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Bowman's risk-return paradox: an agency theory perspective

Abstract

The negative association between risk and return is paradoxical because risk-averse managers should only expose themselves to higher risk for higher returns. The paradox is resolved, however, if we recognize that risk-averse managers may be taking decisions that pose risk for shareholders and not for their own careers. We draw on the career concerns literature to explain why decisions that pose risk to shareholder returns can enhance managerial careers. We provide evidence that the risk-return paradox is exacerbated by agency problems that contribute to career concerns (i.e., CEO career horizon), and mitigated by various governance mechanisms that curb the agency problem by aligning managers with shareholders (such as monitoring by the market for corporate control, large block owners, institutional owners, vigilant board, and CEO incentive alignment). Our study sheds light on the role of career concerns and corporate governance in resolving the risk-return paradox.

Keywords: Agency theory, Bowman's risk-return paradox, career concerns, corporate governance, moral hazard, natural experiment

BOWMAN'S RISK-RETURN PARADOX: AN AGENCY THEORY PERSPECTIVE

> "*The manager may be risking the company but not his own career if there is attractive 'labor mobility' for managers of unsuccessful companies*…… For the scholar, early work of half a century ago by Berle and Means noted the separation of corporate ownership from corporate control. Newer work by Williamson and Jensen & Meckling respectively has added to our understanding of this potential separation. Will new evidence of risk seeking at the lower end of the scale for corporations and their managers throw new light on 'agency theory' and the potential conflicts of interest between owners and managers?" (Bowman, 1982: 41)

1. Introduction

Finance theory posits a risk-return tradeoff wherein higher risks should be undertaken only in the expectation of higher return, requiring a positive association between risk and return (Ghysels, Santa-Clara, & Valkanov, 2005). Yet, starting with Bowman (1980), considerable empirical research in strategic management reveals a negative – not positive – risk-return association, termed Bowman's paradox (see reviews by Andersen, Denrell, & Bettis, 2007; Bromiley, Miller, & Rau, 2001; Nickel & Rodriguez, 2002). Prior research explains the risk-return paradox as value-reducing risk-taking arising from poor decision-making by managers with lower ability or different risk preferences (Andersen et al., 2007). It is puzzling why such poor decision-making by managers persists unchecked in a capitalist economy wherein efficient labor and other markets are expected to allocate resources efficiently (Fama, 1980). We propose an explanation based on agency theoretical considerations of career concerns (Dewatripont, Jewitt, Tirole, 1999).

Risk-averse managers prefer actions that yield lower risk, given a level of return, and undertake higher risk only if it provides a "risk premium" in the form of higher expected return. The negative risk-return association is puzzling if managers bear the risks of their decisions. However, managers may take value-reducing risk if, as noted by Bowman in the opening quote, "The manager may be risking the company but not his own career." This is the insight developed

in this paper. In public corporations, there is a separation of risk bearing and decision-making (Fama & Jensen, 1983): shareholders, as risk bearers, bear the wealth effects of managerial decisions, and are concerned with financial returns, whereas managers, as decision agents, are concerned with the career returns on their human capital, i.e., job security, job mobility, and pay (Holmstrom, 1999). Strategic decisions can have very different effects on managers' careers and shareholders' returns. Risk-taking activities often enable managers to signal their ability to obtain better career outcomes, even if these activities harm shareholder financial outcomes (Holmstrom, 1999). For example, although risky acquisitions can lead to higher risk but lower returns for shareholders (Jensen and Ruback, 1983), such bold strategic actions can serve as an immediate signal of managerial risk-taking ability that can lead to lucrative career outcomes for managers (Grinstein & Hribar, 2004, Harford & Li, 2007, Harford & Schonlau, 2013). This creates a potential for moral hazard, where managers can take actions that generate lower returns and higher risk for shareholders, while obtaining favorable career outcomes for themselves. According to agency theoretic work on career concerns (e.g., Holmstrom and Ricart i Costa 1986; Prendergast and Stole 1996; Holmstrom 1999**;** Chen, 2015), career concerns create incentives for managers to use investment decisions to enhance their reputation by manipulating the labor market's assessment of their ability. Thus, although taking higher risk for lower return is value-reducing from the shareholder's perspective, managers may undertake such actions in order to build their reputations and careers in the labor market (Hirshleifer, 1993). Our theory yields two testable hypotheses: the risk-return paradox will be exacerbated by factors that contribute to this agency problem (i.e., career concerns), and mitigated by those that alleviate agency conflicts (i.e., governance mechanisms).

Career concerns can spur managers to take strategic decisions that pose high risks and low returns for the shareholder in order to influence market's perception of their ability to enhance their career prospects. These agency problems are likely to be higher for younger CEOs with longer career horizons who have a longer career ahead of them. CEOs' incentive to favorably influence the market's perception of their ability is greatest early in a manager's career because they are 1) more likely to influence market perceptions (as they progress in their careers, accumulation of past performance information reduces managers ability to influence perceptions) (Holmstrom, 1982), 2) gain greater benefits as there is a longer period of time over which managers can benefit from the headstart gained from influencing market perceptions with risk-taking. Considerable research has shown that career concerns result in younger CEOs tending to take more risk (Matta & Beamish, 2008; McClelland & O'Brien, 2011; Serfling, 2014; Krause & Semadeni 2014). We find that CEO career horizons exacerbate the risk-return paradox.

A variety of governance mechanisms serve to align managers'career outcomes with shareholder financial outcomes. Firms differ in the extent to which they have strong governance mechanisms that align managers with shareholders to curb agency problems. In their analysis of the governance role of shareholder rights, Gompers, Ishii, & Metrick (2003) liken a firm to a republic and distinguish between a "dictatorship" where power rests with managers, and weak governance frees up managers to pursue their interests at the cost of shareholders, and a "democracy," where power rests with shareholders, and managers are subject to strong governance that constrains them to take actions that are in the best interests of shareholders. Flawed decision-making involving higher risk for lower returns can persist unchecked over time only when managers are unconstrained by strong governance mechanisms. In a "dictatorship," governance mechanisms are weak, managers are not subject to strong oversight, and poor decision-making

that contributes to a risk-return paradox can continue unchecked. Conversely, in a "democracy," strong governance mechanisms better align managers' careers with shareholder returns, rewarding managers with improved career prospects for taking value-enhancing risk (i.e., risk that is compensated by commensurate positive financial returns to shareholders) and penalizing managers with detrimental career consequences for taking value-reducing risk, thereby mitigating the risk-return paradox. We find empirical support with a variety of governance mechanisms that align managers with shareholders, i.e., the market for corporate control, ownership by large blockholders and institutional investors, board vigilance, and CEO incentive alignment.

Prior literature attributes higher risk-taking to differences in managerial abilities and risk propensities, and fails to consider the role of market mechanisms that should curb such inefficiencies in a capitalist economy. Our contribution lies in explaining how agency conflicts that enhance managers' career prospects when they take actions that increase risk while reducing returns can lead to the risk-return paradox. This marks a difference from prior work which tends to focus only on the *level of risk*, ignoring that agency problems may also induce managers to take risks that reduce shareholder value because doing so can enhance their career prospects. By studying the moderating effects of the risk-return relationship, we provide evidence that supports our view that the paradox is exacerbated by agency problems that contribute to career concerns (i.e., CEO career horizons), and mitigated by various governance mechanisms that curb the agency problem by aligning managers with shareholders.

2. Theory and hypothesis

2.1 Literature on Bowman's paradox and various explanations

Investments are undertaken in the hope of earning returns, but also have the risk of potential loss as there is "unpredictability or downside unpredictability of business outcome variabilities"

(Bromiley et al., 2001: 261). Investments in relatively low risk assets such as treasury bills can only generate fixed returns. Higher returns require higher risk-taking. Conversely, higher risk is only worth bearing if it promises higher returns. As Ghysels et al. (2005: 510) state, "This risk-return trade-off is so fundamental in financial economics that it could be described as the 'first fundamental law of finance." The risk-return tradeoff rule should apply to strategic decisions that involve risk such as entering new markets, launching new products, and exploring new ways to prune costs. To maximize shareholder wealth, managers should only undertake higher risk investments if these are expected to yield commensurately higher returns for shareholders. If this risk-return tradeoff holds for strategic decisions, it implies a positive relationship between firm risk and financial returns to shareholders.

Considerable empirical evidence, however, reveals an anomalous negative relationship between risk and return using corporate accounting variables, termed Bowman's risk-return paradox in the strategic management literature (for surveys see Andersen et al., 2007; Bromiley et al., 2001; Nickel & Rodriguez, 2002). The negative relationship between firm risk and financial return is paradoxical because it calls to question prevailing assumptions about managerial decision-making under uncertainty. A risk-return tradeoff is premised on risk-aversion, wherein, given a level of return, individuals prefer bets that yield lower risk; a bet involving a higher risk (i.e., a higher level of performance variability) is only undertaken if it provides a "risk premium" in the form of higher expected return. A risk-return paradox, on the contrary, indicates risk-seeking, wherein, given a level of return, individuals prefer bets that yield higher risk; a bet involving a higher risk is accepted although it does not provide a "risk premium" and in fact imposes a "risk discount" in the form of lower expected return. Considerable empirical work has shown evidence of a risk-return paradox (Andersen & Bettis, 2015; Bowman, 1980, 1982;

Fiegenbaum & Thomas, 1988; Henkel, 2009; Miller & Bromiley, 1990; Miller & Chen, 2004; Miller & Leiblein, 1996)

Andersen, et al. (2007), in their review of the Bowman's paradox literature, summarized three related explanations of value-reducing risk that might account for the risk-return paradox, based on flawed managerial decision-making related to risk preferences and ability. First, based on prospect theory, decision makers may frame the situation in relation to a reference point; if the situation is framed as a loss in relation to the reference point, managers tend to be more risk-seeking than when the same situation is framed as a gain (Kahneman & Tversky, 1979). Second, based on behavioral theory, managers may base risk assessments on performance comparisons with a referent aspirational level of performance; when performance is below the aspiration level, firms take more risks in searching for solutions to close the gap than when performance exceeds the aspirational level (Cyert & March, 1963). Third, given heterogeneity in managerial abilities, some managers may simply be weak decision makers that pursue risky strategies with lower returns (Andersen et al., 2007). Furthermore, recent research also shows that CEO personality attributes such as narcissism and overconfidence (Chatterjee & Hambrick, 2007; Chatterjee & Hambrick, 2011; Li & Tang, 2010; Simon & Houghton, 2003; Zhu & Chen, 2015) and social class (Kish-Gephart & Campbell, 2015) can lead them to overestimate their own competences and underestimate the uncertainties facing the firm, thereby taking more risks than might be justified on objective criteria, with concomitant negative effects on returns. All these cases lead to value-reducing risk-taking, wherein higher risk may be chosen even though it reduces returns.

