

**MANAGERIAL RISK TAKING:  
A MULTI-THEORETICAL REVIEW AND FUTURE RESEARCH AGENDA**

**ABSTRACT**

Managerial risk taking is a critical aspect of strategic management. To improve competitive advantage and performance, managers need to take risks, often in an uncertain environment. Formal economic assumptions of risk taking suggest that if the expected values for two strategies are similar but one is a greater gamble (uncertain), managers will choose the strategy with a more certain outcome. Based on these assumptions, agency theory assumes that top managers should be compensated or monitored to achieve better outcomes. We review the theory and research on agency theory and managerial risk taking along with theories that challenge this basic assumption about risk taking: the behavioral theory of the firm, prospect theory, the behavioral agency model and the related socioemotional wealth perspective, and upper echelons theory. We contribute to the literature by reviewing and suggesting research opportunities within and across these theories to develop a comprehensive research agenda on managerial risk taking.

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Managerial risk taking is a central component of strategic management research (Pablo, Sitkin, & Jemison, 1996; Sitkin & Pablo, 1992). In the business world, top managers must inevitably confront the uncertainty surrounding organizations. Indeed, managerial strategy would have little value if it did not address the risk associated with such uncertainty. As such, the salience of top managerial risk taking should not be taken lightly in either the theoretical academic arena or the realm of practice. Understanding managerial risk taking is important. Consider the most recent deep recession. This event demonstrates the drastic consequences that managerial risk taking can have for firms and the global economy. Inappropriate managerial risk taking at Lehman Brothers, a large investment bank, led to the largest bankruptcy in US history and helped to precipitate a global recession (Siepel & Nightingale, 2014).

In this review, we focus on *managerial* risk taking, i.e., top managers' strategic choices associated with uncertain outcomes, rather than organizational risk, i.e., the subsequent uncertainty pertaining to the organization's income stream (e.g., Bowman, 1980; Bromiley, 1991; Palmer & Wiseman, 1999; see Bromiley, Miller, & Rau, 2001 for a review). A host of firm behaviors were considered as indicators of managerial risk taking, reflecting the wide array of decisions that reflect strategic choice with uncertain consequences (e.g., R&D spending, diversification, acquisitions and divestitures, competitive actions). Because we focus on behaviors of the corporate elite, we concentrate on issues related to corporate governance and top managers—the Chief Executive Officer (CEO) and the top management team (TMT). We review managerial risk-taking actions and behaviors through different theoretical frames of reference: agency theory, behavioral theory of the firm, prospect theory, the behavioral agency model and the related socioemotional wealth perspective, and upper echelons theory. Although reviews on these theories have been

Hoskisson, R. E., Chirico, F., Zyung, J. D., & Gambeta, E. forthcoming. **Journal of Management** conducted (Carpenter, Geletkanycz, & Sanders, 2004; Dalton, Hitt, Certo, & Dalton, 2007; Finkelstein, Hambrick, & Cannella, 2009; Gavetti, Greve, Levinthal, & Ocasio, 2012; Gómez-Mejía, Cruz, Berrone, & De Castro, 2011; Holmes, Bromiley, Devers, Holcomb, & McGuire, 2011; Pepper & Gore, 2015), the broad spectrum of strategic actions reviewed in prior work does not allow research opportunities through cross-fertilization of theoretical frameworks to specifically address the managerial risk taking phenomenon. A central contribution of our comprehensive phenomenon-focused review, therefore, is that it examines managerial risk taking in depth through a range of key theoretical perspectives and provides suggestions for future research within and across these perspectives. The theories presented have been most prominently used in strategy research on corporate elites' risk-taking behaviors and span the individual and group levels of analysis, including top executives or the dominant coalition. Although there are other theories that are related to risk taking (e.g., stakeholder theory and institutional theory), there is very little empirical research addressing managerial risk taking; as such we address them in the discussion section.

In the following sections, we review in detail each of the theories to construct a model of managerial risk taking. Furthermore, we discuss research opportunities that pertain to each of the theories separately and propose a future research agenda that includes opportunities through cross-fertilization of theories and other ways to move the literature on managerial risk taking forward. In this discussion, we elaborate on the inconsistencies and knowledge gaps in the existing literature. Our review results in the development of a theoretical framework, which we present in Figure 1, that integrates the antecedents and moderators based on the theories reviewed and the associated managerial risk-taking outcomes.

## **METHOD**

The online appendix (Table 1) contains a description of articles on managerial risk taking

Hoskisson, R. E., Chirico, F., Zyung, J. D., & Gambeta, E. forthcoming. **Journal of Management** and serves as a basis for the model of managerial risk taking presented in Figure 1. We surveyed premier journals in the management field (see Podsakoff, MacKenzie, Bachrach, & Podsakoff, 2005; *Academy of Management Journal*, *Administrative Science Quarterly*, *Strategic Management Journal*, *Journal of Management*, *Academy of Management Review*, *Organization Science*, *Journal of Management Studies*, *Management Science*) and journals that have demonstrated a specific focus on managerial risk taking in a range of fields (e.g., entrepreneurship, international business, finance, and accounting). We conducted systematic searches of these journals (Tranfield, Denyer, & Smart, 2003) using different separate and combined keywords related to managerial risk taking. We further refined this list by discarding articles that did not fit our criteria (e.g., studies on organizational risk, experiments on MBA or undergraduate students). However, we did not limit our review to empirical studies; rather, we also included highly cited conceptual works.

## **THEORIES OF MANAGERIAL RISK TAKING**

### **Agency Theory**

Much of the research on control of modern corporations has employed agency theory (AT) (Dalton et al., 2007; Jensen & Meckling, 1976). AT formally addresses the long-standing concern regarding the separation of ownership and control of large US corporations (Berle & Means, 1932). The focus is generally on the risk-sharing problems that arise when cooperating parties have different attitudes and when one party (e.g., principals or owners) delegates work to the other party (e.g., managerial agents). Specifically, top-level executives may experience an agency conflict with shareholders regarding their risk preferences. Shareholders, who are entitled to the residual value generated by a firm, can diversify risk through their ownership portfolio and are therefore assumed to be risk neutral. Managerial agents, by contrast, cannot diversify their employment risk and are thus more risk averse. If corporate managers are made to bear significant residual risks, they will seek much higher monetary rewards or will make less risky decisions and

thereby formulate unattractive corporate strategies (Hoskisson, Castleton, & Withers, 2009).

To overcome the problem of risk aversion, AT provides several mechanisms, such as ex-ante equity or performance-based compensations that align agent and shareholder interests on outcomes, and control mechanisms such as monitoring by the board of directors (BOD) or powerful institutional investors.

***Agency Theory Research on Compensation Incentives and Risk Taking.*** Classical AT has drawn implicitly on the capital asset pricing model (CAPM) in suggesting that risk taking ex ante should always be encouraged due to the hypothesized positive relationship between risk and return (Holmstrom, 1979; Jensen & Murphy, 1990). Specifically, the predominant view of AT is that aligning the risk preferences of CEOs with those of shareholders by awarding CEOs equity-based incentives discourages CEO risk aversion and reduces agency costs. Some research has demonstrated that equity-based compensation increases CEO risk taking (e.g., Carpenter, Pollock & Leary, 2003; Devers, McNamara, Wiseman & Arrfelt, 2008; Sanders & Hambrick, 2007) and reduces moral hazard problems (O'Connor, Priem, Coombs & Gilley, 2006). In addition, a recent acknowledgement of the role of CEO severance pay implies that incentive schemes may encourage risk taking via, for instance, the reduced fear of losing one's job (Cowen, King, & Marcel, 2016; Rau & Xu, 2013). Although incentives are found to be effective when implemented within certain boundaries, overemphasis on risk-taking incentives is found to have important implications for possible "bad risk" taken by managers (Dong, Wang, & Xie, 2010; Sanders & Hambrick, 2007). For example, Sanders (2001) finds that certain types of equity-based compensation such as restricted stock options and short-term incentives reduce managerial risk taking (Devers et al., 2008; Hoskisson, Hitt & Hill, 1993). However, as noted above, although stock-based compensation is intended to align managerial interests with shareholder interests, it may also create excessive risk-bearing for the CEOs, exacerbating risk aversion (Low, 2009;

Coles, Daniel & Naveen, 2006), and may lead CEOs to shift risk-bearing based on their exposure (Eisenhardt, 1989). In the case of mutual funds, for example, Kempf, Ruenzi, and Thiele (2009) find that in bad years (bear markets), mutual fund managers may take fewer risks if they are in the looser category but take more risk if they are in the better performing category. This result suggests that a framing effect occurs when employment risk becomes more salient than compensation incentives. Although this specific body of research on employment risk appears to be related to the behavioral agency model (Wiseman & Gómez-Mejía, 1998), it is based on a theory of the trade-off between employment risk and incentive compensation risk, which is argued quite explicitly using a rational exposition of AT. In all, this stream of research suggests important decision-framing considerations that should be more fully considered (Larrazza-Kintana, Wiseman, Gómez-Mejía, & Welbourne, 2007; Lim & McCann, 2013) when using stock option incentives.

***AT Research on Monitoring and Risk Taking.*** Because incentive compensation cannot perfectly control CEOs' and other top managers' behavior, due to the effect of increasing CEO or top management exposure to risk, monitoring may improve top-level executives' risk taking. Two types of monitoring mechanisms have generally been examined in the literature: monitoring by BODs and monitoring by owners. Monitoring by a firm's owners has generally been operationalized by taking into account large block holders, concentrated ownership or dedicated institutional investors (owners who hold their stock long term). Research on the effects of ownership structure on managerial risk taking has generally supported the view that the abovementioned ownership structures tend to increase managerial risk taking. Hoskisson, Johnson, and Moesel (1994) find that firms are less over-diversified than their industry counterparts when the firm had a larger number of block holders, they imply that this is due to greater risk taking by top managers given institutional ownership pressure through their monitoring. Also, Hoskisson, Hitt, Johnson, and Grossman (2002) show that dedicated institutional investors have a stronger

influence on firm internal innovation compared with transient owners. Similarly, Connelly, Tihanyi, Hitt, and Certo (2010) find that dedicated institutional investors are willing to support long-term competitive (risky) moves versus more tactical moves than transient institutional investors. Both internal innovation and competitive moves are riskier than short-term acquisitions of innovation and tactical moves (Hoskisson et al. 2002; Connelly et al. 2010). This suggests that the ownership structure and monitoring by particular block holder owner types can influence positively key strategy leaders risk taking behavior. Bushee (1998) finds similar results.

Various contingency factors have been examined in the literature on ownership structure and managerial risk taking. For example, Faleye, Hoitash & Hoitash (2011) investigate CEO ownership and find that it reduces managerial risk taking, as predicted by AT, due to the CEO's greater personal exposure. However, also in line with AT predictions, this is reversed in cases of highly diversified firms (Amihud & Lev, 1981) or family-owned firms when the industry is growing (Schulze et al., 2003). Thus, the particular type of firm structure, industry growth, and ownership all serve important roles in moderating managerial risk taking.

The BOD also serves as an important tool in fostering appropriate managerial risk taking. Indeed, research has suggested that not only monitoring but also strategic advice from BOD members can help improve CEOs' and other corporate elites' strategic decision making (Hillman & Dalziel, 2003; Westphal, 1999). From an AT point of view, therefore, independent outside directors play an important role in shaping the strategic behavior of the firm (Deutsch, Keil, & Laamanen, 2007). However, outside directors' role in monitoring and providing strategic advice has not received strong support from empirical research, as it shows little effect on organizational functioning and firm performance (Daily, Certo, Dalton, & Roengpitya, 2003; Daily & Dalton, 1994; Dalton, Daily, Ellstrand, & Johnson, 1998). In fact, the theory proposed by Baysinger and Hoskisson (1990) suggests that a predominance of outside directors may negatively influence risk

taking due to an emphasis on financial outcome controls versus a balance with strategic controls that would share risk taking with the CEO. This notion is corroborated by Zahra (1996), who finds that a balanced number of inside directors positively influences risk taking (e.g., corporate entrepreneurship) and that the converse, a predominance of outside directors, negatively influences corporate entrepreneurship. Overall, more research must be conducted to better understand how the expected roles of boards relate to managers' risk taking.

How board members are compensated can also influence their monitoring. Hambrick and Jackson (2000) document the complex relationships between compensation and monitoring that can arise among the corporate elite and, ultimately, their effect on managers' risk taking. For example, the effect of CEO stock option grants is amplified when the BOD possesses more stock options or the CEO is also the chairperson but to a lesser degree when both conditions are present (O'Connor et al., 2006). Research conducted by Deutsch, Keil, and Laamanen (2011) finds that BOD stock option incentives influence board members' monitoring such that CEOs make more risky decisions than they would with only their own long-term incentives in place. Lim and McCann (2013), however, find a potential "house money effect" of board members' stock option compensation because it is over and above what they might have received as their normal compensation. As such, executives may be motivated to take more risks than they would otherwise. Without this behavioral slant in understanding board incentives, we might not be able to fully grasp the incentive effect of board compensation from a strict agency point of view.

***Future Research on AT and Risk Taking.*** A review of the research on AT suggests that research opportunities will likely stem from examining contextual and institutional differences in governance. First, we note that more research is needed to determine the effect of monitoring on managerial risk taking. The predominance of outsider directors, as well as all-outsider BODs, in US corporations (Joseph, Ocasio & McDonnell, 2014; Tihanyi, Graffin, & George, 2014) may



render much of the research on the effect of BOD member affiliation obsolete but also open up opportunities to examine other characteristics of BOD members (Krause, Semadeni & Cannella, 2013). The role of international institutional contexts also merits greater consideration because of the great variance in legal frameworks governing countries (Aguilera & Jackson, 2003, 2010; Lubatkin, Lane, Collin, & Very, 2005) and cross-border ownership (Desender, Aguilera, Lópezpuertas-Lamy & Crespi, 2014). According to agency theorists, greater attention to international institutions and cross-border ownership is important given that compensation systems and performance implications are not uniform across countries, reflecting either differences in risk aversion between US and non-US CEOs or differences in measurement (Murphy, 2012). As noted by Wiseman, Cuevas-Rodríguez, and Gomez-Mejia (2012) institutions also extends to the social context of the principal-agent relationship. These contextual factors include industry-specific contexts (Diestre & Rajagopalan, 2011), environment (Tuggle, Sirmon, Reutzel, & Bierman, 2010), or firm life-cycle stage (Lynall, Golden, & Hillman, 2003).

