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DEVIANT VERSUS ASPIRATIONAL RISK TAKING: THE EFFECTS OF PERFORMANCE FEEDBACK ON BRIBERY EXPENDITURE AND R&D INTENSITY

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Combining the theses of "problemistic search" and "slack search," past research in the behavioral theory of the firm suggests that both low- and high-performing firms may engage in the same type of risk-taking activity. We counter this view with a consistent, motivation-based logic in the theory: low-performing firms are fixated on finding short-term solutions to immediate problems, so they have an increased probability of exhibiting deviant risk-taking behavior such as bribery, whereas high-performing firms are concerned about sustaining their competitive advantage in the long run and will more likely engage in aspirational risk taking such as research and development (R&D). Using a sample of 9,633 firm-year observations covering 2,224 listed companies in China, we find that, as a firm's performance falls further below its aspiration level, it has larger abnormal entertainment spending, an implicit measure of bribery expenditure, but not higher R&D intensity. However, as a firm's performance rises further above its aspiration level, it has greater R&D intensity, but not more bribery expenses. Legal development and industry competition moderate the relationship between performance feedback and risk-taking behavior.

Do low- and high-performing firms differ in their risk-taking behavior? Researchers in the behavioral theory of the firm (BTOF) have long examined firms' risk-taking behavior as a response to performance feedback (Argote & Greve, 2007; Bromiley, 1991; Cyert & March, 1963; Ref & Shapira, 2017). According to the BTOF, decision-makers use a particular aspiration level as a reference point to evaluate performance. When performance falls below the aspiration level, the firm is motivated to initiate problemistic search for solutions, and it becomes increasingly risk prone. When performance rises above the aspiration level, the firm has excess resource capacity to start slack search and again becomes risk-seeking (Cyert & March, 1963; Levinthal & March, 1981; March, 1988; March & Shapira, 1987). Combining the theses of "problemistic search" and "slack search," one would expect that both the lowest- and highest-performing firms engage in the same type of risk-taking activity (Chen & Miller, 2007; Cho, Arthurs, Townsend, Miller, & Barden, 2016; Chrisman & Patel, 2012; Joseph, Klingebiel, & Wilson, 2016).

There are two issues with making such a generalization. First, the theoretical logics used are not consistent. Whereas the problemistic search argument emphasizes firms' *motivation* for risk taking, the slack search argument stresses the *capacity* for risk taking. Extant research has often employed the former to examine the effect of negative performance feedback on a particular risk-taking activity and relies on the latter to develop the association between positive performance feedback and the same risk-taking activity. For instance, some researchers argue that, when firms' performance falls, they will increase acquisition or research and development (R&D) activities as a problemistic search effort (Chen & Miller, 2007; Iyer & Miller, 2008), and, when performance rises, firms will engage in the same

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activities in slack search because higher performance translates into more accumulated resources (Chen & Miller, 2007; Kuusela, Keil, & Maula, 2017; O'Brien & David, 2014). If a consistent theoretical logic were employed, however, the conclusion would be different. For example, from the perspective of slack resources, neither acquisition nor R&D would be a preferred option when a firm's performance is declining (Kuusela et al., 2017).

Second, such generalization is at odds with existing management and strategy theories: low- and high-performing firms differ widely in their motivations and capacities, and they are expected to exhibit different strategies and behaviors (e.g., Chen, 1996; Hamel & Prahalad, 1989). Even though some of them may have similar propensities for risk taking, it is unlikely they will engage in the same specific kind of risk-taking activity given cross-firm differences. Recent research in the BTOF finds that, among firms with below-average performance, relatively lower- and higher-performing firms take opposing strategic actions (Kuusela et al., 2017). It is quite possible that, along the whole performance spectrum, low- and high-performing firms will focus on different types of risk taking that suit their respective objectives and situations.

We aim to resolve these issues and make several important contributions to the BTOF. Our first intended contribution is to construct a more coherent framework in the BTOF by using a consistent motivation-based logic to examine the effects of both negative and positive performance feedback on risk taking. We rely on a motivation logic instead of a capacity logic because motivation plays a prominent role in the BTOF, as well as in other seminal works in the Carnegie School tradition, of which Cyert and March (1963) are a part (Gavetti, Greve, Levinthal, & Ocasio, 2012; Gavetti, Levinthal, & Ocasio, 2007); in contrast, the slack resources explanation is more proximate to standard economic theories. Despite its centrality to the BTOF (Argote & Greve, 2007; Mahoney, 2005), the motivation logic has not been used consistently in extant research for examining risk taking by both low- and high-performing firms.

Our second intended contribution is to better specify the relationships between performance feedback and risk-taking behaviors, by examining two contrasting types of risk taking—deviant and aspirational—as a response to negative and positive feedback, respectively. "Deviant risk taking" refers to risky undertakings with illegal and/or unethical actions; examples include financial misrepresentation (Harris & Bromiley, 2007), corporate illegality (Mishina, Dykes, Block, & Pollock, 2010), and bribery (Martin, Cullen, Johnson, & Parboteeah, 2007). "Aspirational risk taking" refers to risky actions taken by a firm to sustain its competitive advantage and fulfill its long-term aspirations; examples include acquisitions (Iyer & Miller, 2008), fixed-asset investments (Martin, Wiseman, & Gomez-Mejia, 2016), and R&D (Hoskisson, Hitt, & Hill, 1993).

We focus on bribery and R&D as examples of deviant and aspirational risk taking, respectively. Black's Law Dictionary (Black, 1910) defines "bribery" as the offering or receiving of any undue reward to influence the actions of an official or other person in charge of a public or legal duty. Although bribery includes corruptive behavior between private parties, as in the case of commercial bribery (Coase, 1979; Husted, 1999), it is most commonly associated with government corruption (Shleifer & Vishny, 1993; Svensson, 2003). Compared with other deviant behaviors, such as financial misrepresentation or fraud, bribery causes greater damage to society because it not only undermines social welfare and moral values but also jeopardizes institutions (Transparency International, 2016). R&D is essential for developing firms' innovative capability and long-term competitive advantage (Bushee, 1998; Zhou, Gao, & Zhao, 2017). Prior research in the BTOF has related R&D to both low and high performance levels (Chen & Miller, 2007; O'Brien & David, 2014), but it is paradoxical to treat R&D activity as both a remedy for performance shortfalls and a result of high achievements.

Extending the motivation logic to the entire performance spectrum, we argue that low and high performance motivates bribery and R&D differently. The greater the performance shortfall under the aspiration level, the more likely the firm will take deviant actions such as bribery in its eagerness to restore its performance to the aspiration level. In contrast, the greater the performance gap exceeding the aspiration level, the more motivated the firm will be to focus on future-oriented activity such as R&D to sustain its advantage. A firm will not normally initiate both kinds of activities (Birhanu, Gambardella, & Valentini, 2016; Bushee, 1998). This line of reasoning allows us to generate differential, and hence more precise, predictions about the relationship between performance relative to aspirations and risk-taking behaviors.

Our third intended contribution is to present a more complete picture of the relationship between firm performance and risk taking by revealing the moderating role of the environment for this

relationship. When considering boundary conditions, the BTOF-based research has mainly taken organizational characteristics as moderators in empirical studies (Desai, 2016; Joseph et al., 2016) but paid limited attention to environmental factors (see Hoskisson, Chirico, Zyung, & Gambeta, 2017, for a review). We suggest that the development of legal institutions and the level of industry competition influence the motivation effects of both negative and positive performance feedback on bribery and R&D, respectively. Incorporating these environmental factors into its framework will make the BTOF more complete.

The empirical context of our study is Chinese firms listed on the Shanghai and Shenzhen Stock Exchanges during the period 2007–2013. Extant research in the BTOF has rarely examined firms' risk-taking behavior in emerging economies, which feature less developed legal institutions, wider institutional variations, and more prevalent corruption behavior than developed economies (Chan, Makino, & Isobe, 2010; Transparency International, 2016). China is an appropriate context for our study because the powerful influence of the Chinese government on economic activities makes bribery and corruption a salient issue; meanwhile, Chinese firms are also motivated to innovate under competitive pressures (Zhou et al., 2017). Given its wide range of subnational institutional and industry variations (Chan et al., 2010; Chang & Xu, 2008), China offers a rich context in which to investigate both deviant and aspirational risk-taking behaviors.

THEORY AND HYPOTHESES

Performance Relative to Aspirations and Risk Taking

The concepts of aspirations, performance feedback, and search behavior are integral elements of the BTOF (Argote & Greve, 2007). The aspiration level serves as a key reference point for evaluating firms' performance by providing a simple, discrete measure of success or failure: performance below the aspiration level is, subjectively, equated with failure, while performance above the aspiration level signals success (Cyert & March, 1963; March & Simon, 1958). Performance can be evaluated against a firm's social aspiration—namely, the performance level of its peers—or against its historical aspiration, which is its own past performance level (Baum & Dahlin, 2007; Greve, 1998; Kuusela et al., 2017; Levinthal & March, 1981). When performance falls below the aspiration level, problemistic search occurs: the firm starts to look for solutions to the problem (Cyert & March, 1963; March, 1988). A general thesis is that the greater the performance gap below the aspiration level, the more motivated the firm is to engage in risk taking. Empirical research has applied this relationship to various forms of risks and firm actions, including R&D and innovation (Bolton, 1993; Chen, 2008; Chen & Miller, 2007; Greve, 2003), acquisition and divestment (Desai, 2016; Iyer & Miller, 2008; Kuusela et al., 2017), business expansion (Audia & Greve, 2006), new product introduction (Greve, 1998), new market position (Joseph & Gaba, 2015), and financial misrepresentation (Harris & Bromiley, 2007).

Meanwhile, another element of the BTOF points to a contrary relationship: firms with high performance and slack resources are more likely to engage in risk taking and experiment with new practices and changes (Levinthal & March, 1981; March, 1981). As performance exceeds the aspiration level, slack accumulates, which leads to reduced conflict and increased innovativeness (Argote & Greve, 2007; Baum, Rowley, Shipilov, & Chuang, 2005; Levinthal & March, 1981). Although this second search behavior is referred to as "slack search," researchers are not unanimous on the predictor variable: some use slack resources as a predictor (Chen, 2008; Greve, 2003; Iyer & Miller, 2008; Martin et al., 2016), whereas others use performance above aspirations and equate it to slack resources (Eggers & Kaul, 2018; Miller & Chen, 2004; O'Brien & David, 2014; Ref & Shapira, 2017). There are also researchers who use both performance and slack resources while making the same capacity-based argument (e.g., Chen & Miller, 2007; Souder & Bromiley, 2012). Generally, empirical results conform to the slack search prediction that high performance facilitates risk taking.

