22.6% (=0.007/0.031) in the subsequent fiscal year, and by 9.1% (=0.004/0.044) in the subsequent three fiscal years. We discuss the impact of firm age, return, D/E, and cash surplus in section 5 below.

When we replace the *Bad acquisition* indicator with a continuous variable of acquirer's announcement returns in Table 7 Column (3) and (4), we find that the lower the announcement returns, the higher the cash flow volatility, suggesting that firms' cash flow volatility also depends on the magnitude of these bad acquisitions.

Next, we investigate the potential channels through which a firm can engage in risk-taking behaviors. Firms can increase the volatility of future firm performance either through adopting more aggressive financial policies, or investing in more risky investment projects. In this regard, we consider Hypotheses H4b and H4c, which state that firms which made bad acquisitions will choose financial and investment policies that are more risky than the choices of their counterparts. To do so, we first examine the association between bad acquisitions and firms' financial policies. Our measures for firm financial risk are *Lev* and *AssetLiq*, as firms can increase their financial risk by taking on more debt and/or holding less liquid assets. We estimate equation (1) with the left-hand-side variables being *Lev* and *AssetLiq* in the next fiscal year and in the next three fiscal years respectively.

Consider Columns (1)-(4) of Panel A Table 8, which contain the results of the regression used to test Hypotheses H4b. The coefficient reported in Column (1) indicates that in the year following a bad acquisition, a firm significantly increases its leverage ratio by 1.2%. The finding is also economically meaningful compared to the sample mean (median) leverage ratio of 22.3% (18.5%). Meanwhile, firms hold less liquid assets as the coefficient estimate in Column (3) for *Bad acquisition* on $AssetLiq_{t+1}$ is -0.026 and significant at the 1% level. Given the sample mean

AssetLiq$_{t+1}$ of 0.257, this suggests that firms which made bad acquisitions firms reduce their holdings in liquid assets by 10.1% (=0.026/0.257). These results support our hypothesis that firms that made bad acquisitions take on more financial risk than their counterparts.

We also examine firms' investment policies subsequent to a bad acquisition. We measure a firm's investment in risk projects by the variable *R&D/Sales*, as research and development projects are perceived to be more uncertain and more risky, compared to other investment choices such as capital expenditures. Column (5) and (6) of Panel A report the relevant regression results testing Hypotheses H4c. We find that in the fiscal year immediately following bad acquisitions, the R&D sales ratio does not increase significantly. However, if we look at a longer three-year window, we find a positive and significant coefficient on *R&D/Sales*. These results suggest that after bad acquisitions firms increase the risk levels in their investment policies. In this regard, it might take a few years to implement the changes in real investments, while it is relatively quick and easy to modify financial policies to increase firm risk.

Panel B of Table 8 reports the regression results where we replace *Bad acquisition* indicator with a continuous variable of acquirer's announcement returns. We find that the magnitude of bad acquisitions also affects the riskiness of firms' financial and investment policies, as both leverage ratio and R&D sales ratio decrease with ACAR, and asset liquidity ratio increases with ACAR. This is consistent with our earlier findings in stock return volatilities, suggesting that firms' risk-taking behaviors not only depend on whether firms engaged in bad acquisitions, but also depend on the magnitude of these bad acquisitions.

4.3. Executive compensation

In this section, we study executive compensation after acquisitions to explore the impact of CEO incentives on our main finding about risk taking and bad acquisitions. We test hypothesis H5 to examine whether for firms that have made bad acquisitions, CEO compensation is more equity-based than in counterpart firms. To do so, we measure CEO equity incentives with *EquityRatio*, which is the ratio between CEO's equity-based compensation (stock and option values) and CEO's base salary. We estimate equation (1) with the left-hand-side variables being replaced with *EquityRatio* in the subsequent fiscal year and in the subsequent three fiscal years respectively.

Table 9 presents the regression results. In addition to the same control variables as in equation (1), we also include *EquityRatio* in fiscal year t to control for the current compensation structure. Consistent with hypothesis H5, we find that firms that made bad acquisitions feature more equity-based CEO compensation. The coefficient estimate of *Bad acquisition* on $EquityRatio_{t+1}$ is 0.565 and significant at the 10% level in Column (1), while the coefficient estimate of *Bad acquisition* on $EquityRatio_{t+1\sim t+3}$ is 0.825 and significant at the 1% level in Column (2). These magnitudes are economically significant as the sample means of $EquityRatio_{t+1}$ and $EquityRatio_{t+1\sim t+3}$ are 3.784 and 3.964, respectively. When we replace the *Bad acquisition* indicator with a continuous variable of acquirer's announcement returns in Columns (3) and (4) of Table 9, we find CEO's pay incentives also depends on the magnitude of these bad acquisitions. Interestingly, if we replace *Bad acquisition* indicator with an *Acquisition* indicator or *Good acquisition* indicator, we do not observe any significant effect for CEO compensation structure.

Overall, our findings suggest that after unsuccessful acquisitions, as boards of directors and/or CEOs view themselves in the domain of losses and become more risk tolerant, they

redesign the executive compensation contract towards more equity-based to motivate higher levels of risk taking.

5. Discussion: Caveats

Our findings occur against a backdrop of relationships that are a part of the existing literature. For example, in line with Low (2009) and Cassell et al. (2012), larger, older firms, firms with better recent stock performance and lower debt-equity ratio, and firms with more available funds are associated with significantly lower stock return volatility.