While plausible, these explanations are incomplete in ignoring the possibility that unresolved *agency problems* can lead managers to make risk-taking decisions not in the best interests of shareholders, and that governance mechanisms will constrain such departures from

shareholder wealth maximization, thereby mitigating the risk-return paradox. Other related research on managerial risk-taking has explored relationships between governance and the level of risk using agency and behavioral perspectives. These studies, summarized below, do not, however, explore implications of governance for the risk-return paradox.

2.2 Literature on the level of risk-taking

2.2.1 Level of risk-taking: Agency theory.

A large stream of literature using agency theory (e.g., Fama, 1980; Fama & Jensen, 1983; Jensen & Meckling, 1976; Deutsh, 2005; Deutsch et al., 2011; also see the review paper, Eisenhardt, 1989) argues that managers are more risk-averse than shareholders because, unlike shareholders who diversify their financial capital, managers cannot diversify their human capital. Therefore, risk-averse managers tend to take less than the *level* of risk desired by shareholders, thereby reducing shareholder value. Conversely, by better aligning managerial interests with those of shareholders, strong governance is likely to induce risk-averse managers to take higher risks, leading to higher shareholder value. Consistent with this view, considerable empirical research generally documents a positive association between firm risk and strong governance mechanisms such as boards of directors (Deutsch, Keil, & Laamanen, 2011; Wright, Kroll, Krug, & Pettus, 2007), equity-based compensation (Agrawal & Mandelker, 1987; Low, 2009; Sanders, 2001; Sanders & Hambrick, 2007), ownership structure (Agrawal & Mandelker, 1987; Amihud & Lev, 1981; Eisenmann, 2002; Hill & Snell, 1988; Palmer & Wiseman, 1999; Wright, Ferris, Sarin, & Awasthi, 1996b), and the market for corporate control (Ferreira & Laux, 2007; Gompers et al., 2003; John, Litov, & Yeung, 2008).

Similarly, the quiet life model proposed by Bertrand and Mullainathan (2003) focuses on another widely discussed agency problem, managerial shirking. Their study provides similar

implications for risk-taking, arguing that *effort-averse* managers prefer to enjoy the quiet life and avoid costly efforts such as risk-taking activities when insulated from takeover threats. That is, takeover defenses, by weakening the market for corporate control, motivate managers to enjoy the quiet life by cutting back on the level of risk-taking. Conversely, a stronger market for corporate control should induce greater risk-taking by managers. Consistent with this quiet life view, Atanassov (2013) also find that entrenched managers reduce risky investment in innovation activities.

2.2.2 Level of risk-taking: Behavioral decision theory.

Behavioral approaches show that various elements of CEO compensation do not always align managers with shareholders, often affecting managerial risk propensities in complex ways, making managers take both lower and higher *level* of risk than desired by shareholders (Wiseman & Gomez-Mejia, 1998). For example, Devers et al. (2008) find that while restricted stock is negatively associated with risk-taking, stock options are positively related to strategic risk. In contrast, Larraza-Kintana et al. (2007) document a negative association between the value of stock options and risk-taking. To reconcile these conflicting results on the effect of stock options on risk-taking, Martin et al. (2013) show that in a mixed gamble situation, potential wealth weakens the negative effect of current stock option value on risk-taking**.** Delving further into the specific features of stock options, evidence also suggests that exercisable and unexercisable stock options (Devers et al., 2008) and held stock options and not-yet-awarded options (Devers, Wiseman, & Holmes, 2007), have different effects on strategic risk-taking.

2.2.3 Limitations of research on level of risk-taking.

We note two limitations in existing agency and behavioral approaches that link governance to risk. First, these studies only relate governance to the level of risk; they do not theorize about

or empirically examine how governance impacts the relationship between risk and return, and therefore cannot illuminate the risk-return paradox. Behavioral research is generally ambivalent about the effect of risk on return, leaving open the possibility of value-reducing risk-taking that can contribute to the risk-return paradox. However, existing agency research implicitly *assumes* that risk is generally value-enhancing (i.e., returns increases with risk-taking), an assumption that is at odds with the risk-return paradox (wherein returns decrease with risk-taking).

Second, extant research is somewhat narrow in assuming that managers differ from shareholders only in their proclivity for the level of risk-taking. In doing so, this stream of research implicitly *assumes* that both managers and shareholders obtain the same returns from risk-taking. If managers bear the same adverse consequences of their decisions as shareholders, then it is, indeed, puzzling why they would take value-reducing risk that is contrary to their own interest.

Below, we explain the risk-return paradox by showing that risk-taking poses different kinds of returns for managers and shareholders. Prior research using agency theory has emphasized one form of moral hazard that arises from managerial risk-aversion. We develop theory to explain a different form of moral hazard wherein self-interested managers may select risky projects that enhance their own career prospects even when such projects reduce shareholder returns.

2.3 Risk-return paradox: Agency theory of "career concerns" explanation

Value-reducing risk-taking is a common form of moral hazard that applies to a broad variety of situations "in which one person makes the decision about how much risk to take, while someone else bears the cost if things go badly" (Krugman, 2009: 63). Dowd (2009: 142) labels this "Subsidized risk-taking: Heads I win, Tails you lose," stating "Many of these moral hazards involve increased risk-taking: if I can take risks that you have to bear, then I may as well take them; but if I have to bear the consequences of my own risky actions, I will act more responsibly." Dowd illustrates these with examples from the recent financial crisis. In the sub-prime mortgage

market, lenders were less concerned about borrowers' creditworthiness and took higher risk, because the adverse consequences of their failed decisions (e.g., extending credit to borrowers who ultimately default) were borne by a different institution. We build on these ideas to develop the argument that a similar moral hazard problem results in value-reducing risk-taking in public corporations.

In public corporations, shareholders delegate decision-making to professional managers while bearing the wealth effects of the decision (Fama & Jensen, 1983: 312). Shareholders and managers have different concerns. Shareholders are concerned about their returns to financial capital. Managers are concerned about returns to their human capital, i.e., "career concerns" as to job security, job mobility, and pay over their lifetime. Agency problems arise if there is a disconnect between managerial career concerns and shareholder financial returns as managers may select corporate strategies in ways that enhance their future careers at the cost of shareholders (Holmstrom, 1999; Jensen & Meckling, 1976).

Fama (1980) posited that implicit incentives from the forces of labor market competition induce managers to make better decisions because the failure to do so (e.g., poor decision-making that contributes to the risk-return paradox) will result in "ex-post settling up" whereby managers will be penalized by loss of job or lower compensation over the course of their careers. However, Holmstrom (1999: 169) shows, to the contrary, a "fundamental incongruity between the individual's concerns for human capital returns and the [shareholder's] concern for financial returns." The disconnect arises because, in the presence of information asymmetry and bounded rationality, labor markets are weak in resolving issues of adverse selection (managerial ability can be hard to discern) and moral hazard (managers may take hidden harmful actions that are hard to discern). Managers know that their actions in the choice of projects and project success signal

information to the market about their ability, signals that can significantly impact their career prospects. Consequently, the CEO influences these signals through their risk-taking activities in ways that can enhance their careers at the expense of financial returns (Holmstrom, 1999; Holmstrom & Costa, 1986; Milbourn, Shockley, & Thakor, 2001). Career concerns can cause managers to distort signals about their ability by foregoing risks that may reveal deficiencies in their ability (Holmstrom 1999; Holmstrom and Ricart I Costa 1986; Hirshleifer and Thakor 1992) or by taking more risks to signal ability (Hermalin 1993; Prendergast and Stole 1996). The risk-return paradox can arise if managers take more risk to enhance their own careers, without regard to the impact on shareholder returns.

Hirshleifer (1993) provides several examples to show that managers often pursue risky long-term strategies involving new technologies, business models, or emerging markets, even when such strategies hurt financial returns, because doing so enables them to enhance their careers by signaling the labor markets that they can be transformative leaders. Hishleifer notes that managers adopt these strategies to make themselves look better so they can quickly enhance their reputation, and delay and thereby deflect responsibility for adverse outcomes. New business models and acquisitions are examples of strategies that can immediately signal the potential for risk-taking and transformative leadership, where the adverse outcomes are often delayed. Hishleifer notes that managers also enhance their careers by engaging in herding (Scharfstein & Stein, 1990) by copying legitimated risk-taking strategies that often occur in waves because wider adoption can make them seem more desirable and legitimate (Abrahamson, 1991), even when these are not a good strategic fit for the firm and constitute a value-reducing risk.

Considerable empirical evidence, outlined below, shows that risky strategies can enhance managerial careers even when they harm shareholder returns. For example, acquisitions, a risky

strategy, on average, reduce financial returns (Jensen & Ruback, 1983), but can provide career benefits to managers (Jensen, 1986). Commonly termed as "empire building" in the agency literature, acquisitions can help managers enhance their careers by entrenching themselves in the firm and thus enhancing their pay and prestige (Williamson, 1964), and even reduce their risk of job loss (Jensen, 1989), especially with unrelated acquisitions (Amihud & Lev, 1981). Such risk-taking activities, by itself, can signal managerial ability, bringing CEOs better career outcomes such as higher bonuses (Grinstein & Hribar, 2004), higher total pay (Harford & Li, 2007), and more future board seats (Harford & Schonlau, 2013), regardless of whether or not these activities enhance shareholder value.

If risk-taking enhances managerial careers only when they also enhance shareholder returns, managers would have the incentive to pursue higher risk only if it also yields higher return. Our review of the literature above shows that risk-taking enhances managerial careers even when they are harmful to shareholder returns. This disconnect between how risk-taking affects managerial careers and shareholder returns poses an agency problem that can induce managers to pursue higher risk to enhance their own careers, even when such risk-taking leads to lower returns, thereby contributing to the risk-return paradox.

2.4 Role of CEO career horizons in exacerbating the risk-return paradox

CEOs' incentive to favorably influence the market's perception of their ability is greatest early in a manager's career and diminishes over time as the market's beliefs increase in precision due to the accumulation of past performance information (Holmstrom, 1982). Furthermore, a headstart earlier in one's career provides greater benefits as there are more years over which such managers can benefit from their heightened prospects. As such, career concerns will be greatest for younger CEOs, who expect to have many years remaining in the active work force. CEOs with a longer career horizon are more likely to take risks, to the extent that doing so favorably influences

market perceptions of their abilities, and thereby enhances future career prospects. Career concerns are higher for CEOs with longer career horizons, i.e., the time duration until a CEO reaches retirement age (Matta and Beamish, 2008; Krause and Semadeni, 2014). Considerable research has shown that CEOs with longer career horizons tend to take more risk (Matta & Beamish, 2008; McClelland & O'Brien, 2011; Serfling, 2014). Although such risk-taking by CEOs with longer career horizons does not always undermine shareholder value (Li, Low, & Makhija, 2017), CEOs do benefit from such risk-taking regardless of whether or not shareholder value is enhanced (Yim, 2013). As CEOs with longer career horizons benefit more from such risk-taking even when such decisions are harmful to shareholders, we expect the CEO's career horizon to exacerbate the risk-return paradox:

H1. The negative relationship between risk and return is exacerbated by CEO career horizon.