Additionally, determining who has the power to foster particular managerial goals may be important in future AT research on risk taking. For example, a recent meta-analysis suggests that CEOs may be able to increase their compensation when they have power but that a better alignment between CEOs' risk taking and firm performance outcomes can be fostered when monitoring directors have power, even in the presence of powerful CEOs (van Essen, Otten, & Carberry, 2015). This result highlights the notion that corporate governance mechanisms should not be examined in isolation from each other given that they can be "functionally equivalent" (Bell, Filatotchev, & Aguilera, 2014: 302). This suggests that individual governance devices may be substitutes for each other (Beatty & Zajac, 1994). However, other scholars have suggested complementarity or compounding effects between incentives and monitoring (Hoskisson et al., 2009). Although more research on the industrial environment and institutional settings is needed,

substitution and complementarity effects between incentives and monitoring and power differentials with regard to implementing incentives and monitoring, as well as other behavioral aspects, can add value to our agency-based understanding of managerial risk taking. These issues are addressed in the following sections.

### **The Behavioral Theory of the Firm and Prospect Theory**

Deviating from the traditional rational risk-taking assumptions of AT, an extensive body of research has examined managerial risk taking from a behavioral perspective (Simon, 1957) through the Behavioral Theory of the Firm (BTOF; Cyert & March, 1963) and Prospect Theory (PT; Kahneman & Tversky, 1979). First, the BTOF suggests that organizations-coalitions of individuals or groups (Cyert and March, 1963)-compare their performance to aspiration levels and that this comparison shapes their risk-taking preferences. When organizations are performing “close to a target [i.e., aspiration level], they appear to be risk-seeking below the target, [and] risk-averse above it” (Cyert and March, 1992: 228). Second, the assumptions of PT rest on the observation that people are loss averse—they “find the displeasure of losses to be greater than the pleasure of equivalent magnitude gains” (Holmes et al., 2011: 1076)—and thus tend to engage in behavior that minimizes losses relative to a reference point (Kahneman & Tversky, 1979). In PT, aspirations, expectations, norms, and social comparisons can shape the reference point (Holmes et al., 2011). When an individual is below a reference point, s/he will engage in greater risk taking (gain-framed), while if s/he is above the reference point, risk-averse behavior will be prevalent (loss-framed). The two theories differ in important ways. First, BTOF is a group-level theory that describes the behavior of organizations composed of a coalition of individuals or groups, while PT is a theory of individual behavior. Second, BTOF assumes that while individuals have goals, as asserted by PT, organizations per se do not (Cyert & March, 1963: 30). Yet, organizational goals are formed through a political bargaining process that occurs among organizations’ leaders in

determining which goal is more salient or how diverging goals are to be addressed sequentially (Cyert & March, 1963; March, 1962, 1988). These firm-level goals can be set either relative to internal (historical comparison) firm performance or relative to other peer organizations' performance (social comparison). A third difference lies in BTOF's notion of slack resources, as PT does not have an equivalent construct (Cyert & March, 1963).

***BTOF Research on the Performance-Aspiration Gap, Slack, and Risk Taking.*** A wide range of studies have examined the role of performance relative to historical and/or social aspirations on risk taking. In this literature, managerial risk taking has been operationalized as acquisitions (Audia & Greve, 2006; Greve, 2008, 2011; Iyer & Miller, 2008; Kim, Finkelstein, & Halebian, 2015), entrance into new markets (Barreto, 2012), innovation (Chen, 2008; Chen & Miller, 2007; Gaba & Bhattacharya, 2012; Gaba & Joseph, 2013; Greve, 2003; O'Brien & David, 2014; Vissa, Greve, & Chen, 2010), illegal behavior (Baucus & Near, 1991; Harris & Bromiley, 2007; Madsen, 2013), and organizational change (Arrfelt, Wiseman, & Hult, 2013; Baum & Dahlin, 2007; Greve, 1998; Labianca, Fairbank, Andreovski, & Parzen, 2009; Lant, Milliken, & Batra, 1992; Massini, Lewin, & Greve, 2005; Park, 2007). Most of these studies have found evidence supporting BTOF main-effect predictions of greater managerial risk taking after underperforming and lower levels of risk taking when over performing. Additionally, asymmetric risk taking has been found based on the distance from aspiration points rather than simply being above or below: greater over-performance tends to reduce risk taking (Gaba & Bhattacharya, 2012; Greve, 1998; Park, 2007), while worsening under-performance tends to increase risk taking (Greve, 1998; Park, 2007). Higher performance also appears to have a stronger effect in reducing risk taking than underperformance has in increasing it, suggesting both a non-monotonic and kinked-curve relationship depending on whether managers view themselves as above or below the reference point (Greve, 1998).

Important moderators and extensions, however, that reverse BTOF predictions on risk taking have also been found. Organizational size has been shown to reverse managerial risk taking, whereby underperformance relative to aspirations leads to less risk taking for smaller firms but to more risk taking for larger firms (Audia & Greve, 2006; Greve, 2011). Threat rigidity, as a result of extreme forms of underperformance, has also been shown to lead to less managerial risk taking (Iyer & Miller, 2008). Historical and social comparisons, which determine reference points, have primarily been examined in isolation or in conjunction, while several studies have demonstrated that their effects differ. Chen (2008), Chen and Miller (2007) and Kim et al. (2015) show that historical and social aspirations may have opposite effects, whereby risk taking increases when the firm's performance is above historical aspirations but decreases when performance is above social aspirations. Baum et al. (2005) demonstrate that firms above social aspirations but below historical also tend to become more risk-taking. Several scholars have also extended the aspirations of firm managers to include particular targets (Labianca et al., 2009) or particular goals in addition to overall financial performance (Greve, 2008; Baum et al., 2005). In these cases, the particular frame of reference becomes a more salient goal for firm managers' comparisons. More novel extensions, some of which were not included in Cyert and March's (1963) original model, have also been made. Drawing from critical insight from Cyert and March's (1963) original theory, some studies have examined the multiple goals within a firm by showing that responses to firm performance may differ across the layers of management in the firm—a business unit manager may take greater risks in response to underperformance, while corporate managers may take fewer risks (Gaba & Joseph, 2013). Audia and Brion (2007) also provide insight on divergent information by highlighting that managers pay more attention to positive indicators, even when these are secondary performance indicators, and ignore negative indicators, even when these are primary performance indicators. This result highlights a self-

serving framing effect in how managers prioritize divergent information. In addition, some scholars have shown that the ownership structure in the firm dictates the reference points to which managers pay more attention (Vissa et al., 2010). Conditional on the theoretical extensions described thus far, however, BTOF's prediction that risk taking is a function of managers' view of their performance relative to aspiration has been broadly supported (with a few exceptions such as Baucus & Near, 1991, who show that high performers more often engage in illegal behavior, and Baum et al., 2005, who show over-performance in market share leads to greater risk-taking in partner selection).

Organizational slack, a concept that is core to BTOF, has also been widely examined in the context of managerial risk taking. While most findings support the assertion that it increases risk taking (Arrfelt et al., 2013; Barreto, 2012; Chen, 2008; Chen & Miller, 2007; Greve, 2003; Iyer & Miller, 2008), some evidence indicates otherwise. For example, Baucus and Near (1991) find no influence of slack on illegal behavior, and Iyer and Miller (2008) show that absorbed slack does not affect managerial risk taking. Furthermore, expanding on prior studies examining the independent effect of slack, Chen and Miller (2007) examine the moderating impact of slack on over/underperformance relative to aspirations.

***PT Research on Performance Reference Points and Risk Taking.*** In the PT literature, managerial risk taking has been operationalized in a similar manner as in the BTOF literature, including acquisition types (Matta & Beamish, 2008; Park, 2003), divestment (Garbuio, King & Lovallo, 2011; Hayward & Shimizu, 2006), retention of poorly performing units (Shimizu, 2007), innovation (Chattopadhyay, Glick, & Huber, 2001; Markovitch, Steckel, & Yeung, 2005; Morrow, Sirmon, Hitt, & Holcomb, 2007; Simon, Houghton, & Savelli, 2003), illegal behavior (Mishina, Dykes, Block, & Pollock, 2010) and stakeholder engagement (Bamberger & Fiegenbaum, 1996; Jawahar & McLaughlin, 2001). These studies have provided support for the PT propositions that

the manner in which managers frame the prospect of these actions, either as loss or gain in relation to a reference point, affects their degree of risk taking. In addition, they provide support for the PT proposition that the relationship between the perceived distance from the reference point and the degree of risk taking is nonlinear (see Laughunn, Payne, & Crum, 1980; Shimizu, 2007).

Multiple moderators to these traditional PT constructs have added considerable extensions to the theory. For instance, extreme levels of poor performance, which induce threat rigidity, have been shown to induce managers to take a survival frame that reduces their overall risk taking, despite being below their reference point (Chattopadhyay et al., 2001; Jawahar & McLaughlin, 2001). In addition, the degree of experience that managers have with a type of action has been argued to shape the way in which they frame its outcomes, thus driving them to engage in greater levels of such actions (Garbuio et al., 2011; Shimizu, 2007). Organizational size and slack from BTOF have also been shown to affect framing, both in terms of increasing managerial risk taking when they represent greater resource endowment (Chattopadhyay et al., 2001; Singh, 1986) and decreasing it when they allow for losses to be absorbed (Hayward & Shimizu, 2006). An additional extension to PT has been found with the degree of ambiguity (Shimizu, 2007) or the ability to shift blame (Hayward & Shimizu, 2006) in altering managers' risk frames. Various studies have also provided insights into important conditions that may reverse the predictions of PT by coupling them with the house money effect and hubris arguments (see Mishina et al., 2010; high performers can experience pressures to exceed their performance aspirations and take riskier, illegal actions). The role of external analysts in shaping managerial reference frames has been also examined in several studies (e.g., Mishina et al., 2010; Morrow et al., 2007).

### **Behavioral Agency Model**

Integrating concepts from AT, BTOF and PT, the behavioral agency model (BAM) assumes that executives are loss averse and that their compensation plans create reference points

that shape their prospect framing and determine their risk taking (Wiseman & Gómez-Mejía, 1998). Anticipated future wealth (e.g., derived from unexercised stock options) is endowed into current wealth calculations (Devers, Cannella, Reilly, & Yoder, 2007; Pepper & Gore, 2015). To the extent that this perceived current wealth is tied to firm performance, positively framed problems creates risk bearing, i.e. perceived wealth-at-risk, that discourage managerial risk taking. Thus, managers will be loss-averse and prefer actions designed to protect current wealth (e.g., created by the CEO's stock options) rather than risking this wealth in pursuit of new gains.

***BAM Research on Executive Compensation and Risk Taking.*** Multiple studies on executive compensation employ BAM to explain managerial risk taking. Scholars have detailed how risk bearing, creating risk-averse CEO behaviors, depends on the CEOs' perceived gain or loss situation (Martin, Gómez-Mejía & Wiseman, 2013; Martin, Washburn, Makri, & Gómez-Mejía, 2015), which is often triggered by specific forms of CEO pay plans (e.g., in-the-money options) but not other forms (e.g., out-of-the-money options). For example, Larraza-Kintana et al. (2007) find that CEOs seek to protect personal wealth (e.g., derived from in-the-money unexercised stock options) from potential losses and take fewer risks but may also take more risks when faced with employment risk and compensation variability. Devers et al. (2008) also provide empirical evidence of a negative relationship between the value of restricted stock options and strategic risk. CEOs endow their perceptions of current wealth with the restricted stock value, which creates downside risk and thus risk aversion, and is contingent on cash compensation, board of director actions and stock price volatility (see also Devers, Wiseman & Holmes, 2007; Latham & Braun, 2009). Additionally, Matta and Beamish (2008) find that CEOs nearing retirement who have high levels of in-the-money unexercised stock options and equity holdings, which represent CEO endowed wealth, avoid risky international acquisitions that could jeopardize their perceived realized gains. Similarly, Souder and Shaver (2010) find that when managers hold high levels of

exercisable stock options, their firms are less likely to make risky long-term investments.

Additionally, Zhang, Bartol, Smith, Pfarrer, and Khanin's (2008) results show that CEOs are less likely to manipulate firm earnings when they have more in-the-money stock options, higher stock ownership, and fewer out-of-the-money stock options, while firm performance and CEO tenure moderate these relationships (see also Villena, Gómez-Mejía, & Revilla, 2009). Lim and McCann (2013) also use BAM to explain why the relationship between the positive deviation from prior outside director stock option values and risk taking weakens when CEO stock ownership is high and the CEO also holds the board chair position. Lim and McCann (2014) demonstrate that a high value of stock option grants to the CEO leads to less risk taking under both underperforming and overperforming conditions. Yet, a higher amount of stock option grants to outside directors leads to more risk taking when the firm is underperforming.

***BAM Research on Family Decision Makers and Risk Taking.*** Through BAM, family firm research has examined the effect of risk bearing created by “the *nonfinancial* aspects of the firm” or socioemotional wealth (SEW) (Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson, & Moyano-Fuentes, 2007: 106). In family firms—the most prevalent business organization form worldwide (Gedajlovic et al., 2012)—the primary reference point of family owner-managers when framing major strategic decisions is the avoidance of losses in the family's SEW (Zellweger et al., 2012). Gómez-Mejía et al. (2007) find that family decision makers are loss averse in regard to threats to their SEW even if this means accepting a greater performance hazard. Using similar arguments, Gómez-Mejía, Makri, and Larraza-Kintana (2010) and Gómez-Mejía, Patel and Zellweger (2015) show that family decision makers diversify and acquire less than those of non-family firms but are more likely to diversify and engage in unrelated acquisitions as slack increases. Berrone, Cruz, Gómez-Mejía, and Larraza-Kintana (2010) find that family decision makers tend to protect their SEW (e.g., reputation) by improving environmental performance (i.e.,



polluting less). Leitterstorf and Rau (2014) show that family decision makers tend to underprice IPOs to minimize losses to SEW if the IPO fails. Chrisman and Patel (2012) find that family decision makers invest less in R&D, but when performance is below aspiration levels, their R&D investments increase (see also Patel & Chrisman, 2014).