Although both are considered part of the BTOF, problemistic search and slack search are two separate theses, because their logics—motivation versus capacity—are different. Problemistic search features prominently in the original book by Cyert and March (1963: 116) and is one of the "major concepts" of the BTOF. Limited by the cognitive bounds of managers, problemistic search is motivated, simple minded, and biased (Cyert & March, 1963). Motivation underlies all the foundational works of the Carnegie School, particularly March and Simon (1958) and Cyert and March (1963) (Gavetti et al., 2007). The general contention is that search behavior is motivated by the goal to surpass the aspiration level and prompted by dissatisfaction with underperformance

(March & Simon, 1958; Simon, 1964). Cyert and March (1963) elevated this model to the firm level to make it a theory of firms' search behavior (Mahoney, 2005). Slack search, in contrast, emphasizes the resource capacity for search (Levinthal & March, 1981). Resource capacity is one of the major constraints on managerial behavior recognized by "traditional" or "classical" organization theories prior to the Carnegie School (March & Simon, 1958: 34, 35), and the slack search thesis is often linked to other economics-based theories such as the resource-based view (Pitelis, 2007; Ref & Shapira, 2017).

Despite their unequal presence in the original theory, later research in the BTOF often combines problemistic search and slack search arguments and extends them to risk-taking orientations along an entire performance spectrum (Chen & Miller, 2007; Cho et al., 2016; O'Brien & David, 2014). When applied to bribery and R&D—the focal risk-taking behaviors in this study—a direct interpretation seems to be that firms with the lowest and highest performance levels are most likely to bribe and also most likely to engage in R&D. However, this interpretation of the BTOF involves combined but inconsistent application of the theory's two components: motivation-based problemistic search and capacity-based slack search. The motivation logic is used for the scenario of falling, but not rising, performance (Chen, 2008; Harris & Bromiley, 2007), whereas the capacity logic is used mostly with rising, but not falling, performance (Chen & Miller, 2007; Greve, 2003).

We propose two solutions for determining the precise relationship between performance feedback and risk taking. First, we need to use a consistent logic within the BTOF when making theoretical predictions. Between the two theses on search behavior in the BTOF, slack search has mainly been used for the scenario of above-aspiration performance. Although this logic tells us whether or not a firm *can* take risks, it does not tell us *why* a firm takes risks (Pitelis, 2007). For instance, instead of committing slack financial resources to risky R&D projects, a firm could spend these resources on short-term, fixed-income investments to maintain liquidity, or could simply return the money to investors by issuing dividends. Other researchers have applied this resource-related argument to the scenario of below-aspiration performance, suggesting that falling performance increases resource constraints and thus reduces risk-taking activity, especially as a firm approaches bankruptcy (Miller & Chen, 2004; Ref & Shapira, 2017). Yet, as some studies have shown, low-performing firms may still have the slack necessary for executing a resource-consuming strategy (Kuusela et al., 2017; Salge, 2011). Examples include Chinese state-owned enterprises (SOEs) with a "soft budget constraint"—continuous resource support from the government despite failure (Lin & Tan, 1999: 426)—and other "permanently failing organizations" that never die (Meyer & Zucker, 1989). Thus, when both low- and high-performance scenarios are involved, it is better to examine the relationship between performance feedback and risk taking from the motivation logic in the BTOF rather than the capacity logic.

Second, we also need to consider the different types of risk taking. Not all risk-taking activities are alike: some are short-term oriented and problem driven, such as bribery; some are long-term oriented and aspirational, such as R&D. In a recent study, Birhanu et al. (2016) contrasted bribery and investments in fixed assets. They suggested that bribery as a nonmarket strategy substitutes for long-term investments. Meanwhile, research also finds a trade-off between maintaining R&D and meeting short-term earnings targets (Bushee, 1998). Thus, bribery and R&D are very different risk-taking orientations. The former represents myopic search behavior and provides a short-term solution to the firm's immediate problems (Harris & Bromiley, 2007; Lehman & Ramanujam, 2009; Martin et al., 2007); the latter is aimed at strengthening the firm's current leadership position and building long-term capabilities (Flammer & Bansal, 2017; Gentry & Shen, 2013; Hoskisson et al., 1993). It is unlikely that a firm will engage in both types of risk taking simultaneously.

The Differential Effects of Performance Feedback on Bribery and R&D

Whereas the original BTOF provides a motivation-based logic for risk taking in a situation of performance below aspirations, we extend this logic to risk taking with performance above aspirations and argue that low and high performance levels motivate the two risk-taking activities, bribery and R&D, respectively. We discuss these motivation effects in the following four scenarios.

Performance below aspirations and bribery. Performance that falls below the aspiration level translates into problems for the firm and triggers problemistic search. As firms whose performance falls below their aspirations are fixated on reaching the aspiration level, problemistic search becomes myopic and is aimed at solving the immediate

problem (Argote & Greve, 2007). The further performance falls, the more anxious the firm becomes to reach the aspiration level by taking higher risks (Audia & Greve, 2006; Desai, 2016; Iyer & Miller, 2008).

Firms do not normally want to engage in illegal or unethical activities. Legality and morality are important behavioral constraints on most firms (Cuervo-Cazurra, 2006; Jeong & Weiner, 2012; Robertson & Watson, 2004; van Oosterhout, Heugens, & Kaptein, 2006). However, deteriorating performance may cause strain for managers and pressure them to adopt any means that might help meet their financial objectives (Greve, Palmer, & Pozner, 2010; Martin et al., 2007; Zahra, Priem, & Rasheed, 2005). Because some illegal or unethical actions can increase the chances of achieving positive business outcomes by putting competitors or other parties in a disadvantaged position, they may become a choice for firms that are experiencing the strain and hope to improve their situation, even though such actions can cause negative consequences for other firms and society (Harris & Bromiley, 2007; Lehman & Ramanujam, 2009). The firms with the poorest performance will likely feel the greatest strain and therefore take the highest risk, because only drastic actions can possibly restore their standing and help them reach their aspiration level. As bribery provides a quick, short-term solution for firms' problems by securing favorable treatment from officials and other people in power (Birhanu et al., 2016; Martin et al., 2007), it becomes an attractive option for low-performing firms, even though it carries high legal and legitimacy risks for the firm and its managers.

Performance above aspirations and bribery. As performance rises above the aspiration level, there is no longer strong motivation for the firm to solve immediate problems (Levinthal & March, 1981). Although bribery can still benefit the firm financially, there is no strain, because performance feedback is positive. Thus, managers can adhere to the conventional legal and moral standards, and they can consider all risks of an action that may impact the firm's future in both financial and social terms. For an action that may have both financial and social consequences, the firm must consider whether it is worthwhile to take the legal and ethical risks. Higher performance often brings higher reputation, and reputable companies are often under closer scrutiny by stakeholders (Briscoe & Safford, 2008) and thus attract greater public attention for their wrongdoing (Rhee & Haunschild, 2006). A negative event in a successful company is associated with a greater violation of stakeholders' high expectations than a similar event in an average firm (Zavyalova, Pfarrer, Reger, & Hubbard, 2016). Such a violation can lead to long-lasting criticism and suspicion of a firm's overall ethical integrity, and it requires extra impression management to repair the damage (Bansal & Clelland, 2004). Thus, considering both the possible financial benefits and social consequences of bribery, there is not likely to be a clear, significant relationship between performance and bribery when performance is above the aspiration level.

Performance below aspirations and R&D. In contrast to bribery, R&D is a long-term-oriented, aspirational risk-taking activity (Flammer & Bansal, 2017; Hoskisson & Hitt, 1988; Hoskisson et al., 1993). R&D projects typically take long cycles and require continued financial support (Cuervo-Cazurra & Un, 2010); they are therefore not suitable for addressing the immediate problems faced by a firm with deteriorating performance. Although prior research in BTOF often relates R&D activity to declining performance (Chen, 2008; Greve, 2003), and indeed some ambitious firms are committed to R&D in the aftermath of a temporary performance setback and eventually are able to achieve success in reviving the firm, such instances are not common. Facing poor performance, other firms may lack the motivation for R&D spending; instead, managers will cut R&D expenses following deteriorating financial results, because they are anxious to meet profit targets and remedy the balance sheet, even though this may compromise the firm's long-term competitive advantage (Bushee, 1998; Gentry & Shen, 2013). Thus, performance and R&D are unlikely to have an unequivocal, significant correlation when a firm's performance is below its aspiration level.

Performance above aspirations and R&D. Motivation not only explains problemistic search but also drives search behavior when the problem is solved, because managerial search behavior is "adaptive motivated behavior" (March & Simon, 1958: 49): goals are adapted as firm performance varies. When performance rises above the aspiration level, managers are relieved from the pressures of addressing immediate problems and become motivated to focus on developing durable, proprietary assets and ensuring the long-run viability of the firm (O'Brien & David, 2014; Souder & Bromiley, 2012). Thus, in contrast to low performers, market leaders have a high incentive to engage in product development and increase spending on R&D (Robinson & Chiang, 2002). The higher the performance achieved, the more confident managers are about their market

position and growth path. Consequently, they become more aspirational and are likely to engage more intensively in forward-looking activities to ensure further growth and expansion (Birhanu et al., 2016). R&D is widely considered a critical factor for cultivating absorptive capacity (Cohen & Levinthal, 1990) and developing capabilities (Dutta, Narasimhan, & Rajiv, 2005). Most importantly, R&D represents a "tradeoff between future benefit and riskiness" (Eberhart, Maxwell, & Siddique, 2008: 27); the positive effect of R&D on a firm's competitive advantage is best shown over the long run, in a period of five to 10 years (Franko, 1989), making it an attractive option to firms that have already excelled.

Summarizing the above scenarios, we propose two hypotheses:

Hypothesis 1. When a firm's performance is below its aspiration level, there is a negative relationship between performance and bribery.

Hypothesis 2. When a firm's performance is above its aspiration level, there is a positive relationship between performance and R&D.

