AMP Bridging Finance and Behavioral Scholarship on Agent Risk Sharing and Risk Taking

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Executive Overview

A large volume of research has examined agent risk taking and the contracting problem of risk sharing – the sharing of performance risk across agent and principal – to advance our knowledge of mechanisms that can align the assumed divergent interests and risk preferences of the managerial-agent and shareholder-principal. This research has been undertaken in two research streams that appear to have operated in silos, utilizing different theoretical frameworks and methodological approaches: financial economics and behavioral science. We review the theoretical paradigms and empirical findings deriving from both fields in order to identify opportunities for cross-fertilization and to advance future research in both streams. We also make an assessment of how the combined research efforts of finance and behavioral scholars has progressed in developing our understanding of agent risk taking and mechanisms for achieving agent-principal incentive alignment. Finally, we discuss how this research has influenced the corporate world for better or for worse.
After nearly four decades of investigating the agency problem and equity based pay as a means of aligning the incentives of a firm’s principals and agents, this paper examines the progress made in this area and maps a future research agenda. In order to do so, we examine theoretical development and selected empirical research emanating from two different theoretical foundations that have driven agency research in the context of agent risk taking: *financial economics* and *behavioral science*. These perspectives have operated largely in research silos separated by different theoretical assumptions and terminology. The lack of interaction among these streams is puzzling since both areas of research are effectively concerned with the same question: how to design a contractual relationship between the principal and agent that reduces agency costs to the principal. Financial economists often refer to this arrangement in terms of risk sharing (e.g., Gao, 2010; Holmstrom, 1979; Shavell, 1979; Ai & Li, 2015), while behavioral scientists focus on incentive alignment (Gomez-Mejia, Welbourne & Wiseman, 2000; Kolev, Wiseman & Gomez-Mejia, 2014; Nyberg, Fulmer & Gerhart, 2010; Rodriguez, Gomez-Mejia & Wiseman, 2012; Wiseman & Gomez-Mejia, 1998), though both risk sharing and incentive alignment reflect the same phenomenon: making a portion of the agent’s compensation contingent upon achieving outcomes important to the principal. For both groups of scholars, the design of compensation is a critical mechanism for reducing agency costs which arise when agents shirk their obligation to enhance shareholder wealth. A type of agent cost of great interest to agency scholars exploring risk sharing and incentive alignment is through the agent minimizing their concentrated firm-specific risk – the agent is assumed to be less diversified than their principal – at the expense of positive net present value (NPV) investments. It is our contention that bridging these streams can enhance our understanding of how risk sharing through incentive alignment may influence agent risk taking and thus the returns – or residual claims – accruing to the principal.
Financial economists have argued that agency costs arise because agents are rationally opportunistic in pursuing self-interests that are not necessarily in alignment with the interests of principals (e.g., Holmstrom, 1979; Jensen & Meckling, 1976; Shavell, 1979). The difficulty and cost of monitoring agent behavior has led positivist agency scholars in the finance field to focus upon incentive structures that reward agents for achieving goals important to the principal (Jensen & Murphy, 1990). In other words, due to the limitations of directly monitoring agent effort, finance research has sought to design efficient incentive alignment systems that allow principals to transfer a portion of their risk onto the agent by tying a portion of the agent’s compensation to the achievement of performance outcomes important to the principal (Jensen & Meckling, 1979). This transferring of performance risk to the managerial agent is referred to as risk sharing, given the agent shares the principal’s risks associated with share price performance.

While positivist agency scholars have argued that the transfer of risk from the firm’s principal to the managerial agent – through incentive alignment – may encourage wealth maximizing efforts by agents, normative agency scholars point out that this also can aggravate agent risk bearing (Holmstrom, 1979). That is, agent risk bearing created by the concentrated investment of their human capital in their employer is aggravated if the agent must also share the performance risks of the firm. The agent’s over-investment problem is argued to encourage an attitude towards risk that results in sub-optimal investments from the perspective of the principal (Eisenhardt, 1989). The contracting problem of risk sharing between principals and agents has given rise to a large literature within the finance field. This research has sought the optimal contract for balancing the costs and benefits of risk sharing between agents and principals (e.g., Bettis, Bizjak & Lemmon, 2001; Gao, 2010). In particular, financial economists have focused considerable attention on equity forms of pay
(such as stock options) and how different characteristics of equity-based pay may influence agent decisions under assumptions of rational self-interest.

Attracted to its essential prediction that incentives may reduce agency costs, organizational and behavioral scholars adopted positive agency theory as a foundation upon which they produced a corresponding stream of research examining the role of executive compensation in influencing firm performance and executive behaviors (e.g., Gephart-Kish & Campbell, 2015; Gomez-Mejia, Berrone & Franco-Santos, 2010; Martin, Gomez-Mejia & Wiseman, 2013). Inspired by the elegant explication of agency theory for the benefit of management scholars by Eisenhardt (1989), behavioral research judiciously attempted to enrich the management field’s understanding of how incentive alignment properties of equity based pay may control agency costs such as shirking and perquisite consumption. In adopting the positive agency view of Jensen and Meckling (1976), early applications of the theory within organizational sciences retained the assumptions of rational self-interest that ignored the more nuanced view of human nature emerging from behavioral sciences.

Utilizing the rich empirical findings and theoretical development of behavioral decision research, a behavioral approach to understanding the agency problem – in particular the problem of risk sharing – was subsequently developed in an effort to reconcile the disparate views of positive and normative agency scholars regarding the merits of risk sharing as a possible solution to the agency problem (Wiseman & Gomez-Mejia, 1998). The behavioral view utilized the guiding principles of prospect theory research (e.g., Kahneman & Tversky, 1979) along with other seminal research emanating from behavioral science and psychology (e.g., Cyert & March, 1963; Lopes, 1984, 1987). In particular prospect theory suggested that: (1) individuals are inherently loss averse rather than risk averse; (2) the value assigned by individuals to wealth is referent dependent – for example, the negative utility of financial losses outweighs the positive utility attached to gains of the same dollar value; (3)
risk preferences are context dependent, allowing for risk-seeking behavior when anticipating a loss; and (4) probability is non-linear such that probabilities near certainty are given more weight in decisions than less certain outcomes. Individuals are risk averse if they prefer a certain outcome to a gamble with the same expected value. Loss aversion suggests individuals weigh losses more heavily than gains, meaning they will prefer the aforementioned gamble over a certain outcome if the expected value of both alternatives equates to a loss. Individuals are described as risk seeking when a gamble is preferred over a certain outcome with the same positive expected value.