***Future Research on BTOF, PT, BAM and Risk Taking.*** Based on our review of managerial risk-taking studies that have adopted BTOF, PT and/or BAM as their dominant frameworks, we focus on three areas that may provide fruitful research opportunities. First, although a critical component of classic PT (Kahneman & Tversky, 1979) pertains to the magnitude of the loss/gain, its implications have seldom been tested and thus merit further investigation (Laughunn et al., 1980; Shimizu, 2007). PT as originally framed (Kahneman & Tversky, 1979) posits a nonlinear and asymmetrical relationship between risk taking and distance from the reference point for both gains and losses. Interestingly, BTOF rather suggests that when firm performance largely exceeds aspirations, firms' risk-taking preferences may switch from risk aversion to risk seeking (Cyert & March, 1963; March & Shapira, 1992). Conversely, firms with exceptionally poor performance may change aspiration levels and aspire simply to survive (Iyer & Miller, 2008; March & Shapira, 1987); thus, they become risk averse when managers perceive that the firm's survival is seriously threatened. An exciting avenue for future research may be to understand whether this BTOF logic may be applied to PT, BAM and SEW studies and to extend beyond what we already know from the house money effect, executive hubris and threat rigidity (Chattopadhyay et al., 2001; Hayward & Hambrick, 1997; Mishina et al., 2010). In addition, it is worth exploring whether existing contradictory findings of PT and BAM studies may be better explained by BTOF predictions in extreme loss and gain contexts. Yet, we note that employing BTOF and PT/BAM predictions simultaneously may lead to the issue of mixing theoretical mechanisms at the individual and group/firm levels. However, of note, the use of PT in explaining

risk behavior at the group and firm levels has been possible by examining the strong influence of an individual within the firm and its group. Also, BTOF is more concerned with understanding how aspirations are formed, and this focus could provide value to research based on PT.

Second, in regard to the theories examined in this section, future research should determine managers' reference points, especially when they are nonfinancial in nature (e.g., SEW; Chua, Chrisman & De Massis, 2015; Miller & Le Breton-Miller, 2014; Schulze & Kellermanns, 2015). Clearly, reference points vary across managers (and groups). As such, a situation that one manager views as a gain could be viewed as a loss by another manager. For instance, Bamberger and Fiegenbaum (1996) argue that because individuals in the same organization may use different reference points, some managers may be in gain frames, while others are in loss frames. The resulting differences in risk-taking preferences may create conflict that disrupts strategy implementation. This potential conflict in reference points is particularly relevant to the BTOF, in which the reference point for a firm is reached through internal political bargaining by balancing different managerial goals and coalitions. While most BTOF studies have assumed a singular and overarching firm-level goal (typically measured through a financial metric), various recent studies have expanded our understanding of reference points by examining conflicting goals (e.g. Gaba & Joseph, 2013; Lim & McCann, 2014; Vissa et al., 2010). Although these studies have provided some differentiation in reference point setting and firm risk-taking reactions, to date, no studies have examined the effect of the internal political bargaining process on how these reference points are set and how conflicts within the TMT shape risk-taking behavior. Addressing such questions might require more novel methodology than that currently employed by most BTOF research, such as experimental methods (e.g., Audia & Brion, 2007). In addition, no studies have examined this relationship within the TMT level of analysis as opposed to the TMT-board level or the corporate-business unit level. Researching such conflicts within the TMT is critical for

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Finally, further conceptualizations of both potential gains and losses associated with managerial risk taking (cf. mixed gamble; see Bromiley, 2009, 2010) may help scholars to elucidate conflicting results about the relationship between stock option wealth and managerial risk taking (Balkin, Markman & Gómez-Mejía, 2000; Devers et al., 2008; Larraza-Kintana et al., 2007; Sanders, 2001; Souder & Shaver, 2010). Most studies have relied on the current, historical and social aspiration levels that shape managers' reference points, while very few have focused on future potential outcomes (see Chen, 2008; Martin et al., 2013). In fact, CEO risk preferences are influenced by current wealth that could be lost relative to prospective wealth that could be gained. For instance, Martin et al. (2013) examine stock options as mixed gambles for CEOs by going beyond pure gambles that offer sole loss (BAM) or sole gain (AT) outcomes. Their findings show that CEOs' perception of a higher level of prospective gains from their stock options tends to offset the negative effect of current wealth on risky strategic choices. Future studies may build more fully on the mixed gamble logic to explain how risk taking may vary in family-owned firms and other organization forms with the goal of protecting current and/or maximizing future financial and non-financial wealth (see Gómez-Mejía et al, 2015).

### **Upper Echelons Theory**

Upper echelons theory (UET) builds on Simon's (1957) fundamental premise of bounded rationality (Hambrick, 2005, 2007; Hambrick & Mason, 1984). The executives' construal of reality is a product of their "orientations" and eventually translates into their strategic choices, which involve taking risks (Carpenter et al., 2004; Child, 1972; Finkelstein et al., 2009). These executive orientations are formed by two major dimensions of personal characteristics, *psychological properties* and *observable experiences*, and are the primary focus of UET studies on managerial risk taking. Thus, this review section is structured based on these dimensions and by

level of analysis (individual/CEO vs. group/TMT). We devote more space to reviewing research on CEOs due to their increasing influence on risk taking and firm performance (Quigley & Hambrick, 2015) and the greater volume of research on CEOs compared to TMT decision making.

***Research on Psychological Properties of the CEO and Risk Taking.*** Three psychological properties of executives relevant to UET and the study of managerial risk taking are values, cognitive models, and personality characteristics. Among the three, values, which reflect CEOs' preferences for a particular state of affairs (Hambrick & Brandon, 1988), have received the least attention. However, a great amount of research has been conducted on CEOs' cognitive models and risk taking, building on the premise that managers' cognition forms their construal of the outside world and thus affects their strategic choices (Eggers & Kaplan, 2013; Helfat & Peteraf, 2015). For example, CEOs' attention to new market opportunities has been found to affect their tendency to break strategic inertia (Eggers & Kaplan, 2009; Kaplan, 2008); cognitive orientations (e.g., regulatory focus [Gamache, McNamara, Mannor, & Johnson, 2015]) are found to influence acquisition decisions.

Personality traits also make up a large body of research on CEOs' psychological properties and managerial risk taking. Beyond direct measures of risk propensity (Strandholm, Kumar, & Subramanian, 2004), executives' self-concepts, such as core self-evaluation (Judge, Locke, & Durham, 1997), narcissism (Campbell, Goodie, & Foster, 2004), hubris (Hayward & Hambrick, 1997), and overconfidence (Russo & Schoemaker, 1992), have garnered significant attention. Hiller and Hambrick (2005) find that CEOs' core self-evaluation (CSE) leads to strategic dynamism and deviation. Simsek, Heavey, and Veiga (2010) find that higher CSE increases managers' entrepreneurial orientation. Although early work has used case studies (e.g., Bedeian, 2002; de Vries & Miller, 1985; Lubit, 2002), Chatterjee and Hambrick (2007) use unobtrusive indicators to show that CEO narcissism leads to strategic dynamism and grandiosity and that

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narcissism moderates capability cues (e.g., recent performance, social praise) on risk taking (Chatterjee & Hambrick, 2011). Gerstner, König, Enders, and Hambrick (2013) also find that higher CEO narcissism leads to the adoption of discontinuous technologies. Similarly, executive hubris is related to larger acquisitions (Roll, 1986), higher acquisition premiums (Hayward & Hambrick, 1997), greater investment in high-technology projects (Li & Tang, 2010), and more innovation (Tang, Li, & Yang, 2015). Finally, overconfidence (Bazerman & Neale, 1982; Busenitz & Barney, 1997) is associated with a higher percentage of capital investment (Malmendier & Tate, 2005a, 2005b), a propensity to pursue acquisitions (Liu, Taffler, & John, 2009; Malmendier & Tate, 2008) and risky product launches (Simon & Houghton, 2003).

Personality characteristics other than self-concept traits have been less examined. Expanding on early research on managers' locus of control (Miller, de Vries, & Toulouse, 1982), Miller and Toulouse (1986) find that CEOs' need for achievement and flexibility increase product innovation, aggressive marketing, and future orientation. Additionally, Nadkarni and colleagues find that personality factors such as the Big Five (Nadkarni & Hermann, 2010) or temporal orientation (Nadkarni & Chen, 2014) promotes risk taking (e.g., strategic change, new product launches), while Delgado-Garcia and De La Fuente-Sabate (2010) show that CEOs' positive affective traits promote deviant (risky) strategies. In all, CEOs with different personality traits make different risk decisions in different contexts, evidenced by a wide array of strategic actions.

***Research on Observable CEO Experiences and Risk Taking.*** While experiences have “more noise than purer psychological measures” (Hambrick & Mason, 1984: 196), they serve to shape and reflect values and cognitive models that influence decision making (Finkelstein et al., 2009; Hitt & Tyler, 1991). Executive tenure is one of the most studied attributes of executives in the risk-taking literature—long-tenured executives are reluctant to make changes and thus take fewer risks (Boeker, 1997a; Hambrick & Fukutomi, 1991; Hambrick, Geletkanycz, &

Fredrickson, 1993; Miller, 1991). New executives, however, are more likely to support new product-market entry (Boeker, 1997b), experimentation (Miller & Shamsie, 2001), technological dynamism (Wu, Levitas, & Priem, 2005), innovation (Chaganti & Sambharya, 1987; Thomas, Litschert, & Ramaswamy, 1991), R&D spending (Barker & Mueller, 2002), and risky subprime mortgage lending (Lewellyn & Muller-Kahle, 2012).

Functional background, another aspect of executives' experience, is the lens through which managers view business problems and solutions (Dearborn & Simon, 1958). Specifically, scholars have found that "output-oriented" functions (e.g., marketing, sales, R&D), compared with "throughput-oriented" functions (e.g., manufacturing, accounting, finance, administration), lead to prospector strategies (Chaganti & Sambharya, 1987), market-oriented strategic changes (Strandholm et al., 2004), R&D spending (Barker & Mueller, 2002), and new product-market entries (Boeker, 1997b). Conversely, greater experience in finance, accounting, or law leads to greater diversification via acquisitions (Finkelstein, 1992; Fligstein, 1990; Jensen & Zajac, 2004; Palmer & Barber, 2001; Song, 1982). Furthermore, more varied functional experiences increase CEOs' willingness to accept accounting fraud (Troy, Smith, & Domino, 2011).

Research on educational experience indicates that while more years of formal education lead to greater innovations (Thomas et al., 1991), MBA degrees may (Bertrand & Schoar, 2003; Palmer & Barber, 2001) or may not (Barker & Mueller, 2002; Geletkanycz & Black, 2001; Grimm & Smith, 1991) relate to risk taking. Additionally, greater international experience leads to more internationalization (Sambharya, 1996), and CEOs' professional experience diversity leads to greater strategic change and new industry strategy (Crossland, Zyung, Hiller, & Hambrick, 2014).

***Research on Other Characteristics of the CEO and Risk Taking.*** CEO age is also found to affect risk taking. For example, younger CEOs invest more in R&D (Barker & Mueller, 2002), change strategies in response to environmental change (Grimm & Smith, 1991), and willingly

accept financial fraud (Troy et al., 2011). Gender differences also relate to risk taking; a change from a male to a female CEO is associated with a decrease in risk taking (Elsaid & Ursel, 2011). Studies have shown that greater CEO power induces risk taking, e.g., engaging in risky subprime mortgage lending (Lewellyn & Muller-Kahle, 2012) or strategic deviance from general tendencies (Tang, Crossan, & Rowe, 2011). Relatedly, the predecessor CEO remaining as the board chair hinders strategic change (Quigley & Hambrick, 2012). Finally, Mousa and Wales (2012) show that founder CEOs value and implement more entrepreneurial strategies but seem to lack the capabilities needed to sustain firm growth and continue market expansion in later tenure years with more complex industry conditions (Souder, Simsek, & Johnson, 2012).

***UET Research on Top Management Teams (TMTs) and Risk Taking.*** While some studies have cautioned against using the TMT as the unit of analysis (e.g., Dalton & Dalton, 2005), rich evidence suggests that studies on TMTs (versus CEOs) can predict firm outcomes (Ancona, 1990; O'Reilly, Snyder, & Boothe, 1993; Tushman, Virany, & Romanelli, 1985; Wiersema & Bantel, 1992). A TMT has three central conceptual elements: composition—the collective characteristics of the team; structure—the roles of members, the relationships between them, and the size of the team; and process—the social and behavioral integration among its members (Finkelstein et al., 2009). While many studies have shown how collective attributes of TMTs influence risk-taking decisions, relatively less research has focused on TMT structure and process aspects. Research examining the effects of team composition on risk taking has mostly used team members' heterogeneity in terms of observable characteristics to proxy their cognitive heterogeneity (Hambrick & Mason, 1984). Most studies have shown that heterogeneity in industry tenure, firm tenure, function and education is positively associated with greater entrepreneurial strategies after deregulation (Cho & Hambrick, 2006), strategic change (Boeker, 1997a; Wiersema & Bantel, 1992), and firm international diversification (Tihanyi, Ellstrand, Daily, & Dalton, 2000).

Other findings suggest that some types of heterogeneity may lead to less innovation (Bantel & Jackson, 1989) and slow down acquisition processes (Nadolska & Barkema, 2014). Such evidence may reflect the cautions against making causal statements regarding TMT heterogeneity and risk taking, as diversity may allow active debate and information sharing (Bantel & Jackson, 1989; Wiersema & Bantel, 1992) but also create potential conflict within the team (Li & Hambrick, 2005; O'Reilly et al., 1993). While using demographics has been a popular approach to measuring team cognition, many studies have more directly captured this variable by examining the role of TMTs' shared mental models in risk taking (e.g., Barr, 1998; Barr, Stimpert, & Huff, 1992; Kaplan, Murray, & Henderson, 2003; Milliken & Lant, 1991; Nadkarni & Barr, 2008).

Other studies have examined the effect of aggregate levels of such TMT attributes on risk-taking activities, as reflected in strategic conformity and rigidity (Finkelstein & Hambrick, 1990), diversification (Boeker, 1997a; Wiersema & Bantel, 1992), new product-market entry (Boeker, 1997b), strategic persistence (Geletkanycz & Black, 2001; Grimm & Smith, 1991), innovation radicalness (West & Anderson, 1996), international diversification (Reuber & Fischer, 1997; Tihanyi et al., 2000), strategic reorientation (Gordon, Stewart, Sweo, & Luker, 2000), and acquisitions (Nadolska & Barkema, 2014). Geletkanycz and Hambrick (1997) suggest that TMTs' human and social capital relate to strategic deviation from industry norms. Furthermore, TMTs' collective orientations (e.g., corporate governance, political ideology) are related to exploration/growth strategies (Kwee, Van Den Bosch, & Volberda, 2011) and tax avoidance (Christensen, Dhaliwal, Boivie, & Graffin, 2015).

***Future Research on CEOs, TMTs and Risk Taking.*** The behavioral mechanisms underlying senior managers' decisions remain largely unknown due to methodological challenges in capturing their psychological characteristics. While primary data can be obtained from small, private firms, the findings derived from such data are not easily generalized to large, public firms.