The Moderating Roles of Institutional and Industry Environments

While we see performance feedback as the primary determinant of risk taking, there may be boundary conditions that influence this relationship. Factors contributing to managerial risk taking can be classified into two categories: organizational and environmental (Palmer & Wiseman, 1999). The BTOF-based studies have focused on organizational moderators, such as organizational inertia (Audia & Greve, 2006), firm structure (Joseph et al., 2016), and board characteristics (Desai, 2016). Yet, this research has largely overlooked environmental moderators (Hoskisson et al., 2017), which prevents a fuller understanding of the relationship between performance and risk taking.

We suggest that the environment should be considered as an important contextual factor for BTOF studies, because it impacts managers' cognitions of performance and risk, and hence their motivations for risk taking (Cho et al., 2016; Iriyama, Kishore, & Talukdar, 2016; Martin et al., 2007; Mishina et al., 2010). We introduce two environmental factors into our framework: (1) legal development and (2) industry competition. The development of legal institutions has direct implications for the containment of illegal behaviors such as bribery, as well as for the protection of intellectual property rights resulting from R&D activities. The level of competition can affect the perceived difficulty of reaching corporate goals and performance aspirations.

Legal development. Research on bribery and corruption highlights the importance of institutional environments in shaping firm behavior (Cuervo-Cazurra, 2006; Husted, 1999; Lee & Weng, 2013; Martin et al., 2007; Xie & Li, 2018). The intensity of bribery and corruption is heavily influenced by the development of legal institutions in a region. In places where the level of legal development is low, legal protection of corporate property and interests is ineffective, which encourages expropriation and corruption (Acemoglu & Johnson, 2005; La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 1998). In such an institutional environment, people who offer or accept bribes have higher chances of achieving their objectives and lower risks of being subject to prosecution (Jeong & Weiner, 2012; Spencer & Gomez, 2011). Thus, low-performing firms, which are already inclined to take risks, have stronger motivation to engage in bribery in the hope of changing their fortunes by colluding with people in power and taking advantage of other firms or individuals. In contrast, where legal development is high, it is not easy to violate other people's properties or interests even by using government power; with the help of due legal processes and capable legal professionals, both the bribe givers and bribe takers will likely be prosecuted once their crime is discovered (Cuervo-Cazurra, 2006; Zhu, 2017). Thus, even the worst-performing firms and the most desperate managers will find it fruitless to take such a risk.

For firms whose performance approximates their aspiration level, the effect of legal development should exhibit a similar pattern but not to the same magnitude. According to the BTOF, when their performance is adjacent to the aspiration point, firms are not motivated to take risks (Desai, 2016; Miller & Chen, 2004). For those firms, there is less need to increase bribery activity even if legal institutions are weak, and there is less room to reduce bribery activity even if legal institutions are strong.

Hypothesis 3a. When a firm's performance is below its aspiration level, legal development weakens the negative relationship between performance and bribery.

Legal development also impacts risk taking when performance rises above the aspiration level. Our theory predicts that high-performing firms are more likely to engage in aspirational risk taking such as R&D. Yet, whether a firm can actually reap the benefits of R&D depends on the legal environment in

which it is situated: only strong legal institutions can protect the intellectual properties created by firms, whereas underdeveloped legal institutions demotivate firms and prevent them from investing in proprietary capabilities (Delios & Henisz, 2000; La Porta, Lopez-De-Silanes, Shleifer, & Vishny, 2002; Peng & Heath, 1996; Varsakelis, 2001). The differential influences of strong versus weak legal institutions can exist not only between countries but also between regions within a country. For instance, it is well known that, in China, legal institutions are more mature in the coastal regions, and local governments in those regions are less likely to expropriate rents from firms or to interfere in their operations than local governments in inland areas (Che & Qian, 1998; Fan, Wong, & Zhang, 2013; Xu, Lu, & Gu, 2014). Thus, in regions with strong legal development, high-performing firms are fully motivated to invest in proprietary assets and enhance their own technological capabilities, whereas, in regions with less developed legal institutions, such motivation becomes weaker.

Hypothesis 3b. When a firm's performance is above its aspiration level, legal development strengthens the positive relationship between performance and R&D.

Industry competition. Industry environment is an important determinant of firm conduct and performance (Porter, 1981), and the competition level of an industry has been related to both corruption and R&D in prior research (Iriyama et al., 2016; Lee, 2005). High competition in a crowded industry—as indicated by low industry concentration—reduces scale economies and survival chances for all firms; consequently, firms have to operate in a more cost-efficient way or better differentiate themselves from others (Porter, 1980). Bribes are expected to bring positive net gains at least in the short run because their benefits, such as government contracts and entry permits, often exceed their costs, such as private payments to officials in power (Jeong & Weiner, 2012). Therefore, to some firms, bribery may represent a risky yet cost-effective solution. So, just as individuals under strain may display anomie in society (Merton, 1938), firms under competitive pressure can exhibit deviant behaviors such as bribery (Martin et al., 2007; Zahra et al., 2005). Meanwhile, research has not reached a definitive conclusion on the relationship between industry competition and R&D intensity, although the majority of studies in industrial organization seem to have found a negative correlation between the two (Lee, 2005).

We adopt a BTOF perspective and treat performance feedback as the determining factor for risk taking, with industry competition as a moderator. Consistent with our theoretical arguments for the main effects of performance feedback, we also provide a motivation-based logic for the moderating effects of competition. For performance below aspirations, we suggest that, facing higher competition, firms perceive stronger rivalry and competitive threats and experience a higher level of strain when making decisions (Iriyama et al., 2016; Kilduff, Galinsky, Gallo, & Reade, 2016; Martin et al., 2007). This propels firms to search more desperately for quick solutions to the immediate problem when they see their performance fall further below the aspiration level. As legal and moral constraints further loosen their grip on these low-performing firms, they become more reckless and are more easily drawn into bribery and corruption.

Hypothesis 4a. When a firm's performance is below its aspiration level, industry competition strengthens the negative relationship between performance and bribery.

Industry competition may also play a role when firm performance is above the firm's aspirations. When its performance rises just above the aspiration level, a firm may refrain from spending on R&D, because it has not entirely circumvented the immediate problems. High competition makes the firm more reluctant to spend, because there is a high possibility that financial performance will fall below the aspiration level due to industry rivalry. In contrast, when its performance rises far above the aspiration level, the firm will have higher motivation to increase R&D activity and explore opportunities for the future (O'Brien & David, 2014; Souder & Bromiley, 2012). High competition makes such long-term-oriented risk-taking activity (Birhanu et al., 2016) more pertinent and desirable, because otherwise the firm may lose the competitive battle in the long run (Porter, 1980). Although high competition also puts pressure on the firm to address current problems caused by competition, such pressure is not equally shared across firms: firms with highly positive performance feedback are in an advantageous position over their peers and will have the confidence and intention to focus on future-oriented risk-taking activities.

Hypothesis 4b. When a firm's performance is above its aspiration level, industry competition strengthens the positive relationship between performance and R&D.

METHODOLOGY

Data and Sample

Our sample covers Chinese listed companies on the Shanghai and Shenzhen Stock Exchanges from

2007 to 2013. We chose 2007 as the starting year because the quality of information disclosure improved significantly when relevant new accounting standards became effective in February 2006. We chose 2013 as the ending year because an anticorruption campaign launched by the Chinese government propelled listed companies to hide entertainment expenses starting in 2014.[1] To establish the causal link, we lagged our independent, moderating, and control variables by one year, so the ending year for these variables is 2012.

We excluded B-share firms because they disclose only financial data in their annual reports, not other data needed for this study. We also excluded firms in the financial sector because they follow different accounting standards. To reduce the irregularities commonly associated with newly listed firms, we excluded firms that had been listed for one year or less. We further dropped firm-year observations with missing values, and obtained a final sample of 9,633 firm-year observations from 2,224 listed companies. The sample firms on average had been listed for 12.6 years, had an asset value of RMB 2.24 billion, and had 1,817 employees.

We relied on multiple sources to construct our data. First, we collected data on business-related entertainment and travel expenses as disclosed in annual reports. Second, we collected data on provincial-level legal development from the marketization index compiled by the National Economic Research Institute in China. Third, we obtained other firm- and industry-level data from the Chinese Securities Market and Accounting Research database and the Wind Datafeed Service, which provided financial data on all the listed firms and have been widely used in prior management and strategy research (e.g., Zhou et al., 2017).

Measurement

Dependent variables. We used *bribery expenditure* and *R&D intensity* to represent deviant and aspirational risk taking, respectively. Borrowing insights from research in economics (Cai, Fang, & Xu, 2011), accounting (Zeng, Lee, & Zhang, 2016), and political science (Zhu, 2017), we used entertainment and travel expenses disclosed in firms' annual reports to measure a listed company's bribery expenditure. These expenses are recorded in the accounting books of Chinese firms as a standard expenditure item. According to Cai et al. (2011), Chinese managers use this account to reimburse expenditures related to (a) normal business activities, such as entertaining clients and suppliers; (b) managerial excesses; and (c) bribes to government officials and other parties, through fake or inflated receipts. To tease out normal entertainment expenditures and managerial excesses, we first estimated a model of entertainment and travel expenses as a function of total sales, total assets, marketing expenses divided by total sales, capital intensity, and the average compensation of the three highest-paid executives, based on Cai et al. (2011). The first four variables are important determinants of normal entertainment expenses, and the fifth variable is critical to capture managerial excesses.[2] We then used the residual from this model for abnormal entertainment expenses, which can be attributed to bribery activities. This approach provides a measure of bribery expenditure that does not depend on self-reporting by managers.

R&D intensity reflects a firm's efforts to build its long-run innovative capabilities. We used industry-adjusted R&D intensity and calculated it as a firm's R&D expenditure divided by its sales minus industry R&D intensity. Industry R&D intensity is the average R&D intensity of all firms in a three-digit China Securities Regulatory Commission industry category.

Independent variables. For a firm's performance relative to its aspirations, we followed previous BTOF studies (e.g., Greve, 1998; Harris & Bromiley, 2007) to compare the performance of a focal firm with other firms' performance (i.e., social aspiration) and the firm's own past performance (i.e., historical aspiration).[3] To measure performance, we calculated a firm's return on assets (ROA) as its net income divided by the average of its beginning and ending total assets in a specific fiscal year. A firm's social

[1] An extreme example is China Railway Constructions (stock code: SH601186), the entertainment and travel expenditure for which was 0.8 billion RMB in 2013 and 0 in 2014. Numerous media articles reported this sudden change in the reporting of entertainment expenditures due to the government's anti-corruption initiative.