Though retaining a weak form of the assumption of self-interest, the behavioral approach discarded the assumption – long held by financial economists – of rationality which implied unwavering and consistent preference orderings, whereby consistent preference orderings simply means that individuals always prefer more wealth to less and less risk over more risk (Jensen, 1994). This assumption provides the foundation on which financial economists model agents as consistently risk averse and principals as risk neutral. The behavioral approach replaces the assumption of consistent risk preference orderings with empirically validated patterns of behavior. As a result of doing so, behavioral agency scholars have come to different conclusions from those of financial economists about the role and influence of incentive alignment mechanisms on agent preferences regarding risk (e.g., Devers, McNamara, Wiseman & Arrfelt, 2008; Larraza-Kintana, Wiseman, Gomez-Mejia & Welbourne, 2007; Martin et al., 2013; Sanders, 2001; Sanders & Hambrick, 2007). The behavioral approach challenged the financial economists’ view that all forms of wealth (or forms of compensation) are valued equally by the agent and thus should have similar influences on behavior (Devers et al., 2008; Martin et al., 2013). Recognizing these differences opened new lines of investigation to behavioral agency research that are closed to financial economists’ theorizing as a result of the use of restrictive assumptions. For instance,
relaxing the assumption that managerial agents will always prefer less risk to more (that is, are consistently risk averse) is likely to substantially alter financial economists’ predictions of agent risk behavior and their modeling of the optimal principal-agent contract and provide greater insight into the efficient use of stock and options in equity based pay.

Given the different theoretical foundations and conclusions about individual preferences regarding risk, perhaps it should not be surprising that there has been limited cross-fertilization of ideas between financial economists and behavioral scholars when considering agent responses to risk sharing arrangements, especially as it applies to agent risk taking behavior. The omission of behavioral research from studies of agency by financial economists is curious given the growing influence of the behavioral perspective in other areas of finance, such as investor behavior (e.g., Barberos & Thaler, 2003). Despite the differences between the two streams, we believe a review of the respective literatures will yield positive contributions to our understanding of agent behavior under conditions of risk sharing. Thus, we review and compare the theory and selected empirical findings of finance and behavioral views of agency theory with a focus upon the study of risk sharing, principal-agent incentive alignment and the role of equity based pay in incentive alignment. Though we hope to capture the essence of the two primary research streams regarding risk sharing between principals and agents, we focus on what we believe to be foundational contributions to the understanding of risk sharing and its role in risk taking. Admittedly, this delimiting of our review is somewhat subjective, and every scholar is likely to have a personal list of important contributions. Thus our task is complicated by the normal scholarly debates over merit, as well as the voluminous amount of research and theorizing that has occurred on these topics. Recognizing this limitation, we offer our brief review as a platform for outlining a future research agenda that integrates key elements of each perspective in an attempt to focus and enhance agency research. Finally, we develop a progress report for this research and examine
how it has impacted corporate practice in the past or has the potential to impact it in the future.

**Risk Sharing and the Agency Problem**

Most of the research and theorizing about the agency problem over the last forty years can be traceable to Jensen & Meckling’s (1976) seminal article developing a formal model of agency theory. Their work was prompted by the inability of financial economists to explain why firms failed to maximize shareholder wealth. Agency theory was developed to explain this failure of neo-classical economic theory of firms by suggesting that self-interest on the part of management may result in shirking, perquisite consumption and other behaviors that fulfill the manager’s interests at the expense of shareholders. Given the difficulty and costs of directly monitoring agents, agency scholars advocated the use of incentive alignment as a means for controlling these agency costs (Eisenhardt, 1989). As noted previously, this resulted in risk sharing by the principal and agent such that the agent bore some risk to personal wealth in pursuit of performance outcomes desired by the shareholder-principal (Holmstrom, 1979; Shavell, 1979). This risk sharing was thought to provide agents with an incentive to maximize shareholder wealth by linking a portion of agent compensation to increases in shareholder wealth. However, sharing of risk exacerbated the exposure to harm (or risk bearing) of agents who are unable to diversify their human capital investment in the firm (Fama, 1980; Holmstrom, 1979; Shavell, 1979). Recognizing the competing influences of risk sharing on agent behavior, financial economists devoted much of their attention to devising compensation contracts that attempt to balance the benefits of contingent compensation’s incentives with the costs demanded by agents in return for the additional risk bearing it creates (e.g., Bettis, Bizjak & Lemmon, 2001; Gao, 2010). We next review the theoretical developments and empirical findings of both the finance and behavioral scholars,
in examining risk sharing and incentive alignment. We summarize theoretical assumptions of both streams in Figure 1.

**** Insert Figure 1 about here ****

The Economic Perspective on Risk Sharing

**Theory.** Financial economists’ theoretical approach to agency research has been based upon the assumptions that human beings are rational utility maximizers and that the risk preferences of principals (risk neutral) and agents (risk averse) are determined by their relative abilities to diversify personal risk (e.g., Holmstrom, 1979; Jensen & Meckling, 1976; Shavell, 1979). Hence, shareholders (the principal) can diversify their financial investment in the firm, leading to the conclusion they are generally risk neutral in their preferences regarding each investment; yet managers (the agents) cannot diversify their human capital investment, leading to the conclusion they are risk averse (Holmstrom, 1979; Shavell, 1979). The assumption of a risk differential between agents and principals has led finance researchers to examine the risk incentives associated with stock options and restricted stock in order to examine how they may be used to incentivize the agent to take more risk (e.g., Coffee, 1988; Jensen & Meckling, 1976). Firms are argued to utilize a mix of options and restricted stock in an attempt to create optimal agent risk incentives and thus the optimal contract (Core & Guay, 1999). The optimal contract weighs the costs of compensating the agent for bearing that additional risk against the benefits assumed from incentivizing the agent to take more risk (Holmstrom, 1979). According to this line of research, the nature of the optimal contract will depend upon capital structure (Jensen & Meckling, 1976; Farmer & Winter, 1996; John & John, 1993), firm size (Core & Guay, 1999; Smith & Watts, 1992), monitoring difficulty (Core & Guay, 1999; Demsetz & Lehn, 1985), the agent’s attitude toward risk (Hall & Murphy, 2002; Lambert, Larcker & Verrecchia, 1991; Lewellen, 2006; Shavell, 1979; Ross, 2004) and the agent’s ability to reduce (or hedge) their exposure to
adverse changes in firm-specific wealth (Gao, 2010).

Stock option grants – a form of executive (or agent) compensation and equity based pay – have been the focus of a large body of finance research examining the effect of equity based pay upon agent risk taking. Indeed, finance scholars have developed a strong empirical literature examining how rational utility maximizing agents respond to the dynamic nature of stock options (see review below). Beginning with the assumption that stock options create no downside and unlimited upside potential for agents, financial economists have looked to stock options as a way to avoid aggravating the agent’s risk burden, while also incentivizing shareholder wealth maximization (Jensen & Murphy, 1990). They justify this assumption by arguing that because agents have no upfront investment in the option and no obligation to exercise them, they experience no loss of wealth should the option prove worthless. Thus, stock options have been viewed as having great potential for providing an efficient solution to balancing incentive alignment with the problem of risk sharing (Flor, Frimor & Munk, 2014; Jensen & Murphy, 1990; Smith & Stulz, 1985). That is, the asymmetry of option payoffs, creating larger proportionate gains for the agent than the principal if the stock price increases, could be justified based on the financial economists’ assumption that the agent must be compensated for the increased risk they bear from having a portion of their pay dependent on fluctuations in firm performance (Holmstrom, 1979). Combining options with stock is argued to provide a near efficient solution to avoiding agent risk aversion, more efficient than using stock alone as the equity incentive (Flor et al., 2014).