As noted, H1 is premised on career horizons influencing the extent to which CEOs benefit from risk-taking even when such decisions are harmful to shareholders. Below, we explain the role of corporate governance in aligning managers with shareholders, and thereby mitigating the risk-return paradox.

2.5 Role of governance in attenuating the risk-return paradox

We have noted that career concerns can cause managers to take value-reducing risks, and implicit governance from competition in managerial labor markets as explained by Fama (1980) is unlikely to align managerial career concerns with shareholder returns (Holmstrom, 1982). The empirical evidence on Fama (1980)'s ex-post settling up idea regarding the resolution of career concerns is mixed, but on balance supports the view that implicit incentives from managerial labor markets do not fully align managerial career concerns with shareholder interests. While research provides some indication of ex-post settling up by showing that annual CEO pay adjustments depend both on current and earlier performance (Brickley, Linck, & Coles, 1999; Wowak,

Hambrick, & Henderson, 2011), ex-post settling up is generally compromised in the absence of countervailing governance checks, e.g., CEOs of failing organizations often avoid stigma and the concomitant adverse employment consequences (Semadeni, Cannella, Fraser, & Lee, 2008). A vast literature starting with Holmstrom (1982) shows that explicit governance mechanisms are needed for alignment (see Hermalin and Weisbach (2014) for a survey of the literature).

We posit that strong governance mechanisms can shape the relationship between risk and return by aligning managers with shareholders. When governance mechanisms are weak, managerial career returns and shareholder financial returns are misaligned because managers gain discretion to enhance their careers at the expense of shareholders by taking risky strategies that do not yield commensurate financial returns. Such value-reducing strategies exacerbate the disconnect between firm risks and financial returns. Conversely, when governance mechanisms are strong, managerial career returns are aligned with shareholder financial returns, because managers are constrained from taking risky strategies that do not yield commensurate financial returns for shareholders, and must pursue risk from the shareholders' perspective, accepting higher risk only with commensurate financial returns because doing so directly impacts their career prospects. For example, strong governance mechanisms should induce self-interested managers that might otherwise take certain risky strategies without commensurate returns to adjust their strategies, e.g., either giving up such strategies (given the low returns) or finding ways to raise returns for such strategies (given the high level of risk). These trends should result in governance mechanisms attenuating the risk-return paradox by weakening the negative relationship between risk and return. Taking a negative risk-return association as our baseline from the risk-return paradox literature, we propose a moderating hypothesis, whereby governance mechanisms weaken the risk-return paradox.

More generally, there are several alternate governance mechanisms including: market for corporate control (e.g., Gompers et al., 2003; Cheng & Indjejikian, 2009; Lel et al., 2015; Cain et al., 2017), board vigilance (e.g., Daily & Dalton, 1994; Guo & Masulis, 2015; Walters et al. 2007; Maria-Victoria et al., 2018), ownership by large block owners (e.g., Berle & Means, 1932; Morck, Shleifer, & Vishny, 1988) and institutional investors (e.g., Wright et al., 1996: Andriosopoulos & Yang 2015), and managerial incentives that align managerial pay with shareholder value (Eisenmann, 2002; Sanders & Hambrick, 2007). These governance mechanisms provide discipline by a combination of monitoring and incentives, whereby managers are rewarded with better pay for decisions that enhance shareholder value or punished with lower pay and job loss for decisions that erode shareholder value. We describe each of these separately and present hypotheses.

2.5.1 Market for corporate control.

Gompers et al. (2003) focus on shareholder rights, the dimension of governance that affects the power distribution between managers and shareholders and thus the strength of the market for corporate control. They illustrate this dimension using the metaphor of corporations as republics. Compared with a "dictatorship" regime, a "democracy" regime shifts the balance of power to shareholders. As such, shareholders in a democracy regime can more easily replace the incumbent directors and managers by voting their shares or by selling their shares to a third party who takes over the company and replaces the incumbent. When firms have more takeover defenses, they are less vulnerable to pressures from the market for corporate control. Conversely, firms with fewer takeover defenses are more subject to the discipline of the market for corporate control. Accordingly, a more vibrant market for corporate control induces managers to take actions that are in the best interests of shareholders, as failure to do so will adversely impact managers' careers. This in turn should mitigate agency problems, and weaken the risk-return paradox.

H2a. The negative relationship between risk and return is weakened by governance provided by the market for corporate control.

2.5.2 Board monitoring.

In public corporations, the board of directors represents an important internal governance mechanism (Fama & Jensen, 1983). Boards approve and monitor corporate strategies such as investing in risky projects that are initiated and implemented by managers (Fama & Jensen, 1983). Vigilant boards exercise discipline by appointing, advising, and monitoring CEOs, and approve or rescind takeover defenses (Walsh and Seward, 1990). Thus, vigilant directors constitute an important governance mechanism in monitoring and incentivizing managers to align them with shareholders such that managers' compensation and career prospects are enhanced only if decisions also enhance shareholder value. Various characteristics of the board shape the extent to which boards are vigilant. Boards with a higher percentage of independent directors, and boards which separate the duties of the CEO and chairman of the board of directors are likely to be more independent of managers and therefore more likely to align managers with shareholders (Daily & Dalton, 1994). Also, the intensity of board activity as captured by number of board meetings can improve board monitoring (Dalton, Daily, Johnson, & Ellstrand, 1999). With more meetings, board members are likely to have more time to confer and monitor management resulting in value-enhancing risk strategies. These arguments and findings suggest that board vigilance, by aligning managers with shareholders, induces managers to take actions that are in the best interests of shareholders, as failure to do so will adversely impact managers' careers. This in turn should mitigate agency problems, and weaken the risk-return paradox.

H2b. The negative relationship between risk and return is weakened by governance provided by board monitoring.

2.5.3 Blockholder ownership.

Large block owners have both the incentive and the ability to monitor managers (Connelly, Hoskisson, Tihanyi, & Certo, 2010). The concentration of cash flow rights provides greater motivation for these owners to monitor risky investments more closely. Moreover, the reduction of free-rider problems due to ownership concentration enhances monitoring effectiveness. Vigilant owners gain influence through their voting power and their threat of selling off shares to strengthen the market for corporate control. Research has shown that these shareholders support value-enhancing corporate strategies and oppose value-decreasing strategies (Bethel & Liebeskind, 1993; Hill & Snell, 1988; Shleifer & Vishny, 1997). Accordingly, managers are more likely to be aligned with shareholders in the presence of large block shareholders, as failure to take actions that enhance shareholder value is likely to adversely impact managers' careers. This in turn should mitigate agency problems, and weaken the risk-return paradox.

H2c. The negative relationship between risk and return is weakened by governance provided by blockholder ownership.

2.5.4 Institutional ownership.

Institutional investors, as a group, own a large proportion of the shares of large corporations and gain influence both from the threat to sell off their shares, and from activism by voting or pressuring managers (Useem, 1993). Empirical research has shown that institutional investors shape growth-oriented risk-taking (Wright et al., 1996). Accordingly, managers are more likely to be aligned with shareholders in the presence of institutional shareholders, as failure to take actions that enhance shareholder value is likely to adversely impact managers' careers. This in turn should mitigate agency problems, and weaken the risk-return paradox.

H2d. The negative relationship between risk and return is weakened by governance provided by institutional ownership.

2.5.5 CEO incentive alignment.

Agency theory posits that incentive pay aligns managers with owners and creates an incentive for managers to maximize shareholder value (Palmer & Wiseman, 1999; Sanders & Hambrick, 2007). A variety of incentive mechanisms such as CEO share ownership, stock options, and bonuses tied to earnings can serve to better align managers' pay and career outcomes with shareholder value. Accordingly, managers are more likely to be aligned with shareholders when managers' incentive is better aligned with shareholder value. This in turn should mitigate agency problems, and weaken the risk-return paradox.

H2e. The negative relationship between risk and return is weakened by governance provided by CEO incentive alignment.

Figure 1 summarizes **H1 and H2**

3. Methods

3.1 Sample period and data sources

Our sample includes firms listed in S&P 1500 in any year during our sample period. S&P 1500 is an index of 1,500 US firms put together by the firm Standard & Poor. These firms include firms in the S&P 500, the S&P MidCap 400, and the S&P SmallCap 600, covering about 90% of the U.S. market capitalization. Standard & Poor makes changes to this set of firms from time to time, and we use firms listed in this index during any of the years in our sample period (1995 through 2016). This yields a total of 2,753 firms. Our sample period starts with the year 1995, as the corporate governance data coverage is limited in prior years, and ends with 2016. Corporate financial data are obtained from Compustat and stock return data from CRSP. We use the following six sources for the multiple governance measures used in the study: RiskMetrics/Institutional Shareholder Services (ISS)' Corporate Governance database for takeover defenses,

RiskMetrics/ISS' Director database for board independence, Compustat ExecuComp for executive compensation, executive ownership, CEO age and other board data, Thomson-Reuters' Institutional Holdings database for institutional ownership, and Blockholder Ownership dataset for blockholder ownership (Dlugosz, Fahlenbrach, Gompers, & Metrick, 2006). The actual number of firms and observations varied from model to model because we deleted firms that did not have complete data for our major variables. Furthermore, the blockholder ownership dataset was available only from 1995 to 2002, limiting the sample for analyses involving blockholder ownership. To minimize survivorship bias, we allowed firms to enter and exit our sample during the period from 1995 through 2016.[1]

3.2 Measures of risk and return

The typical approach in prior research on the risk-return paradox is to select a period of time for the sample, and regress Return on Risk, measured as the mean and variance of accounting returns (Operating Income to Total Assets), respectively, over the sample time period (Bromiley, Miller, & Rau, 2001). We follow this typical approach for our primary analyses and measure return and risk respectively as the mean and standard deviation of ROA over our sample period—1995 to 2016 *)*].[2] To mitigate simultaneity concerns, for the remaining explanatory variables including governance measures and control variables, we follow John et al. (2008) and use the values of the

[1] Of the 2,753 firms in our base-line model (Table 3, Model 1), 1,652 firms leave the sample over the course of our 22 year sample period due to missing data. No new firms enter after the first year.

[2] As noted later we check robustness of our findings to multiple sub-sample periods. Return and risk in these analyses were measured as mean and standard deviation of ROA over these sub sample time periods. For example, when we run our analyses over the 2006 to 2016 time period, we measure return and risk as the mean and standard deviation of ROA over the 2006 to 2016 time period and when we run our analyses over the 1999-2002 time period we measure return and risk as the mean and standard deviation of ROA over the 1999 to 2002 time period.

variables in the first year of the firms' entry into our sample. The unit of analysis in these tests is each firm-level observation.

As a secondary analysis, we also perform panel-data analyses, regressing annual ROA on a firm-year-specific risk measure. We adopt a measure of firm-year risk, the standard deviation of analyst forecasts (*Forecast Dispersion*) based on I/B/E/S. This proxy is an ex-ante measure of future income variability (Bromiley, 1991).