[2] The results show that entertainment expenditures are significantly affected by firm sales ($p < .01$), firm assets ($p < .01$), marketing expenditures ($p < .01$), capital intensity ($p < .01$), and compensation of the three highest-paid executives ($p < .01$). The adjusted R-squared value of this model is 0.70.

[3] Although a recent study examined the possibly differential effects of social and historical aspirations on firms' acquisition behavior (Kim, Finkelstein, & Haleblian, 2015), such a comparison is beyond the scope of our study.

aspiration level was defined as the average ROA of its industry peers—namely, all the listed companies with the same three-digit China Securities Regulatory Commission industry code as the focal firm in a year. A firm's historical aspiration level was defined as the firm's ROA in the previous year.

Consistent with prior BTOF research (e.g., Audia & Greve, 2006; Greve, 2003; Mishina et al., 2010), we used a spline function to distinguish between performance below and above aspirations. *Performance (when below social aspiration)* equals firm ROA minus industry average ROA if firm ROA was less than industry average ROA, and it equals 0 if firm ROA was greater than or equal to industry average ROA. *Performance (when above social aspiration)* equals firm ROA minus the average ROA in the industry if firm ROA was greater than or equal to the industry average ROA, and it equals 0 if firm ROA was less than industry average ROA. Similarly, *performance (when below historical aspiration*) equals firm ROA in a year minus firm ROA in the previous year if firm ROA in that year was less than ROA in the previous year, and it equals 0 if firm ROA in that year was greater than or equal to ROA in the previous year. *Performance (when above historical aspiration)* equals firm ROA in a year minus firm ROA in the previous year if firm ROA in that year was greater than or equal to ROA in the previous year, and it equals 0 if firm ROA in that year was less than ROA in the previous year.

Moderating variables. Prior research has widely used the National Economic Research Institute index to reflect provincial-level economic, political, and legal development in China (e.g., Jia, 2014; Zhou et al., 2017). We used its subdimension on market institutions' development and legal protection to measure *legal development*. It contains three items: (1) development of market and legal intermediaries, in terms of the shares of lawyers and independent accountants in local population; (2) legal environment for businesses; (3) legal protection of intellectual property rights.[4]

We measured *industry competition* with industry concentration, using the Herfindahl–Hirschman index (Barth, Lin, Lin, & Song, 2009). We reverse-coded the index so that higher scores indicate higher competition levels in an industry.

Control variables. We included various control variables that may affect firms' risk taking. We controlled for *CEO age*, *CEO tenure*, *political ties*, and *board size*, as CEO and board characteristics may influence firms' behavior (Desai, 2016; Martin et al., 2016; Mishina et al., 2010). CEO tenure is the number of years since the current CEO took the position. We coded political ties as 1 if either the chairperson or CEO was a delegate to the People's Congress or People's Political Consultative Conference in a given year (Jia, 2014), and 0 otherwise. Board size is the total number of directors on the board.

We controlled for *firm size*, indicated by the natural logarithm of total employees, and *listing age,* the number of years since the firm was listed. We included the three slack measures commonly used in extant research: (1) absorbed slack, indicated by *SGA/Sales*, the ratio of selling, general, and administrative expenses (SGA) to sales; (2) unabsorbed slack, indicated by the *current ratio*, the ratio of current assets to current liabilities; and (3) potential slack, indicated by the *equity ratio*, or total equity divided by total debt (Greve, 2003; Iyer & Miller, 2008). In addition to serving as controls for slack resources for estimating R&D intensity, these three variables serve as reverse proxies for financial constraints when estimating bribery expenditure (Martin et al., 2007).

We controlled for state ownership with *SOE*, coded as 1 if a listed firm was majority-owned by the government and 0 otherwise (Zhou et al., 2017). We then controlled for *foreign sales percentage*, measured as foreign sales divided by total sales. Given that the global market normally is more competitive for emerging economy firms, prior studies have often used foreign sales percentage to indicate the extent of export market orientation (Luo, 2002; Zhou et al., 2017). We also controlled for *organizational change*, coded as 1 if a listed firm had board chair and/or CEO turnover in a specific year, and 0 otherwise (Hayward & Shimizu, 2006). As previous research has established an association between corporate donations and socially responsible/irresponsible behavior (Coffey & Wang, 1998; Muller & Kräussl, 2011), we controlled for *donation* with the percentage of corporate donations over sales. We further included a city-level control: the *number of firms in city*. We log transformed it to reduce skewness.

We summarize our measurement scales in Appendix A (Table A1). Table 1 reports the means and standard deviations of the variables and their correlations. Overall, the magnitudes of the correlations are small. In the regression models, we computed variance inflation factors (VIFs), which ranged from 1.01 to 1.30—well below the cutoff of 10. Thus, multicollinearity was not a major concern.

[4] There is a fourth item—legal protection of consumer interests and rights—for 2007.

TABLE 1
Descriptive Statistics and Correlations

		Mean	*SD*	1	2	3	4	5	6	7	8
1	Bribery expenditure	0.01	0.67	1.00							
2	R&D intensity	0.14	0.66	−0.02†	1.00						
3	Performance (below social aspiration)	−0.02	0.06	−0.03**	0.01	1.00					
4	Performance (above social aspiration)	0.02	0.04	−0.01	0.03**	0.22**	1.00				
5	Performance (below historical aspiration)	−0.02	0.05	−0.02*	0.01	0.52**	0.12**	1.00			
6	Performance (above historical aspiration)	0.02	0.05	0.05**	0.02†	0.02*	0.16**	0.16**	1.00		
7	Legal development	8.70	4.86	0.02†	−0.03**	0.05**	0.05**	0.05**	−0.06**	1.00	
8	Industry competition	−0.06	0.12	0.00	−0.15**	−0.04**	0.06**	0.01	0.00	0.03**	1.00
9	CEO age	47.57	6.20	0.01	0.00	0.02†	0.00	0.03*	−0.01	−0.01	−0.03**
10	CEO tenure	3.66	1.89	−0.05**	−0.02*	0.04**	−0.02†	0.01	−0.04**	−0.01	0.00
11	Political ties	0.31	0.59	0.02*	0.02†	0.01	0.05**	−0.02	−0.02†	0.13**	−0.03*
12	Board size	9.06	1.81	0.00	−0.03**	0.02	0.01	0.03*	−0.04**	−0.04**	0.02†
13	Firm size	7.47	1.36	−0.07**	−0.06**	0.09**	−0.03**	0.08**	−0.09**	−0.11**	−0.07**
14	Listing age	12.65	4.52	0.05**	−0.04**	−0.09**	−0.05**	−0.03*	0.13**	−0.07**	−0.01
15	SGA/Sales	0.06	0.14	−0.39**	0.01	−0.06**	0.02*	0.00	−0.01	−0.02†	0.03*
16	Current ratio	1.50	1.11	0.11**	−0.01	0.00	0.03**	0.00	0.05**	0.01	−0.07**
17	Equity ratio	3.28	7.68	−0.05**	0.06**	0.07**	0.05**	0.00	−0.04**	0.01	0.07**
18	SOE	0.52	0.5	0.07**	0.00	−0.05**	−0.07**	0.05**	0.01	−0.11**	−0.01
19	Foreign sales (%)	0.34	2.89	−0.02*	0.02*	0.01	0.02†	0.00	−0.01	0.03**	−0.03**
20	Organization change	0.01	0.09	0.00	0.00	−0.02*	−0.02	−0.02	0.00	0.00	0.00
21	Donation	2.81	5.23	−0.03**	0.00	0.04**	−0.03**	0.06**	−0.08**	−0.05**	−0.02*
22	Number of firms in city	835	1,142	0.04**	0.00	−0.05**	0.05**	−0.02†	0.05**	−0.07**	−0.03**

Modeling

We tested our hypotheses using panel analysis with standard errors clustered at industry level. We took several initiatives to address potential endogeneity in our analysis. First, we lagged our explanatory variables by one year to reduce the possibility of reverse causality. Second, we controlled for a set of executive-, board-, company-, and city-level variables that may affect performance relative to aspirations, bribery expenditure, and R&D intensity simultaneously. Third, we included year, industry, and city fixed effects—namely, five year dummies, 70 industry dummies, and 337 city dummies—in our regression models to account for within-group variation over time and limit the potential bias caused by omitted variables. Such an empirical approach allows the predicted mean of the dependent variable to vary across groups and thus controls for unobserved heterogeneity (Gormley & Matsa, 2014).

RESULTS

We report the results of bribery and R&D regression models pertaining to performance relative to social aspiration in Tables 2 and 3, and the results pertaining to performance relative to historical aspiration in Tables 4 and 5. Because the results based on social and historical aspirations are highly consistent, we discuss the results of hypothesis testing based on Tables 2 and 3. In each table, we entered all the control variables, the moderators, and the R&D/bribery measures in Model 1, the performance feedback measures in Model 2, and the interaction terms in Models 3–4. We then included all variables in Model 5, the full specification model.

In support of Hypothesis 1, Model 2 in Table 2 shows that the impact of prior performance (when below social aspiration) on bribery expenditure is negative ($b = -0.73$, $p < .01$). Marginal effect analysis reveals that, as performance (when below social aspiration) rises from two standard deviations below the mean to one standard deviation below the mean, bribery expenditure decreases by 24.80%. Model 2 also shows that the effect of performance (when above social aspiration) on bribery is not significant.