Research using secondary data has gained headway in recent years, but criticisms that such measures may vary in their ability to capture actual characteristics remain (e.g., Priem, Lyon, & Dess, 1999). Ideally, researchers may use qualitative approaches that precede quantitative methods to provide richer and more accurate insight into developing unobtrusive measures for large-scaled analysis. Furthermore, developing typologies of senior executives that represent risk-taking profiles based on certain combinations of psychological and experience characteristics may also be a fruitful avenue. Future research may also focus on the implications of other specific management roles beyond the CEO, such as the COO and CFO, for risk taking (Menz, 2012; Zhang, 2006).

In addition, more research is needed to examine the influence of TMT structure and process variables on risk taking, which have mostly been directly linked to performance outcomes. Future research opportunities focused on the structure (e.g., power dynamics) and process (e.g., social comparison) components of TMTs are possible. Given unequal power distribution within the TMT (Finkelstein, 1992; Mintzberg, 1979), future studies could delve deeper into power dynamics in the TMT. For example, the well-guided strategic intentions of the less powerful may be disregarded if powerful individuals make suboptimal choices because of the individual-level factors discussed earlier. Furthermore, if power is unequally distributed across members, political behaviors that lead to undesirable risk taking may arise. The power dynamic view of the TMT in UET is similar to the dominant coalition views of the BTOF; thus, a combination of these perspectives regarding eventual TMT risk-taking behavior may be fruitful.

Future studies could also examine the influence of social comparison in TMTs. Social comparison is particularly relevant for explaining group-level influence on risk behavior. As TMT members may routinely compare themselves with each other because they observe similarities in their demographic characteristics, abilities, or positions (Festinger, 1954), such propensity may also be based on pay (Fredrickson, Davis-Blake, & Sanders, 2010; Seo, Gamache, Devers, &

Carpenter, 2014), causal attribution by other organizational actors and public media (Hayward, Rindova, & Pollock, 2004; Meindl, Ehrlich, & Dukerich, 1985), or status (Locke, 2003). Given the empirical evidence that an individual's negative feelings of envy or inequality can result in unnecessary risk taking to reduce the perceived gap between the actor and the target(s) (Flynn, 2003; Smith & Kim, 2007), individual-level effects on risk taking may be more pronounced when TMT members engage in social comparison. In addition, because team support for risk taking tends to increase risky choices (West & Anderson, 1996), comparison processes among team members may influence the team's social integration and thereby affect decision riskiness.

Finally, future research could combine explanations regarding the effects of compositional heterogeneity with team decision-making processes. Relatedly, how the interplays between the CEO and other TMT members influence the risk taking of both the CEO/individual executive and the top team as a whole could be an interesting research topic. For example, Shi, Hoskisson and Zhang (2016) show that the death of an outside board member slows the acquisition activity of a CEO and associated TMT. Additionally, CEOs' personality can influence the TMT's risk taking (Peterson, Smith, Martorana, & Owens, 2003), and CEOs' ties with firm members across different functions may impact a firm's entrepreneurial orientation (Cao, Simsek, & Jansen, 2012).

### **Future Research Opportunities and Challenges *across* the Theoretical Perspectives**

In this section, we present challenges wherein predictions and findings across the theories might differ, potential theoretical assumptions conflict, levels of analysis are confounded, various risk-taking decisions take place simultaneously, and the measurement of risk taking varies across studies. All of these challenges offer future research opportunities. In Figure 1, we present an overall model summarizing the main effects of the theories reviewed. potential moderators, and the outcomes across managerial, firm and environmental levels. In contrast with previous reviews (e.g. Bromiley et al., 2001), our work, graphically summarized in Figure 1, offers the reader a

broader picture of *managerial risk taking* and of potential future research opportunities and challenges not only within but also across the multiple theoretical perspectives detailed in this manuscript. While our understanding of the risk-taking mechanisms proposed by individual theories has advanced considerably, challenges remain when two or more of these theoretical frameworks are adopted within the same study.

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Insert Figure 1 about here  
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Although studies have begun to adopt multiple frameworks of risk taking to examine how the mechanisms interact (e.g., Lim & McCann, 2014; Wowak & Hambrick, 2010), such work remains sparse. Certainly, some theories can more readily be paired with other frameworks as they combine individual- or TMT-level mechanisms from various theories, such as BAM and SEW (which combine mechanisms from AT, BTOF and PT) or UET (which combines individual biases and TMT-level structural makeups). For example, some work suggests that intermediaries may induce hubris and prominence in managers' perceptions (as predicted by UET) and thus may motivate managers of even high-performing firms to engage in high risk taking, reversing standard PT predictions (Mishina et al., 2010). Further, Matta and Beamish (2008) demonstrate that in addition to the traditional performance levels utilized in constructing reference points, CEOs' career stage plays an important role in framing their risk taking decisions. Although some cross-fertilization of theoretical perspectives has been conducted, opportunities remain underexploited.

This work does not intend to propose grand, theory-level integrations among the various frameworks. Rather, it indicates future research opportunities that emerge from our review of the theories. For example, Finkelstein et al.'s (2009) notion of TMT composition, structure and process might provide insight into other group-level theories, such as the BTOF, by helping to delineate the political bargaining processes and power distribution within TMT coalitions (Cyert

& March, 1963). This area has remained relatively unexamined and is often treated as a “black box” in the literature. Yet, as the theories we have reviewed span different levels of analysis (see Figure 1), particular attention needs to be given to defining the key assumptions of each theory and understanding how they inform each other to explain risk-taking decisions. Past studies adopting multiple theoretical frameworks have mostly assumed that the underlying theoretical mechanisms can be equally applied across different levels of analysis (e.g., Shimizu, 2007). We note that this approach should be taken with caution. Consider the case of using PT, an individual-level framework, to theorize about organizational-level constructs such as slack. The intra-organizational distribution of capability and power among TMT members to secure slack for their own units (cf. Cyert & March, 1963; Greve, 2003) would likely shift their risk preferences. We suggest that future work should focus on how individual TMT members are differently impacted by firm-level constructs rather than examining the average impacts collapsed at the TMT level.

Clearly, individual decision makers are nested in groups of decision makers, which are nested in firms. However, very few studies have noted this nested structure when examining risk taking. We have little evidence, for example, regarding how TMTs may influence individuals’ risk-taking decisions. Arguably, collective group dynamics may affect how individuals arrive their decision to take or avoid risk. Peterson et al. (2003) document the inverse relationship—how CEOs’ traits influence their TMT’s decisions. The relationships we have identified must be viewed through this multilevel structure to extend prior findings and to address their potential cross-level implications. Greater care must be taken when incorporating theoretical mechanisms that operate at various levels of analysis to avoid combining them haphazardly. Instead, a real multilevel framework that captures the nested structure in which these decisions are made may advance our understanding of risk taking (see Kim, Hoskisson, & Wan, 2004).

Just as higher-level (e.g., group) characteristics can influence individual members, the

idiosyncratic characteristics of the decision makers' risk choices can offer new insights. For example, the impact of stock option pay, a firm-level governance device, on risk taking may change under certain executive cognitive profiles (Wowak & Hambrick, 2010). Furthermore, managers' unique cognitive orientations may alter the way they interpret positive and negative performance feedback and discrepancies from aspiration levels. In this sense, putting managerial idiosyncrasies back into AT, the BTOF, PT, and the BAM traditions is a meaningful and intriguing direction to pursue. At the same time, this direction highlights the importance of identifying conditions (e.g., high- vs. low-discretion settings) that alter the impact of executive characteristics on risk-taking strategies. For example, different incentive schemes, monitoring intensities (Shi, Connelly, & Hoskisson, forthcoming), or social positions of the firm relative to peers could considerably magnify or constrain a manager's inclination to avoid or take risk.

Another important challenge in incorporating mechanisms from various theories concerns the possibility of simultaneity, wherein the mechanisms that affect risk taking are codetermined by the risk-taking decision itself (see the potential moderators presented in Figure 1). With a few exceptions (e.g., Coles et al., 2006), this challenge has remained relatively unaddressed. Coles et al. (2006) document that stock options encourage managerial risk taking, which in turn affects future stock option-based incentive mechanisms. While this simultaneity applies even in studies that rely on only a single theoretical framework, it becomes particularly challenging when examining multiple mechanisms. Each mechanism that incentivizes risk taking might influence other determinants of managerial risk taking, perhaps leading to a chain reaction that results in either overly excessive or overly conservative managerial risk taking. For example, managerial psychological predisposition to risk taking, which might lead to greater levels of risk taking, could affect incentive-based mechanisms, which might reinforce managerial preferences and lead to excessive risk taking. For example, Gamache et al. (2015) find that option grants offset the

conservative tendencies of CEOs with a high prevention focus but do not exaggerate the risk-taking tendencies of CEOs with a high promotion focus. Alternatively, this simultaneity between incentive mechanisms might have the opposite result, such that incentive mechanisms could offset each other and lead to overly conservative behavior. Although some research has been conducted considering a single theory, such as examining substitution among governance devices within agency theory (cf. Rediker & Seth, 1995), less attention has been given to the effects derived from mechanisms associated with other theories.

The different measures of risk taking within each theory also present a challenge when incorporating multiple theories on managerial risk taking. Who is the focal individual making the risky decision? How do managers interpret problems and choose reference points that affect the final corporate strategic decision and how do these processes differ between managers? Reflecting these concerns, Devers et al. (2007) caution that firm risk, often captured by accounting measures, may not reflect executives' attitudes and biases toward risk. In this regard, we encourage greater use of primary data to measure managers' risk behaviors and reference points (see, for example, Labianca et al., 2009; Larraza-Kintana et al., 2007; Massini et al., 2005; Singh, 1986). We recognize the difficulty of collecting primary data, but we believe that this approach, along with mixed methods (which are seldom used), will advance our understanding of managers' past, present and future reference points and attitudes toward risk taking.

Certain types of risk-taking measures, such as R&D spending, may apply across theories. Other measures, however, might be viewed as risk taking from one theoretical lens but as risk reducing from other theoretical perspectives. For example, acquisitions and divestitures, depending on whether they are related or unrelated to the firm, could be viewed from AT as reducing the manager's risk exposure (Amihud, & Lev, 1981; Baysinger & Hoskisson, 1990). In particular, some studies have shown that CEOs benefit from an acquisition regardless of the actual

performance of the acquisition (Bliss & Rosen, 2001; Harford & Li, 2007) and appear to use acquisitions to increase their compensation (Seo et al., 2014). However, acquisitions and divestitures have often been applied as measures of increased risk taking in works adopting theories such as the BTOF, PT or the BAM (e.g., Iyer & Miller, 2008; Larraza-Kintana et al., 2007; Matta & Beamish, 2008; Park, 2003). Measures are often confounded even within the same theory. For example, divestitures have been utilized both as “risk reducing” and “high risk” actions in PT studies (e.g., Shimizu, 2007; Markovitch et al., 2005; Pathak, Hoskisson and Johnson, 2014). Managers, of course, can engage in various forms of risk taking simultaneously. Some of these managerial decisions might increase their level of risk taking while also reducing their risk exposure. Studies examining multiple risk-taking decisions have often empirically treated each decision as independent from the others and have used separate models for each decision. However, if some of these risk-taking measures are viewed differently depending on the theoretical lens utilized in the study, then these managerial risk taking decisions must be treated as correlated with each other, requiring modeling techniques that treat multiple risk-taking decisions as endogenous to each other (e.g., multi-stage methods, such as structural equation modeling or 3-stage least squares) or the error terms in each regression as correlated (e.g., seemingly unrelated regressions). While such theoretical and empirical treatment of various risk-taking decisions might not change the fact that various mechanisms lead to more managerial risk taking, they may change our understanding of why such risk-taking decisions are undertaken if the risk exposure of managers is counteracted by other managerial decisions.

Finally, our review also shows important variations in the selection criteria for the adopted samples, covariates and statistical methods and an important shift from cross-sectional (e.g., Simon et al., 2003) to longitudinal studies (e.g., Mishina et al., 2010; O’Brien & David, 2014); these confirm the greater rigor in research over the last decade (Table 1). These studies have used

different measures of risk, which increases the applicability of the related theories to multiple phenomena. However, this also makes it difficult to draw comparisons between studies, especially when, as noted above, an action is considered to be a proxy of managerial risk taking in one study and a proxy of managerial risk aversion in another.

### **Boundary Conditions and Alternative Explanations**

Across the multiple theoretical frameworks we have reviewed, there are common but important boundary conditions that may change the relationships between the independent and dependent constructs we have identified. First, managers' responses to incentives and monitoring and the injection of managers' framing of situations, aspirations, and idiosyncratic characteristics' effects on firm behavior are all heavily contingent on the degree of discretion, or latitude of action, available to the decision makers (Hambrick & Finkelstein, 1987; see Wangrow, Schepker, & Barker, 2015, for a recent review). We note that theories on risk taking need to incorporate managerial discretion as an important mediator and/or moderator for a better understanding of the relationships between managers and their risky choices. For example, who (i.e., the board or the CEO) has the discretion to force her or his will is greatly related to the outcome of monitoring. Second, the predictions of the theories examined in this review of managerial risk taking have received considerable support. However, support is not universal, as some investigations have found that managerial risk actions are in conflict with the theories' predictions; this leads to the existence of additional boundary conditions that determine the limitations to applying a theory (Bacharach, 1989). As noted in the AT section, most of the dominant theoretical frameworks examined in this review are utilized as boundary conditions to AT, where managerial framing, individual or group characteristics, experiences, psychological biases, firm performance, slack, or family ownership all play a role in clarifying AT's main predictions on managerial risk taking.

Acknowledging the importance of identifying boundary conditions, our review also



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highlighted some additional theoretical perspectives that have been used to understand managerial risk taking. Adding to the threat-rigidity hypothesis (Chattopadhyay et al., 2001; Staw, Sandelands, & Dutton, 1981), house money effect (Thaler & Johnson, 1990), hubris (Hayward & Hambrick, 1997) and social comparison theory (Festinger, 1954) discussed above, we focus on three important contingency theoretical frameworks: escalation of commitment, stakeholder theory and institutional theory. First, escalation of commitment has been extensively used to explain why managers maintain an ineffective course of action (a risk-taking behavior) despite receiving negative feedback concerning its viability (Staw, 1981; Whyte, 1986). For example, Ross and Staw (1986), through a case analysis of the top team managing Expo 86, explain why the TMT remained resolute in its plans to host the world's fair in British Columbia despite increasing costs and deficit projections. Contingency theories, which either operate at extreme ends of performance (e.g., threat-rigidity) or alter the assumptions of the major theories reviewed (e.g., escalation of commitment), are amenable to application in managerial risk-taking studies. Second, the main focus of the theoretical perspectives and the related studies reviewed in the present article is managerial risk-taking behavior that is explicitly economic or financial in nature. However, important contingencies to each of these theories may exist depending on the social or institutional settings in which firms operate. For example, stakeholder theory, both in its normative (Freeman, 1984) and instrumental (Jones, 1995) forms, is fundamentally a theory of managerial action and the risks associated with engaging with outside stakeholders. Several studies included in our review (e.g., Bamberger & Fiegenbaum, 1996; Jawahar & McLaughlin, 2001) have taken an explicit stakeholder-oriented view of managerial risk taking. However, much of this literature is theoretical in nature, and empirical investigations of managerial decision makers taking risks to engage stakeholders remain sparse and provides an important opportunity for future research.