3.3 CEO career concerns proxy

We use *CEO Careeer Horizon* as a proxy for the executive's career concerns. Because young CEOs with more years to retirement may be more concerned about their career prospects than older CEOs with less years to retirement, empirical studies have suggested *CEO Careeer Horizon* as a proxy for career concerns,where CEO Career Horizon is measured as the number of years before the CEO turns 70—the commonly assumed retirement age (e.g., Krause & Semandeni, 2014; Matta & Beamish).

3.4 Corporate governance measures

3.4.1 Market for corporate control.

Our measurement of external corporate governance follows the conceptual notion of takeover vulnerability introduced by (Gompers et al., 2003). Various studies (e.g., Bebchuk, Cohen, & Ferrell, 2009), however, suggest that some of the 24 firm-level antitakeover provisions (ATPs) used to construct the Gompers et al. (2003) index may represent "noise". Therefore, to gauge the strength of the market for corporate control that is not affected by this "noise", we used a parsimonious index based on the sum of three important firm-level antitakeover provisions (ATPs), namely, staggered boards, blank check preferred stock and restrictions on shareholders' calling special meetings or acting through written consent (Cremers & Nair, 2005). We denoted

Market for Corporate Control as 3 (i.e., the maximum number of ATP provisions) minus the actual number of ATPs of the firm such that a higher value of the measure indicates stronger corporate governance.

3.4.2 Ownership structure.

While the diffusion of ownership leads to the separation of ownership and control that provides managers considerable discretion, the presence of powerful owners can provide governance (Berle & Means, 1932). Large block owners have both the incentive and the power to exercise influence (Bethel & Liebeskind, 1993; Hill & Snell, 1988; Shleifer & Vishny, 1997). We calculated *Blockholder Ownership* as the percentage of common equity owned by outside shareholders who own five percent or more of outstanding shares and are not officers or directors of the firm, an affiliated entity, or Employee Share Ownership Plans (Dlugosz et al., 2006).

Institutional investors typically do not individually own large blocks of shares, but as a group, own a large proportion of the shares, and therefore gain influence both from the threat to sell off their shares, and to engage in activism by voting or pressuring managers and thereby influencing value-enhancing risk-taking (Wright, Ferris, Sarin, & Awasthi, 1996). We measured *Institutional Ownership* as the percentage of ownership by institutional investors.

3.4.3 Board monitoring.

While boards of directors constitute an important governance mechanism, managers often gain control over boards by serving on the board and by gaining leadership of the board. Thus, not all boards are equally effective in constraining value-reducing risk-taking. Boards with a higher percentage of outsiders (*Board Independence*) are viewed as valuable monitors, capable of improving managerial decision-making and guarding against value destruction (Daily & Dalton, 1994). Similarly, board leadership (from separating the duties of the CEO and chairperson of the

board of directors) enhances a board's ability to effectively monitor the decisions of the CEO, leaving less opportunities for CEOs to engage in value-reducing risk-taking (Daily & Dalton, 1994). Also, because boards exercise monitoring through their deliberations, the number of board meetings during the year is likely to enhance the extent of board monitoring (Dalton, Daily, Johnson, & Ellstrand, 1999). Accordingly, we measure the effectiveness of board monitoring by focusing on these board characteristics that clearly address complementary aspects of board monitoring.[3]

We tested the effect of board monitoring based on a composite measure of board governance comprising of *CEO-Chair Duality* (where the CEO is also the Chairperson of the Board), *Board Independence* and *Board Meetings*. As these various board indicators may operate jointly to provide monitoring, we used a method for factor extraction, principal component analysis, to obtain a common factor that summarizes the common information contained in these three measures (Chen, Lu, & Sougiannis, 2012). Specifically, we obtained the first principal component of the three variables as our measure of board monitoring. While *Board Independence*

[3] We also considered two other board characteristics, namely, board size and board member busyness (the average number of other firms' boards in which the firm's board members also served). However, in contrast to *Separate CEO-Chair*, *Board Independence* and *Board Meetings*, the influence of board size and board member busyness on monitoring effectiveness appears less clear. Prior studies suggest that the monitoring effectiveness of board size is contextual. While larger boards in firms with more complex operations provide information benefits as advisers (e.g., Boone et al. 2007; Coles et al. 2008), a stream of studies on board size show that smaller boards are better at monitoring managers (e.g., Jensen 1993; Yermack 1996; Faleye 2003). For example, on one hand, a larger board can improve monitoring effectiveness because more individuals and perspectives are engaged in the monitoring task, thereby enhancing the advisory role of boards. On the other hand, a larger board can engender greater coordination costs arising from less cohesion and focus. Similarly, board members who are on many other firms' boards are equipped with greater exposure and experience that can enhance the monitoring process. However, such busyness also suggests less time and effort devoted to monitor the firm's management.

and *Board Meetings* loaded positively on the measure, *CEO-Chair Duality* loaded negatively. Thus, higher scores on our measure indicate higher monitoring effectiveness[4].

Because of measurement error, we believe that it is unlikely that any single board characteristic perfectly captures a firm's unobservable level of board monitoring. By summarizing the common information among these observable measures, principal component analysis reduces measurement error and provides the common factor underlying the covariance among these variables. However, we also tested but do not report results based on using these component measures of board governance separately.

3.4.4 CEO incentive alignment.

Aligning the interests of the CEO with those of the shareholders through stock-based incentives (stocks and options) has been noted as an important governance mechanism. Following a stream of finance and accounting studies (e.g., Guay 1999; Core and Guay 2002; Coles et al. 2006; Armstrong et al. 2015), we measure *CEO Incentive Alignment* as the sensitivity of CEO wealth to stock price changes, i.e., the change in the dollar value of the manager's wealth tied to the firm through their ownership of stocks and options, for a one percentage point change in stock price. Specifically, using data from Execucomp, CEO incentive alignment is measured as the change in the value of the CEOs portfolio of vested and unvested stock options, computed using the formula provided in Core and Guay (2002), which in turn is the Black-Scholes (1973) option valuation model as modified by Merton (1973) to account for dividends, for a 1% change in the firms stock price plus the change in the value of stocks owned by the CEO for a 1% change in the firms stock price (see Core and Guay 2002 and Coles et al 2013 for details). The total number or

[4] As part of our exploratory analyses we tested each of these components separately and found their effects to be statistically insignificant.

value of stock ownership or options, in contrast, is a more noisy measure of the extent to which CEOs interests are aligned with those of stockholders through stock-based incentives.

3.4 Control variables

We also controlled for other factors that might affect performance: *Size*, measured as the natural log of total firm sales; *Leverage*, measured as total debt divided by total assets; *Capital Expenditure*, calculated as the ratio of capital expenditure to total assets; *Age*, measured as the natural log of the number of years the firm has been on Compustat; *Segments*, a measure of diversification using the natural log of the number of a firm's product segments, and *Competition*, a measure of product market concentration computed as the Herfindahl index (the sum of squared market shares of all firms, based on sales, in the same four-digit SIC industry). In our tests for the impact of *CEO Career Horizon*, we also controlled for *CEO Tenure*, measured as the number of years the CEO has been in his or her position at the focal firm. For the firm-level cross-sectional analyses, we computed these measures in the first year of entry of the firm in our sample and included industry fixed effects to control for unobserved heterogeneity across industries. For the panel data analyses, we computed these measures for each firm-year and control for both industry and year fixed effects.

3.5 Model

Our study seeks to extend prior work on the risk-return paradox. Typically, the empirical research on Bowman's risk-return paradox (Bowman, 1980; Andersen et al., 2007) models firm level cross-sectional associations between risk and return, by regressing returns (mean of ROA over the sample period) on risk (standard deviation of ROA over that period). For the remaining explanatory variables, values of the variables in the first year of the firms' entry into the sample are used to mitigate simultaneity concerns (John et al., 2008). We follow this approach as our

primary method. In addition, as a secondary analysis, we also perform panel-data analysis by regressing annual ROA on a firm-year-specific risk measure, (*Forecast Dispersion*) and other firm-year-specific explanatory variables.

To test Hypothesis 1 that career concerns aggravate the risk-return paradox, we estimate the following firm-level cross-sectional and panel data regressions:

$$Mean(ROA)_i = \beta_0 + \beta_1 Std(ROA)_i + \beta_2 Career\ Concerns_i + \beta_3 Career\ Concerns_i * Std(ROA)_i + \sum \beta_m * \text{control variables}_i + Industry\ fixed\ effects + \varepsilon_i \quad (1)$$

$$ROA_{it} = \beta_0 + \beta_1 Firm\text{-}Year\ Risk_{it} + \beta_2 Career\ Concerns_{it} + \beta_{32} Career\ Concerns_{it} * Firm\text{-}Year\ Risk_{it} + \sum \beta_m * \text{control variables}_{it} + Industry\ fixed\ effects + Year\ fixed\ effects + \varepsilon_{it} \quad (2)$$

Similarly, we test Hypothesis 2 using the following models: a firm-level cross-sectional specification (Equation 3) and a panel-data model (Equation 4) as follows:

$$Mean(ROA)_i = \beta_0 + \beta_1 Std(ROA)_i + \beta_2 Governance_i + \beta_3 Governance_i * Std(ROA)_i + \sum \beta_m * \text{control variables}_i + Industry\ fixed\ effects + \varepsilon_i \quad (3)$$

$$ROA_{it} = \beta_0 + \beta_1 Firm\text{-}Year\ Risk_{it} + \beta_2 Governance_{it} + \beta_3 Governance_{it} * Firm\text{-}Year\ Risk_{it} + \sum \beta_m * \text{control variables}_{it} + Industry\ fixed\ effects + Year\ fixed\ effects + \varepsilon_{it} \quad (4)$$

For Bowman's paradox to hold, there should be a negative association between risk and return. A significant and *negative* interaction term between risk and career concerns would support Hypothesis 1 since it would indicate that CEOs with more (less) time to retirement exacerbate (weaken) the negative association between risk and return. Similarly, a significant and *positive* interaction term between risk and corporate governance measures will support Hypothesis 2, since this would indicate that stronger corporate governance mitigates the negative association between risk and return.

We test our main independent variables (our measures of risk, career concerns, and corporate governance) for endogeneity using the augmented regression test (Davidson and MacKinnon, 1993). The tests show that our measures of risk, career concerns, and corporate

governance are not endogeneous in our cross-sectional data. OLS is both efficient and consistent under these conditions and hence is the preferred method. We therefore, use OLS regressions for our cross-sectional analyses.

The augmented regression tests, however, show that although our measure of career concerns is not endogenous, we cannot rule out endogeniety of our measures of risk and corporate governance in panel data. For our panel data analyses therefore, we use 2SLS regressions with valid instruments to account for the potential endogeneity of our measures of risk and corporate governance. In addition, OLS is inappropriate for panel data. We therefore use a fixed effects estimation for our panel data analyses after a Hausman test, which compares fixed and random effects estimations, indicated fixed effects as the appropriate method.[5]

Finally, we also perform and report robustness checks. First, we run our primary analysis (cross-sectional analysis) on a number of sub-periods to see if our results hold. Second, although the typical empirical research on Bowman's risk-return paradox has modeled firm level cross-sectional associations between risk and return, by regressing returns over the sample period on risk over that period, it is possible that risk incurred over a period of years may influence returns on a subsequent period of years. To address this possibility, we re-run our primary analyses with risk measured over a period of years on return measured over a subsequent period of years to see if our results hold.