In sum, the literature from financial economics largely views agent characteristics as a constant\(^1\) and thus devotes most of the effort towards developing analytic predictions about the effects of awarding equity – stock and options – to the agent with an objective of create

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\(^1\) Though the field of Finance has recognized the importance of individual differences, as reflected in the concept of *managerial style* (Bertrand & Schoar, 2003)
optimal agent risk incentives (or the optimal principal-agent contract). As we will see in the next section, empirical findings have not been entirely supportive of these predictions.

**Empirical findings.** Empirical research by financial economists has examined the effect of equity ownership upon agent risk incentives and the design of the optimal agent-principal contract. For example, this research has explored the relationship between agent risk taking and the dynamic characteristics of stock options that they hold as a result of past equity grants. Convexity of stock options (i.e. *gamma*) held by the agent reflects the rate of (exponential) increase in their option wealth as a result of increases in the firm’s stock price. This option characteristic has been shown to positively influence executive risk taking, which has been explained on the basis that greater convexity increases the monetary incentives for the agent to pursue growth opportunities through investments that are associated with greater earnings volatility (Chava & Purnanandum, 2010; Cohen et al., 2000; Cohen, Dey & Lys, 2013; Guay, 1999; Rajgopal & Shevlin, 2002). That is, empirical findings support the hypothesis that the positive relationship between stock volatility and agent option wealth leads agents to make higher risk decisions given this increases stock volatility and therefore their option wealth. Thus, empirical support has been provided for the idea that stock options encourage risk taking.

Despite the aforementioned findings, foundational agency theory suggesting that equity ownership leads to greater agent risk taking and that equity is awarded by boards of directors with the objective of purposefully creating optimal agent risk incentives, has been challenged by four issues identified by empirical finance research. First, the aforementioned convexity from option pay does not necessarily always succeed in increasing agent risk taking and therefore does not unequivocally reduce the assumed risk aversion of managerial agents (Carpenter, 2000; Coles et al., 2006; Hall & Murphy, 2002; Lambert, Larcker & Verrecchia, 1991; Lewellen, 2006; Ross, 2004). Second, the empirical task of examining the
relationship between equity based pay and agent risk taking is confounded by the risk premium required to hold stock options (Coles et al., 2006; Hall & Murphy, 2002; Lambert, Larcker & Verrecchia, 1991; Lewellen, 2006). That is, as executives take more risk – possibly to enhance the value of their stock option wealth – the higher risk premium associated with stock and options makes additional risk taking less attractive to the CEO. The difficulty of controlling for this risk premium in studies of the relationship between stock options and risk behavior has thwarted this stream of empirical research (Hayes, Lemmon & Qiu, 2012). Third, there is possible endogeneity of the risk incentives attached to stock options when predicting agent risk taking, given a causal effect of variance increasing investments or exogenous events that increase firm risk (or risk taking) upon the use (or inclusion) of executive stock options in compensation contracts (Rajgopal & Shevlin, 2002; Dai, Jin & Zhang, 2014). Fourth, a significant decrease in the awarding of option based compensation after the introduction of new accounting rules (FAS 123R) suggests that stock options are merely perceived as another form of compensation (Hayes et al., 2012), challenging the idea that firms purposely award stock options with the objective of incentivizing risk taking, as suggested by earlier agency research (c.f. Core & Guay, 1999).

A corporate decision providing further insight into agent risk taking and opportunistic agent risk management that has also been explored by finance scholars is corporate diversification. Similar to the effect of stock option awards to the CEO, research examining corporate diversification has featured conflicting theorizing and empirical findings. Diversification had been argued to allow the managerial agent to reduce the firm’s overall risk profile and therefore the firm-specific risk of the managerial agent (Amihud & Lev, 1981; May, 1995). Thus, diversification has proved a useful decision to analyze, given it allows scholars to further examine the relationship between firm-specific risk and actions that can reduce it. However, the view that greater firm-specific risk leads to more diversification
has been challenged by empirical research demonstrating that the primary motive to undertake corporate diversification was less powerfully driven by the agent’s desire to reduce idiosyncratic firm risk and more strongly driven by the private benefits the managerial agent extracts from managing a diversified firm, such as greater ability to skim (through perquisite consumption) and enhanced career prospects (Aggarwal & Samwick, 2003; Denis, Denis & Sarin, 1997). That is, it appears from this latter research stream that the motive to further enrich oneself overrides the risk reduction motive for managerial agents.

Along with examining the effect of stock options upon agent risk taking in the form of strategic investments (or propensity for leverage), the finance literature has adeptly identified other forms of opportunistic agent risk behavior that impose costs upon shareholders. These include the misreporting of financial performance or smoothing of income in order to minimize the risk of loss of equity wealth (Armstrong et al., 2013; Bergstresser & Philippon, 2006; Burns & Kedia, 2006; Grant, Markarian & Parbonetti, 2009; Kim, Li & Li, 2015). These forms of opportunistic agent risk behavior – or opportunistic risk reduction – through the manipulation of the stock price creates additional agency costs; these costs arise given that smoothing of earnings or earnings management (or manipulation) deceives shareholders and other firm stakeholders regarding the agent’s performance and the value of their investment. Similarly, the sensitivity of option value to changes in the stock’s volatility (i.e. *vega*) has been found to positively influence firm leverage (a common risk proxy) and stock return volatility (Cohen et al., 2000; Guay, 1999). Extending the study of the effects of CEO incentives to the employee (as opposed to the shareholder, as the stakeholder who bears the cost of opportunistic CEO behavior), CEOs have also been found to increasingly underfund pensions as option delta and vega increase (Anantharaman & Lee, 2014). In exploring and

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2Note that this literature has also outlined caveats for the efficiency of stock options. Hall & Murphy (2002) suggest that options align interests more effectively if they are valuable (exercise price below market price) when granted, due to the marginal losses the CEO will incur if stock prices decline in this situation.
detailing these forms of opportunistic agent behavior, the finance literature has successfully outlined limitations to the effectiveness of equity based pay as a mechanism for creating optimal risk incentives and thus reducing agency costs.

In sum, the above brief review of empirical research emanating from financial economics provides some support for the initial and seminal theorizing regarding the positive risk incentives associated with equity-based pay. However it has also provided evidence to the contrary and underlined empirical shortcomings.