As can be seen from Tables 3 and 8, we find that firms with more cash surplus are less risky, have lower leverage, and do not significantly change R&D. The negative coefficients of cash surplus on risk measures and leverage are consistent with Cassell et al. (2012), although they do not provide detailed explanations for why this should be the case. We believe that our various measures of risk reflect potential for default. For firms with ample cash available to finance new projects, leverage is lower in accordance with the pecking order principle, and default risk is lower because of higher coverage ratios, with both features being reflected in stock return volatility.

Three features of our results did surprise us. The first surprise pertains to the result that cash flow volatility is positively related to firm age, and negatively related to cash surplus (Table 7). In contrast to stock return volatility, where the sign for age is negative, older firms feature higher cash flow volatility. In addition, the coefficients associated with past return and debt-to-equity are significant for stock return volatility (in the expected directions) in Table 3, but not for $CFVol_{t+1}$ in Table 7 Column (1) and (3). If we examine cash flow volatility using a longer window $CFVol_{t+1\sim t+3}$, the coefficients associated with past return and debt-to-equity are

significant in the expected directions (Table 7 Column 2 and 4). We do acknowledge that our measure of cash flow volatility is quite coarse as the best available data to us is quarterly earnings.

The second surprising finding is regarding R&D investment. Other papers such as Coles et al. (2006) and Cassell et al. (2012) find a positive and significant coefficient of cash surplus on R&D, while we do not (Table 8, Columns 5 and 6). We recognize that their sample is quite different from ours. When we add an interaction term of cash surplus and the bad acquisition indicator in our regression to investigate whether our R&D finding also holds for bad acquisitions, we find that it does.

The third surprise pertains to coefficients on market-to-book (M/B). Low (2009) finds positive and significant coefficients for M/B in stock return volatility regressions, while Cassell et al. (2012) find negative and significant coefficients of M/B on return volatility and on R&D/sales. Cassell et al. (2012) have some discussion on this, stating: "... high-growth firms may be inclined to take on additional risk. Alternatively, high-growth firms are generally young firms that may have more difficulty accessing capital needed to finance risky investment projects."

In this regard, our results feature positive and significant coefficients of M/B on systematic risk, and negative coefficients on idiosyncratic risk, with cancellation for the joint effect on total risk, as its coefficient turns out to be insignificant. Cassell et al. (2012) find negative coefficients on risk measures (total risk and idiosyncratic risk), and they do control for firm age, which also has a negative coefficient. Low (2009) has a positive coefficient of M/B on total, systematic, and idiosyncratic risk; however, she does not control for firm age.

Our result seems to suggest that high-growth firms take on more risk that can be compensated by the market, while reducing the risk which cannot be compensated (perhaps due to resource constraints). In this regard, although we do control for firm age, it is possible that age is an imperfect measure for firms' access to financing.

As we mentioned in the introduction, the approach in this paper focuses mostly on the risk and value characteristics of acquiring firm managers, and less on issues pertaining to sentiment. In this regard, our working hypothesis is that markets efficiently price both targets and acquirers.

There is an empirical issue associated with mispricing of acquirers. As it happens, acquisitions are generally associated with negative risk adjusted abnormal returns in the long run, although some have positive abnormal returns around the deal announcement dates. This finding has been established in the literature, and we can confirm that the finding holds within our sample. Betton, Eckbo, and Thurborn (2008) describe three possible explanations for the post-merger underperformance, beginning with sentiment. First, the market slowly corrects its overvaluation of the merged firms' shares. Second, the merger is a response to a negative industry shock, with securities being efficiently priced and correctly reflecting the merged firm performing better than it would have without the merger. Third, the estimation of underperformance stems from some artifact in the econometric methodology.

In respect to the sentiment-based explanation, the important issue for our argument is that relative prices are correct, meaning that prices correctly reflect the risks associated with bad acquisitions relative to good acquisitions. If so, our results would be valid, even if acquiring firms were generally overpriced at the time of the acquisition announcements.

6. Conclusion

M&A activities are among the largest and most visible forms of corporate investment impacting shareholder wealth. The behavioral literature suggests that the outcomes of M&A deals will significantly alter managerial perspectives on risk and risk taking, with a negative outcome leading to increased risk. In this regard, announcement returns surrounding M&A transactions provide a good proxy for whether managers view themselves as being in the domain of gains or the domain losses, so that a positive (negative) reaction by the market will place managers psychologically into the corresponding domain.

Our main finding is that firms which made bad acquisitions take on more systematic risk as well as more idiosyncratic risk than their counterparts, with risk being measured by the volatility of equity returns. In this regard, the worse the acquisition, the higher the total risk, systematic risk, idiosyncratic risk. What makes this finding germane is that higher risk is not associated with general acquisitions or good acquisitions.

Firms that make bad acquisitions tend to have different characteristics from counterparts. Our analysis indicates that are bigger, have higher market-to-book ratios, higher sales growth, higher earnings, and lower debt-equity ratios. However, prior to the acquisition announcement, their stock returns and cash flows exhibit no significant differences relative to counterparts.

Potential omitted variables such as CEO overconfidence and executive compensation incentives do not explain the observed higher risk for firms that made bad acquisitions. In addition, we find that the risk profile of a firm that made a bad acquisition is intensified if the firm faces stronger external (existence of blockholder and broader analyst coverage) and internal governance (younger CEO, shorter-tenure CEO, and less antitakeover provisions). These

findings are in line with the behavioral approach suggesting that in the domain of losses, decision makers generally become more tolerant of risk.