4. Results

[5] Additionally, we use a natural experiment that induced an exogenous weakening of corporate governance to address the potential endogeniety of corporate governance. We provide detailed information of the procedure and results in Appendix B.

4.1 Descriptive statistics

Table 1 presents the descriptive statistics and correlations among variables for firms in our sample. Firms in our sample represent a broad range of industries (a total of 68 two-digit SICs) with no two-digit industry accounting for more than 10 percent of the total sample. Panel A of Table 1 reports descriptive statistics for risk, return, career concern proxy, corporate governance mechanisms and control variables. As Panel A shows, the means (medians) of the primary measures of risk and return are about 0.07 (0.04) and 0.07 (0.08) respectively, suggesting that the sample firms are on average profitable. The summary statistics also reports vulnerability for takeovers of the firms in the sample. A firm with *Market for Corporate Control*=0 would be least vulnerable and one with *Market for Corporate Control* =3 would be most vulnerable. The mean (median) for the sample is 1.75 (2.00), indicating that the external governance for the sample, as measured by the *Market for Corporate Control*, is average and comparable with that reported by other studies. Also, the descriptive statistics of the other corporate governance mechanisms and CEO Career Horizon are consistent with prior research. For example, similar to prior studies on *CEO Career Horizon* (e.g., Krause and Semadeni 2014), the mean (median) *CEO Career Horizon* in our sample is 14.20 (15.00).[6]

We report the correlation matrix among these variables in Panel B. It shows that risk is *negatively* associated with return, and governance mechanisms (*CEO Incentive Alignment* and *Institutional Ownership*) are positively and significantly associated with return, providing confirmation for the paradox and for the positive impact of governance on performance. *Market for Corporate Control* and *Board Monitoring* are positively associated with return, but not

[6] While the mean of *CEO Career Horizon* In Krause and Semadeni (2014) based on a sample of only four years is about 11 years, the more stable *Industry CEO Career Horizon* is 15 years.

significant at the 5% level. Finally, *CEO Career Horizon* is negatively and significantly associated with return suggesting the deleterious effect of career concerns on performance.

4.2 Tests of the effect of career concerns on the risk-return relationship

Table 2 reports the results of the impact of career concerns on the risk-return paradox. To mitigate the influence of outliers, both the dependent and independent variables were winsorized at the top and bottom one percent. Model 1 of Table 2 presents the baseline regression testing the relationship between risk and return for all firms in the sample without missing data on *CEO Career Horizon*, and indicates that risk is significantly and negatively associated with return, consistent with the risk-return paradox. Model 2 examines the moderating effect of career concerns (*CEO Career Horizon*) on the relationship between risk and return. In both models, return and risk are measured as *Mean(ROA)* and *Std(ROA)* respectively, and *CEO Career Horizon* and control variables are measured in the first year of entry of the firm in our sample. The coefficient for the interaction is negative and significant, indicating that *CEO Career Horizon* amplifies the negative association between risk and return, supporting the hypothesis that career concerns exacerbate the paradox.

Models 3 and 4 of Table 2 present the second stage results of fixed effects panel data analyses using 2SLS. As mentioned earlier, the augmented regression test suggests that risk (*Forecast Dispersion*) is endogenous but *CEO Career Horizon* is not. To mitigate the endogeneity bias, we treat risk as an endogenous regressor by modeling a fixed effects two-stage least squares (2SLS) regression. Also, since we estimate the moderating effect of career concerns, we also instrument the interaction of risk and *CEO Career Horizon* (Wooldridge, 2010). Our choice of instruments is motivated by economic intuition: the instruments should be correlated with the independent variable, risk, but uncorrelated with the dependent variable, return. Following prior

research (John et al., 2008), we used the average risk (forecast dispersions) of firms in the industry calculated at the four and two-digit SIC levels as instruments for risk in the first stage. We instrument the interaction term with the interactions between industry mean forecast dispersion calculated at the four and two-digit SIC levels and *CEO Career Horizon*.These instruments make intuitive sense since the risk choices of peer firms are likely to affect the risk choices of an individual firm through product market competition but are unlikely to affect the individual firm's performance. We also perform diagnostic tests to confirm the validity of the instruments. Specifically, the first and second stage diagnostic tests show that none of the models are under-identified or suffer from weak instruments. Moreover, the Sargan test of overidentification, in each case, shows that the null hypothesis that the instruments are valid is not rejected. These tests support the validity of our instruments. Overall, the second-stage results of the fixed effects two-stage least squares estimation (Models 3 and 4) are consistent with the results using firm-level cross-sectional regressions (Models 1 and 2).

4.3 Tests of the effect of corporate governance on the risk-return relationship

Table 3 shows the moderating effect of corporate governance mechanisms on the risk-return relationship. We mitigate the influence of outliers, both the dependent and independent variables by winsorizing at the top and bottom one percent. Model 1 reports the results of testing the relationship between risk and return and provides support for the risk-return paradox. Model 2 presents evidence on the moderating effect of the *Market for Corporate Control* on the relationship between risk and return. Similar to the career concerns test, we measure return and risk as *Mean(ROA)* and *Std(ROA)* respectively, and governance and control variables are measured in the first year of entry of the firm in our sample. The coefficient for the interaction is positive and significant, indicating that the market for corporate control weakens the negative association

between risk and return, supporting Hypothesis 2a. Models 3 through 6 test the moderating effect of CEO Incentive Alignment, Institutional Ownership, Blockholder Ownership, and Board Monitoring respectively. The interaction effects of each of these variables with risk is positive and significant lending support to Hypotheses H2b through H2e.

In addition, we estimate the economic significance of our results, which is best illustrated by computing elasticities relating the percentage change in returns for a given percentage change in risk. For example, the relative impact of *Blockholder Ownership* comparing its high with low levels (as measured by one standard deviation above and below the mean of *Blockholder Ownership* i.e., (0.22+0.17) for the high level, and (0.22-0.17) for the low level, respectively) indicates that an increase of risk (*Std(ROA)*) by 0.01 (approximately 14% of the mean *Std(ROA)* in our sample) raises return (*Mean(ROA)*) by 1.445*0.01*0.34 (=0.0049), where 1.445 is the coefficient on *Blockholder Ownership*Std(ROA)* shown in column 5 of Table 3, and 0.34 is the difference between the high and low level of *Blockholder Ownership*. This increase in return (*Mean(ROA)*) is approximately 7.14 percent of the sample mean of *Mean(ROA)*. Using similar calculations, we report the economic significance of the respective governance mechanism in each of the regressions in Table 3: 1.13 percent for the Market for Corporate Control, 4.84 percent for CEO Incentive Alignment, 2.67 percent for Institutional Ownership, and 3.81 percent for Board Monitoring

Table 4 shows the second stage results for our fixed effects panel data analyses using 2SLS. As mentioned earlier, we could not rule out potential endogeneity of our measures of risk (Forecast Dispersion) and corporate governance in panel data using the augmented regression tests. Also as mentioned earlier, we use the industry average forecast dispersion calculated at the four and two-digit SIC levels as instruments for our measure of risk (Forecast dispersion). For our corporate

governance variables, we use the industry averages of the respective corporate governance variables calculated at the four and two-digit SIC levels as instruments. These instruments also make intuitive sense because governance choices of industry peers are likely to affect the firm's governance choices through benchmarking and mimetic efforts but the governance choices of peers are unlikely to affect the dependent variable--returns.

Since we estimate the moderating effects of corporate governance, we also instrument the interaction of risk and our corporate governance variables using the interaction between industry average forecast dispersion calculated at the four and two-digit SIC levels and industry averages of the respective corporate governance variables calculated at the four and two-digit SIC levels (Wooldridge, 2010). We also perform diagnostic tests to confirm the validity of the instruments. Specifically, the first and second stage diagnostic tests show that none of the models are under-identified or suffer from weak instruments. Moreover, the Sargan test of overidentification, in each case, shows that the null hypothesis that the instruments are valid is not rejected. These tests support the validity of our instruments.

The significant negative coefficient for *Forecast Dispersion* in Model 1 supports Bowman's Paradox, and the significant and positive coefficients for the interaction terms in Models 2 through 6 support the moderating effects of the various corporate governance mechanisms (Hypotheses 2a through 2e). Results of these fixed effects 2SLS panel data analyses, therefore, are consistent with results of our main cross-sectional analyses in Table 3

3.4 Robustness checks

Although Bowman's work regarding the paradox conceptually focuses on the cross-sectional relationship between risk and return, and the typical empirical research on Bowman's paradox has modeled firm level cross-sectional associations between risk and return, by regressing

returns over the sample period on risk over that period, it is possible that there may be a lag between risk and return. That is, risk incurred over a few years may influence returns on a subsequent period of years. To check the robustness of our results to this possibility, we re-run our primary analyses with risk measured over a period of years on return measured over a subsequent period of years, an approach that mirrors that of Anderson and Bettis (2015). Specifically, we run models where we examine risk (standard deviation of ROA) measured over the first half of our sample period (i.e., 1995-2005) on returns (mean ROA) measured over the next half of our sample period (i.e., 2006-2016), risk over the first seven years of our sample period (1995-2001) on returns over the next seven years of our sample period (i.e., 2002-2008), and finally risk over the first four years of the sample period (i.e., 1995-1998) on returns over the next four years of the sample period (i.e., 1999-2002). Results of these analyses show that findings from our main analyses (Table 3, and the cross-sectional analyses in Table 2) hold. In the interest of space, we include results of just one of these runs in Table 5.

Finally, we re-run our primary analyses over various sub-periods of our sample. We report the results of splitting the sample between two periods (1995-2005 and 2006-2016) in panels A and B of Table 6. We also examine the risk-return relationship over other sub-periods such as 1995-1998, 1999-2002 and 2003-2007 (see Appendix A). Results of these analyses show that findings from our main analyses (Table 3, and the cross-sectional analyses in Table 2) hold across these sub-periods.

4.5 Plot analyses

Our findings of strong governance weakening the negative relationship between risk and return are consistent with two possibilities. As governance mechanisms align managers with shareholders, the slope of the association between risk and return could switch from negative to

positive (i.e., the risk-return paradox is eliminated yielding the risk-return tradeoff), or become less negative without switching to positive (i.e., the risk-return paradox is weakened but persists). To assess this relationship visually, we plot the interaction effects for maximum (maximum values in our sample), high (mean + one standard deviation), medium (mean), and low (mean – one standard deviation) levels of the corporate governance variables using coefficients in the model and setting control variables to their means (see Figure 2).