A Behavioral View of Risk Sharing

Organizational and behavioral scholars became attracted to agency theory as a way to understand the role of senior executives in firm performance. Agency theory’s accessibility to organizational science can be credited in large part to the work of Eisenhardt (1989), who had concluded that agency theory:

(a) offers unique insights into information systems, outcome uncertainty, incentives, and risk and (b) is an empirically valid perspective, particularly when coupled with complimentary perspectives. (pp. 57)

Eisenhardt noted that the theory elucidated issues within the firm that are relevant to organizational and behavioral scholars – such as the use of information systems, incentives and managerial risk preferences – and would benefit from being combined with other theoretical perspectives. Her admonition to reconsider agency theory through the lens of organizational scholarship led to a growing agency literature rooted in sociology and psychology. This research produced an alternative perspective on the causes and consequences of agency costs, as well as the mechanisms for controlling agency costs (e.g., Gomez-Mejia & Balkin, 1992). While some responses to the financial economists’ view of agency theory merely attacked it as being overly critical of human nature (e.g., Davis, Schoorman & Donaldson, 1997; Perrow, 1986), others sought to supplement agency theory’s contribution by introducing alternative perspectives that replaced some of its restrictive
assumptions to broaden its appeal (Wiseman & Gomez-Mejia, 1998; Gomez-Mejia, Welbourne & Wiseman, 2000). Collectively referred to as behavioral agency theory, this latter research stream has attempted to bridge agency theory (as formulated by financial economists) with behavioral research examining decision-making under uncertainty. However, this behavioral approach to agency is a nascent field of research, with a limited number of theoretical and empirical studies explicitly (that is, studies combining behavioral and agency theories) using behavioral theory to examine agent risk taking and the agency problem of risk sharing. We now review theoretical and empirical research in this field from psychology and behavioral research that provided the platform.

**Theory.** The behavioral approach to agency theory has drawn upon a wide range of research from behavioral science, sociology and psychology examining choice behavior and individual risk preferences (Camerer, 1989; Cohen, Jaffray & Said, 1987; Kahneman & Tversky, 1979, 1984; Lopes, 1984; Tversky, Sattath & Slovic, 1988; Weymark, 1981). The idea that an individual’s choices will depart from the rational predictions of expected utility theory (Bernoulli, 1738/1954; von Neumann & Morgenstern, 1947) has a long tradition in behavioral research (Simon, 1955). More recent work is collectively known as prospect theory and draws mostly upon experimental research on individual choice behavior under uncertainty. Recent advancements in this area have demonstrated that individual’s risk preferences are context dependent and that individual choices under uncertainty systematically depart from predictions of rational choice models (Kahneman & Tversky, 1979; Kahneman, 2012; Luce & Fishburn, 1991). In particular, behavioral research on choice under uncertainty indicates that individuals are profoundly affected in their decision making by cognitive limitations and often rely on decision heuristics that lead to choices which appear less rational or less consistent across choice situations than assumed by economists (Shapira, 1995). This is reflected by prospect theory’s value function, which implies that
individuals value additional wealth more when they are below their reference point. Further, if an individual’s expected outcome is framed as a loss – when the expected outcome is below the subjectively determined reference point – individuals will take more risk to avoid this loss, creating the potential for accentuating the loss. Yet if the expected outcome is framed as a gain (an expected outcome above their reference point) they will take less risk in order to avoid losing wealth (Kahneman & Tversky, 1979).

In addition to the value function, prospect theory provides a probability weighting function, demonstrating that objective probabilities and decision weights will typically not reflect the probability associated with the outcome. The probability weighting function provided by Kahneman and Tversky (1979) suggests that individuals will underweight most probabilities (especially larger ones), but as the probability approaches zero they will overweight the event. Changes in decision weights corresponding to changes in probabilities are larger as probabilities approach certainty (i.e., zero or 100%) (Allais, 1953) and are smaller in the middle range of probabilities (Fennema & Wakker, 1997). An additional aspect of this body of research is the principle of diminishing sensitivity, suggesting that individuals value incremental gains less as their subjectively determined gain increases (Tversky & Kahneman, 1992). Decision weights and diminishing sensitivity are important aspects of prospect theory that behavioral agency research has been criticized for failing to incorporate (Holmes et al., 2011).

An independent line of theorizing developed by organizational behaviorists created predictions that appear to correspond to those of prospect theory. The behavioral theory of the firm (Cyert & March, 1963) suggests that organizational behavior is performance dependent such that performance below aspirations leads organizations to engage in search behavior (e.g., Bromiley, 2009; Camerer, 1989; Cohen, Jaffray & Said, 1987; Weymark, 1981). This failure to achieve desired performance goals encourages behavior that some
scholars have equated to risk taking (Wiseman & Bromiley, 1996). This theory has enriched our understanding of risk taking by assisting us in understanding how the target (or aspiration) is determined and the inherent limitations of an individual’s ability to process all relevant information to inform risk choices (bounded rationality). It has also informed prospect theory scholars to consider aspirations as a referent for determining gain and loss contexts (Lopes & Oden, 1999).

Other research grounded in psychology, social-psychology and sociology has also explored in detail individual risk behavior, such as how risk taking may differ across financial, social and ethical domains (Weber, Blais & Betz, 2002), how it may be affected by social structures (Zajac & Westphal, 2013), how it may be influenced by personality traits (Li & Tang, 2010; Lopes, 1984, 1987; Herrmann & Nadkarni, 2014; Simon, 1955; Wowak & Hambrick, 2010) and how contextual variables such as anxiety (Mannor et al., in press) and vulnerability (Martin et al., 2013) may affect risk taking behavior. In general, however, prospect theory’s framing effect and the concept of loss aversion has assumed a more prominent role in the behavioral agency literature.

Infusing traditional agency theory with the aforementioned research from psychology and behavioral science, the behavioral agency model relaxes traditional agency theory’s restrictive assumption of consistent preference orderings, fundamentally altering predictions of agent risk preferences (Wiseman & Gomez-Mejia, 1998; Gomez-Mejia et al., 2000). Specifically, this approach relaxes the assumption that individuals consistently prefer less risk to more and more wealth to less. For instance, the agent’s subjectively determined goals (equating goals with prospect theory’s reference levels) for their compensation related wealth, will affect how they value the compensation that they receive and thus their risk preferences (Heath, Larrick & Wu, 1999). This is based upon prospect theory’s value function, which suggests that individuals will value additional wealth that satisfies a wealth
goal more than wealth that exceeds that goal (Kahneman & Tversky, 1979; Lopes, 1984). It follows that agents will not value all forms of pay equally, even when they appear to have the same expected value. Agents may endow and therefore assign higher values to some forms of compensation over others simply because the agent perceives that they have claimant rights to that pay (the *endowment effect*), regardless of whether they hold legal rights to it (Franciosi, Kujal, Michelitsch, Smilth & Deng, 1996; Thaler, 1980).

Recognizing differential valuation of pay suggests that stock options would indeed have downside risk potential, which creates risk bearing and weighs on risk taking (Beatty & Zajac, 1994). However, the agent is also expected to weigh potential for further gains against these potential losses when making decisions that influence their wealth (Kuhberger, 1998; Martin et al., 2013; Tversky & Kahneman, 1992). Thus stock options, like equity ownership, reflect a mixed gamble in which gains as well as losses are possible (Martin, et al., 2013).