Our analysis suggests that the increased risk for firms that made bad acquisitions can be traced to five specific elements. First, is cash flow volatility: the worse the acquisition the higher the cash flow volatility. Second, is higher leverage. Third, is the reduction in holdings of liquid assets. Fourth, is increased risk in choice of investment policies. Fifth is, CEO compensation structure, which tilts more towards equity-based pay.

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Appendix: Variable Definitions

Variables	Definitions	Data Source
Firm Characteristics		
Total assets	Total assets in millions	Compustat
Market capitalization	Market value of equity in millions.	Compustat
Firm age	Firm age.	Compustat
M/B ratio	The ratio of market value of equity to the book value of assets.	Compustat
Sales growth	The percentage change in total sales from the previous year.	Compustat
Return	The stock return over fiscal year t.	CRSP
D/E ratio	The ratio of total debt to the market value of equity.	Compustat
Cash surplus	Net cash flow from operations minus depreciation expense plus research and development expenditures, scaled by total assets.	Compustat
Risk Measures		
TotRisk $_{t+1}$	The natural logarithm of the annualized variance of daily stock returns in fiscal year t+1.	CRSP
TotRisk $_{t+1\sim t+3}$	The natural logarithm of the annualized variance of daily stock returns in fiscal years t+1 to t+3.	CRSP
SysRisk $_{t+1}$	The natural logarithm of the annualized variance of daily expected stock returns in fiscal year t+1.	CRSP
SysRisk $_{t+1\sim t+3}$	The natural logarithm of the annualized variance of daily expected stock returns in fiscal years t+1 to t+3.	CRSP
IdioRisk $_{t+1}$	The natural logarithm of the annualized variance of daily residual stock returns in fiscal year t+1.	CRSP
IdioRisk $_{t+1\sim t+3}$	The natural logarithm of the annualized variance of daily residual stock returns in fiscal years t+1 to t+3.	CRSP
CFVol $_{t+1}$	The standard deviation of quarterly earnings in the fiscal year t+1.	Compustat
CFVol $_{t+1\sim t+3}$	The standard deviation of quarterly earnings in the fiscal years t+1 to t+3.	Compustat
Leverage $_{t+1}$	The ratio of total debt to total assets in	Compustat

	fiscal year t+1.	
Leverage $_{t+1\sim t+3}$	The average ratio of total debt to total assets in fiscal years t+1 to t+3.	Compustat
AssetLiq $_{t+1}$	Current assets minus current liabilities, scaled by total assets, in fiscal year t+1.	Compustat
AssetLiq $_{t+1\sim t+3}$	Current assets minus current liabilities, scaled by total assets, average across fiscal years t+1 to t+3.	Compustat
R&D/Sales $_{t+1}$	The ratio of R&D expenditures to total sales, in fiscal year t+1.	Compustat
R&D/Sales $_{t+1\sim t+3}$	The ratio of R&D expenditures to total sales, average across fiscal years t+1 to t+3.	Compustat
EquityRatio $_{t+1}$	The ratio of CEO equity-based compensation to base salary, in fiscal year t+1.	ExecuComp
EquityRatio $_{t+1\sim t+3}$	The ratio of CEO equity-based compensation to base salary, average across fiscal years t+1 to t+3.	ExecuComp
Acquisition measures		
Bad acquisition	Indicator variable: 1 for firm-years engaged in acquisitions in fiscal year t where ACAR <= -3%, 0 otherwise.	SDC/CRSP
Acquisition	Indicator variable: 1 for firm-years engaged in acquisitions in fiscal year t, 0 otherwise.	SDC/CRSP
Good acquisition	Indicator variable: 1 for firm-years engaged in acquisitions in fiscal year t where ACAR >= 3%, 0 otherwise.	SDC/CRSP
External and internal governance measures		
Blockholder	Indicator variable: 1 if there exists an institutional holder with at least 5% stock ownership, 0 otherwise.	Thomson CDA/Spectrum
No. of analysts	Average of the 12 monthly number of earnings forecasts for each fiscal year of a firm.	I/B/E/S
CEO age	Age of the CEO.	ExecuComp
CEO tenure	Tenure of the CEO.	ExecuComp/ RiskMetrics
GIM index	Antitakeover provision index constructed by Gompers, Ishill, and Metrick (2003)	RiskMetrics

Table 1: Sample distribution

Panel A and B present the distribution of sample firm-year observations by fiscal year and by firm industry classification, respectively. Our sample contains 87,518 firm-year observations from 1990 to 2010.

Panel A: By fiscal year

Year	No. of observations	Percent
1990	3,726	4.3%
1991	3,749	4.3%
1992	3,809	4.4%
1993	4,105	4.7%
1994	4,459	5.1%
1995	4,671	5.3%
1996	4,932	5.6%
1997	5,264	6.0%
1998	5,163	5.9%
1999	4,908	5.6%
2000	4,757	5.4%
2001	4,622	5.3%
2002	4,283	4.9%
2003	4,040	4.6%
2004	3,892	4.4%
2005	3,794	4.3%
2006	3,711	4.2%
2007	3,586	4.1%
2008	3,515	4.0%
2009	3,336	3.8%
2010	3,196	3.7%
Total	87,518	100.0%

Panel B: By Fama-French twelve industry classification

Fama-French industry	No. of observations	Percent
Consumer nondurables	6,208	7.1%
Consumer durables	2,940	3.4%
Manufacturing	12,175	13.9%
Oil, gas and coal	4,437	5.1%
Chemical products	2,533	2.9%
Business equipment	20,548	23.5%
Telephone and television	3,436	3.9%
Wholesale and retail	11,093	12.7%
Healthcare	10,870	12.4%
Other	13,278	15.2%
Total	87,518	100.0%

Table 2: Summary statistics

This table presents the full sample summary statistics of 87,518 firm-year observations between 1990 and 2010. Variable definitions are in the Appendix.