In support of Hypothesis 2, Model 2 in Table 3 shows that the relationship between performance (when above social aspiration) and R&D intensity is positive ($b = 1.10$, $p < .01$). Marginal effect analysis reveals that, as performance (when above social aspiration) rises from one standard deviation above the mean to two standard deviations above the mean, R&D intensity increases by 9.58%. Model 2 also

TABLE 1
(Continued)

9	10	11	12	13	14	15	16	17	18	19	20	21	22
1.00													
0.14**	1.00												
0.00	−0.16**	1.00											
0.06**	0.01	0.06**	1.00										
0.10**	0.04**	0.01	0.26**	1.00									
0.09**	0.06**	−0.10**	0.01	0.01	1.00								
−0.03*	0.02*	−0.02*	−0.05**	−0.05**	0.00	1.00							
0.04**	−0.04**	0.08**	0.13**	0.30**	0.13**	−0.11**	1.00						
0.01	0.02	−0.05**	−0.08**	−0.16**	−0.07**	0.04**	−0.12**	1.00					
0.13**	−0.08**	0.08**	0.26**	0.28**	0.19**	−0.10**	0.29**	−0.16**	1.00				
0.01	0.00	−0.01	−0.06**	−0.01	−0.04**	0.02†	0.00	0.02*	−0.06**	1.00			
−0.02	−0.10**	0.01	−0.05**	0.02	−0.01	0.00	0.02†	−0.02	0.03**	0.00	1.00		
0.00	−0.16**	0.02*	0.04**	0.10**	−0.03**	0.00	0.04**	0.01	0.01	0.00	0.01	1.00	
−0.09**	−0.25**	0.24**	0.02†	−0.01	−0.10**	−0.02	0.05**	−0.06**	0.06**	0.01	0.03**	−0.20**	1.00

Notes: n = 9,633. Two-tailed tests.
† $p < .10$
* $p < .05$
** $p < .01$

shows that performance (when below social aspiration) does not have a significant effect on R&D intensity.

An important assumption we hold in this study is that bribery and R&D have an inverse relationship. Model 1 in Table 2 shows that prior R&D intensity negatively affects bribery expenditure ($b = -2.78$, $p < .01$); Model 1 in Table 3 shows that prior bribery expenditure negatively affects R&D intensity ($b = -0.07$, $p < .01$). These results support our conjecture that bribery and R&D are fundamentally different risk-taking behaviors.

For Hypotheses 3 and 4, we followed prior BTOF studies (e.g., Audia & Greve, 2006; Greve, 2003) to plot the corresponding moderating effects in Figures 1 and 2 based on the results pertaining to social aspiration in Tables 2 and 3, using Model 5 in each table as a basis of calculation. We split the sample along the mean levels of the moderating variables and examined the effect of performance relative to aspirations in each subsample. We report the results of hypothesis tests in conjunction with the figures.

Model 5 in Table 2 reports that the interaction term between firm performance (when below social aspiration) and legal development is positive ($b = 0.14$, $p < .01$), supporting Hypothesis 3a. Based on Model 5, Figure 1a shows that, in the subsample with low legal development, performance (when below social aspiration) is negatively associated with bribery expenditure (solid line). Marginal effect analysis reveals that, as performance (when below social aspiration) rises from two standard deviations below the mean to one standard deviation below the mean, bribery expenditure decreases by 45.5%; but, in the subsample with high legal development, this negative effect disappears, and the relationship is insignificant (broken line).

Model 5 in Table 3 reports that the interaction term between firm performance (when above social aspiration) and legal development is positive ($b = 0.09$, $p < .05$), supporting Hypothesis 3b. Figure 1b shows that, in the subsample with high legal development, performance (when above social aspiration) is positively associated with R&D intensity (solid line).

TABLE 2
Performance Relative to Social Aspiration and Bribery Expenditure$_{t+1}$

	Model 1	Model 2	Model 3	Model 4	Model 5
CEO age	0.00	0.00	0.00	0.00	0.00
	(1.39)	(1.32)	(1.41)	(1.29)	(1.38)
CEO tenure	−0.01*	−0.01*	−0.01*	−0.01*	−0.01*
	(−2.21)	(−2.16)	(−2.17)	(−2.16)	(−2.18)
Political ties	−0.01	−0.01	−0.01	−0.01	−0.01
	(−1.00)	(−0.90)	(−0.94)	(−0.91)	(−0.95)
Board size	−0.00	−0.00	−0.00	−0.00	−0.00
	(−1.16)	(−1.21)	(−1.23)	(−1.21)	(−1.23)
Firm size	−0.08**	−0.08**	−0.08**	−0.08**	−0.08**
	(−13.59)	(−13.32)	(−13.53)	(−13.30)	(−13.52)
Listing age	0.01**	0.01**	0.01**	0.01**	0.01**
	(7.05)	(6.73)	(6.82)	(6.74)	(6.84)
SGA/Sales	−0.44**	−0.50**	−0.51**	−0.50**	−0.51**
	(−12.21)	(−13.37)	(−13.61)	(−13.32)	(−13.56)
Current ratio	0.04**	0.04**	0.04**	0.04**	0.04**
	(5.75)	(5.36)	(5.32)	(5.40)	(5.38)
Equity ratio	−0.00*	−0.00*	−0.00*	−0.00*	−0.00*
	(−2.57)	(−2.22)	(−2.20)	(−2.23)	(−2.20)
SOE	0.03†	0.03	0.03	0.03	0.03†
	(1.77)	(1.55)	(1.63)	(1.59)	(1.67)
Foreign sales (%)	−0.00	−0.00	−0.00	−0.00	−0.00
	(−0.10)	(−0.16)	(−0.19)	(−0.17)	(−0.20)
Organization change	−0.02	−0.03	−0.04	−0.03	−0.03
	(−0.33)	(−0.43)	(−0.55)	(−0.39)	(−0.50)
Donation	−0.00	−0.00	−0.00	−0.00	−0.00
	(−0.69)	(−0.48)	(−0.43)	(−0.50)	(−0.46)
Number of firms in city	0.00	0.00	−0.00	0.00	−0.00
	(0.12)	(0.00)	(−0.03)	(0.02)	(−0.02)
Legal development	0.00	0.00	0.01	0.00	0.01
	(0.74)	(0.83)	(1.36)	(0.84)	(1.42)
Industry competition	1.41**	1.33**	1.33**	1.27**	1.23**
	(4.37)	(4.15)	(4.14)	(3.92)	(3.80)
R&D intensity	−2.78**	−2.70**	−2.71**	−2.69**	−2.70**
	(−2.93)	(−2.85)	(−2.86)	(−2.84)	(−2.85)
Performance (when below social aspiration)		−0.73**	−1.76**	−0.61**	−1.64**
(Hypothesis 1)		(−6.25)	(−7.94)	(−4.43)	(−7.23)
Performance (when above social aspiration)		0.11	0.13	0.15	0.18
		(0.69)	(0.41)	(0.76)	(0.52)
Performance (when below social aspiration) ×			0.13**		0.14**
Legal development (Hypothesis 3a)			(5.49)		(5.74)
Performance (when above social aspiration) ×			−0.01		−0.01
Legal development			(−0.19)		(−0.33)
Performance (when below social aspiration) ×				−1.09†	−1.54*
Industry competition (Hypothesis 4a)				(−1.68)	(−2.36)
Performance (when above social aspiration) ×				−0.25	−0.02
Industry competition				(−0.27)	(−0.02)
Constant	0.08	0.09	0.07	0.11	0.09
	(0.43)	(0.47)	(0.39)	(0.55)	(0.48)
Year, industry, and city fixed effects	Yes	Yes	Yes	Yes	Yes
R^2	0.28	0.28	0.29	0.29	0.29
n	9,633	9,633	9,633	9,633	9,633

Notes: t statistics in parentheses. Two-tailed tests.
† $p < .10$
* $p < .05$
** $p < .01$

TABLE 3
Performance Relative to Social Aspiration and R&D Intensity$_{t+1}$

	Model 1	Model 2	Model 3	Model 4	Model 5
CEO age	0.00	0.00	0.00	0.00	0.00
	(0.35)	(0.34)	(0.33)	(0.36)	(0.36)
CEO tenure	−0.00	−0.00	−0.00	−0.00	−0.00
	(−0.35)	(−0.35)	(−0.34)	(−0.34)	(−0.33)
Political ties	−0.01	−0.01	−0.01	−0.01	−0.01
	(−0.46)	(−0.47)	(−0.50)	(−0.45)	(−0.49)
Board size	−0.01**	−0.01**	−0.01**	−0.01**	−0.01**
	(−3.10)	(−3.11)	(−3.07)	(−3.10)	(−3.06)
Firm size	−0.05**	−0.05**	−0.05**	−0.05**	−0.05**
	(−7.07)	(−7.08)	(−7.11)	(−7.10)	(−7.15)
Listing age	−0.01**	−0.01**	−0.01**	−0.01**	−0.01**
	(−4.70)	(−4.63)	(−4.55)	(−4.66)	(−4.58)
SGA/Sales	0.00	0.01	0.01	0.01	0.02
	(0.05)	(0.24)	(0.31)	(0.30)	(0.38)
Current ratio	−0.02**	−0.02**	−0.02**	−0.02**	−0.02**
	(−2.95)	(−2.93)	(−2.93)	(−2.85)	(−2.85)
Equity ratio	0.01**	0.01**	0.01**	0.01**	0.01**
	(8.22)	(8.15)	(8.19)	(8.20)	(8.24)
SOE	−0.02	−0.02	−0.02	−0.02	−0.02
	(−1.02)	(−0.93)	(−0.93)	(−1.01)	(−1.02)
Foreign sales (%)	0.01*	0.01*	0.01*	0.01*	0.01*
	(2.52)	(2.52)	(2.45)	(2.56)	(2.49)
Organization change	−0.09	−0.09	−0.09	−0.09	−0.10
	(−1.14)	(−1.13)	(−1.16)	(−1.14)	(−1.19)
Donation	0.00	0.00	0.00	0.00	0.00
	(0.67)	(0.63)	(0.66)	(0.66)	(0.69)
Number of firms in city	0.00	0.00	0.00	0.00	0.00
	(1.07)	(1.08)	(1.14)	(1.10)	(1.16)
Legal development	0.00	0.00	0.00	0.00	0.00
	(0.75)	(0.74)	(0.35)	(0.70)	(0.27)
Industry competition	−0.13	−0.11	−0.10	−0.23	−0.23
	(−0.34)	(−0.30)	(−0.28)	(−0.62)	(−0.61)
Bribery	−0.07**	−0.07**	−0.07**	−0.07**	−0.07**
	(−3.09)	(−3.05)	(−3.03)	(−3.02)	(−3.00)
Performance (when below social aspiration)		0.10	0.15	0.22	0.25
		(0.70)	(0.59)	(1.34)	(0.93)
Performance (when above social aspiration)		1.10**	0.62†	0.22	1.08**
(Hypothesis 2)		(2.75)	(1.72)	(0.94)	(2.63)
Performance (when below social aspiration) ×			−0.01		−0.00
Legal development			(−0.20)		(−0.08)
Performance (when above social aspiration) ×			0.08*		0.09*
Legal development *(Hypothesis 3b)*			(2.22)		(2.50)
Performance (when below social aspiration) ×				−1.07	−1.09
Industry competition				(−1.41)	(−1.42)
Performance (when above social aspiration) ×				2.81*	3.16**
Industry competition *(Hypothesis 4b)*				(2.55)	(2.84)
Constant	−0.25	−0.26	−0.23	−0.26	−0.23
	(−1.10)	(−1.15)	(−1.01)	(−1.18)	(−1.03)
Year, industry, and city fixed effects	Yes	Yes	Yes	Yes	Yes
R^2	0.15	0.15	0.16	0.16	0.16
n	9,633	9,633	9,633	9,633	9,633