The figures indicate an interesting pattern. To varying degrees, the corporate governance mechanisms studied weaken but do not eliminate the risk-return paradox except for two governance mechanisms that do so at their maximum levels in our sample. At low levels of governance, we observe a negative association between risk and return in keeping with Bowman's paradox. At medium levels of governance, however, the risk-return paradox is reduced, and we observe a less negative association between risk and return. This weakening of the paradox continues with higher levels of governance culminating in a reversal (a positive association) at maximum levels in the case of *Blockholder Ownership* and *Board Monitoring*.

5. Discussion and conclusion

Prior research explains the risk-return paradox as value-reducing risk-taking arising from poor decision-making by managers with lower ability or different risk preferences (Andersen et al., 2007). It is puzzling why such poor decision-making by managers is allowed to persist unchecked in a capitalist economy wherein resources are expected to be allocated efficiently. We explore a novel explanation suggested by Bowman's conjecture that the risk-return paradox may arise as the "*manager may be risking the company but not his own career if there is attractive 'labor mobility' for managers of unsuccessful companies.*" In essence, we present and test two

hypotheses: 1) agency problems arising from career concerns induce managers to take value-reducing risk thereby exacerbating the risk-return paradox, 2) corporate governance mechanisms ameliorate such agency problems, thereby mitigating the risk return paradox. Analyses of a large sample of U.S. firms, over more than two decades, support our hypotheses.

Our theory differs from alternate explanations for the risk-return paradox in prior work that are based on managers taking poor decisions that yield value-reducing risk because they have lower ability or different risk preferences (Andersen et al., 2007). Explanations of different risk preferences tend to be rooted in behavioral biases from prospect theory or behavioral theory. Although seemingly plausible, these explanations are incomplete in assuming that flawed decision-making can persist unchecked, ignoring how career concerns lead to value-reducing risk-taking that contributes to the risk-return paradox, and failing to consider the disciplinary role of corporate governance mechanisms in mitigating the paradox. Exploring career concerns is important as weak decision-making can only persist over time in a context where a manager's career returns are disconnected from shareholders' financial returns.

Our study underscores an important class of agency problems, a form of moral hazard that arises from career concerns, and is perpetuated through information asymmetries. Decisions involving risk-taking can have very different effects on managerial careers and shareholder returns. The paradox arises because such risk-taking can enable managers to signal their ability and enhance their career prospects, even when such risks are harmful for shareholder returns. Implicit incentives in managerial labor markets should curb such risk-taking, but several studies (Grinstein & Hribar, 2004; Harford & Li, 2007; Harford & Schonlau, 2013) have shown that labor markets reward CEOs for risk-taking even when such risk-taking harms returns. We find that CEO career horizons, which is an indicator of career concerns, exacerbate the risk-return paradox suggesting

that CEOs with more years before retirement may take value-reducing risk that exacerbates the risk-return paradox. Presumably, such CEOs are choosing to take such value-reducing risks as they perceive career advantages.

Our study also underscores the role of corporate governance mechanisms in disciplining value-reducing risk-taking. Strong governance serves to reduce agency conflicts, and thus mitigate the risk-return paradox. Firms that are relatively unconstrained by governance mechanisms allow managers to pursue their career concerns unimpeded by effective oversight to take value-reducing risks that contribute to the risk-return paradox; governance mechanisms constrain managers from pursuing risks that erode shareholder returns, thereby mitigating the risk return paradox. Our results indicate that the governance mechanisms we studied mitigate the risk-return paradox, but do not fully reverse it. In fact, we observed risk-return tradeoffs only for firms with maximum levels of blockholder ownership or board monitoring.

Our study differs from much of the prior agency theoretic research relating governance to the level of risk (e.g., Wright et al., 1996). Focusing on the level of risk-taking and arguing that managers are more risk-averse than shareholders (Eisenhardt, 1989), this literature shows that strong governance mechanisms that align managers with shareholders mitigate such risk-aversion problems by fostering risk-taking (Sanders & Hambrick, 2007). These prior studies tend to focus on one type of moral hazard that arises from managerial risk aversion, wherein managers pursue lower levels of risk than is preferred by shareholders. In doing so, prior research ignores another type of moral hazard that arises from managers making decisions that are risky to shareholders but not to managers (i.e., pursuing risky strategies that enhance their career returns at the expense of shareholder financial returns). The difference is that prior research tends to assume that strategic decisions involving higher risk-taking is generally value-enhancing to shareholders, whereas the

career concerns literature recognizes that such strategic decisions can pose different kinds of returns for shareholders (financial returns) and managers (career returns). Thus, extant research is somewhat narrow; in focusing only on the level of risk, thereby failing to recognize that agency problems may also induce managers to take risks that reduce shareholder value because doing so can enhance their career prospects. As a consequence, prior work ignores the role that corporate governance can play in resolving the agency problems underlying the risk-return paradox. Our study complements the prior management research by explaining how agency problems and corporate governance affect return on risk.

Our theory also differs from alternate explanations for the risk-return paradox in prior work that are based on managers taking poor decisions that yield value-reducing risk because they have lower ability or different risk preferences (Andersen et al., 2007). Explanations of different risk preferences tend to be rooted in behavioral biases from prospect theory or behavioral theory. Recognizing that strategic decisions pose different kinds of returns for shareholders and managers also has the potential for informing prior research using behavioral agency models on risk-taking. Typically research studies using behavioral agency models (Devers et al., 2008; Martin et al., 2013) assume that investments in risky strategies such as R&D, capital equipment, and acquisitions constitute evidence of higher managerial risk-taking. Although such strategic investments may well constitute financial risk for shareholders, one must be cautious in concluding that strategic investments also constitute risk for managers, who often benefit from these strategic decisions even if the strategy fails and shareholders suffer adverse consequences. More attention needs to be paid in disentangling risk-taking where the risks have the potential to adversely impact managers' careers and are therefore more amenable to behavioral explanations versus risk-taking that merely harms shareholders, and poses no adverse impact to managerial careers. Furthermore, more

attention should be paid to why managerial labor markets assign greater weight to risk-taking rather than to return generation.

Also, we should note some practical implications of our research. First, our research helps point out that career concerns exacerbate value-reducing risk-taking, indicating that particular attention may need to be paid to monitoring younger CEOs to ensure their risk-taking enhances firm value and not just their own careers. Second, our research helps show that governance mechanisms affect the value consequences of risk-taking by aligning managerial career concerns and shareholder interests. Specifically, it shows that strong governance motivates managers and aligns their interests with shareholders. It should therefore be possible for a firm to design its corporate governance mechanisms in a way that mitigates value-reducing investments.

Finally, we call for more future research on the role of governance in affecting the risk-return relationship. Several avenues of research seem promising. First, while we include several governance mechanisms in our empirical tests, we encourage research on other governance mechanisms, especially the role of international institutions and networks (Lin, Peng, Yang, & Sun, 2009), that can enhance our understanding of risk-return patterns across countries and over time. Second, prior research has noted that governance mechanisms do not all operate the same way and the effects are not strictly linear and can even be curvilinear (for a survey see Dalton, Hitt, Certo, & Dalton, 2007). Therefore, it is worthwhile for future research to consider alternative models.

Third, prior research has noted that multiple mechanisms operate together either as substitutes (high levels of one mechanism precludes the need for other mechanisms) or complements (high levels of one mechanism are more effective in the presence of other mechanisms) (Misangyi & Acharya, 2014; Rediker & Seth, 1995). Misangyi and Acharya (2014)

show, using qualitative comparative analysis, that governance mechanisms combine in ways that are both substitutive and complementary and that performance is highest when incentive and monitoring mechanisms operate as complements. We find that in our sample, when tested individually, most governance mechanisms mitigate but do not fully reverse the risk-return paradox. Therefore, future studies that view governance mechanisms as a bundle may help show that governance mechanisms are more potent when they operate in conjunction with each other by identifying the combination of various governance mechanisms that are most effective in constraining value-reducing risk and mitigating the paradox. Understanding these differences can help firms craft more effective governance mechanisms that limit value-reducing risk.

Lastly, while we have made a start in understanding how agency problems and governance solutions shape the risk-return paradox, future work should more fully unpack the role of market discipline in shaping value enhancing risk-taking. The fundamental insight from our study is that managerial decisions can pose very different risks for managers and shareholders. Corporate policies that enhance value for other stakeholders can pose risks for shareholders. For example, commitments to safeguard employee contracts by providing pensions can be motivating to employee stakeholders to enhance shareholder value, but can also impact shareholder risks if it makes it harder to let go of employees in a downturn. Delving deeper into various factors that shape managerial risk-taking (as opposed to the risks only harming shareholders) holds promise for understanding the paradox of why firms take value-reducing risk. Comprehensive models of risk-taking that identify a more exhaustive set of antecedents, their direct and reciprocal effects on fostering or restraining value-reducing risk-taking, and how they interact with each other are useful avenues for exploration.

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Table 1
Descriptive statistics and correlation

Panel A

Variable	Mean	Median	S.D.
MeanROA	0.07	0.08	0.10
StdROA	0.07	0.04	0.09
Natural Log Size	5.87	5.96	1.94
Leverage	0.20	0.16	0.20
Capital Expense	0.07	0.05	0.07
Natural Log Segments	0.31	0.00	0.52
Natural Log Age	2.36	2.40	1.14
Competition	0.20	0.15	0.17
Market for Corporate Control	1.75	2.00	0.72
Natural Log CEO Incentive Alignment	4.90	4.92	1.60
Institutional Ownership	0.46	0.47	0.23
Blockholder Ownership	0.22	0.19	0.17
Board Monitoring	-0.16	0.38	0.88
CEO Tenure	7.20	5.00	7.27
CEO Career Horizon	14.20	15.00	7.63

Panel B

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1 MeanROA														
2 StdROA	-0.59*													
3 Natural Log Size	0.32*	-0.43*												
4 Leverage	0.02	-0.17*	0.11*											
5 Capital Expense	0.05*	0.08*	-0.03	0.04*										
6 Natural Log Segments	0.03	-0.17*	0.38*	0.06*	-0.09*									
7 Natural Log Age	0.11*	-0.23*	0.54*	0.05*	-0.09*	0.39*								
8 Competition	0.06*	0.02	0.10*	-0.03	0.02	0.08*	0.09*							
9 Market for Corporate Control	0.00	0.00	-0.05*	0.04*	-0.01	0.03	-0.13*	0.00						
10 Natural Log CEO Incentive Alignment	0.23*	-0.05	0.25*	-0.18*	0.04	0.00	-0.12*	0.11*	-0.01					
11 Institutional Ownership	0.16*	-0.17*	0.35*	-0.02	0.03	0.08*	0.15*	0.06*	0.02	0.25*				
12 Blockholder Ownership	-0.06	0.05	-0.21*	0.02	-0.03	-0.14*	-0.25*	0.09*	-0.05	0.09*	0.01			
13 Board Monitoring	0.01	-0.07*	0.00	0.11*	-0.07*	0.07*	0.02	-0.03	0.10*	-0.19*	-0.04	-0.13*		
14 CEO Tenure	0.07*	-0.01	-0.02	-0.09*	0.03	0.00	0.02	0.02	-0.07*	0.34*	0.01	0.04	-0.22	
15 CEO Career Horizon	-0.11*	0.13*	-0.19*	0.00	0.04	-0.16*	-0.28*	-0.07*	0.02	-0.13*	-0.03	0.08*	0.05	-0.36*