Variables	N	Mean	Median	STD	P25	P75
Firm Characteristics						
Total assets ($mil)	87,518	2,003	178	6,313	42	873
Market capitalization ($mil)	87,518	2,170	174	7,216	37	892
Firm age	87,518	14.787	10.000	14.068	5.000	20.000
M/B ratio	87,518	2.859	1.909	4.392	1.093	3.411
Sales growth	87,518	0.205	0.088	0.621	-0.031	0.256
Return	87,518	0.155	0.023	0.748	-0.294	0.383
D/E ratio	87,518	0.586	0.165	1.251	0.014	0.544
Cash surplus	87,518	0.027	0.045	0.168	-0.022	0.110
Risk Measures						
TotRisk t+1	87,518	8.132	8.080	1.163	7.296	8.900
TotRisk t+1~t+3	83,673	8.200	8.141	1.105	7.402	8.921
SysRisk t+1	87,518	4.474	4.820	2.147	3.397	5.951
SysRisk t+1~t+3	83,673	4.649	4.933	1.991	3.638	6.041
IdioRisk t+1	87,518	8.002	7.955	1.231	7.104	8.826
IdioRisk t+1~t+3	83,673	8.060	7.995	1.190	7.184	8.862
CFVol t+1	69,184	0.031	0.013	0.054	0.006	0.031
CFVol t+1~t+3	75,322	0.044	0.020	0.071	0.010	0.044
Leverage t+1	79,660	0.223	0.185	0.214	0.026	0.347
Leverage t+1~t+3	79,868	0.227	0.189	0.210	0.044	0.344
AssetLiquidity t+1	79,480	0.257	0.239	0.254	0.072	0.430
AssetLiquidity t+1~t+3	79,678	0.248	0.234	0.246	0.071	0.418
R&D/Sales t+1	79,801	0.190	0.001	0.850	0.000	0.068
R&D/Sales t+1~t+3	79,944	0.231	0.002	1.113	0.000	0.072
EquityRatio t+1	21,269	3.784	1.634	6.817	0.160	4.261
EquityRatio t+1~t+3	21,269	3.964	2.185	5.999	0.830	4.649
Acquisition measures						
Bad acquisition	87,518	0.025	0.000	0.156	0.000	0.000
Acquisition	87,518	0.097	0.000	0.295	0.000	0.000
Good acquisition	87,518	0.038	0.000	0.191	0.000	0.000
External and internal governance						
Blockholder	87,518	0.505	1.000	0.500	0.000	1.000
No. of analysts	87,518	3.925	1.000	5.771	0.000	5.000
CEO age	16,285	55.174	55.000	7.250	50.000	60.000
CEO tenure	14,189	11.063	8.000	8.805	4.000	15.000
GIM index	14,489	9.152	9.000	2.604	7.000	11.000

Table 3: Bad acquisition and stock return volatility

This table presents the OLS regression results for the sample of firm-year observations between 1990 and 2010. Panel A reports stock return volatility with daily stock returns in fiscal year t+1, and Panel B reports stock return volatility with daily stock returns in fiscal years t+1 to t+3. Variable definitions are in the Appendix. All regressions control for fiscal year fixed effects and industry/firm fixed effects whose coefficients are suppressed for brevity. T-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and firm clustering are reported in parentheses. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Panel A: Stock return volatility with daily stock returns in fiscal year t+1

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	TotRisk		SysRisk		IdioRisk	
Bad acquisition	0.137***	0.069***	0.269***	0.089**	0.146***	0.081***
	(8.826)	(4.892)	(7.918)	(2.574)	(9.471)	(5.707)
Log(total assets)	-0.285***	-0.203***	0.296***	0.310***	-0.327***	-0.252***
	(-87.346)	(-25.748)	(46.454)	(17.545)	(-101.182)	(-32.662)
Log(firm age)	-0.182***	-0.171***	-0.251***	-0.337***	-0.188***	-0.118***
	(-23.279)	(-9.302)	(-16.795)	(-9.441)	(-24.149)	(-6.620)
M/B ratio	0.000	-0.000	0.034***	0.019***	-0.003***	-0.002***
	(0.203)	(-0.673)	(19.078)	(10.913)	(-3.203)	(-3.225)
Sales growth	0.028***	-0.000	0.130***	0.048***	0.024***	-0.001
	(5.975)	(-0.072)	(11.589)	(3.846)	(5.150)	(-0.252)
Return	-0.048***	-0.036***	0.267***	0.248***	-0.060***	-0.049***
	(-12.504)	(-10.258)	(31.420)	(27.904)	(-15.785)	(-14.013)
D/E ratio	0.228***	0.214***	-0.038***	0.012	0.246***	0.230***
	(49.175)	(45.939)	(-4.675)	(1.207)	(52.877)	(48.515)
Cash surplus	-1.097***	-0.676***	-0.624***	-0.396***	-1.101***	-0.671***
	(-42.605)	(-25.355)	(-11.671)	(-5.947)	(-42.553)	(-25.200)
Constant	9.400***	9.159***	2.407***	3.193***	9.561***	9.220***
	(93.504)	(192.235)	(14.887)	(32.135)	(94.981)	(196.762)
Fixed Effect	Year/Ind	Year/Firm	Year/Ind	Year/Firm	Year/Ind	Year/Firm