Notes: t statistics in parentheses. Two-tailed tests.
† $p < .10$
* $p < .05$
** $p < .01$

TABLE 4
Performance Relative to Historical Aspiration and Bribery Expenditure$_{t+1}$

	Model 1	Model 2	Model 3	Model 4	Model 5
CEO age	0.00	0.00	0.00	0.00	0.00
	(1.11)	(1.16)	(1.12)	(1.15)	(1.12)
CEO tenure	−0.01*	−0.01*	−0.01*	−0.01*	−0.01*
	(−2.36)	(−2.20)	(−2.18)	(−2.20)	(−2.18)
Political ties	−0.02	−0.02	−0.02	−0.02	−0.02
	(−1.31)	(−1.36)	(−1.29)	(−1.42)	(−1.35)
Board size	−0.00	−0.00	−0.00	−0.00	−0.00
	(−0.89)	(−0.90)	(−0.83)	(−0.77)	(−0.71)
Firm size	−0.08**	−0.08**	−0.08**	−0.08**	−0.08**
	(−12.95)	(−12.56)	(−12.61)	(−12.53)	(−12.59)
Listing age	0.01**	0.01**	0.01**	0.01**	0.01**
	(6.82)	(6.36)	(6.40)	(6.31)	(6.35)
SGA/Sales	−0.39**	−0.44**	−0.45**	−0.45**	−0.45**
	(−10.51)	(−11.69)	(−11.83)	(−11.77)	(−11.90)
Current ratio	0.04**	0.04**	0.04**	0.04**	0.04**
	(5.73)	(5.13)	(5.15)	(5.22)	(5.23)
Equity ratio	0.00	0.00	0.00	0.00	0.00
	(0.31)	(0.35)	(0.34)	(0.38)	(0.37)
SOE	0.03	0.03†	0.03†	0.03†	0.03†
	(1.60)	(1.75)	(1.71)	(1.81)	(1.77)
Foreign sales (%)	−0.00	−0.00	−0.00	−0.00	−0.00
	(−0.34)	(−0.33)	(−0.43)	(−0.35)	(−0.45)
Organization change	0.02	0.02	0.02	0.02	0.02
	(0.28)	(0.22)	(0.28)	(0.25)	(0.31)
Donation	0.00	0.00	0.00	0.00	0.00
	(1.36)	(1.36)	(1.38)	(1.38)	(1.39)
Number of firms in city	0.00	0.00	0.00	0.00	0.00
	(0.10)	(0.09)	(0.08)	(0.10)	(0.09)
Legal development	0.01	0.01	0.01	0.01	0.01
	(1.14)	(1.27)	(1.28)	(1.33)	(1.27)
Industry competition	1.77**	1.79**	1.77**	1.74**	1.73**
	(5.13)	(5.20)	(5.16)	(5.03)	(5.02)
R&D intensity	−2.24*	−2.11*	−2.10*	−2.11*	−2.11*
	(−2.26)	(−2.13)	(−2.13)	(−2.14)	(−2.13)
Performance (when below historical aspiration)		−0.38**	−0.91**	−0.29**	−0.82**
(Hypothesis 1)		(−6.76)	(−8.78)	(−4.74)	(−7.58)
Performance (when above historical aspiration)		0.05	0.05	0.05	0.05
		(1.29)	(1.06)	(1.08)	(1.07)
Performance (when below historical aspiration) ×			0.07**		0.07**
Legal development (Hypothesis 3a)			(6.05)		(5.91)
Performance (when above historical aspiration) ×			−0.01		−0.01
Legal development			(−1.04)		(−1.01)
Performance (when below historical aspiration) ×				−1.77**	−1.64**
Industry competition (Hypothesis 4a)				(−3.46)	(−3.19)
Performance (when above historical aspiration) ×				−0.03	−0.09
Industry competition				(−0.07)	(−0.20)
Constant	0.66	0.64	0.61	0.63	0.61
	(1.10)	(1.07)	(1.03)	(1.06)	(1.02)
Year, industry, and city fixed effects	Yes	Yes	Yes	Yes	Yes
R^2	0.27	0.28	0.28	0.28	0.29
n	9,633	9,633	9,633	9,633	9,633

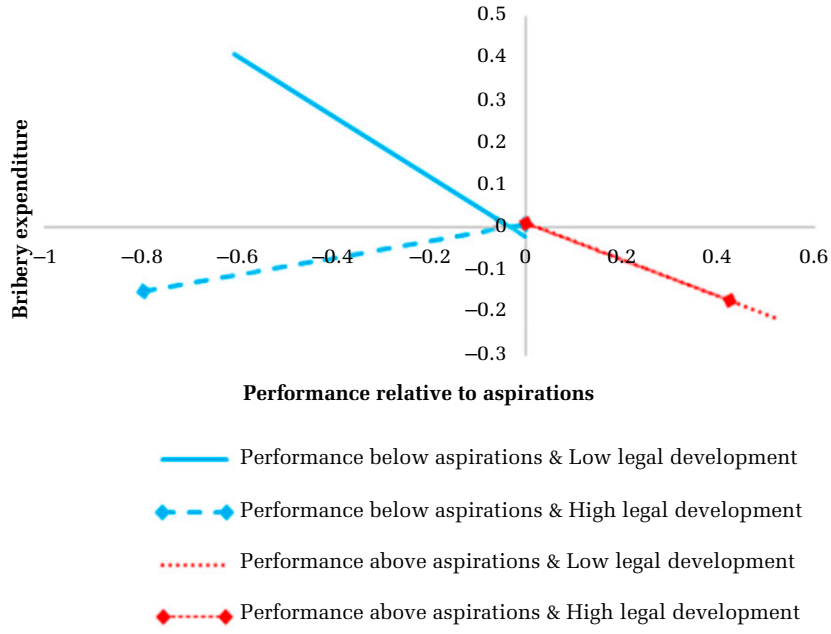
Notes: t statistics in parentheses. Two-tailed tests.
† $p < .10$
* $p < .05$
** $p < .01$

TABLE 5
Performance Relative to Historical Aspiration and R&D Intensity$_{t+1}$

	Model 1	Model 2	Model 3	Model 4	Model 5
CEO age	0.00	0.00	0.00	0.00	0.00
	(0.29)	(0.28)	(0.28)	(0.30)	(0.30)
CEO tenure	−0.00	−0.00	−0.00	−0.00	−0.00
	(−0.57)	(−0.63)	(−0.63)	(−0.65)	(−0.65)
Political ties	−0.00	−0.00	−0.01	−0.00	−0.01
	(−0.27)	(−0.27)	(−0.31)	(−0.28)	(−0.34)
Board size	−0.02**	−0.02**	−0.02**	−0.02**	−0.02**
	(−3.31)	(−3.28)	(−3.30)	(−3.22)	(−3.24)
Firm size	−0.06**	−0.06**	−0.06**	−0.06**	−0.06**
	(−7.86)	(−7.97)	(−7.97)	(−7.96)	(−7.95)
Listing age	−0.01**	−0.01**	−0.01**	−0.01**	−0.01**
	(−5.24)	(−5.06)	(−5.05)	(−5.08)	(−5.08)
SGA/Sales	−0.01	0.00	0.00	0.00	0.00
	(−0.31)	(0.08)	(0.10)	(0.03)	(0.04)
Current ratio	−0.04**	−0.03**	−0.04**	−0.03**	−0.03**
	(−3.86)	(−3.63)	(−3.64)	(−3.58)	(−3.59)
Equity ratio	−0.00	−0.00	−0.00	−0.00	−0.00
	(−0.37)	(−0.38)	(−0.37)	(−0.35)	(−0.34)
SOE	−0.03	−0.03	−0.03	−0.03	−0.03
	(−1.40)	(−1.44)	(−1.42)	(−1.41)	(−1.39)
Foreign sales (%)	0.01*	0.01*	0.01*	0.01*	0.01*
	(2.26)	(2.24)	(2.27)	(2.23)	(2.26)
Organization change	−0.06	−0.06	−0.06	−0.06	−0.06
	(−0.75)	(−0.71)	(−0.73)	(−0.71)	(−0.73)
Donation	0.00	0.00	0.00	0.00	0.00
	(0.84)	(0.83)	(0.81)	(0.86)	(0.85)
Number of firms in city	0.01*	0.01*	0.01*	0.01*	0.01*
	(2.31)	(2.31)	(2.35)	(2.30)	(2.33)
Legal development	0.00	0.00	−0.00	0.00	−0.00
	(0.04)	(0.03)	(−0.13)	(0.00)	(−0.18)
Industry competition	−0.75	−0.76	−0.74	−0.82†	−0.81†
	(−1.57)	(−1.58)	(−1.54)	(−1.71)	(−1.68)
Bribery expenditure	−0.03**	−0.03**	−0.03**	−0.03**	−0.03*
	(−2.65)	(−2.65)	(−2.60)	(−2.59)	(−2.53)
Performance (when below historical aspiration)		−0.06	−0.13	−0.08	−0.14
		(−1.14)	(−1.27)	(−1.22)	(−1.39)
Performance (when above historical aspiration)		0.12†	0.30*	0.18*	0.40**
(Hypothesis 2)		(1.72)	(2.46)	(2.41)	(3.09)
Performance (when below historical aspiration) ×			0.01		0.01
Legal development			(0.69)		(0.74)
Performance (when above historical aspiration) ×			0.02†		0.03*
Legal development (Hypothesis 3b)			(1.80)		(2.06)
Performance (when below historical aspiration) ×				0.29	0.31
Industry competition				(0.49)	(0.53)
Performance (when above historical aspiration) ×				1.46*	1.64*
Industry competition (Hypothesis 4b)				(2.03)	(2.26)
Constant	0.70	0.71	0.72	0.71	0.72
	(1.04)	(1.05)	(1.07)	(1.05)	(1.07)
Year, industry, and city fixed effects	Yes	Yes	Yes	Yes	Yes
R^2	0.15	0.17	0.17	0.17	0.17
n	9,633	9,633	9,633	9,633	9,633

Notes: t statistics in parentheses. Two-tailed tests.
† $p < .10$
* $p < .05$
** $p < .01$

FIGURE 1a
Performance Relative to Social Aspiration, Legal Development, and Bribery Expenditure (Hypothesis 3a)



Marginal effect analysis reveals that, as performance (when above social aspiration) rises from one standard deviation above the mean to two standard deviations above the mean, R&D intensity increases by 21.2%; but, in the subsample with low legal development, this positive effect disappears (broken line).