Pairwise correlations. * p<0.05

Table 2

CEO career concerns and relationship to risk-return: OLS cross section and fixed effects 2SLS panel data analyses

	Model 1 Mean ROA	Model 2 Mean ROA	Model 3 ROA	Model 4 ROA
Intercept	0.034	0.029	-0.094***	-0.100***
Std(ROA)	-0.727***	-0.584***		
CEO Career Horizon*Std(ROA)		**-0.008***		
Forecast dispersion			-0.054***	-0.040***
CEO Career Horizon*Forecast dispersion				**-0.001****
CEO Career Horizon		0.000		0.000*
CEO Tenure	0.001*	0.001*	0.000	0.000+
Natural Log Size	0.009***	0.009***	0.049***	0.050***
Leverage	-0.067***	-0.065***	-0.099***	-0.099***
Capital Expense	0.084*	0.079*	0.205***	0.202***
Natural Log Segments	-0.012**	-0.012**	-0.011***	-0.011***
Natural Log Age	-0.002	-0.002	-0.039***	-0.039***
Competition	0.014	0.015	-0.003	-0.002
Industry fixed effects[1]	Yes	Yes		
Year fixed effects	No	No	Yes	Yes
Sample size	1337	1337	15611	15611
R-square	0.402	0.404	NA	NA

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (Two tail tests)

Models 1 and 2 are firm level analyses using OLS regressions. Models 3 and 4 are second stage results of fixed effects panel data analyses with 2SLS. [1] Industry dummy variables were dropped by the fixed effects estimation. NA=not applicable. R-square does not indicate goodness of fit in 2SLS. Because 2SLS is a method for estimating slope coefficients after accounting for endogeniety there is no meaningful goodness-of-fit statistic comparable to R-square for 2SLS.

Table 3

Corporate governance: Firm level cross-sectional analyses

	Model 1 Mean ROA	Model 2 Mean ROA	Model 3 Mean ROA	Model 4 Mean ROA	Model 5 Mean ROA	Model 6 Mean ROA
Intercept	0.058*	0.060*	-0.001	0.059*	0.106**	0.114***
Std(ROA)	-0.655***	-0.750***	-1.115***	-0.780***	-0.863***	-0.250***
Market for Corporate Control		-0.002				
Market for Corporate Control*Std(ROA)		**0.054***				
Natural Log CEO Incentive Alignment			0.004*			
Natural Log CEO Incentive Alignment*Std(ROA)			**0.104*****			
Institutional Ownership				-0.018*		
Institutional Ownership*Std(ROA)				**0.399*****		
Blockholder Ownership					-0.096***	
Blockholder Ownership*Std(ROA)					**1.445*****	
Board Monitoring						-0.007***
Board Monitoring*Std(ROA)						**0.149*****
Natural Log Size	0.008***	0.008***	0.004*	0.006***	0.004**	0.003**
Leverage	-0.033***	-0.033***	-0.056***	-0.033***	-0.049***	-0.022**
Capital Expense	0.105***	0.104***	0.058+	0.100***	0.121**	0.069**
Natural Log Segments	-0.014***	-0.014***	-0.010**	-0.011***	-0.010**	-0.011***
Natural Log Age	-0.006***	-0.005***	0.005+	-0.005**	-0.001	-0.003+
Competition	0.022*	0.022*	0.012	0.025**	0.012	0.019*
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No	No
Sample size	2753	2753	1308	2442	1051	2117
R-square	0.415	0.416	0.424	0.402	0.295	0.131
Economic significance		1.13%	4.84%	2.67%	7.14%	3.81%

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (Two tail tests)

Table 4

Corporate governance: Fixed effects 2SLS panel data analyses (second stage results)

	Model 1 ROA	Model 2 ROA	Model 3 ROA	Model 4 ROA	Model 5 ROA	Model 6 ROA
Intercept	-0.190***	-0.129***	-0.129***	-0.169***	-0.042	-0.104***
Forecast Dispersion	-0.064***	-0.146***	-0.153***	-0.226***	-0.173***	-0.060***
Market for Corporate Control		-0.045***				
Market for Corporate Control*Forecast Dispersion		**0.060*** **				
Natural Log CEO Incentive Alignment			0.009***			
Natural Log CEO Incentive Alignment*Forecast Dispersion			**0.020*** **			
Institutional Ownership				0.012		
Institutional Ownership*Forecast Dispersion				**0.241*** **		
Blockholder Ownership					-0.020	
Blockholder Ownership*Forecast Dispersion					**0.283*** **	
Board Monitoring						-0.002
Board Monitoring*Forecast Dispersion						**0.006** **
Natural Log Size	0.061***	0.062***	0.043***	0.058***	0.061***	0.049***
Leverage	-0.091***	-0.093***	-0.088***	-0.083***	-0.125***	-0.088***
Capital Expense	0.147***	0.146***	0.191***	0.139***	0.116**	0.233***
Natural Log Segments	-0.015***	-0.014***	-0.009***	-0.014***	-0.009***	-0.012***
Natural Log Age	-0.026***	-0.030***	-0.026***	-0.028***	-0.078***	-0.031***
Competition	-0.005	-0.009	0.001	-0.005	-0.013	-0.007
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Sample size	20379	20379	13300	19113	3814	17379

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (Two tail tests). Industry dummy variables were included as controls but were dropped by the fixed effects estimation.

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Table 5

Robustness to measuring risk over the first seven years of our sample period and return over the next seven years

	Model 1 Mean ROA	Model 2 Mean ROA	Model 3 Mean ROA	Model 4 Mean ROA	Model 5 Mean ROA	Model 6 Mean ROA	Model 7 Mean ROA
Intercept	-0.035	0.062	0.024	0.031	-0.117+	0.009	0.123*
Std(ROA)	-0.039***	-0.812***	-1.387***	-2.241***	-0.061***	-1.213***	-0.436***
CEO Career Horizon		0.002+					
CEO Career Horizon*Std(ROA)		**-0.030****					
Market for Corporate Control			-0.030***				
Market for Corporate Control*Std(ROA)			**0.674*****				
Natural Log CEO Incentive Alignment				-0.003			
Natural Log CEO Incentive Alignment*Std(ROA)				**0.196*****			
Institutional Ownership					0.084***		
Institutional Ownership*Std(ROA)					**0.077****		
Blockholder Ownership						-0.077*	
Blockholder Ownership*Std(ROA)						**1.956****	
Board Monitoring							-0.027***
Board Monitoring*Std(ROA)							**0.625*****
CEO Tenure		0.000					
Natural Log Size	0.022***	0.008*	0.021***	0.011**	0.024***	0.012***	0.001
Leverage	0.051*	-0.033	0.049*	-0.020	-0.058***	-0.023	-0.002
Capital Expense	0.306***	0.194*	0.309***	0.153+	0.389***	0.206**	0.176***
Natural Log Segments	-0.008	-0.008	-0.01	-0.007	0.003	-0.011+	-0.004
Natural Log Age	-0.006	-0.008	-0.005	-0.009	0.006	-0.003	-0.006+
Competition	-0.009	0.026	-0.011	0.008	0.011	0.014	0.022
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No	No	No
Sample size	2028	1068	2028	907	1983	737	1608
R-square	0.088	0.279	0.108	0.339	0.212	0.211	0.163

+ p<0.1, * p<.05, ** p<.01, *** p<.001 (Two tail tests)

Table 6

Robustness to sub sample periods

Panel A: 1995 to 2005

	Model 1 Mean ROA	Model 2 Mean ROA	Model 3 Mean ROA	Model 4 Mean ROA	Model 5 Mean ROA	Model 6 Mean ROA	Model 7 Mean ROA
Intercept	0.063*	0.121	0.071**	0.027	0.078**	0.116**	0.116***
Std(ROA)	-0.890***	-0.610***	-1.090***	-1.544***	-1.132***	-0.987***	-0.400***
CEO Career Horizon		0.001+					
CEO Career Horizon*Std(ROA)		**-0.022*** **					
Market for Corporate Control			-0.005				
Market for Corporate Control*Std(ROA)			**0.110** **				
Natural Log CEO Incentive Alignment				0.002			
Natural Log CEO Incentive Alignment*Std(ROA)				**0.151*** **			
Institutional Ownership					-0.041***		
Institutional Ownership*Std(ROA)					**0.758*** **		
Blockholder Ownership						-0.067***	
Blockholder Ownership*Std(ROA)						**0.744** **	
Board Monitoring							-0.011***
Board Monitoring*Std(ROA)							**0.252*** **
CEO Tenure		0.001**					
Natural Log Size	0.009***	0.008***	0.009***	0.004*	0.007***	0.005***	0.003**
Leverage	-0.036***	-0.077***	-0.036***	-0.058***	-0.036***	-0.048***	-0.025**
Capital Expense	0.154***	0.163***	0.151***	0.094**	0.144***	0.129**	0.091***
Natural Log Segments	-0.017***	-0.010**	-0.018***	-0.012**	-0.014***	-0.014***	-0.014***
Natural Log Age	-0.007***	-0.010**	-0.007***	0.003	-0.006**	-0.004	-0.004*
Competition	0.014	-0.008	0.015	0.006	0.017	-0.001	0.008
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No	No	No
Sample size	2753	1337	2753	1308	2442	1051	2117
R-square	0.471	0.502	0.473	0.507	0.474	0.34	0.182

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (Two tail tests).

Table 6

Robustness to sub sample periods

Panel B: 2006 to 2016

	Model 1 Mean ROA	Model 2 Mean ROA	Model 3 Mean ROA	Model 4 Mean ROA	Model 5 Mean ROA	Model 6 Mean ROA
Intercept	0.066+	0.064	0.068+	0.080+	0.074+	0.116***
Std(ROA)	-0.581***	-0.260**	-0.703***	-1.202***	-0.755***	-0.271***
CEO Career Horizon		-0.0003				
CEO Career Horizon*Std(ROA)		**-0.016****				
Market for Corporate Control			-0.002			
Market for Corporate Control*Std(ROA)			**0.072***			
Natural Log CEO Incentive Alignment				0.008***		
Natural Log CEO Incentive Alignment*Std(ROA)				**0.128*****		
Institutional Ownership					0.012	
Institutional Ownership*Std(ROA)					**0.256***	
Board Monitoring						-0.014***
Board Monitoring*Std(ROA)						**0.164*****
CEO Tenure		0.0003				
Natural Log Size	0.013***	0.010***	0.013***	0.004*	0.014***	0.006***
Leverage	-0.034***	-0.056***	-0.034***	-0.038**	-0.031**	-0.013
Capital Expense	0.223***	0.211***	0.219***	0.148***	0.277***	0.133***
Natural Log Segments	-0.004	-0.004	-0.004	-0.002	-0.005	-0.003
Natural Log Age	-0.013***	-0.010**	-0.013***	-0.008*	-0.012***	-0.015***
Competition	0.014	0.005	0.015	0.01	0.011	0.013
Industry fixed effect	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No	No
Sample size	2189	1465	2189	1393	1726	1697
R-square	0.283	0.205	0.285	0.311	0.318	0.107

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (Two tail tests). Blockholder ownership data is not available for this time period.