Observations	87,518	87,518	87,518	87,518	87,518	87,518
Adjusted R-squared	0.583	0.749	0.302	0.463	0.629	0.775

Panel B: Stock return volatility with daily stock returns in fiscal years t+1to t+3

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	TotRisk		SysRisk		IdioRisk	
Bad acquisition	0.122***	0.043***	0.231***	0.049*	0.132***	0.054***
	(7.668)	(3.292)	(7.739)	(1.909)	(8.245)	(4.031)
Log(total assets)	-0.285***	-0.137***	0.332***	0.217***	-0.330***	-0.182***
	(-82.239)	(-16.050)	(47.660)	(12.016)	(-95.575)	(-21.232)
Log(firm age)	-0.183***	-0.185***	-0.268***	-0.457***	-0.189***	-0.116***
	(-22.311)	(-9.434)	(-16.966)	(-12.458)	(-22.883)	(-6.073)
M/B ratio	0.000	0.001	0.033***	0.014***	-0.002***	-0.001
	(0.424)	(1.485)	(18.101)	(9.459)	(-2.785)	(-0.919)
Sales growth	0.045***	0.010**	0.140***	0.053***	0.043***	0.011***
	(9.265)	(2.527)	(14.003)	(5.456)	(8.788)	(2.667)
Return	-0.042***	-0.031***	0.213***	0.149***	-0.052***	-0.040***
	(-11.722)	(-10.860)	(29.172)	(21.563)	(-14.377)	(-13.998)
D/E ratio	0.214***	0.156***	-0.091***	-0.029***	0.234***	0.171***
	(41.731)	(31.295)	(-9.697)	(-2.814)	(45.416)	(33.292)
Cash surplus	-1.154***	-0.587***	-0.544***	-0.248***	-1.172***	-0.587***
	(-40.014)	(-21.815)	(-9.291)	(-3.984)	(-40.037)	(-21.771)
Constant	9.568***	8.986***	1.944***	3.564***	9.767***	9.021***
	(85.803)	(176.259)	(9.123)	(36.691)	(86.834)	(177.222)
Fixed Effect	Year/Ind	Year/Firm	Year/Ind	Year/Firm	Year/Ind	Year/Firm
Observations	83,673	83,673	83,673	83,673	83,673	83,673
Adjusted R-squared	0.582	0.811	0.381	0.644	0.634	0.833

Table 4: Effect of external and internal governance

This table presents the effect of external and internal governance on firm risk after bad acquisitions. Variable definitions are in the Appendix. All regressions control for fiscal year fixed effects and industry fixed effects whose coefficients are suppressed for brevity. T-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and firm clustering are reported in parentheses. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Panel A: Blockholder

VARIABLES	(1) TotRisk	(2) SysRisk	(3) IdioRisk
Bad acquisition	0.092***	0.298***	0.101***
	(4.073)	(5.817)	(4.544)
Bad acquisition * Blockholder	0.090***	-0.059	0.090***
	(2.875)	(-0.882)	(2.897)
Blockholder	-0.209***	0.123***	-0.220***
	(-21.262)	(5.941)	(-22.581)
Controls	Yes	Yes	Yes
Fixed Effects	Year/Ind	Year/Ind	Year/Ind
Observations	87,518	87,518	87,518
Adjusted R-squared	0.590	0.303	0.636

Panel B: Analyst coverage

VARIABLES	(1) TotRisk	(2) SysRisk	(3) IdioRisk
Bad acquisition	0.067***	0.470***	0.067***
	(2.697)	(7.907)	(2.722)
Bad acquisition * Log(no. of analysts)	0.053***	-0.160***	0.060***
	(3.701)	(-5.180)	(4.284)
Log(no. of analysts)	-0.024***	0.339***	-0.045***
	(-4.158)	(27.595)	(-7.770)
Controls	Yes	Yes	Yes
Fixed Effects	Year/Ind	Year/Ind	Year/Ind
Observations	87,518	87,518	87,518
Adjusted R-squared	0.583	0.318	0.630

Panel C: CEO age

VARIABLES	(1) TotRisk	(2) SysRisk	(3) IdioRisk
Bad acquisition	2.861***	4.522***	2.414***
	(3.820)	(3.085)	(3.176)

Bad acquisition * Log(CEO age)	-0.682***	-1.087***	-0.566***
	(-3.638)	(-2.940)	(-2.977)
Log(CEO age)	-0.341***	-0.362***	-0.339***
	(-5.550)	(-3.475)	(-5.350)
Controls	Yes	Yes	Yes
Fixed Effects	Year/Ind	Year/Ind	Year/Ind
Observations	16,285	16,285	16,285
Adjusted R-squared	0.559	0.390	0.590

Panel D: CEO tenure

VARIABLES	(1) TotRisk	(2) SysRisk	(3) IdioRisk
Bad acquisition	0.374***	0.471***	0.379***
	(3.983)	(2.605)	(3.987)
Bad acquisition * Log(CEO tenure)	-0.101**	-0.125	-0.097**
	(-2.422)	(-1.475)	(-2.300)
Log(CEO tenure)	-0.022**	0.031*	-0.031***
	(-2.004)	(1.719)	(-2.729)
Controls	Yes	Yes	Yes
Fixed Effects	Year/Ind	Year/Ind	Year/Ind
Observations	14,189	14,189	14,189
Adjusted R-squared	0.572	0.405	0.601