Model 5 in Table 2 shows that the interaction term between performance (when below social aspiration)

FIGURE 1b
Performance Relative to Social Aspiration, Legal Development, and R&D Intensity (Hypothesis 3b)

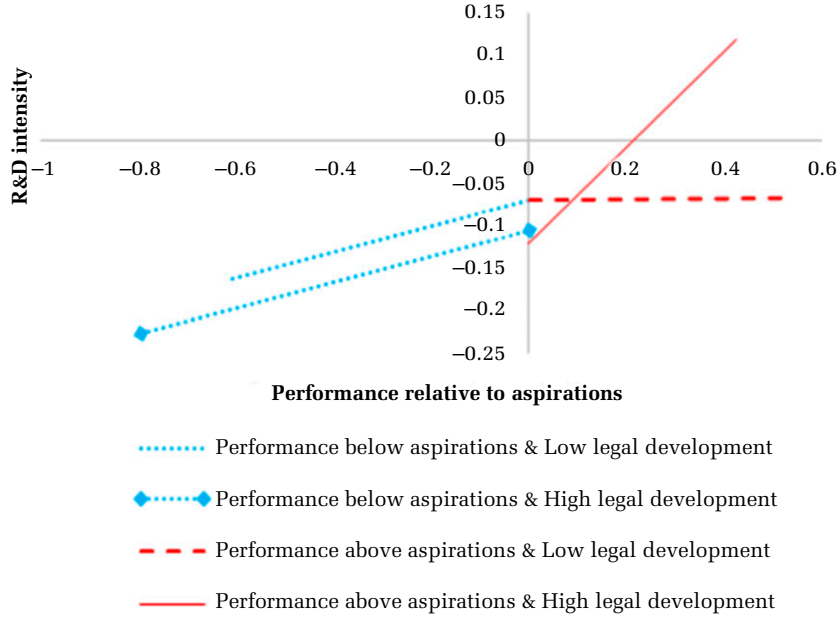
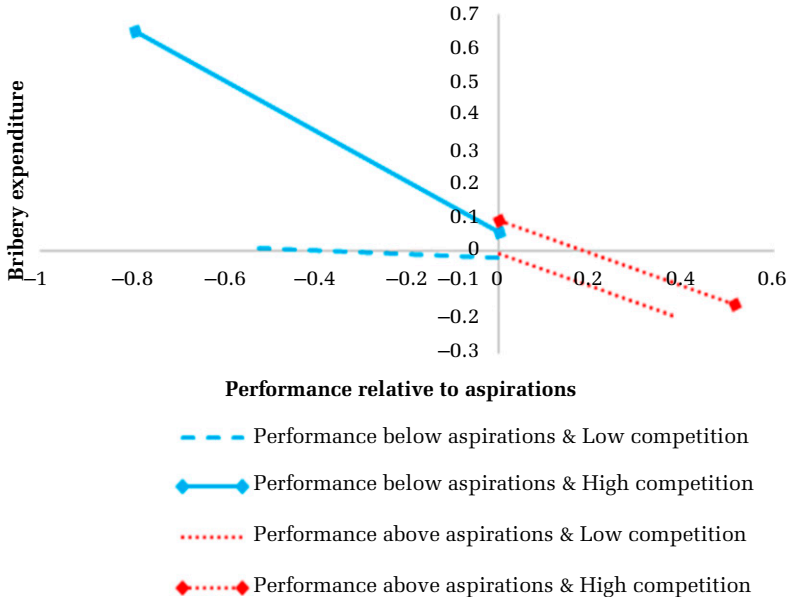
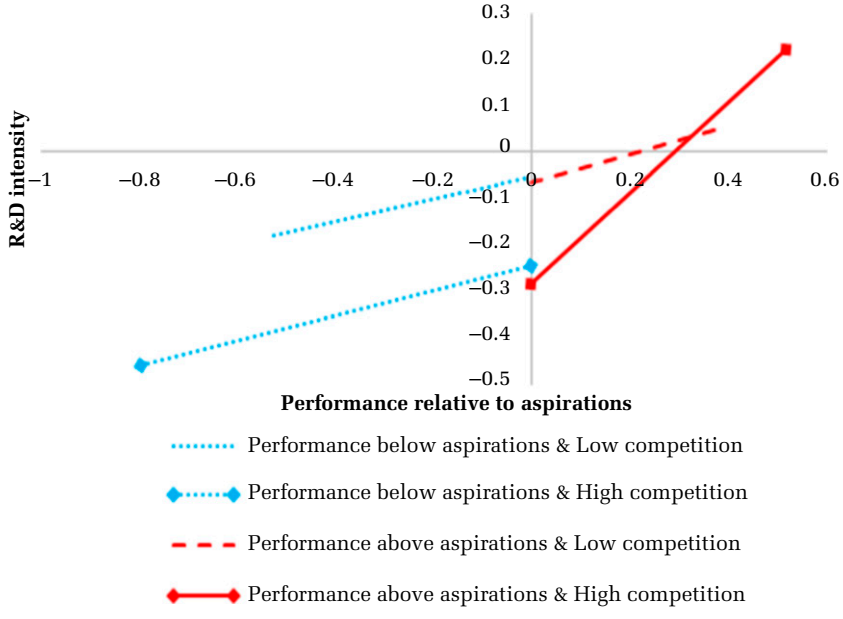


FIGURE 2a
Performance Relative to Social Aspiration, Industry Competition, and Bribery Expenditure (Hypothesis 4a)



and industry competition is negative ($b = -1.54$, $p < .05$), providing support for Hypothesis 4a. Figure 2a shows that, in the subsample with low competition, performance (when below social aspiration) is not significantly related to bribery expenditure (broken line). In the subsample with high competition, however, the relationship becomes negative and significant (solid line). Marginal effect analysis reveals that, as performance (when below social aspiration) rises from two standard deviations below the mean to one standard deviations below the mean, bribery expenditure decreases by 26.0%.

FIGURE 2b
Performance Relative to Social Aspiration, Industry Competition, and R&D Intensity (Hypothesis 4b)



Model 5 in Table 3 shows that the interaction term between performance (when above social aspiration) and industry competition is positive ($b = 3.16$, $p < .01$), lending support for Hypothesis 4b. Figure 2b shows that, in the subsample with low competition, performance (when above social aspiration) is not significantly related to R&D intensity (broken line). In the subsample with high competition, however, the relationship becomes positive and significant (solid line). Marginal effect analysis reveals that, as performance (when above social aspiration) rises from one standard deviation above the mean to two standard deviations above the mean, R&D intensity increases by 12.5%.

Robustness Tests

We conducted a series of robustness tests. First, two alternative measures of performance—return on equity and return on sales—were used to replicate our analyses. The results obtained are qualitatively similar to the main results using ROA. Second, we used two-digit instead of three-digit industry classification to operationalize the relevant variables in our models, and the statistical inferences remain unchanged. Third, because bribery and R&D are related to each other, we used seemingly unrelated regressions that allow the error terms of bribery and R&D to correlate. Here too, the results remain unchanged.

Fourth, as we used a composite measure of legal development to test Hypothesis 3a and Hypothesis 3b, one could argue that the legal environments for bribery and R&D activities should be measured differently. We therefore selected the most relevant items in the composite measure as its substitute variables. Among the three items of legal development, "legal environment for businesses" is most relevant to bribery, as it will likely reduce the motivation to give or accept bribes, and "legal protection of intellectual property rights" is most closely linked to R&D. We used these two items to test Hypothesis 3a and Hypothesis 3b, respectively, and obtained highly consistent results.

Fifth, we note that, while the performance feedback variables have significant signs consistent with our predictions, the three slack resource measures yield inconsistent results among themselves and across the two dependent variables. We calculated the standardized coefficients of the performance feedback variables and found them to be comparable to those of the slack indicators. These findings support our use of the motivation-based logic in explaining risk-taking behavior.

Sixth, we conducted subgroup analysis by separating our sample into two subsamples (below versus above social aspiration) and then using a continuous measure of performance (industry-adjusted ROA) to test our hypotheses on each subsample. The results are highly consistent with our main analysis using the spline function: Hypothesis 1, Hypothesis 3a, and Hypothesis 4a are supported on the subsample of firms with below-aspiration performance, and Hypotheses 2, 3b, and 4b are supported on the subsample of firms with above-aspiration performance.

Seventh, there may be omitted variables that influence both firm performance and risk taking simultaneously. Our fixed effects analysis can deal with the problem when those omitted variables have time-invariant effects on the dependent variables. However, if such effects are time variant, a two-stage model may help address the issue. Therefore, we estimated a two-stage Heckman selection model by calculating the inverse Mills ratio based on the first-stage model[5] and then adding the inverse Mills ratio to the second-stage model. Again, the results are similar to earlier analyses.

Eighth, to further address any concern over the omitted-variable bias, we followed Frank, Maroulis, Duong, and Kelcey's (2013) analysis and calculated the impact threshold of a confounding variable to quantify the degree of bias necessary to invalidate our results. In our sample ($n = 9{,}633$), the estimated effect was -0.73 (Model 2, Table 2); the threshold for making an inference was calculated to be -0.24, based on a standard error of 0.12 and critical t value of -1.96. Thus, bias must account for -0.49 ($-0.73 - (-0.24)$), or about 67% ($-0.49/-0.73$) of the estimated effect to invalidate our results, which is highly improbable (Frank et al., 2013).