**Empirical findings.** Drawing upon behavioral decision research and the aforementioned theory, various empirical studies in this stream have sought to predict individual and agent risk behavior in response to equity based pay (Devers et al., 2008; Larraiza-Kintana, et al., 2007; Martin et al., 2013; Sanders, 2001; Sanders & Carpenter, 2003; Sanders & Hambrick, 2007). A common theme emerging from this empirical literature has been the role of loss aversion, the influence of agent risk bearing and the degree to which the agent has endowed different types of compensation related wealth. Risk bearing is a measure of wealth-at-risk of loss and according to the concept of loss aversion, should be negatively related to risk taking (Wiseman & Gomez-Mejia, 1998). Providing support for this behavioral approach to the agency problem, risk bearing has been found to negatively influence agent risk taking or decisions that may threaten accumulated equity wealth (Devers et al., 2008; Larraza-Kintana, et al., 2007; Lim & McCann, 2013; Martin et al., 2013; Sanders, 2001; Sanders & Carpenter, 2003; Zhang, Bartol, Smith, Pfarrer & Khanin, 2008). Empirical
support has also been provided for the behavioral theory of the firm’s predictions with regard to aspirations and performance in the context of CEO risk behavior (Harris & Bromiley, 2007; Bromiley & Harris, 2013).

A further theoretical insight from empirical research has been the value of prospect theory’s framing concept and the associated use of reference points when predicting executive and firm behavior. The executive (or agent) is likely to have a goal (or reference point in prospect theory’s language) in mind for the value of their equity wealth (Devers et al., 2008; Harris & Bromiley, 2007; Zhang, et al., 2008). In fact, individuals have been demonstrated to have multiple goals and reference points (Lehner, 2000). These findings provide support for behavioral agency’s prediction that the agent’s goals influence their risk preferences in ways not predicted by expected utility models of agency (see for instance, Holmstrom, 1979). Said differently, the ability to predict agent risk taking appears to have been enhanced by incorporating problem framing and behavioral theory more generally within agency theory’s frameworks.

Empirical behavioral research has also examined the contextual situations that influence the efficiency of incentive alignment and monitoring. These studies have revealed that: (1) incentive alignment is more effective than monitoring as a means of controlling agency costs, (2) that higher risk firms are less likely to use incentive compensation due to the costs of having the agent bear this risk, and (3) higher monitoring costs due to more complex operations lead to greater use of incentive alignment (Beatty & Zajac, 1994; Tosi, Katz & Gomez-Mejia, 1997). These findings provide some empirical validation for propositions emerging from traditional agency theory, as outlined by Eisenhardt (1989). However, by contrast, the failure to find a strong relationship between firm performance and the use of incentive alignment (or board monitoring) has not been supportive of traditional agency theory (Daily, Dalton & Canella, 2003; Kolev et al., in press; Tosi, Werner, Katz &
In sum, organizational and behavioral scholars have combined traditional agency theory with behavioral decision research, embracing the concepts of agent loss aversion, endowment and prospect theory’s valuation curve in order to predict agent risk behavior. Empirical behavioral research remains nascent, yet findings appear to be supportive of behavioral agency theoretical frameworks.

**Comparing Economic and Behavioral Views of Risk Sharing**

Both financial economists and behavioral scholars draw upon the aforementioned seminal work of agency theorists such as Jensen, Meckling, Fama and Murphy. The inspirational work of these financial economists provided the foundations of agency theory, paving the way for the subsequent large volume of research – in both finance and behavioral streams – by scholars who have gone in search of mechanisms for curbing the opportunistic behavior of managerial agents and resolving the contracting problems of moral hazard and adverse selection through some form of risk sharing. Thus, both groups of scholars have used as a starting point the assumptions of classical agency theorists, including an opportunistic agent, bounded rationality and information asymmetry. However, since Eisenhardt’s (1989) lucid explanation of agency theory and its subsequent kindling of interest to behavioral scholars, the two groups – finance and behavioral science – have diverged significantly in terms of their methods and theory. As we elaborate upon below, this divergence derives primarily from different conceptions of agent risk preferences.

**Theoretical differences.** Finance scholars have held steadfastly to the original assumptions of neo-classical economics in the study of agent risk behavior and in particular, the assumptions of agent rationality and self-interest, as the following quotes indicate:

“A considerable body of theory posits that employee stock options (ESOs) offer incentives to risk-averse managers to invest in high-risk high-return projects on behalf of risk-neutral shareholders.” Rajgopal and Shevlin (2002: 146).
“The sensitivity of stock options’ payoff to return volatility, or vega, provides risk averse CEOs with an incentive to increase their firms’ risk more by increasing systematic rather than idiosyncratic risk.” Armstrong and Vashishtha (2012: 70).

The apparent rejection of behavioral theory in the study of the agency problem by finance scholars is at odds with other streams of accounting and finance research that have adopted a behavioral approach (e.g., Barberos & Thaler, 2003; Farrell, Goh & White, 2014; Fung, 2015; Thaler, 2005). The field of behavioral finance is yet to be applied to the study of agent risk taking and incentive alignment. Thus, the focus of finance research continues to be upon a contracting problem of risk sharing based on the assumption that agents are over-invested in their firm leading to an avoidance of risk by the agent. This has led to a focus on bridging the purported risk differential between agent and principals by encouraging the agent to adopt a risk posture closer to that of the firm’s principals through risk sharing. A related concern in this literature has been balancing the benefits of risk sharing with the costs, given agents are assumed to require higher compensation for accepting greater risk (Hoskisson et al., 2009).

The theoretical approach of behavioral scholars differs on various fronts. First, according to behavioral decision research – that has formed the basis of the management theorizing – individual preference orderings, including those regarding risk, are not consistent across decision contexts (Kahneman & Tversky, 1979, 1992). In particular, an agent’s risk preferences are a function of wealth relative to wealth goals and prospects for changes to wealth (Wiseman & Gomez-Mejia, 1998; Gomez-Mejia et al., 2000). Both streams continue to examine antecedents to agent risk taking using these different theoretical platforms.

A second point of contention is the normative view among finance scholars that higher executive risk taking is good for shareholders and therefore should be incentivized to the point where the anticipated benefits of risk sharing no longer exceeds the cost of compensating agents for accepting risk sharing agreements. Despite that CAPM has proven valuable in pricing debt or equity in the capital markets through the prescription that higher
risk demands higher returns, when the relationship between risk and return is studied longitudinally using panel data (Andersen, Denrell & Bettis, 2007; Bromiley, 1991) or in the cross section (Bowman, 1980; Wang, Yan & Yu, 2012), empirical evidence from the management research suggests that risk and return may be negatively related for the majority of industries and some investors. Reinforcing these empirical findings is the overwhelming view among regulators and business leaders that excessive and careless risk taking contributed to the depth of the Great Recession (Basel Committee, 2009; Bushman & Williams, 2015; Geithner, 2009). These views suggest agent-principal contracts that encourage greater agent risk taking – assumed to reduce agency costs by finance scholars – may trigger unintended negative consequences for shareholder wealth as well as society as a whole.