The institutional setting in which firms operate also provides an important boundary

condition. For example, O'Brien and David (2014) utilize social institutional differences in communitarianism to demonstrate that managerial action can be viewed as more or less risky depending on the societies in which they operate. Likewise, Geletkanycz (1997) finds that cultural values (e.g., individualism, uncertainty avoidance, power distance, and long-term orientation) impact executives' commitment to the status quo. In addition, as noted earlier, the institutional context can alter how the agent-principal relationship is understood (e.g., Wiseman et al., 2012). Different legal frameworks for shareholder protection (e.g., through civil vs. common law) may represent additional boundary conditions that could shift managerial risk-taking behavior across institutional settings, particularly from an AT perspective (e.g., Heracleous & Lan, 2012). As such, important contingencies across these theories are likely because they can redefine the meaning of "risk taking" and expand it beyond firm-level financial measures.

### **Outcomes of Managerial Risk Taking**

The outcomes of managerial risk taking (see Figure 1) remain less studied than the antecedents. As some scholars have noted (e.g., Nickel & Rodriguez, 2002), managerial risk-taking behaviors may ultimately impact organizational risk, mostly captured in the variance of the firm's future income stream. The relationship between risk and return has been the subject of much debate since Bowman's (1980, 1982) "paradox", which found that the positive risk-return expectations of CAPM and the original AT predictions are not generalizable, implying the existence of multiple internal and external contingencies (Andersen, Denrell & Bettis, 2007; Bromiley et al., 2001; Nickel & Rodriguez, 2002). In the following, we suggest opportunities for studying the outcomes of managerial risk taking. First, we know little about when and why the antecedents suggested by the diverse theories we have reviewed can lead to *extreme* risk behaviors—excessively risky vs. excessively conservative—that may potentially imperil the organization. Indeed, risk taking, which is driven by numerous factors, can go wrong. For

example, the negative performance effects of most acquisitions have elicited concerns (Haleblian, Devers, McNamara, Carpenter, & Davison, 2009). Additionally, unethical behaviors associated with risk taking (Baucus & Near, 1991; Harris & Bromiley, 2007; Mishina et al., 2010; Troy et al., 2011; Zhang et al., 2008) can lead firms to suffer significant reputational damage or performance fluctuation/decline. However, there is also recent evidence that while overconfidence accompanies volatile returns, it also brings greater innovative success (Hirshleifer, Low, & Teoh, 2012).

Extreme risk taking or avoidance can occur, and their consequences merit further attention.

Second, further work may explore how managerial risk taking determines different types of managerial, firm and environmental outcomes, thus offering a better understanding of the internal and external consequences of managers' risk behaviors. Some work has been directed at the outcomes of risk taking (see Figure 1). For instance, some scholars have found that risk taking affects individual outcomes such as managers' subsequent changes in pay and long-term pay (Seo et al., 2014), satisfaction with firm performance (Simon et al., 2003), the CEO vega (i.e., CEO wealth associated with stock options) and the CEO's future risk taking (Coles et al., 2006). Other studies have shown how it affects firm outcomes (see Andersen et al., 2007; Bromiley et al., 2001; Nickel & Rodriguez, 2002; Ruefli, Collins & LaCugna, 1999)--principally firm performance (e.g., Bromiley, 1991; Strandholm et al., 2004; Villena et al., 2009) but also corporate restructuring and diversification (Hoskisson, Hitt, & Hill, 1991), firm recovery (Morrow et al., 2007), learning (Sitkin, See, Miller, Lawless, & Carton, 2011), survival/failure (Gómez-Mejía et al., 2007; Latham & Braun, 2009), structure (environment-scanning, technocratization, differentiation: Miller et al., 1982), internationalization (Reuber & Fischer, 1997), product introduction (Simon et al., 2003; Simon & Houghton, 2003) divestiture (Hoskisson et al., 1994; Pathak et al., 2014), and BOD oversight of earning statements (Laux & Laux, 2009).

However, except for some recent works of Gómez-Mejía, Chrisman and colleagues on

SEW in family firms, little is known about the non-financial outcomes and goals derived from risk-taking decisions. We strongly encourage future work that explores this domain because non-financial outcomes are often highly relevant not only for family and founder enterprises but also for other organizational forms characterized by intense social structures, such as high-reliability and not-for-profit organizations. Finally, with a few exceptions (e.g., Malmendier & Tate, 2008: market reaction; Miller et al., 1982: environmental change), little is known about the macro implications of managerial risk, such as the environment's dynamism, munificence, or competitiveness (Keats & Hitt, 1988). For example, one could ask whether having industry competitors with strong incentives for risk taking would lead to more intense rivalry among incumbents.

## **CONCLUSION**

Motivated by the growing influence and importance of managerial risk taking in the modern business world, our treatise examines the different theoretical and research perspectives that have worked to further our understanding of this organizational phenomenon. We recognize that such an attempt calls for not only a broader review of the literature but also a review that spans multiple theoretical angles. While most previous reviews have focused on research associated with individual theories, aimed at surveying a broad range of behaviors within each literature stream, we note that significantly less work presents opportunities that emerge from crossing multiple theoretical perspectives on managerial risk taking. Because of the differences in the key assumptions and levels of analysis across these theories, we have attempted to create a model to guide future research and to help identify and examine possible gaps in the literature and the competing predictions and moderators that have been applied differently across perspectives. We hope that our review provides fruitful direction for future research on this topic.

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Table 1

## Articles Examining Managerial Risk Taking

Authors, Year, Journal	Main Theory	Level of Analysis	Causes of Managerial risk	Type of Managerial risk	Sample	Main Finding/Conclusion	*
Amihud & Lev (1981) BJE	AT	Managers	Ownership concentration vs. dispersion Discretion	Acquisitions: horizontal, vertical, conglomerate; diversification	309 Fortune 500 firms; 1965	For conglomerate mergers, for which diversification is generally considered to be a primary motive, manager-controlled firms engage in greater acquisitions than owner-controlled firms.	E
Baysinger & Hoskisson (1990) AMR	AT	Managers	BOD composition; BOD controls	Diversification; R&D	NA	Outsider-dominated BODs emphasize financial controls; insider-dominated BODs emphasize strategic controls. Greater financial controls lead to less managerial risk taking (less R&D and more unrelated diversification); greater strategic controls lead to greater managerial risk taking.	T
Hoskisson, Hitt & Hill (1991) OS	AT; PT	Managers	Level of diversification; corporate structure	General managerial risk taking	NA	Extensive diversification leads to less managerial risk taking if the firm operates under an M-form structure. Short-term financial goals are emphasized and loss of control over SBUs leads to less risk taking.	T
Hoskisson, Hitt & Hill (1993) OS	AT	Managers	Financial incentives	R&D intensity	108 Fortune 1000 firms; 1986	Financial incentives for managers lead to lower levels of R&D intensity. Short-term financial incentives have the strongest effect, while long-term financial incentives have no effect in lowering R&D intensity.	E
Hoskisson; Johnson & Moesel (1994) AMJ	AT	Managers	Block holder equity; proportion of inside/outside directors	Diversification; R&D intensity; debt ratio	203 firms; 1985-1990	Block holder ownership increases managerial risk taking (lower diversification, higher R&D); outside directors reduce risk taking.	E
Zahra (1996) AMJ	AT	Managers	BOD composition; BOD and TMT stock ownership; institutional ownership; tech. opportunities	Corporate entrepreneurship	127 Fortune 500 firms; 1991	Long-term (short-term) institutional ownership is positively (negatively) associated with CE, as is high outsider BOD ratio, but high outsider BOD stock ownership mitigates this association. However, these mechanisms have mixed associations depending on the technological opportunities available to the firm.	E
Bushee (1998) AR	AT	Managers	Institutional ownership; transient or dedicated	R&D expenditures	All firms; 1983-1994	High levels of institutional ownership reduce the likelihood of reducing R&D to reverse earnings shortfall (i.e., more risk taking). High levels of transient institutional ownership, however, increase the likelihood of decreasing R&D (i.e., less risk taking).	E
Hoskisson, Hitt, Johnson & Grossman (2002) AMJ	AT	Managers	Board independence; Institutional ownership	Internal innovation; External innovation	234 firms	The managers of public pension funds prefer internal innovation, but professional investment funds prefer acquiring external innovation. Inside directors with equity emphasize internal innovation, and outside directors with equity emphasize external innovation.	E
Schulze, Lubatkin & Dino (2003) AMJ	AT; BAM	Owner-Managers	Ownership dispersion; market growth	Debt ratio	1464 firms; 1995	Ownership dispersion has a U-shaped relationship with managerial risk taking in family firms: concentrated ownership, or a coalition of minority owners, increases risk taking. Equal distribution reduces risk taking. These	E

						effects, however, only exist when market growth is high.	
Carpenter, Pollock & Leary (2003) SMJ	AT; UET	Managers	VC-backing; TMT stock ownership; international experience of BOD members and TMT	Internationalization (Foreign sales to total assets)	97 IPO firms in electrical ind.; 1990-1999.	VC-backing reduces internationalization when its BOD member has no internationalization experience, but increases it when the BOD member does. High levels of TMT stock ownership increase internationalization, and TMT internationalization experience positively moderates this effect.	E
Coles, Daniel & Naveen (2006) JFE	AT	CEO	CEO delta and vega	R&D; CAPEX; diversification; leverage; Herfindahl Index	S&P 500, Midcap 400, Smallcap 600; 1992-2002	Higher levels of CEO vega lead to higher levels of risk taking. These higher risk taking strategies, in turn, lead to compensation packages that increase CEO vega, thus reinforcing CEO risk taking.	E
O'Connor, Priem, Coombs & Gilley (2006) AMJ	AT	CEO	CEO stock options; CEO duality; BOD stock options	Fraudulent financial reporting	103 intentional financial misreporting; 2000-2004	CEO stock options aid corporate governance by reducing moral hazard; large CEO stock option grants are sometimes associated with a lower incidence of fraudulent reporting and sometimes with a greater incidence depending on whether CEO duality is present and whether directors also hold stock options.	E
Sanders & Hambrick (2007) AMJ	AT	CEO	CEO stock options	R&D spending, CAPEX, acquisitions	950 S&P 500, Mid and Small-Cap firms; 1998	CEO stock options lead to high levels of investment and extreme corporate performance (big gains <i>and</i> big losses), suggesting that stock options prompt CEOs to make high-variance bets, not simply larger bets. Option-loaded CEOs deliver more big losses than big gains.	E
Devers, McNamara, Wiseman & Arrfelt (2008) OS	AT; BAM; PT	CEO	Equity-based compensation; Cash-based compensation; BOD actions; stock price volatility	R&D expenditures; CAPEX; long-term debt	794 firms; 1992-2005	Unexercisable stock options increase CEO's risk taking; exercisable stock options increase risk taking at a diminishing rate; restricted stock options reduce risk taking. Cash-based compensations positively moderate the risk-taking effect of exercisable stock options. BOD repricing or reloading of exercisable or restricted stock options positively moderates risk taking. Stock price volatility negatively moderates the relationship between risk taking and unrestricted stock options but positively moderates the relationship for restricted stock options.	E
Kempf, Ruenzla & Thiele (2009) JFE	AT	Managers	Employment risk; compensation; prior performance	Portfolio adjustments (intended risk adjustment ratio)	18924 mutual funds; 1980-2003	When focused on compensations (bull markets), poor performing managers increase risk taking. When focused on employment risk (bear markets), poor performers decrease risk taking.	E
Low (2009) JFE	AT	CEO	Equity-based incentives, takeover protection, board structure	Risk reduction	2399 firm; 1990-2004	In response to an exogenous increase in takeover protection, managers lower firm risk, which is concentrated among firms with low managerial equity-based incentives, particularly firms with low CEO portfolio sensitivity to stock return volatility. Furthermore, the risk reduction lowers shareholder wealth. Finally, firms respond to the increased protection by providing managers with greater incentives for risk taking.	E
Dong, Wang & Xie (2010) JBF	AT	CEO	CEO delta and vega	Capital structure changes (debt or equity offerings)	All debt or equity offering;	High vega leads to greater CEO risk taking (excessive debt offering even when over-leveraged).	E

					1993-2007		
Deutsch, Keil & Laamanen (2011) SMJ	AT	CEO; BOD	Stock option compensation for outside BOD directors and CEO	Book equity to market equity	1165 firms; 1997-2006	Stock option compensation for both outside BOD directors and CEOs increases risk taking but more so when outside BOD directors have high levels. Outside BOD directors' stock option compensation weakens the effect of CEO stock option compensation.	E
Faleye, Hoitash & Hoitash (2011) JFE	AT	CEO; BOD	Monitoring intensity; CEO compensation and ownership;	Innovation (R&D expenditures and patent quality)	S&P 1500; 1998-2006	High monitoring intensity by BOD leads to lower R&D and innovation quality. High CEO ownership is also negatively associated. However, BOD members with high service on other BODs increases R&D and innovation quality, as does high CEO stock compensation.	E
Connelly, Tihanyi, Certo & Hitt (2010) AMJ	AT	Managers	Institutional ownership	Strategic vs. tactical competitive actions	All dual-firm rivalries in Fortune 500, 1997-2006	Dedicated institutional (transient) investors ownership is positively (negatively) related to strategic competitive actions. Transient inst. ownership is positively related to tactical actions. Appreciable ownership of the same firm by these two classes of investors influences both strategic and tactical competitive actions.	E
Lim, & McCann, (2013) SMJ	AT; BAM; house money effect	CEO; BOD	Outside BOD director stock-option value; CEO ownership and duality	R&D expenditures; CAPEX; long-term debt	278 firms; 1993-2006	Outside BOD director prior positive stock option value leads to more risk taking; relative stock option value has a V-shaped relationship with risk taking. CEO ownership and duality both negatively moderate the effects of positive BOD director prior positive stock option value, and risk taking becomes negative when both CEO ownership and duality are present.	E
Castañer & Kavadis (2013) SMJ	AT	CEO	CEO variable compensation, stock options, ownership concentration, independent director ratio; CEO non-duality; Free cash flow	Financial diversification	59 French firms; 2000-2006	At high levels of free cash flow, CEO variable compensation increases financial diversification, whereas chairman/CEO non-duality reduces it. By contrast, independent directors increase financial diversification at low values of free cash flow (although weakly). Ownership concentration reduces financial diversification only when free cash flow is low.	E
Baucus & Near (1991) AMJ	BTOF	Managers	Performance relative to aspirations; Slack	Illegal behavior	Fortune 500 firms; 1974-1983	High-performers were more likely to engage in illegal behavior, but organizational slack had no effect.	E
Lant, Milliken & Batra (1992) SMJ	BTOF	Managers	Performance relative to aspiration	Strategic reorientation	Furniture and Software firms: 1984-1986	Poor past performance increased the likelihood of firm reorientation.	E
Greve (1998) ASQ	BTOF	Managers	Performance relative to aspirations	Organizational Change	Radio makers; 1984-1992	Underperformers engage in more format changes, while overperformers engage in fewer format changes. The effect of good performance is stronger than that of poor performance.	E
Greve (2003) AMJ	BTOF	Managers	Performance relative to aspirations; Slack	R&D intensity; innovation launches	Shipping industry in Japan: 1971-1996	Underperformance leads to more R&D and overperformance to less. Overperformance leads to fewer innovation launches. Slack increased R&D but not innovation launches.	E