Panel E: Antitakeover provisions

VARIABLES	(1) TotRisk	(2) SysRisk	(3) IdioRisk
Bad acquisition	0.322***	0.573**	0.306***
	(3.131)	(2.442)	(3.019)
Bad acquisition * GIM index	-0.021**	-0.042*	-0.018*
	(-2.031)	(-1.664)	(-1.719)
GIM index	-0.012***	-0.010	-0.013***
	(-2.952)	(-1.479)	(-3.043)
Controls	Yes	Yes	Yes
Fixed Effects	Year/Ind	Year/Ind	Year/Ind
Observations	14,489	14,489	14,489
Adjusted R-squared	0.544	0.391	0.575

Table 5: Magnitude of bad acquisition and firm risk

This table presents the OLS regression results for the sample of firm-year observations between 1990 and 2010. The dependent variable in Column (1) and (2) is the log annualized variance of daily stock returns in fiscal year t+1. The dependent variable in Column (3) and (4) is the log annualized variance of daily expected stock returns in fiscal year t+1. The dependent variable in Column (5) and (6) is the log annualized variance of daily residual stock returns in fiscal year t+1. Other variable definitions are in the Appendix. All regressions control for fiscal year fixed effects and industry/firm fixed effects whose coefficients are suppressed for brevity. T-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and firm clustering are reported in parentheses. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	TotRisk		SysRisk		IdioRisk	
ACAR of bad acquisition	-0.016***	-0.008***	-0.031***	-0.013***	-0.017***	-0.009***
	(-11.017)	(-6.048)	(-10.302)	(-4.166)	(-11.269)	(-6.366)
Log(total assets)	-0.285***	-0.203***	0.296***	0.309***	-0.327***	-0.252***
	(-87.414)	(-25.807)	(46.497)	(17.522)	(-101.236)	(-32.699)
Log(firm age)	-0.182***	-0.171***	-0.250***	-0.337***	-0.188***	-0.118***
	(-23.239)	(-9.290)	(-16.762)	(-9.431)	(-24.112)	(-6.607)
M/B ratio	0.000	-0.000	0.034***	0.019***	-0.003***	-0.002***
	(0.221)	(-0.661)	(19.106)	(10.923)	(-3.188)	(-3.211)
Sales growth	0.027***	-0.001	0.129***	0.047***	0.023***	-0.001
	(5.775)	(-0.144)	(11.455)	(3.784)	(4.976)	(-0.301)
Return	-0.047***	-0.036***	0.267***	0.248***	-0.060***	-0.049***
	(-12.384)	(-10.192)	(31.517)	(27.938)	(-15.667)	(-13.948)
D/E ratio	0.228***	0.214***	-0.038***	0.012	0.245***	0.230***
	(49.182)	(45.952)	(-4.691)	(1.196)	(52.881)	(48.523)
Cash surplus	-1.096***	-0.676***	-0.624***	-0.396***	-1.101***	-0.671***
	(-42.619)	(-25.363)	(-11.672)	(-5.945)	(-42.565)	(-25.208)
Constant	9.400***	9.160***	2.407***	3.195***	9.562***	9.221***
	(93.644)	(192.367)	(14.909)	(32.179)	(95.128)	(196.830)
Fixed Effect	Year/Ind	Year/Firm	Year/Ind	Year/Firm	Year/Ind	Year/Firm
Observations	87,518	87,518	87,518	87,518	87,518	87,518
Adjusted R-squared	0.583	0.749	0.302	0.463	0.629	0.775

Table 6: Robustness

This table presents the robustness test for our baseline results. Variable definitions are in the Appendix. All regressions control for fiscal year fixed effects and industry/firm fixed effects whose coefficients are suppressed for brevity. T-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and firm clustering are reported in parentheses. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Panel A: Stock return volatility after controlling for CEO overconfidence

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	TotRisk		SysRisk		IdioRisk	
Bad acquisition	0.144***	0.079***	0.177***	0.115***	0.155***	0.086***
	(6.784)	(4.143)	(4.508)	(3.006)	(7.278)	(4.482)
Confident CEO	0.048***	0.066***	0.187***	0.208***	0.032**	0.048***
	(3.668)	(4.843)	(8.121)	(7.371)	(2.385)	(3.577)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effect	Year/Ind	Year/Firm	Year/Ind	Year/Firm	Year/Ind	Year/Firm
Observations	24,594	24,594	24,594	24,594	24,594	24,594
Adjusted R-squared	0.580	0.731	0.455	0.574	0.591	0.738

Panel B: Stock return volatility after controlling for CEO compensation structure

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	TotRisk		SysRisk		IdioRisk	
Bad acquisition	0.130***	0.075***	0.171***	0.129***	0.145***	0.084***
	(5.875)	(3.676)	(4.205)	(3.190)	(6.467)	(4.090)
EquityRatio	0.011***	0.005***	0.014***	0.008***	0.010***	0.004***
	(14.189)	(7.451)	(10.678)	(6.361)	(12.236)	(5.666)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effect	Year/Ind	Year/Firm	Year/Ind	Year/Firm	Year/Ind	Year/Firm
Observations	22,710	22,710	22,710	22,710	22,710	22,710
Adjusted R-squared	0.581	0.731	0.460	0.584	0.596	0.743

Panel C: Stock return volatility after general acquisitions and good acquisitions