Third, finance research examining optimal agent contracting has assumed that all forms of wealth are fungible. By contrast, behavioral research has demonstrated that individuals (including agents) place different values on different forms of wealth (Devers, Wiseman and Holmes, 2007). How the agent values wealth depends upon whether the agent’s wealth goals have been achieved and the agent’s subjective estimations of prospective changes to current wealth (Larrazá-Kintana et al., 2007). For example, agents may shift their risk preferences over time as the value of their stock option portfolio adjusts due to changes in the firm’s stock price (Martin et al., 2013). Lastly, a recent stream of research focusing on family principals and family agents shows that for these parties, the framing of gains and losses may be socioemotional rather than financial in nature (Gomez-Mejía et al, 2001, 2003, 2007, 2010b, 2011, 2014, in press; Berrone et al., 2010, 2012; Le Breton Miller & Miller,

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3 This empirical finding has been questioned on the basis of endogeneity and identification problems with risk-return models, yet after correcting for these issues, the negative relationship has been found to persist (Henkel, 2009). For a detailed review of the risk-return literature, refer Nickel and Rodriguez (2002).
2013). These behavioral findings suggest that agent responses to financial incentives may be more nuanced and complex than presumed by financial models of agent compensation.

**Empirical differences.** The two streams of literature differ markedly in their methods as well. First, the exogenous variables used in finance research, such as *delta*, *gamma* and *vega* of stock options used to predict agent risk taking and model the optimal contract, have not found their way into the behavioral literature. Further, finance scholars suggest that agents can opportunistically manipulate their contracts based upon the risk or characteristics of their option portfolio to maximize compensation (e.g., Rajgopal & Shevlin, 2002). These features of finance research are symptomatic of an attention to precise technical details and more extensive use of inductive quantitative analysis that distinguishes this literature from that of organizational scholars.

The finance approach contrasts with most behavioral work that focuses on the *value* of stock option awards in predicting agent risk taking (e.g., Carpenter, 2000; Lim & McCann, 2013; Sanders, 2001; Sanders & Hambrick, 2007). However, some behavioral scholars have challenged this focus on the value of option awards by finding that agents subjectively value stock options differently than the objective values of those options reported in proxy statements (Devers et al., 2007). Others have found evidence that accumulated cash value of in-the-money options plays a stronger role in determining agent risk taking than the value of option awards calculated in the year of their award (Devers et al., 2008). More recently Martin et al. (2013) compared the existing cash value of stock options against prospective future value of those options to examine how both values might interact to influence risk behavior. This research comes closer to bridging behavioral and financial research given behavioral scholars are considering the possibility that the agent may take additional risk in response to option grants, consistent with Jensen and Meckling’s (1976) original assertion.
An area of intersection between behavioral and finance examinations of agency are the measures of agent risk taking which are similar across both fields. These include R&D, CAPX, leverage (Devers et al., 2008; Kish-Gephardt & Campbell, 2015; Larraza-Kintana et al., 2007; Martin et al., 2013) and adoption of new technology (Li & Tang, 2010). These types of investments (that increase a firm’s fixed costs) have been referred to as variance increasing investments in the finance literature (Rajgopal & Shevlin, 2002). Interestingly, finance research has revealed that stock options’ convexity has a negative effect upon CAPX, yet a positive effect upon R&D and leverage (positive) (Coles et al., 2006). This raises questions over the use of these measures as proxies for CEO strategic risk taking in behavioral literature.

A major difference in methods between finance and behavioral examinations of agency rests on the use of formal modeling. Finance research has utilized formal modeling in their search for an optimal contract that balances the costs and benefits of risk sharing arrangements. By contrast, behavioral research has made less use of formal modeling and has overlooked the idea that compensation for additional risk bearing is necessary. For instance, behavioral scholars have examined factors related to an individual’s personality, and how those factors may drive agent behavior (Hayward & Hambrick, 1997; Herrmann & Nadkarni, 2014; Li & Tang, 2010). Further, empirical behavioral research has demonstrated the potentially destructive effects of encouraging greater risk taking and thus the potential perverse incentives created by granting options to executives (Martin et al., 2015; Denya et al., 2005; Sanders, 2001; Sanders & Hambrick, 2007; Sitkin & Pablo, 1992). While the destructive effect of options has been recently addressed by accounting scholars (Flor et al., 2014), and finance scholars have considered factors that may result in value destruction (e.g., Harford, Humphrey-Jenner, Powel, 2012) they have yet to consider the value destroying effect of options when modelling optimal agent contracting.
**Progress Report**

As described above, much theorizing and empirical analysis has been undertaken across the disciplines, with regard to the contracting problem of risk sharing and understanding antecedents to executive (agent) risk taking. The central concern of finance agency research has been specifying the optimal contract that will induce agent effort through incentive alignment and *reduce agency costs*; the focus of behavioral research has been explaining how agents respond to different risk sharing arrangements under different conditions of uncertainty. In this section we review: (1) theoretical and empirical progress; and (2) how this progress has benefited practice.

**Theoretical and empirical progress.** Has the abundance of theorizing and empirical research succeeded in enhancing our understanding of how we can limit the opportunistic actions of managerial agents by successfully aligning their risk behavior with that desired by the firm’s shareholders? One can argue that advancements in our understanding of antecedents to agent risk behavior have provided the theoretical basis to limit agency costs associated with risk profile divergence. This has been achieved by identifying levers available to shareholders to regulate agent risk taking – or strategic choices that influence the firm’s risk profile. For example, behavioral scholars have found support for theory drawing upon prospect theory and the concept of mixed gambles, demonstrating that the CEO’s risk behavior will depend upon their estimates of what they to gain relative to what they have to lose (Martin et al., 2013; Tversky & Kahneman, 1992). Similarly, finance scholars have developed a strong understanding of how the CEO’s option portfolio – and in particular, the dynamic characteristics of options as represented by the “option Greeks” – influence CEO risk behavior (e.g., Guay, 1999; Coles et al., 2006). Thus, advancements in understanding of antecedents to agent risk taking appear to have been of theoretical and practical value.
Despite this progress, open questions remain. For instance, our understanding of antecedents to risk taking other than compensation design remains limited. Such alternate antecedents could include the choice of CEO, executive investments outside of the firm and their personality traits. These antecedents to agent risk taking and agency costs are under-explored and have great potential as future avenues of agency research.