Appendix A: Robustness to other sub sample periods

Panel A: 1995 to 1998 sub period

	Model 1 Mean ROA	Model 2 Mean ROA	Model 3 Mean ROA	Model 4 Mean ROA	Model 5 Mean ROA	Model 6 Mean ROA	Model 7 Mean ROA
Intercept	-0.038	0.084+	-0.012	-0.014	0.059+	0.130**	0.093**
Std(ROA)	-0.529***	-0.029	-1.073***	-1.653***	-1.410***	-1.048***	-0.423***
CEO Career Horizon		0.001					
CEO Career Horizon*Std(ROA)		**-0.023****					
Market for Corporate Control			-0.013**				
Market for Corporate Control*Std(ROA)			**0.272*****				
Natural Log CEO Incentive Alignment				0.005**			
Natural Log CEO Incentive Alignment*Std(ROA)				**0.165*****			
Institutional Ownership					-0.042***		
Institutional Ownership*Std(ROA)					**1.298*****		
Blockholder Ownership						-0.079***	
Blockholder Ownership*Std(ROA)						**0.823****	
Board Monitoring							-0.011***
Board Monitoring*Std(ROA)							**0.355*****
CEO Tenure		0.001*					
Natural Log Size	0.025***	0.010***	0.024***	0.009***	0.013***	0.007***	0.008***
Leverage	-0.025*	-0.088***	-0.025*	-0.068***	-0.048***	-0.050***	-0.047***
Capital Expense	0.092*	0.199***	0.093*	0.159***	0.175***	0.178***	0.077*
Natural Log Segments	-0.027***	-0.014***	-0.027***	-0.017***	-0.020***	-0.017***	-0.020***
Natural Log Age	-0.008**	-0.007*	-0.008**	0.004	-0.009***	-0.007	-0.007**
Competition	0.02	0.030*	0.021	0.005	0.018	-0.002	0.012
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No	No	No
Sample size	2753	1337	2753	1308	2442	1051	2117
R-square	0.918	0.161	0.919	0.404	0.482	0.313	0.178

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (Two tail tests)

Panel B: 1999 to 2002 sub period

	Model 1 Mean ROA	Model 2 Mean ROA	Model 3 Mean ROA	Model 4 Mean ROA	Model 5 Mean ROA	Model 6 Mean ROA	Model 7 Mean ROA
Intercept	-0.04	0.041	-0.043	0.053	0.05	0.054	0.085*
Std(ROA)	-0.939***	-0.815***	-1.004***	-1.421***	-1.419***	-1.369***	-0.720***
CEO Career Horizon		0.001					
CEO Career Horizon*Std(ROA)		**-0.017*** **					
Market for Corporate Control			0.006				
Market for Corporate Control*Std(ROA)			**0.063***				
Natural Log CEO Incentive Alignment				0.005*			
Natural Log CEO Incentive Alignment*Std(ROA)				**0.069****			
Institutional Ownership					-0.033**		
Institutional Ownership*Std(ROA)					**1.006*** **		
Blockholder Ownership						-0.056*	
Blockholder Ownership*Std(ROA)						**1.202*** **	
Board Monitoring							-0.011**
Board Monitoring*Std(ROA)							**0.128****
CEO Tenure		0.001*					
Natural Log Size	0.020***	0.014***	0.021***	0.007**	0.014***	0.014***	0.005**
Leverage	-0.039**	-0.093***	-0.040**	-0.065***	-0.045***	-0.046**	-0.042***
Capital Expense	0.345***	0.127*	0.338***	0.118*	0.204***	0.127*	0.314***
Natural Log Segments	-0.011**	-0.011*	-0.010*	-0.020***	-0.018***	-0.015***	-0.014***
Natural Log Age	-0.003	-0.010*	-0.005	-0.005	-0.003	-0.009*	-0.007*
Competition	0.016	-0.004	0.016	-0.005	0.004	-0.011	0.003
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No	No	No
Sample size	2530	1413	2530	1308	2258	1229	1909
R-square	0.542	0.495	0.545	0.421	0.518	0.336	0.244

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (Two tail tests)

Panel C: 2003 to 2007 sub period

	Model 1 Mean ROA	Model 2 Mean ROA	Model 3 Mean ROA	Model 4 Mean ROA	Model 5 Mean ROA	Model 6 Mean ROA
Intercept	0.018	0.046	0.031	0.126**	0.014	0.075*
Std(ROA)	-0.587***	-0.523***	-0.686***	-3.100***	-1.114***	0.155***
CEO Career Horizon		0.0001				
CEO Career Horizon*Std(ROA)		**-0.012*** **				
Market for Corporate Control			-0.007*			
Market for Corporate Control*Std(ROA)			**0.058***			
Natural Log CEO Incentive Alignment				-0.004*		
Natural Log CEO Incentive Alignment*Std(ROA)				**0.431*** **		
Institutional Ownership					-0.033**	
Institutional Ownership*Std(ROA)					**1.527*** **	
Board Monitoring						-0.023***
Board Monitoring*Std(ROA)						**0.593*** **
CEO Tenure		0.001**				
Natural Log Size	0.020***	0.017***	0.021***	0.005*	0.022***	0.006***
Leverage	-0.029*	-0.036*	-0.028*	-0.033*	-0.056***	-0.002
Capital Expense	0.394***	0.321***	0.389***	0.278***	0.301***	0.303***
Natural Log Segments	-0.004	-0.005	-0.003	-0.005	-0.002	-0.005+
Natural Log Age	-0.012***	-0.007	-0.013***	-0.001	-0.005	-0.008**
Competition	0.014	0.005	0.014	0.017	0.009	0.014
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	No	No	No	No	No	No
Sample size	2480	1472	2480	1455	2160	1893
R-square	0.551	0.625	0.553	0.501	0.573	0.496

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (Two tail tests).
Blockholder ownership data is not available for this time period.

Appendix B: Controlling for the potential endogeniety of corporate governance through a natural experiment approach.

To address the potential endogeniety of corporate governance in this alternative analysis, we leverage the passage of State anti-takeover laws, specifically the business combination (BC) laws, which were passed by States in a staggered fashion in the mid to late 1980s (Bertrand & Mullainathan, 2003). By lowering the chance of firms being taken-over, these laws weakened corporate governance for firms that were incorporated in States that passed these laws[7]. Since the passage of these laws were exogenous to the firm, the setting provides a natural experiment to test our hypothesis that strong (weak) corporate governance mitigates (amplifies) the negative relationship between risk and return, while ensuring that the source of change in corporate governance is not endogenous. By observing firms both before and after the law's passage we can discern the effect of weakening corporate governance on the risk-return relationship.

We use a sample of all firms for which we could obtain data from Compustat on the relevant variables for the sample period, 1976 to 1995, which covers both the pre and post BC law passage years (a total of 33,468 firm-year observations). Data on passage of BC law are from Bertrand and Mullainathan (1999). We test the effect of exogenous weakening of corporate governance on the risk return relationship by regressing our measure of return (ROA) on risk (Forecast dispersion), a dummy variable labeled Afterlaw which takes a value of 1 for firms that were incorporated in States that passed the BC law for years after the passage of the law and 0 otherwise, and the interaction between Forecast dispersion and Afterlaw. A significant negative coefficient for Forecast dispersion in the above regression model, run without the interaction

[7] According to Bertrand and Mullainathan (1999), "these laws directly influence moral hazard and, therefore, may better proxy for managerial discretion" (p. 536), providing support for the notion that the passage of these laws are an exogenous source that weakened corporate governance in general.

variable, i.e., the base model, will support Bowman's risk-return paradox. A negative coefficient for the interaction term in the full regression model will indicate that the relationship between risk and return is more negative after the passage of the BC law which weakened corporate governance, supporting hypothesis 2.

We estimate the regression models with fixed effects 2SLS. We instrument our measure of risk, Forecast dispersion, in the first stage using the industry average Forecast dispersion calculated at the two and four digit SIC levels. We also instrument the interaction effect between Forecast dispersion and Afterlaw with the interaction between industry average Forecast dispersion calculated at the two and four digit SIC levels and Afterlaw (Wooldridge, 2002). First and second stage diagnostic tests show that the models are not under-identified and do not suffer from weak instruments. The Sargan test of overidentification also shows that the null hypothesis that the instruments are valid is not rejected—supporting the validity of our instruments.

Results are shown in the Table below. Model 1 is the base model and Model 2 includes the interaction effect. The coefficient of Forecast dispersion is negative and significant in Model 1 supporting Bowman's paradox. The coefficient of the interaction between Forecast dispersion and Afterlaw, in Model 2, is negative and significant supporting hypothesis 2. Results of this alternative analysis therefore also support our main results.

Table: Controlling for potential endogeniety of corporate governance by using the natural experiment approach: Fixed effects 2SLS analyses (second stage results)

	Model 1 ROA	Model 2 ROA
Intercept	0.441***	0.441***
AfterLaw	0.003	0.005
Forecast dispersion	-0.055***	-0.045***
AfterLaw*Forecast dispersion		**-0.078***
Natural Log Size	-0.033***	-0.034***
Leverage	-0.033***	-0.032***
Capital Expense	0.049***	0.049***
Natural Log Segments	0.003	0.003
Natural Log Age	-0.043***	-0.042***
Competition	-0.041*	-0.042*
Year fixed effects	Yes	Yes
Sample size	33468	33468

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001 (Two tail tests). Industry dummies and Incorporation state dummies were included as additional controls, but these dummy variables were dropped by the fixed effects estimation.

Figure 1

Model:

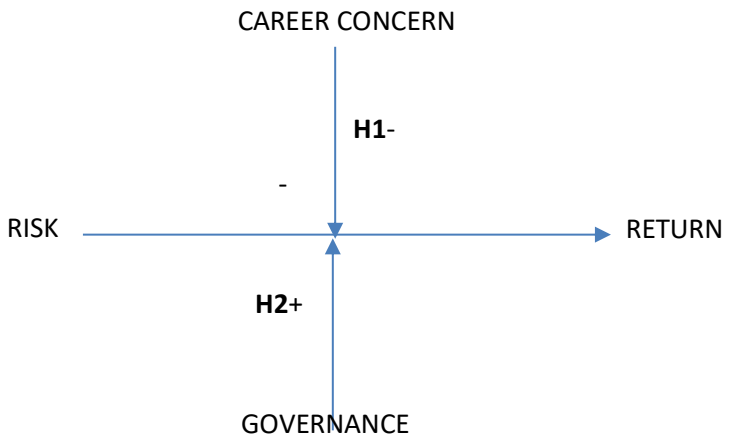

Figure 2: Corporate governance and the risk-return relationship