Massini, Lewin & Greve (2005) RP	BTOF	Managers	Performance relative to aspirations	New organizational routines	US and EU firms; 1992 and 1996; 1993 and 1997	Firms that compared their performance relative to the industry average were more likely to engage in low-risk adoption of existing organizational routines, while those comparing themselves with top industry performers were more likely to engage in high-risk innovation of new organizational routines.	E
Baum, Rowley, Shipolov & Chuang (2005) ASQ	BTOF	Managers	Market share and status performance relative to aspirations	Local vs. distant partner selection	Canadian banks from 1958-1990	Banks whose market share performance was both below and above their aspirations engaged in more risky ties with distant partners, while only those whose status performance was below aspirations did so as well. Status performance above aspirations did not increase risk-taking. However, those performing above their social status aspirations, but below their historical, tended to be more risk-taking in ties.	E
Audia & Greve (2006) MS	BTOF; PT	Managers	Performance relative to aspirations; firm size	Factory Expansion	11 Japanese shipbuilders; 1974-1995	Performance below the aspiration level reduces risk taking in small firms but either does not affect risk taking or increases risk taking in large firms.	E
Audia & Brion (2007) OBHDP	BTOF	Managers	Performance relative to aspirations (revenue and profit performance)	New product introductions	8 hard disk drive manufacturers, up to 1999	When managers face two performance indicators, one primary and one secondary, they pay attention more to whichever indicates a positive performance, even when this indicator is secondary in importance.	E
Chen & Miller (2007) SMJ	BTOF	Managers	Performance relative to aspirations; expectations; Slack	R&D intensity	Manufacturing firms: 1980-2001	Underperformance increases R&D intensity, while overperformance decreases when over social aspirations but increases when above historical. Slack increases R&D intensity but not for overperformers with low slack.	E
Baum & Dahlin (2007) OS	BTOF	Managers	Performance relative to aspirations	Organizational learning; accident cost per mile	US freight railroads: 1975-2001	Firms performing relatively close to their goals engage in less risky behavior by focusing on learning from their own experiences, while those at extremes of performance try to learn more from others' experiences.	E
Park (2007) OS	BTOF	Managers	Performance relative to aspirations	Strategic convergence or divergence	Food-processing firms: 1985-2000	Firms closer to their performance goals tend to diverge more; however, when they compare their performance with a particular target that is performing considerably above their own performance, their strategy tends to converge toward the high-performing target firm.	E
Harris & Bromiley (2007) OS	BTOF	Managers	Performance relative to aspirations	Financial restatements	All US public firms: 1997-2002	Lower performance relative to both internal and external reference points increases the likelihood of financial misrepresentations.	E
Chen (2008) OS	BTOF	Managers	Performance relative to aspirations; expectations; Slack	R&D intensity	Manufacturing firms: 1980-2001	Underperformance increases R&D intensity, while overperformance decreases when over social aspirations but increases when above historical. Slack increases R&D intensity.	E
Greve (2008) AMJ	BTOF	Managers	Size or performance relative to aspirations	Growth	Insurance firms in Norway: 1911- 1996	Managers pay sequential attention to both performance and size goals in determining the level of risk taking.	E
Iyer & Miller (2008) AMJ	BTOF; threat rigidity	Managers	Performance relative to aspirations; slack, proximity to bankruptcy	Acquisition likelihood; timing	All public firms; 1980-2000	Acquisition is more likely for underperforming firms and less likely for overperforming firms. Slack increases likelihood of acquisitions. Yet, among firms threatened by bankruptcy, the probability of an acquisition, a risk taking strategy, decreases with proximity to bankruptcy.	E

Labianca, Fairbank, Andreviski & Parzen (2009) SO	BTOF	Managers	Performance relative to aspirations	Organizational change type and extent	US Business schools; cross-sectional	Low performers are more likely to engage in radical organizational change. High performers are also more likely to engage in radical organizational change if they gauge their performance to be below a particular set of competitors.	E
Vissa, Greve & Chen (2010) OS	BTOF	Managers	Performance relative to aspirations; Business-group affiliation	R&D intensity; Market search intensity	Public firms in India: 1988 - 2004	BG-affiliation shifts attention from internal to external aspirations.	E
Greve (2011) SMJ	BTOF	Managers	Performance relative to aspirations, firm size	Size of acquisition	Shipping firms; 1992-2004	Large firms increase risk taking when underperforming, while small firms decrease risk taking in response to underperformance.	E
Madsen (2011) JOM	BTOF	Managers	Performance relative to aspirations	Safety performance	133 US airlines; 1990-2007	A positive association exists between airline profitability and airline accident rates for airlines performing below their aspirations, but a negative association exists for airlines performing above their aspirations.	E
Barreto (2012) OS	BTOF	Managers	Performance relative to aspirations; slack	New branches opened in new markets	Banks in Portugal; 1991-1994	Firms with high performance relative to their goals are less likely to expand into attractive markets, while firms with high levels of slack are more likely to expand in unattractive markets.	E
Gaba & Bhattacharya (2012) SEJ	BTOF	Managers	Innovation performance relative to aspirations	Adoption or termination of corp. venture capital unit	IT firms: 1992-2003	Higher risk-taking in adopting, or not terminating, CVCs when performance is close to aspirations but not when it is far from aspirations in either direction.	E
Gaba & Joseph (2013) OS	BTOF	Managers	Performance relative to aspirations	New product introduction	6 phone manufacturers: 2002-2008	Underperformance leads to more new product introduction at the business unit level but more cost-cutting measures at the corporate office level.	E
Arrfelt, Wiseman & Hult (2013) AMJ	BTOF	Managers	Performance relative to aspirations; Slack	Over/Underinvestment	All public US firms: 1998-2006	Underperforming firms tend to over-invest in business units with poor future growth potentials and that high levels of organizational slack also leads to high over-investment.	E
O'Brien & David (2014) SMJ	BTOF	Managers	Performance relative to aspirations.	R&D intensity	Public Japanese firms: 1992-2004	Communitarian nature of the ownership of the firm leads to higher R&D intensity when performance is above aspirations.	E
Lim & McCann (2014) OS	BTOF; BAM	Managers	Performance relative to aspirations; stock option value	R&D intensity	Manufacturing firms: 1992-2006	High value of stock-option grants to CEO leads to less risk taking in both over- and underperformance conditions, while high-value stock-option grants to outside directors leads to more risk taking while underperforming.	E
Kim, Finkelstein & Halebian (2015) AMJ	BTOF	Managers	Performance relative to historical and social aspiration; prior acquisition performance	Acquisitions	3,010 U.S. acquisitions; 1988-2005	Firms' acquisition behavior varies significantly depending on whether historical or social comparisons are used. High variability in the previous acquisition performance of a firm intensifies the relationship between acquisition performance relative to aspirations and the probability of the firm making acquisitions below historical and social aspirations, but attenuates the relationship above such aspirations.	E
Laughunn, Payne & Crum (1980) MS	PT	Managers	Loss or gain framing, magnitude of the loss	Investing own money or firm's	224 managers	Managers are risk seeking when losses are not serious but more risk averse when potential losses became large.	X

				money in alternatives; losses and profits accruing accordingly	from US, Canada, and Europe		
Singh (1986) AMJ	PT; BTOF	Managers	Organizational performance, slacks, decentralization	R&D; debt; high-risk investments	64 firms	A negative relationship between organizational performance and risk taking exists. Also, firms with more slack engage in greater risk taking.	E
Bamberger & Fiegenbaum (1996) AMR	PT	Managers	Reference points	HR policies	NA	Managers adopt loss or gain frames depending on how HR-related outcomes compare with strategic reference points, and this framing increases managers' openness to risk-seeking and risk-averse HR policies.	T
Jawahar & Laughlin (2001) AMR	PT	Managers	Threat to firm survival, firm life cycle stage	Addressing stakeholder needs	NA	In the absence of threats to firm survival, managers will pursue a risk-averse strategy, that is, actively address all stakeholders' needs. Yet, in the presence of a threat, a risk-seeking strategy will be adopted, and only the interests of stakeholders most critical to immediate survival will be addressed.	T
Chattopadhyay, Glick & Huber (2001) AMJ	PT; Threat rigidity	Managers	Likely loss; likely gain; control-reducing threat; control-enhancing opportunity; slack; strategic type	Externally or internally directed actions	Managers in 177 firms	Actions are more likely to be internally rather than externally directed (thus, less risky) in response to control-reducing threats. Such behavior is more likely when firms have more slack. Yet, in line with PT, CEOs who perceive a loss-related threat to their resources respond with riskier externally directed actions. Risk-seeking behaviors are more likely when firms have more slack to fund them.	E
Park (2003) SMJ	PT	Managers	Perf. relative to social asp.; profitability of industry	Related and unrelated acquisitions	229 acquisitions; 1974-1979	Lower-performing firms and those operating in a less profitable industry are more likely to engage in unrelated acquisitions, and higher-performing firms and those operating in a more profitable industry are more likely to engage in related acquisitions.	E
Simon, Houghton & Savelli (2003) JBV	PT	Managers	TMT disappointment with current firm performance	High-risk product intro. into unfamiliar markets	55 top managers	Small business top managers who are disappointed with their firm's current performance introduce high-risk products into less familiar markets and require more resources. This decreases the product's economic performance and the manager's subsequent satisfaction with the business.	E
Markovitch, Steckel & Yeung (2005) MS	PT	Managers	Stock return performance relative to aspirations	Commercialization or tech. alliances, acquisitions, divestitures, R&D, advert. exp., brand building	19 pharmaceutical firms; 1980-2000	Managers with above-average (below-average) stock returns invest less (more) in high-risk actions than in low-risk actions to improve their current product portfolio.	E
Hayward & Shimizu (2006) AMJ	PT; escalation of commitment	CEO	Firm performance; CEO involvement in acquisition; industry stability; slack	Divestment of poorly performing acquired unit	136 firms; 1988-1998	CEOs tend to divest poorly performing acquired units (a risk-averse strategy) when organizational factors (higher acquiring firm slack and performance) absorb the loss and provide gain contexts but also when CEOs cannot be incriminated (CEOs were not involved in the acquisition and operate in a stable environment).	E
Shimizu (2007) AMJ	PT; BTOF; Threat rigidity	Managers	Performance, ambiguity, failure to improve performance, resources, divestiture	Divestiture of a formerly acquired unit	68 units of 68 firms; 1988-1998	Managers are risk seeking and thus likely to retain a poorly performing unit when the loss resulting from its performance is relatively small but will be risk averse and thus divest the unit when the performance loss becomes large. High ambiguity makes this relationship stronger when the unit loss is	E



			experience, size			small but weaker when it is large. Failure to improve performance, resource availability, divestiture experience, size interact with the individual-level tendencies predicted by PT.	
Morrow, Sirmon, Hitt & Holcomb (2007) SMJ	PT; RBV	Managers	Failing to meet the performance expectations of investors	New products, processes, or technologies, and M&A	178 firms; 1982-1994	In manufacturing firms that are unable to meet investors' expectations, managers engage in risk-taking actions that positively affect organizational recovery as measured by investors' expectations.	E
Matta & Beamish (2008) SMJ	PT; BAM	CEO	Time to retirement, CEO in-the-money options holdings, CEO equity holdings	International acquisitions	293 firms; 1995-1999	CEOs nearing retirement exhibit growing aversion to risk in terms of international acquisitions. A longer CEO career horizon is associated with a higher likelihood of international acquisitions. Yet, CEOs nearing retirement with high levels of in-the-money unexercised options and equity holdings are less likely to engage in international acquisitions.	E
Mishina, Dykes, Block & Pollock (2010) AMJ	PT; house money effect; hubris	Managers	Performance relative to aspirations; performance relative to expectations; firm prominence	Illegal behavior	194 S&P 500 firms; 1990-2007	Authors reverse the arguments and predictions of loss aversion: high performers can experience pressures to maintain or exceed their performance aspirations that make them more willing to take risky illegal actions, and this likelihood is even greater when a firm is also prominent.	E
Garbuio, King & Lovallo (2011) JOM	PT; Endowment effect	Managers	Resources of the firm	Resource acquisition or divestment	NA	The greater managers' loss aversion (endowment effect, familiarity effect and extremeness aversion), the less likely managers will be to engage in resource acquisition and divestment processes that generate optimal economic value for a firm.	T
Sitkin, See, Miller, Lawless & Carton (2011) AMR	PT; BTOF	Managers	Firm performance, slacks	Seemingly impossible stretch goals	NA	Seemingly impossible goals are paradoxically most seductive for managers with low recent performance and low slack although they are unable to afford the risks associated with them.	T
Wiseman & Gómez-Mejía (1998) AMR	BAM	Managers	Compensation plans	Overall executive risk-taking actions	NA	Executives are loss averse and that their compensation plans create reference points for them. To the extent that executive wealth is tied to firm performance, positively framed problems (gain situation; stock options) create risk bearing, that is, perceived wealth-at-risk, which negatively influences managers' risk taking.	T
Larrazza-Kintana, Wiseman, Gómez-Mejía & Welbourne (2007) SMJ	BAM	CEO	Employment risk, variability in compensation, downside risk, intrinsic value of stock options	R&D; new market entry; manufacturing or product innovation; CAPEX; downsizing; debt; acquisition; advertising	108 CEOs of IPO firms; 1993-1995	CEOs are loss averse and thus seek to protect personal wealth from potential losses (negative association between in-the-money unexercised stock options & downside risk and risk taking) but may also take greater risk when faced with loss (e.g., positive association between employment risk & compensation variability and risk taking).	E
Zhang, Bartol, Smith, Pfarrer & Khanin (2008) AMJ	BAM	CEO	In-the-money/out-of-the-money stock options, stock ownership; firm performance, CEO tenure	Earnings manipulations	2,532 US public companies; 1995-1999	CEOs are less likely to manipulate firm earnings when they have more in-the-money stock options, higher levels of stock ownership, and less out-of-the-money stock options; firm performance and CEO tenure act as moderators of these relationships.	E