VARIABLES	(1) TotRisk	(2) SysRisk	(3) IdioRisk	(4) TotRisk	(5) SysRisk	(6) IdioRisk
Acquisition	0.001	0.030	0.009			
	(0.117)	(1.528)	(1.208)			
Good acquisition				0.001	0.031	0.010
				(0.074)	(1.015)	(0.822)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effect	Year/Firm	Year/Firm	Year/Firm	Year/Firm	Year/Firm	Year/Firm
Observations	87,518	87,518	87,518	87,518	87,518	87,518
Adjusted R-squared	0.749	0.463	0.775	0.749	0.463	0.775

Panel D: Stock return volatility after all-equity financed bad acquisitions

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	TotRisk		SysRisk		IdioRisk	
All-equity bad acquisition	0.333***	0.168***	0.571***	0.202***	0.330***	0.172***
	(12.262)	(6.676)	(9.819)	(3.733)	(12.150)	(6.711)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effect	Year/Ind	Year/Firm	Year/Ind	Year/Firm	Year/Ind	Year/Firm
Observations	87,518	87,518	87,518	87,518	87,518	87,518
Adjusted R-squared	0.583	0.749	0.302	0.463	0.629	0.775

Table 7: Bad acquisition and cash flow volatility

This table presents the OLS regression results for the sample of firm-year observations between 1990 and 2010. The dependent variable in Column (1) and (3) is the standard deviation of quarterly earnings in fiscal year t+1. The dependent variable in Column (2) and (4) is the standard deviation of quarterly earnings in fiscal years t+1 to t+3. Other variable definitions are in the Appendix. All regressions control for fiscal year fixed effects and firm fixed effects whose coefficients are suppressed for brevity. T-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and firm clustering are reported in parentheses. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

	(1)	(2)	(3)	(4)
VARIABLES	CFVol $_{t+1}$	CFVol $_{t+1\sim t+3}$	CFVol $_{t+1}$	CFVol $_{t+1\sim t+3}$
Bad acquisition	0.007*	0.004**		
	(1.704)	(2.382)		
ACAR of bad acquisition			-0.001*	-0.001***
			(-1.707)	(-2.996)
Log(total assets)	-0.007*	0.001	-0.007*	0.001
	(-1.862)	(0.577)	(-1.874)	(0.552)
Log(firm age)	0.015***	0.006***	0.015***	0.006***
	(3.422)	(4.159)	(3.428)	(4.171)
M/B ratio	-0.000	-0.000	-0.000	-0.000
	(-0.609)	(-0.306)	(-0.607)	(-0.302)
Sales growth	-0.003	0.000	-0.003	0.000
	(-0.696)	(0.400)	(-0.701)	(0.366)
Return	-0.003	-0.001***	-0.003	-0.001***
	(-1.136)	(-2.979)	(-1.129)	(-2.941)
D/E ratio	0.010	0.002***	0.010	0.002***
	(1.141)	(3.733)	(1.140)	(3.720)
Cash surplus	-0.051**	-0.035***	-0.051**	-0.035***
	(-2.209)	(-7.820)	(-2.213)	(-7.832)
Constant	-0.010	0.024***	-0.010	0.024***
	(-0.221)	(5.271)	(-0.220)	(5.295)
Fixed Effect	Year/Firm	Year/Firm	Year/Firm	Year/Firm
Observations	69,184	75,322	69,184	75,322
Adjusted R-squared	0.403	0.601	0.403	0.601

Table 8: Bad acquisition and financial/investment risk

This table presents the OLS regression results for the sample of firm-year observations between 1990 and 2010. The dependent variable in Column (1) and (2) are financial leverage in fiscal year t+1, and the average financial leverage in fiscal years t+1 to t+3, respectively. The dependent variable in Column (3) and (4) are asset liquidity measure in fiscal year t+1, and the average asset liquidity measure in fiscal years t+1 to t+3, respectively. The dependent variable in Column (5) and (6) are R&D expense/sales in fiscal year t+1, and the average R&D expense/sales in fiscal years t+1 to t+3, respectively. Other variable definitions are in the Appendix. All regressions control for fiscal year fixed effects and firm fixed effects whose coefficients are suppressed for brevity. T-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and firm clustering are reported in parentheses. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Panel A: Bad acquisition indicator

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Lev_{t+1}	$Lev_{t+1\sim t+3}$	$AssetLiq_{t+1}$	$AssetLiq_{t+1\sim t+3}$	$R\&D/Sales_{t+1}$	$R\&D/Sales_{t+1\sim t+3}$
Bad acquisition	0.012***	0.012***	-0.026***	-0.018***	1.128	0.898*
	(3.612)	(4.001)	(-7.109)	(-6.138)	(0.924)	(1.937)
Log(total assets)	0.024***	0.022***	-0.020***	-0.022***	0.112	-0.238
	(11.249)	(10.511)	(-8.695)	(-9.583)	(0.202)	(-0.598)
Log(firm age)	0.018***	0.018***	-0.042***	-0.039***	-1.028	-0.116
	(4.446)	(4.314)	(-9.874)	(-9.310)	(-1.041)	(-0.177)
M/B ratio	0.000	0.000	0.000	0.000	0.015	-0.096**
	(0.223)	(0.422)	(0.253)	(0.305)	(0.200)	(-2.166)
Sales growth	0.003**	0.003***	-0.001	-0.001	-3.226***	-1.405*
	(2.425)	(2.895)	(-0.721)	(-0.751)	(-2.928)	(-1.884)
Return	-0.001	0.000	0.010***	0.006***	0.119	0.286**
	(-0.923)	(0.377)	(9.876)	(7.074)	(0.341)	(1.965)
D/E ratio	0.045***	0.030***	-0.021***	-0.015***	0.016	-0.017
	(33.609)	(24.836)	(-16.649)	(-11.786)	(0.189)	(-0.424)
Cash surplus	-0.136***	-0.102***	0.106***	0.075***	2.285	-1.394
	(-16.770)	(-13.458)	(10.859)	(8.322)	(0.548)	(-0.526)
Constant	0.053***	0.067***	0.472***	0.465***	5.806	4.085**
	(4.514)	(5.847)	(38.792)	(39.932)	(1.217)	(2.288)