**Practical implications.** Practical value of research acts as a good test of theoretical progress and thus the scrutiny of the theory’s practical implications allows us to build upon the prior section (Corley & Gioia, 2011). Questioning whether theoretical advancements have translated into value for practitioners is a particularly salient question in the light of the blatant governance failures that have been associated with the Great Recession. Many prominent public figures, including ex-president of the United States Barrack Obama, the head of the European Union, and the Director of the Federal Reserve Bank have unambiguously attributed the depth of the Great Recession and subsequent economic malaise on excessive and careless risk taking in the lead up to 2007 (Bushman & Williams, 2015). One can point to the huge divergence in the financial fates of executives who led firms prior to their demise and the firm’s shareholders as further evidence of the failures of corporate governance – or failure to align the fortunes of agent and principal – in practice. For an extreme example, Charles Prince exited his role as CEO of Citigroup with stock and options of approximately $160 million, as the firm he led incurred many billions of dollars of losses and required a bailout. This and the various other examples of bonuses granted to executives at the height of the financial crisis suggest that incentive alignment of the fates of principal and agent has been lacking. This apparent failure of incentive alignment in practice once more suggests lack of appropriate guidance or failure to influence practice with existing theoretical guidance.
The above examples of governance failures and the associated agency costs raise questions such as whether agency research contributed to these failures and could agency research have mitigated (or prevented) the excessive risk taking that has been the focus of public debate? There are obviously no clear answers to these questions that will not be shrouded in subjective opinion and therefore be open to criticism. It appears however that the excessive risk taking, in particular within (but certainly not restricted to) financial services, was not anticipated by the boards or compensation committees that are charged with ensuring that executives behave in the interests of the firm’s principals. We have noted above that the theory allows for predicting CEO risk behavior in response to the stock and stock options that were large components of total pay (e.g., Devers et al., 2008; Lim & McCann, 2013; Sanders & Hambrick, 2007). Yet it appears that these theoretical insights were not utilized by boards and compensation committees. This suggests that these practitioners were either aware of the theory yet chose to ignore it due to internal politics or regulatory constraints, or ignorant of recent theoretical developments which could have informed their decisions regarding the rewarding of key agents. With regard to the first explanation, as noted by Bebchuk and Fried (2004), CEO power may have ensured that the compensation contract was designed to achieve the objective of CEO enrichment rather than encouraging sound risk taking in the interests of a wider group of firm stakeholders. Government policies with regard to compensation may also have restricted the ability or willingness to design compensation contracts that achieved better shareholder outcomes (such as tax legislation). If the second explanation (not aware of academic research’s insights) is valid, it would reflect poorly upon business academia for not having the mechanisms in place to communicate their research or perhaps for not having the credibility to capture the attention of practitioners.

Finally, perhaps agency scholars can be criticized for propagating the view that agent (or CEO) risk taking should be encouraged. This is an implication of agency theory’s
assumption that CEOs eschew optimal risk taking and thus must be incentivized to take more risk to satisfy the risk neutral shareholder-principals. This paradigm continues to guide the finance scholars. If practitioners are guided by the advice and assumptions of financial economics, it is possible that they are (or were prior to the Great Recession) anchored to and guided by this perspective. In the post-recession era, “risk” is sometimes considered to be a “dirty word” in corporate board rooms, as prudent risk taking becomes the dominant theme (Geithner, 2009). This emphasizes the need for agency scholars, regardless of their field, to elucidate the caveat that agents’ attitudes toward risk may not necessarily be misaligned with those of shareholders and thus should not necessarily be discouraged, but instead should be understood within the context that the agent is operating.

The review of the practical implications of agency research provides various ideas for future studies. First, the problems identified with the practical utility of agency research suggests there may be value in re-visiting assumptions and definitions that have driven much of the agency research, in an attempt to improve the predictive validity of the theoretical frameworks used. For instance, the assumption of a risk differential between agents and principals partly rests on viewing principals as universally risk neutral. Given that agents have been shown to exhibit diverse risk profiles, recognizing that principals may exhibit similar diverse attitudes toward risk raises the question: when is risk preference divergence between agent and principal most likely to occur?

Another question emerging from the above review of practical implications is: when will agent-principal risk preference divergence be good or bad for shareholders or other firm stakeholders? Firms with greater risk profile divergence (based on the assumptions of a risk averse manager and risk neutral shareholders) prior to the recent crisis may have been less exposed to the negative performance implications of the financial downturn that began in 2008, challenging the assumption that risk profile divergence is bad for shareholders. Along
similar lines, we must ask: what constitutes “prudent” risk taking in practice? Because of an explicit or implied rationality assumption and dogmatic adherence to a “high risk/high return” paradigm, financial economists are generally less concerned with a distinction between good and bad risk taking. Behavioral sciences also have much to contribute to a better understanding of the concept of “prudent” agent risk taking and how it may be encouraged (or otherwise) by equity based pay.

Finally, due to constraints on access to data, there has been limited research on risk sharing effects on behavior, controlling for agents entire wealth portfolio. Clearly, agents seek to limit their exposure to firm-specific risk by, for example, exercising options and selling the resulting stock, thus limiting the portion of personal wealth that is exposed to firm risk. Assessing risk sharing the context of total agent wealth is an area ripe for further examination (Zajac, 2006).

A Research Agenda Based on Cross-Fertilization

What is evident from the difference in approaches of finance and behavioral scholars (outlined above) is that the two streams have operated mostly in separate silos with limited acknowledgement of each other’s contributions. One could argue that this approach has impeded our combined progress in advancing agency theory, our understanding of antecedents to agent risk taking and optimizing the use of equity based pay. Certainly, practitioners have embraced cross-functional cooperation given the need to ensure goal alignment and to deal with the obvious inter-reliance across functions – including finance, operations, marketing, in-house strategic planning, treasury – in pursuing the firm’s overarching strategic goals. Yet this cross-functional approach to problem solving appears to be seldom applied in business scholarship.

The failure to more explicitly acknowledge and integrate the different streams of research is partly driven by fundamental differences in philosophies about what constitutes a
“contribution”. But this does not negate the possibility of cross-fertilization of ideas across these streams. Below we outline how both streams could benefit and research opportunities that could evolve from combining the findings and advancements of both streams.

First, behavioral research could benefit from utilizing the impressively rigorous findings and methods that have emerged from the finance stream. For instance, the finding that executive stock options influence capital expenditures differently from how it influences other decisions such as R&D spending and leverage policies could assist behavioral scholars to refine their operationalizations of risk taking (see Coles et al., 2006). That insight came from focusing on various option dynamics such as the exponential growth of option returns (c.f., Coles et al., 2006). The robust findings that the characteristics of options represented by “the Greeks” (i.e., delta, vega and gamma) influence agent risk behavior have been largely ignored by behavioral scholars, who have focused instead upon the value of annual option pay or the accumulated value of options.

A reason for not examining these option characteristics can be defended by behavioral researchers on the grounds that these are not metrics that the agent can readily observe and due to bounded rationality, the agent is therefore less likely to be cognizant of such metrics when making decisions under uncertainty. Behavioral researchers are concerned with heuristics that directly influence the agent’s calculus of wealth-at-risk of loss versus prospective wealth to be gained (i.e., a mixed gamble; Martin et al., 2013). The challenge for behavioral researchers lies in building a bridge between their heuristics and the exogenous variables used by finance scholars. The robust findings emerging from finance research suggest that agents may be more sophisticated in understanding the metrics associated with their option portfolio than management scholars have given them credit for. For instance, agents (especially those with financial advisors such as a CEO) may have at least a basic understanding of how the value of their options changes in response to stock price changes.
(gamma, delta) or changes in volatility (vega). Thus, it may be worth re-visiting the heuristics associated with executive stock options that subsequently influence agent behavior.