Devers, McNamara, Wiseman & Arrfelt (2008) OS	BAM	CEO	Unexercisable, exercisable, restricted stock options, cash compensation board of director, actions, stock price volatility	R&D expenditures; CAPEX; long-term debt	794 manufacturing firms; 1992-2005	The value of restricted stock options is negatively related to risk taking. Yet, a positive relationship exists between unexercisable and exercisable stock options and risk taking (the latter at decreasing rates). Moderators: cash compensation, board of director actions and stock price volatility.	E
Villena, Gómez-Mejía & Revilla (2009) DS	BAM	Managers	Compensation and employment risk, environmental risk	Supply chain integration	133 Spanish manufacturing firms	Compensation and employment risks increase supply chain executives' risk bearing and thus reduce their willingness to make risky decisions in terms of supply chain integration with negative effects on operational performance. The employment risk/supply chain integration negative relationship is strengthened when environmental risk is high.	E
Latham & Braun (2009) JOM	BAM, threat rigidity	Managers	Managerial ownership; slack	R&D investments	327 software firms; 2000-2001	Firms with more managerial ownership and slack resources individually and jointly reduce managers' innovation decisions under circumstances of poor performance. Also, poorly performing firms that continue to invest in innovation exhibit a lower probability of survival.	E
Souder & Shaver (2010) SMJ	BAM; PT; BTOF	Managers	Exercisable, unexercisable stock options, cash flow, firm age	Long horizon investments	52 cable TV firms; 1972-1996	When managers hold high levels of exercisable stock options, their firms are less likely to make risky long-term investments. Yet, firms are more likely to pursue long horizon investments when managerial stock options are not yet exercisable. Also, firms are constrained from making long horizon investments when short-term performance is poor—and this effect is especially pronounced for young firms.	E
Martin, Gómez-Mejía & Wiseman (2013) AMJ	BAM	CEO	Current and prospect wealth of CEOs' stock options, hedging instruments to the CEO, the perception of vulnerability to dismissal by CEO	R&D expenditures; CAPEX; long-term debt	9143 manufacturing firms; 1996-2009	Prospective wealth within the CEOs' stock options positively moderates the current wealth/risk taking negative relationship. Also, the availability of hedging instruments to the CEO accentuates the prospect wealth/risk taking positive relationship, while the perception of vulnerability to dismissal by CEO attenuates the current wealth/risk taking negative relationship.	E
Martin, Washburn, Makri & Gómez-Mejía, (2015) HRM	BAM	CEO	Stock options, cash compensation, perceived firm efficacy	Innovation resonance (R&D performance)	297 firms; 1992-1995	CEO risk bearing (due to stock options or cash compensation) negatively influences invention resonance when perceived firm efficacy is low. However, this negative influence reverses when efficacy is high.	E
Gómez-Mejía, Haynes, Núñez-Nickel, Jacobson & Moyano-Fuentes, (2007) ASQ	SEW	Family decision makers	Family ownership and management, Generation in control, Firm performance	Joining a cooperative	1,237 olive oil mills in Spain; 1944-1998.	Family decision makers are loss averse when it comes to threats to their SEW even if this means accepting a greater performance hazard, and this effect is stronger in earlier generations. Specifically, family firms are less likely to join a cooperative compared with non-family firms (because through a cooperative the family firm loses control or SEW) but also avoid other risky business decisions that might aggravate that financial risk in exchange for continued family control.	E
Gómez-Mejía, Makri, & Larraza Kintana (2010)	SEW	Family decision makers	Family ownership and management, Cultural distance,	Diversification	360 firms (160 family-controlled);	Family decision makers diversify less both domestically and internationally than those of nonfamily firms but prefer domestic rather than international, and those that go the latter route prefer to choose regions that are 'culturally	E

JMS			business risk		1998-2001	close'. Also, they are more willing to diversify as business risk increases.	
Berrone, Cruz, Gómez-Mejía & Larraza-Kintana (2010) ASQ	SEW	Family decision makers	Family ownership, family CEO, CEO duality, CEO stock options	Environmental performance	194 US firms; 1998 - 2002	Family decision makers tend to protect their SEW (e.g., reputation) by improving environmental performance (i.e., polluting less). The authors also argue that the presence of a family CEO, CEO duality (not confirmed) and CEO stock options (confirmed) positively moderate the family firm/environmental performance relationship.	E
Chrisman & Patel (2012) AMJ	SEW	Family decision makers	Family ownership and management, Performance aspirations	R&D investment, variability in R&D	964 manufacturing firms; 1998-2007	Family decision makers invest less in R&D than their nonfamily counterparts (but the variability of their investments is greater). Yet, when performance is below aspiration levels, R&D investments increase in family firms (but the variability of those investments decrease) relative to nonfamily firms.	E
Leitterstorf & Rau (2014) SMJ	SEW	Family decision makers	Family ownership and management	IPO underpricing	153 German IPO firms; 2004-2011	Family decision makers tend to underprice IPOs relative to their nonfamily counterparts to minimize threats or losses of SEW deriving from the risk of a failed IPO.	E
Patel & Chrisman (2014) SMJ	SEW	Family decision makers	Family ownership and management, Performance aspirations	R&D investments	847 firms; 1996-2005	When performance exceeds aspirations, family decision makers manage socioemotional and economic objectives by making exploitative R&D that leads to more reliable and less risky sales levels compared with their nonfamily counterparts. Rather, performance below aspirations leads to exploratory R&D investments that result in potentially higher but less reliable sales levels.	E
Gómez-Mejía, Patel & Zellweger (2015) JOM	SEW	Family decision makers	Family ownership, firm's vulnerability (performance below aspiration levels and/or low levels of slack)	Acquisitions	692 manufacturing firms; 1997-2011	Family control implies a general reluctance to acquire, and when an acquisition happens, there is a preference for related targets. Yet, increased vulnerability leads to a heightened propensity to prioritize financial over SEW problem framing, which is reflected in the acquisition of unrelated targets.	E
Kimberly & Evanisko (1981) AMJ	UET	Managers	Tenure, cosmopolitanism, education	Tech. and administrative innovations	Hospitals AHA survey	Manager tenure, cosmopolitanism, and education level increase the tendency of technological and administrative innovation.	E
Miller, Kets de Vries, & Toulouse (1982) AMJ	UET; congruence	CEO	Locus of control	Product-market innovation; competitive proactiveness; long-range plans; risky projects	33 Montreal firms	More internal CEOs tended to pursue more product-market innovation, undertake greater risks, and lead rather than follow competitors.	E
Song (1982) SMJ	UET	CEO	Functional background	Diversification (acquisitions)	53 firms; 1980	CEOs with production and marketing backgrounds have a greater tendency to pursue internal diversification than acquisitive diversification. For CEOs with finance, accounting, and law experience, the opposite is true.	E

Roll (1986) JOB	UET	CEO	Hubris	Acquisitions	NA	On average, decision makers in acquiring firms pay too much for their targets.	T
Miller & Toulouse (1986) MS	UET	CEO	CEO personality; firm size and environmental dynamism	R&D innovation; advertising intensity; prestige pricing	97 Quebec firms	CEO flexibility is associated with risk-embracing decision making. CEO need for achievement is related to broadly focused and marketing-oriented strategies. CEOs with an internal locus of control pursue more product innovation and are more future-oriented. The relationships are moderated by firm size and environmental dynamism.	E
Chaganti & Sambharya (1987) SMJ	UET	CEO	CEO outsider, functional background	Strategic orientation	3 tobacco companies	Greater outsider orientation in Prospectors than in Defenders and Analyzers; greater marketing orientation in Prospectors than in Analyzers; greater R&D and production orientation and less finance orientation in Prospectors than in Defenders.	E
Bantel & Jackson (1989) SMJ	UET	Managers	TMT education level, functional heterogeneity	Innovation	460 midwestern banks	More innovative banks are managed by more educated teams that are diverse in their functional areas.	E
Hambrick & Fukutomi (1991) AMR	UET	CEO	CEO tenure	Experimentation and then inertia	NA	CEOs experiment early in their tenure but increasingly commit to select themes and become inertial.	T
Miller (1991) MS	UET	CEO	CEO tenure	Strategic maladaptation	95 Quebec firms	Match (adaptation) of strategy to environment is less likely for long-tenured CEOs, which leads to poorer performance.	E
Thomas, Litschert, & Ramaswamy (1991) SMJ	UET	CEO	CEO firm and position tenure, age, functional backgrounds, education	Strategic orientation	224 electronic computing firms	CEOs of Prospectors are younger, shorter tenured in both the company and position and more educated than those in Defenders. Prospector firms are more likely to be led by CEOs with backgrounds in output functions, while Defender firms have a greater proportion of CEOs with backgrounds in throughput functions; market-oriented firms led by Prospector-profiled CEOs achieve superior performance outcomes.	E
Grimm & Smith (1991) SMJ	UET	Managers	Manager age, firm and industry tenure, years of education	Strategic change	855 managers in 27 railroad firms; 1977-1985	Younger managers and those with less experience are more likely to change their strategies with shifting environmental conditions.	E
Barr, Stimpert, & Huff (1992) SMJ	UET, cognition	TMT	Attention to and interpretation of environmental change	Organizational renewal	Matched pair of railroad firms	Organizational renewal depends on that ability to associate environmental change with firm strategy and to modify that association over time.	E
Finkelstein (1992) AMJ	UET	Managers	Financial background; managerial power	Diversification, acquisitions	1763 managers in 102 firms; 1978-1982	The unweighted and the power-weighted measures of the proportion of top team members with finance backgrounds are positively related to the number of SIC codes (unweighted measure marginally significant); power-weighted measures increase the cost of acquisitions (ownership power marginally significant). Finance backgrounds are not significantly related to the total number of acquisitions made.	E
Wiersema & Bantel (1992) AMJ	UET	Managers	TMT age, firm and team tenure, and education	Strategic change	100 firms; 1980	Corporate strategic change is positively associated with TMTs with lower average age, shorter firm tenure, greater team tenure, higher educational level, higher educational specialization heterogeneity, and greater academic	E

						training in the sciences.	
Thomas, Clark, & Gioia (1993) AMJ	UET	CEO	Executive's industry and firm tenure	Leadership and strategic commitment to status quo (CSQ)	690 firms; 1988	Executive industry tenure is positively related to both types of CSQ.	E
Sambharya (1996) SMJ	UET	Managers	TMT international experience	International diversification	54 manufacturing firms; 1985	TMTs with a higher mean, greater heterogeneity, and a higher proportion of managers with foreign experience increase international involvement.	E
West & Anderson (1996) JAP	UET	Managers	TMT innovators proportion, team size, support for innovation	Radicalness of innovation	27 hospital TMTs	Team size and proportion of innovators increase innovation radicalness; team support for innovation increases novelty.	E
Geletkanycz (1997) SMJ	UET	Managers	Cultural value	Leadership and strategic commitment to status quo (CSQ)	1540 executives from 20 countries	Values of individualism, uncertainty avoidance, power distance, and long-term orientation are significantly related to executives' adherence to existing strategy and leadership profiles.	E
Hayward & Hambrick (1997) ASQ	UET	CEO	Hubris	Acquisition premium	106 firm pairs; 1989-1992	CEO hubris raises acquisition premiums, which is further strengthened by weaker board vigilance and poorer performance.	E
Boeker (1997) AMJ	UET	CEO; Managers	CEO tenure, TMT tenure length and heterogeneity Firm performance	Strategic change	67 semiconductor firms; 1978-1992	Poor performance, long CEO and TMT tenures, and high diversity in TMT tenure are related to greater levels of strategic change. Poor performance magnifies the effect of managerial characteristics on strategic change.	E
Boeker (1997) ASQ	UET	CEO; Managers	CEO functional background, rank at prior firm, industry tenure, prior firm size; TMT tenure length, heterogeneity, and size	New product market entry	67 semiconductor firms; 1978-1992	The effects of executive migration on product-market entry are stronger when the new managers come from the functions of R&D and engineering, when they report to the CEO in their former organization, and when they have greater industry experience. Smaller TMTs and TMTs with shorter tenures show a stronger relationship between executive migration and strategic change.	E
Reuber & Fischer (1997) JIBS	UET	Managers	TMT international experience	Use of foreign strategic partners; speed in obtaining foreign sales after start-up	132 Canadian software firms	Internationally experienced TMTs have a greater propensity to develop foreign strategic partners and to delay less in obtaining foreign sales after start-up, leading to a higher degree of internationalization.	E
Geletkanycz & Hambrick (1997) ASQ	UET	Managers	Intraindustry and extraindustry ties	Strategic deviance	30 food and computer firms; 1983-1987	Executives' intraindustry ties are related to strategic conformity; extraindustry ties are related to strategic deviance and alignment of executives' external ties with the informational requirements of the firm's strategy enhances organizational performance. A unique strategy is not universally advantageous, and the benefits accruing from strategic conformity are especially strong in the more uncertain industry (computer).	E