Fixed Effect	Year/Firm	Year/Firm	Year/Firm	Year/Firm	Year/Firm	Year/Firm
Observations	79,660	79,868	79,480	79,678	79,801	79,944
Adjusted R-squared	0.709	0.775	0.707	0.796	0.164	0.413

Panel B: Magnitude of bad acquisition

	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Lev_{t+1}	$Lev_{t+1\sim t+3}$	$AssetLiq_{t+1}$	$AssetLiq_{t+1\sim t+3}$	$R\&D/Sales_{t+1}$	$R\&D/Sales_{t+1\sim t+3}$
ACAR of bad acquisition	-0.000*	-0.001**	0.002***	0.001***	-0.061	-0.091**
	(-1.647)	(-2.019)	(4.807)	(4.072)	(-0.544)	(-2.055)
Log(total assets)	0.024***	0.022***	-0.020***	-0.022***	0.122	-0.237
	(20.170)	(10.561)	(-8.756)	(-9.626)	(0.221)	(-0.597)
Log(firm age)	0.018***	0.018***	-0.042***	-0.039***	-1.030	-0.114
	(8.281)	(4.307)	(-9.866)	(-9.304)	(-1.042)	(-0.175)
M/B ratio	0.000	0.000	0.000	0.000	0.015	-0.096**
	(0.284)	(0.432)	(0.233)	(0.289)	(0.203)	(-2.163)
Sales growth	0.003***	0.003***	-0.001	-0.001	-3.218***	-1.407*
	(2.788)	(2.961)	(-0.768)	(-0.793)	(-2.923)	(-1.886)
Return	-0.001	0.000	0.010***	0.005***	0.119	0.288**
	(-0.962)	(0.384)	(9.835)	(7.042)	(0.343)	(1.976)
D/E ratio	0.045***	0.030***	-0.021***	-0.015***	0.014	-0.019
	(48.567)	(24.812)	(-16.615)	(-11.759)	(0.164)	(-0.461)
Cash surplus	-0.136***	-0.102***	0.106***	0.075***	2.282	-1.395
	(-22.958)	(-13.459)	(10.862)	(8.325)	(0.547)	(-0.527)
Constant	0.052***	0.066***	0.472***	0.466***	5.774	4.083**
	(7.670)	(5.812)	(38.821)	(39.945)	(1.211)	(2.288)
Fixed Effect	Year/Firm	Year/Firm	Year/Firm	Year/Firm	Year/Firm	Year/Firm
Observations	79,660	79,868	79,480	79,678	79,801	79,944
Adjusted R-squared	0.709	0.775	0.707	0.796	0.164	0.413

Table 9: Bad acquisition and executive compensation

This table presents the OLS regression results for the sample of firm-year observations between 1992 and 2010. The dependent variable in Column (1) and (3) is *EquityRatio* in fiscal year t+1. The dependent variable in Column (2) and (4) is *EquityRatio* in fiscal years t+1 to t+3. Other variable definitions are in the Appendix. All regressions control for fiscal year fixed effects and industry fixed effects whose coefficients are suppressed for brevity. T-statistics based on standard errors adjusted for heteroskedasticity (White, 1980) and firm clustering are reported in parentheses. *, **, and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

	(1) $EquityRatio_{t+1}$	(2) $EquityRatio_{t+1\sim t+3}$	(3) $EquityRatio_{t+1}$	(4) $EquityRatio_{t+1\sim t+3}$
Bad acquisition	0.565*	0.825***		
	(1.711)	(2.637)		
ACAR of bad acquisition			-0.081*	-0.115***
			(-1.862)	(-3.053)
$EquityRatio_{t}$	0.291***	0.281***	0.291***	0.280***
	(11.714)	(11.836)	(11.696)	(11.814)
Log(total assets)	0.826***	0.887***	0.826***	0.887***
	(15.602)	(14.384)	(15.521)	(14.338)
Log(firm age)	-0.686***	-0.655***	-0.682***	-0.650***
	(-7.213)	(-5.785)	(-7.160)	(-5.745)
M/B ratio	0.094***	0.097***	0.094***	0.097***
	(4.714)	(5.043)	(4.712)	(5.041)
Sales growth	0.529***	0.984***	0.514***	0.965***
	(2.879)	(5.048)	(2.785)	(4.971)
Return	0.027	-0.099	0.035	-0.089
	(0.232)	(-0.980)	(0.290)	(-0.877)
D/E ratio	-0.182***	-0.170***	-0.181***	-0.169***
	(-3.375)	(-2.764)	(-3.369)	(-2.757)
Cash surplus	5.189***	6.022***	5.185***	6.015***
	(6.727)	(6.912)	(6.721)	(6.906)
Constant	-3.855***	-3.981***	-3.865***	-3.994***
	(-8.230)	(-8.410)	(-8.273)	(-8.461)
Fixed Effect	Year/Ind	Year/Ind	Year/Ind	Year/Ind
Observations	21,269	21,269	21,269	21,269
Adjusted R-squared	0.217	0.262	0.217	0.262