As an example of the possibilities for utilizing the dynamic qualities of stock options in behavioral research, behavioral scholars could utilize the concept of convexity, known as gamma, to understand why agents may take more risk in the presence of high levels of current equity wealth. Convexity captures the degree of the exponential increase in the agent’s option wealth as stock price increases (e.g., Chava & Purnanandum, 2010; Cohen et al., 2000; Guay, 1999; Rajgopal & Shevlin, 2002). The convex nature of stock option payoffs could be used to delve further into how agents may respond to stock options over the life cycle of those options. The sensitivity of the value of options to volatility or vega could also be of interest to behavioral scholars given the conflict of interest this creates between agent and principal; that is, higher volatility of a firm’s stock options will enhance the wealth of an agent holding them. Yet this volatility also creates costs for the shareholder-principal due to higher funding costs and often negative performance consequences of earnings volatility (Andersen et al., 2007; Henkel, 2009). Thus, the positive relationship between volatility and agent option wealth highlights potentially perverse incentives that are under explored by behavioral research.

Behavioral research could also benefit from embracing the concept of agent hedging – or managing the risk of adverse price movements – that has been explored by finance research (e.g., Gao, 2010). Although steps in this direction have been made (c.f. Martin et al., 2013), the vast majority of behavioral research continues to view the CEO-agent as a passive actor. Golden parachutes (large executive severance payments) could be argued to act as a hedge against failed risk taking, but despite being of interest to management scholars in other research contexts (Wade, O’Reilly & Chandratat, 1990) are yet to be integrated with agency research examining agent risk behavior.
The use of behavioral theory by finance scholars has been limited and in particular, there is often a failure to embrace the robust findings from behavioral decision research demonstrating that individuals are loss averse and their risk preferences are context dependent\(^4\). This is reflected in the theorizing and models based upon assumptions of a risk differential between agents and principals and rigorous definitions for risk aversion and risk neutrality (while behavioral scholars tend to use the terms somewhat more loosely). Recognition that agent risk preferences are reference dependent and that managerial agents are prescient with regard to both the upside and downside consequences of risk taking, could substantially alter theorizing with regard to agent risk behavior and the optimal principal-agent contract. For example, viewing stock options as a mixed gamble (Bromiley, 2009) recognizes that individuals may frame how they value both the current intrinsic value of their options relative to a projection of what they may be worth in the future (Martin, et al., 2013). Incorporating prospect theory driven modifications such as this into formal modeling of the principal-agent contract (commonly used by finance scholars) could greatly assist in furthering our understanding of the optimal use of stock and options in executive compensation contracts. This integration of behavioral decision theory with the econometric rigor previously applied by financial economists to the study of agent risk taking, has the potential to significantly advance knowledge regarding principal-agent risk profile divergence and associated agency costs.

A further theoretical development that may benefit finance scholarship is the notion from behavioral research that it is also necessary to explicitly acknowledge and examine the possibility that opportunistic behavior is not the sole domain of managerial agents. As explicated by Werder (2011), it is possible that various stakeholders may behave

\(^4\) As noted below, an exception is the work by Richard Thaler and colleagues (see Barberos & Thaler 2003, for a review).
opportunistically. This necessitates the study of how risk sharing occurs among actors other than shareholders and managers, and the implications of this risk sharing on contributions to firm value. It also suggests that the influence of shareholders should be a further subject of study, given their scope for opportunistic behavior at the expense of other firm stakeholders.

An example of both behavioral and financial economics research benefiting from integration and cross-fertilization empirical and theoretical advances from each field is the study of inter-temporal choice and frequency of asset performance evaluation. This research stream was inspired by addressing the question of why investors hold bonds when stocks provide returns that are substantially higher (the equity premium puzzle; Benartzi & Thaler, 1995). Integrating the behavioral concepts of loss aversions and framing, this research found evidence that decision makers (investors) accept higher risks when aggregation leads to appraisal of investments less frequently and over longer-time frames (Benartzi & Thaler, 1980; Lowenstein & Thaler, 1989; Thaler, et al., 1997). The idea that investors (and individuals) are less sensitive to losses incurred over the longer-term than more immediate losses – myopic loss aversion – has been applied by behavioral scholars to the study of family firm decision making (Chrisman & Patel, 2012) and the CEO’s response to equity based pay (Martin, Wiseman & Gomez-Mejia, in press).

Lastly, both fields would benefit from further exploring the role of nonfinancial utilities of decision makers when predicting risk behaviors of executives. As noted earlier most of this work has focused on family owners and family agents, and argues that “socioemotional wealth” (SEW) represents an important stock that these individuals want to protect even if this involves a trade-off by accepting lower economic returns (Gomez-Mejia et al., 2014, in press; Martin & Gomez-Mejia, in press). That is, these individuals may be loss averse to both SEW and economic wealth yet in their frame of reference, SEW tends to have a higher priority, except when firm survival is in question (Gomez-Mejia et al., 2007, 2011).
Some of this theoretical development may also be pertinent to realms beyond the family context and opens the door to much needed research involving “mixed gambles” between financial and nonfinancial utilities. For instance, Zona et.al. (in press) argue that executives often engage in interlocks to gain prestige and influence in the industry rather than for financial reasons. Likewise, Chatterjee and Hambrick (2007) argue that top executives of large corporations are often driven by nonfinancial goals (such as empire building, narcissism and power) and that this helps define what they may consider as a gain or a loss.

**Conclusion**

It is evident that both the finance and behavioral fields could gain from paying greater heed to the findings and methods of the other field. We suggest that the failure to do so has impeded the progress of both groups of scholars. Despite these impediments, much progress has been made in predicting agent risk taking, understanding the behavioral effects of equity based pay, managing agent risk incentives and in theory understanding how to mitigate agency problems. Yet these advancements have failed to limit significant governance failures and related agency costs in practice. We have outlined an agenda for greater cross-fertilization of the two fields and trust that this will expedite further academic advancement.
References


## Figure 1: Contrasting and Comparing – Different Theoretical Approaches to the Study of Agent Risk Taking

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<th>Theory</th>
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<th>Behavioral Agency</th>
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<td><strong>Theoretical Assumptions</strong></td>
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<td>Multiple agents possible</td>
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<td>Shareholders as principal</td>
<td>Multiple shareholders possible</td>
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<td>Individuals are rationally self-interested</td>
<td>Enlightened self-interest possible</td>
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<td>Self-interest results in goal conflict</td>
<td>Goal conflict possible not inevitable</td>
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<td>Information asymmetry between agents and principals</td>
<td>Individuals are loss-averse, boundedly rational, and subject to a variety of decision heuristics</td>
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<td>Preeminence of efficiency</td>
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