Barr (1998) OS	UET, cognition	TMT	Managerial interpretations of unfamiliar environmental events and firm activities	Strategic change	6 US pharmaceutical firms, Forbes' list of 1962	Significant strategic changes do not occur until a fully processed, well-defined interpretation of the event appears in the cognitive maps. The strategic response to unfamiliar events is a product of cycling back and forth between interpretation and action.	E
Tihanyi, Ellstrand, Daily, & Dalton (2000) JOM	UET	Managers	TMT age, tenure, education, international experience, tenure heterogeneity	International diversification	126 electronics firms; 1986-1988	Lower average age, greater average tenure, greater average elite education, greater average international experience, and greater tenure heterogeneity of the TMT lead to firm international diversification.	E
Gordon, Stewart, Sweo, & Luker (2000) JOM	UET; Org. Learning; Evolutionary view	Managers	CEO turnover and TMT turnover and heterogeneity	Strategic reorientation	75 software and 45 furniture firms; 1987-1993	TMT turnover leads to greater strategic reorientation, but heterogeneity does not.	E
Miller & Shamsie (2001) SMJ	UET	CEO	CEO tenure	Product line experimentation	Film studios; 1936-1965	Product line experimentation declines over the course of CEO tenures; there is an inverse U-shaped relationship between CEO tenure and an organization's financial performance; product line experimentation is more likely to benefit financial performance late in CEOs' tenures.	E
Palmer & Barber (2001) ASQ	UET; Social class theory	CEO	CEO background, education, social membership; religion; number of BOD seats	Diversifying acquisitions	461 firms; 1962	Jewish CEOs, CEOs with social register/ elite schooling, finance background, exclusive social club membership, sent interlocks, elite MBA degrees, and ownership have a greater tendency to engage in diversifying acquisitions.	E
Geletkanycz & Black (2001) JOM	UET	Managers	Manager functional background, functional diversity, MBA degree	Commitment to status quo (CSQ)	1540 managers from 20 countries	Experience in finance, marketing, law, and general management increases CSQ; Functional diversity decreases CSQ, and MBA education is unrelated to CSQ and does not significantly attenuate the narrowing effects of functional specialization.	E
Barker & Mueller (2002) MS	UET	CEO	CEO tenure, age, functional background, education	R&D intensity	172 firms; 1989-1990	R&D spending is greater at firms where CEOs are younger, have greater wealth invested in firm stock and greater experience in marketing and/or engineering/R&D; a CEO's formal education has no significant association with R&D spending once a CEO has attained a college degree; R&D spending increases when CEOs have advanced science-related degrees; CEO effects on relative R&D spending increase with longer CEO tenure.	E
Ferrier, Fhionnlaioich, Smith, & Grimm (2002) MDS	UET; PT; Threat rigidity	Managers	TMT heterogeneity, performance distress	Competitive aggressiveness	Leading firms in their industries	Performance-distressed firms managed by heterogeneous TMTs are less likely to compete aggressively.	E
Kaplan, Murray, & Henderson (2003) ICC	UET, cognition	TMT	TMT mental model (recognition of technological revolution)	Strategic response to technology revolution	15 US and UK pharmaceutical firms, 1973-1988	TMT recognition of environmental discontinuities shapes established firms' response to technological discontinuities.	E

Simon & Houghton (2003) AMJ	UET	CEO	Overconfidence	Pioneering vs. incremental product intro.	135 small computer firms	Overconfidence increases the degree to which product introductions are pioneering (risky). Furthermore, managers introducing pioneering products are more likely to express extreme certainty about achieving success, but these products are less likely to be successful.	E
Peterson, Smith, Martorana, & Owens (2003) JAP	UET; 5 Factors	Managers	CEO openness to experience	TMT risk taking/aversion	17 CEOs from 9 firms	CEO openness to experience increases TMT risk taking.	E
Bertrand & Schoar (2003) QJE	UET	CEO; Managers	MBA degree	Diversifying acquisitions; invst. to Tobin's Q ratio	600 Fortune 800 firms; 1969-1999	MBA experience increase the level of investment-to-Tobin's Q proportion and the number of diversifying acquisitions.	E
Strandholm, Kumar, & Subramanian (2004) JBR	UET	Managers	Risk-taking propensity, market orientation, firm tenure, industry experience, expertise in internal and external operations	Strategic maladaptation	187 Hospital managers	Top managers of organizations pursuing a market-focused approach are more likely to have a background in external (vs. operations) and have greater propensity for risk taking; yet, they have less industry experience. Firms that are able to align the perceived environmental change-strategic adaptation-and managerial characteristics show higher performance.	E
Jensen & Zajac (2004) SMJ	UET; AT	CEO	Finance background	Diversification, acquisitions	200 Fortune 500 firms	A 'finance' CEO engages more in related and unrelated diversification and acquisitions.	E
Hayward, Rindova, & Pollock (2004) SMJ	UET	CEO	CEO celebrity	Strategic inertia	NA	Distinctive actions are attributed to the CEO, hence creating CEO celebrity and overconfidence to commitment to past actions (strategic inertia).	T
Hiller & Hambrick (2005) SMJ	UET	CEO	Core self-evaluation (CSE)	Large-scale initiatives; strat. deviations and persistence	NA	CEO CSE is positively related to large-scale initiatives, strategic deviation, and strategic persistence.	T
Malmendier & Tate (2005a) JOF	UET	CEO	Overconfidence, firm cash flow	Sub-optimal investment in projects	477 firms; 1980-1994	Overconfident CEOs overinvest when they have abundant internal funds but curtail investment when they require external financing—investment of overconfident CEOs is significantly more responsive to cash flow, particularly in equity-dependent firms.	E
Malmendier & Tate (2005b) EFM	UET	CEO	Overconfidence; firm cash flow	CAPEX	477 firms; 1980-1994	Corroborated findings of Malmendier & Tate (2005a); alternative measures used.	E
Wu, Levitas, & Priem (2005) AMJ	UET	CEO	CEO tenure	Innovation	238 biotech firms; 1992-1996	CEO tenure has an inverted U-shaped effect on invention. Short-tenured CEOs engender more invention under highly dynamic technological environments, while long-tenured CEOs spur greater invention under more stable technologies.	E
Cho & Hambrick (2006) OS	UET	Managers	Change in TMT industry, tenure and functional characteristics, variable pay	Strategic change to entrepreneurial orientation	30 airlines; 1973-1986	Change in the proportion of output-function experience, industry tenure length and heterogeneity, functional heterogeneity, and equity-based pay in the TMT lead to entrepreneurial strategies.	E

Chatterjee & Hambrick (2007) ASQ	UET	CEO	Narcissism	Strategic dynamism, grandiosity, acquisition	111 hardware and software CEOs; 1992-2004	CEO narcissism increases strategic dynamism and grandiosity, as well as the number and size of acquisitions, and engenders extreme and fluctuating organizational performance.	E
Nadkarni & Barr (2008)	UET	TMT	Attention focus	Strategic response to change	24 aircraft, semiconductor, petrochemical, and cosmetic firms, 1970-1994	Top managers' attention and causal logics mediate the relationship between industry velocity and speed of strategic response to changes in the general and task sector.	E
Malmendier & Tate (2008) JFE	UET	CEO	Overconfidence, financing, diversification	Acquisitions	477 firms; 1980-1994	The odds of making an acquisition are 65% higher for overconfident CEOs. The effect is largest if the merger is diversifying and does not require external financing. The market reaction at merger announcement is significantly more negative than that for non-overconfident CEOs.	E
Eggers & Kaplan (2009) OS	UET	CEO	Attention to emerging technology	Adaptation to technical change	26 communications technology firms, 1976-2001	CEO attention to the emerging technology and the impacted industry is related to faster entry, while attention to existing technologies is related to slower progress.	E
Simsek, Heavey, & Veiga (2010) SMJ	UET	CEO	Core self-evaluation (CSE); Environmental dynamism	Entrepreneurial orientation	504 CEOs in Ireland	CEOs with higher CSE have a stronger positive influence on their firms' entrepreneurial orientation. This effect is magnified in firms facing dynamic environments but negligible in stable environments.	E
Li & Tang (2010) AMJ	UET	CEO	Hubris; managerial discretion	Investment in new, high-tech projects	2790 CEOs in Chinese manu. firms	CEO hubris leads to a greater likelihood of investment in new and high tech projects; this effect is stronger when CEO managerial discretion is stronger.	E
Nadkarni & Herrmann (2010) SMJ	UET	CEO	CEO's Big Five Personality dimensions	Strategic maladaptation	195 CEOs in BPO firms	CEO Conscientiousness decreases strategic flexibility; Emotional stability, Extraversion, and Openness increase flexibility; Agreeableness has an inverted-U effect on flexibility. Strategic flexibility mediates the effect of personality on firm performance.	E
Delgado-Garcia & Fuente-Sabate (2010) SMJ	UET	CEO	CEOs' affective traits (positive vs. negative)	Strategic deviation	51 CEOs of Spanish banks	CEOs' negative affective traits are related to more conformist strategies and more typical performance, whereas positive affective traits lead to outcomes that deviate from the central tendencies of the industry. Strategic conformity mediates the relationship between CEO negative affective traits and typical performance.	E
Wowak & Hambrick (2010) SMJ	UET; AT	CEO	Pay-person interaction (materialism, regulatory focus, self-efficacy); stock option pay	Managerial risk taking	NA	An executive's materialism strengthens the positive association between stock option pay and risk-taking behaviors. The positive association between stock option pay and risk taking will be seen only when an executive has a more moderate or malleable orientation rather than either a strong promotion focus or a strong prevention focus. With low self-efficacy, stock options will have little to no effect on risk taking, but with at least moderate self-efficacy,	T



						the higher the executive's self-efficacy, the positive association between stock option pay and risk taking will be stronger.	
Chatterjee & Hambrick (2011) ASQ	UET	CEO	Narcissism, Capability cues (objective performance, social media praise)	Acquisition premiums; risky outlays	CEOs of US firms; 1992-2006; CEOs of acquiring firms; 2001-2008	Capability cues generally impact CEO risk taking, but highly narcissistic CEOs are much less responsive to recent objective performance than their less narcissistic peers. By contrast, highly narcissistic CEOs are especially bolstered by social praise.	E
Tang, Crossan, & Rowe (2011) JMS	UET	CEO	CEO dominance	Strategic deviance	51 computer firms; 1997-2003	Dominant CEOs tend to pursue strategy deviance from the industry central tendency and thus extreme performance (either big wins or big losses). Powerful boards weaken dominant CEOs' tendency toward extremeness and elevate the likelihood that dominant CEOs have big wins versus big losses.	E
Kwee, Van Den Bosch, & Volberda (2011) JMS	UET	Managers	TMT corporate governance orientation; geo. distribution of shareholders	Strategic renewal (exploitative and external-growth actions)	Royal Dutch Shell	Top managers having an Anglo-Saxon corporate governance orientation are more likely to pursue exploitative and external-growth strategic renewal trajectories, while those having a Rhine corporate governance orientation are more likely to pursue exploratory and internal-growth strategic renewal trajectories. The proportion of shareholders from the Anglo-Saxon countries positively moderates exploitative and external-growth strategic renewal trajectories.	E
Troy, Smith, & Domino (2011) SO	UET	CEO	CEO age, functional experience, business degree, stock options	Accounting fraud	312 firms; 1992-2005	Younger, functionally less experienced CEOs and CEOs with no business degrees have a greater tendency to rationalize accounting fraud as acceptable decisions. CEOs' stock options also increase this tendency, but this effect is not moderated by demographic indicators.	E
Tang, Li, & Yang (2012) JOM	UET	CEO	Hubris Environmental munificence and complexity	Innovation	2820 CEOs in Chinese manu. firms	CEO hubris leads to greater innovation; this effect is weaker in more munificent and complex industries.	E
Lewellyn & Muller-Kahle (2012) CGIR	UET; AT	CEO	CEO power (tenure, outsider directorships)	Subprime lending	74 matched firms; 1997-2005	CEO tenure and outside directorships increase the likelihood of specialization in subprime lending.	E
Quigley & Hambrick (2012) SMJ	UET	CEO	CEO retention as board chair after exit	Resource reallocation; acquisition, divestiture, TMT change	Hardware, software and electronics firms; 1994-2006	CEO retention as chair decreases resource reallocation, divestitures, and TMT member change.	E
Souder, Simsek, & Johnson (2012) SMJ	UET; AT	CEO	CEO tenure; founder status; market complexity	Market expansion	US cable TV firms; 1972-1996	Market expansion follows an inverted U-shape for agents and a downward slope for founders, while market complexity reduces market expansion, especially for founders.	E
Cao, Simsek, Jansen (2012) JOM	UET	CEO	Social capital, environmental instability	Entrepreneurial orientation	122 high-tech firms in China	The CEO's bonding social capital with organizational members from various functional units has an inverted U-shaped effect on EO, while the CEO's bridging social capital with the firm's diverse set of external stakeholders has a positive effect on EO. The relationship between CEO bridging social	E

						capital and EO becomes stronger as the firm's environmental instability increases.	
Gerstner, König, Enders, & Hambrick (2013) ASQ	UET	CEO	Narcissism, Audience engagement	Adoption of a discontinuous technology	72 CEOs from 33 pharma firms; 1980-2008	CEO narcissism increases the likelihood of adopting a discontinuous technology, which is more likely when the audience is more engaged.	E
Nadkarni & Chen (2014) AMJ	UET	CEO	Temporal focus	New product introduction	221 firms in 19 industries, 1996-2003	In stable (dynamic) environments, new products are launched faster in firms run by CEOs with high (low) past focus, high present focus, and low (high) future focus.	E
Christensen, Dhaliwal, Boivie, & Graffin (2014) SMJ	UET	Managers	Political orientation	Tax avoidance	All executives; 1992-2008	Firms with top executives who lean toward the Republican Party actually engage in less tax avoidance (argued as corporate risk taking) than firms whose executives lean toward the Democratic Party.	E
Kraiczy, Hack, & Kellermanns (2015) JPIM	UET; SEW	CEO	CEO risk-taking propensity, TMT family member ownership and control	Product portfolio innovativeness	114 CEOs of German manufacturing firms	CEO risk-taking propensity has a positive effect on new product portfolio innovativeness. The relationship between CEO risk taking propensity and new product portfolio innovativeness is weaker if levels of ownership by TMT family members are high (high SEW). Furthermore, the effect of CEO risk-taking propensity on new product portfolio innovativeness is stronger in family firms at earlier generational stages (high SEW).	E
Crossland, Zyung, Hiller, & Hambrick (2014) AMJ	UET	CEO	Career variety	Strategic dynamism and deviance	183 Fortune 250 CEOs; 1999-2005	Career variety positively relates to strategic dynamism and deviation.	E
Seo, Gamache, Devers, & Carpenter (2014) SMJ	UET	CEO	CEO negative standing (status)	Acquisitions	1468 firms; 1996-2008	CEOs with negative relative pay standing status (underpay) engage in greater acquisitions; when these CEOs acquire, they tend to finance those acquisitions more heavily with stock than cash. Acquisition activity partially mediates the influence of CEO negative relative pay standing on subsequent CEO compensation increases; however, that pay increase comes primarily in the form of long-term incentive pay.	E
Nadolska & Barkema (2014) SMJ	UET; Org. Learning	Managers	TMT acquisition experience, tenure diversity, educational diversity	Acquisitions	All Amsterdam SE firms; 1993	TMT acquisition experience increases the number of international acquisitions, and this is weakened by the educational diversity of the team.	E
Gamache, McNamara, Mannor, & Johnson (2015)	UET	CEO	Regulatory focus (promotion vs. prevention)	Acquisitions	512 firms; 1997-2006	CEO promotion (prevention) focus is positively (negatively) associated with the quantity and scale of acquisitions. The independent effect of prevention focus is reversed when more stock options are granted.	E

\*E: Empirical; T: Theoretical; X: Experimental

Figure 1

# Theoretical Framework of Managerial Risk Taking