Ninth, there may be important unobservable effects associated with the location or industry in which firms are nested. Because our models include firm-level explanatory variables, a province-level moderator (i.e., legal development), and cross-level interactions, we conducted a multilevel analysis involving two levels—firm (level 1) and province (level 2)—and allowed both the intercepts and slopes of the regressions to vary across provinces. Meanwhile,

[5] In the first-stage model, we predicted why firms have performance above or below the aspiration level (dummy variable: above = 1, below = 0) with (a) board size, firm size, and firm age; (b) financial slack resources (SGA/sales, current ratio, and equity ratio); (c) state ownership and foreign sales percentage; (d) industry competition; and (e) city-level GDP growth and number of firms in city.

because we also have an industry-level moderator (i.e., industry competition), we conducted a similar multilevel analysis with the firm as level 1 and industry as level 2. Again, the results from these multilevel analyses are highly consistent with our main results.[6]

Additional Analysis

While we focused on the moderating roles of environmental factors in theory development, we also conducted additional empirical analysis by employing relevant organizational moderators to determine what types of firms are more likely to engage in bribery (R&D) when having low (high) performance. The results we obtained by including corresponding interaction terms show that the effect of performance (when below aspirations) on bribery is strengthened for non-SOEs ($b = 0.82$, $p < .01$); smaller firms ($b = 0.54$, $p < .01$); and firms with younger or shorter-tenured CEOs ($b = 0.07$, $p < .01$; $b = 0.33$, $p < .01$). We also found that performance (when above aspirations) has a stronger effect on R&D for non-SOEs than for SOEs ($b = -0.98$, $p < .01$).

DISCUSSION

In this study, we addressed whether low- and high-performing firms differ in their risk-taking orientations and how environmental factors moderate the relationship between performance feedback and risk taking. Guided by the BTOF, we found that low-performing firms are more likely to resort to bribery, a myopic, deviant risk-taking action; in contrast, high-performing firms spend more on R&D, a long-term-oriented, aspirational undertaking. We also found that legal development and industry competition moderate the relationships between performance feedback and risk taking differently. Highly developed legal institutions constrain bribery activity when performance falls and promote R&D when performance rises. In contrast, high competition strengthens the effects of both negative and positive performance feedback on the corresponding risk-taking activities. Our theoretical model and findings make several important contributions to the BTOF.

First, our study contributes to the BTOF by employing a consistent, motivation-based logic for the effects of performance feedback for performance both below and above the aspiration level. The use of inconsistent logics in prior BTOF-based studies is reflected in two ways: they may either use different predictors (below-aspiration-level performance and slack resources) with different logics for problemistic search and slack search, respectively (Chen, 2008; Greve, 2003; Iyer & Miller, 2008), or they might use performance feedback as the predictor of both problemistic and slack searches but with different logics (Miller & Chen, 2004; Ref & Shapira, 2017). In the latter case, high performance is equated to slack resources, because "success breeds slack" (Cyert & March, 1963: 189)—high performance exceeding aspirations leads to accumulated slack (Levinthal & March, 1981). Such an approach implicitly assumes that slack resources account for the effect of above-aspiration performance on risk taking and that performance may not have a separate effect beyond slack resources. However, the recent study by Eggers and Kaul (2018) modeled the impact of performance relative to aspirations on radical innovation in terms of both motivation and capacity. Although they did not separate motivation and capacity empirically, their study highlights the need to make such a distinction. Our motivation-based perspective, along with our empirical models controlling for slack resources, establishes an independent effect of positive performance feedback on aspirational risk taking. This perspective, combined with the motivation-based logic for deviant risk taking in the presence of negative performance feedback, provides a more coherent theory about the relationship between performance feedback and risk taking, and therefore it constitutes an important addition to the BTOF.

Second, our study contributes to the BTOF by relating performance below and above aspirations to deviant and aspirational risk taking, respectively. Prior BTOF research often considers one type of risk taking only, related to one performance scenario—typically, performance below the aspiration level (Audia & Greve, 2006; Chrisman & Patel, 2012; Desai, 2008, 2016; Tyler & Caner, 2016). Other studies treat the same focal action, such as R&D and innovation (Chen & Miller, 2007; O'Brien & David, 2014), corporate acquisition (Cho et al., 2016), and market entry/exit (Joseph et al., 2016; Ref & Shapira, 2017), as a response to both inferior and superior performance. However, they overlook the divergent risk-taking options firms at low- versus high-performance levels may choose. In line with Birhanu et al.'s (2016) study, which showed the contrast between bribery and fixed-asset investment as short-term and long-term strategic orientations, respectively, we establish that bribery and R&D represent opposing

[6] All the results are available upon request.

risk-taking options and place them in a BTOF framework. Meanwhile, building on Kuusela et al.'s (2017) argument that problemistic search leads to only certain strategic actions and not others, we offer a rationale as to why low-performing firms engage in bribery in problem-driven, deviant risk taking, while high-performing firms focus on R&D in long-term-oriented, aspirational risk taking. Our results indicate that the relationship between performance feedback and risk taking depends on the specific type of risk-taking behavior involved. This new insight significantly enhances the predictive power of the BTOF.

Third, our study enriches the BTOF by highlighting how both the institutional and industry environments moderate the relationship between performance and risk taking. Although the BTOF makes a unique contribution to the understanding of risk taking by employing a "behavioral" view, it is not easy to fully evaluate a risky firm action without considering the external constraints on firm behavior. Introducing legal development as a boundary condition for the effect of performance feedback is an important supplement to the BTOF model, because legality and law enforcement are highly relevant to risk taking, especially to deviant behaviors such as bribery and corruption (Cuervo-Cazurra, 2006; Jeong & Weiner, 2012). In addition, the level of competition likely affects risk choices (Iriyama et al., 2016). Thus, the relationship between performance feedback and risk taking can vary from one context to another. We provide evidence that, even within the same country, the motivation consequences of performance relative to aspirations can be significantly weakened or amplified by regional legal development and industry competition.

Our findings also have practical implications. Bribery and corruption are epidemic in many parts of the world, which severely undermines economic growth and is estimated to cause economic loss of more than 5% of global GDP (World Economic Forum, 2012). How to detect and deter bribery thus is a critical question for policy-makers and investors. Our findings suggest that regulators should pay close attention to low-performing firms, which have a higher tendency to engage in bribery, especially where legal development is weak or competition level is high. Further, both regulators and investors should pay close attention to non-SOEs, smaller firms, and firms with younger or shorter-tenured CEOs, as these firms likely spend more on bribery when performance falls than their counterparts. Whereas strong legal institutions help low-performing firms avoid the corruption trap and motivate high-performing firms to spend more on R&D, the practical impact of industry competition is more complicated: high competition pushes low-performing companies to engage in bribery, but it also facilitates R&D activity among high-performing firms. To policy-makers, therefore, competition may be a double-edged sword when used as a regulatory tool.

Importantly, whereas some prior studies consider managers as self-serving and deviant risk seekers even when they have high performance, high prominence, or high status (Hayward & Shimizu, 2006; Krishnan & Kozhikode, 2015; Mishina et al., 2010), our findings bring us back to a more neutral position on corporate managers. Companies may go astray when they are desperate, but deviant behaviors are probably not as widespread as we thought among high-performing firms, even when they are under competitive pressure. Our evidence suggests that such firms are most likely to spend on R&D and generate innovations for the future. These findings should help restore investor confidence in high-performing firms.

This study has several limitations. The first pertains to our bribery expenditure measure. Although we have developed a procedure to tease out the normal entertainment expenses, it is difficult to locate the perfect dividing line between bribes and expenses resulting from conventional lobbying and relationship-building efforts. Therefore, our measure is just a proxy. Future research should attempt to develop more objective and accurate measures of bribery.

The second limitation is that, while we have included legal development as a moderating factor in our theoretical model, we are unable to concurrently examine the moderating role of morality in risk-taking decisions. We define deviant risk taking as risky undertakings with illegal and/or unethical actions. As such, both legality and morality/ethics may constitute important boundary conditions for the relationship between performance feedback and bribery. Previous research indicates that morality does play an important role in decisions concerning questionable practices (Ashforth, Gioia, Robinson, & Treviño, 2008; Husted, Dozier, McMahon, & Kattan, 1996; Treviño & Youngblood, 1990). Yet, we are confined by the lack of appropriate measures for an empirical investigation of the issue. Future research should execute such an investigation by including moral/ethical factors as an additional boundary condition.

The third limitation of this study is that our findings may be subject to the influence of China's

unique institutional and cultural environments. For instance, the dividing line between bribery and business practices such as gift-giving and *guanxi* is sometimes blurred (Dunfee & Warren, 2001), so bribery may be more pervasive in China than in some of the developed economies. If that is the case—and knowing that firms likely choose either bribery or R&D as a strategy, not both—Chinese firms may be more likely than firms in other environments to choose bribery as their risk-taking action when facing falling performance. Although our context is also a benefit, as our study makes an empirical contribution to the BTOF literature, which has rarely covered emerging economy firms, we need to be cautious when generalizing our findings across national contexts.

That said, China features large, segregated markets with a high level of heterogeneity (Chang & Xu, 2008; Zhou et al., 2017), which partly overcomes the above limitation. As Acemoglu and Johnson (2005) point out, all weak institutions are not alike. There is a wide range of geographic regions and industries in our sample, and the relationships between performance and risk taking in Chinese firms vary across these regions and industries. Our study's key message is about the contrasting behaviors between Chinese firms with lower and higher performance: Firms that run into financial or operational trouble are more likely to exhibit deviant risk-taking behaviors, and high-performing firms are driven by their aspirations for the future. To further enhance our understanding, future research should examine the relationship between performance feedback and risk taking across wider national contexts by involving firms from both developed and emerging economies.

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APPENDIX A

MEASUREMENT SCALES

TABLE A1
Variable Operationalization

Variables	Measures	References
Dependent variables		
Bribery expenditure$_{t+1}$	Abnormal entertainment expenses, calculated as the residual of entertainment and travel expenses regressed on sales, assets, ratio of marketing expenses to sales, capital intensity, and average compensation of the three highest-paid executives	Cai et al. (2011), Zeng et al. (2016), Zhu (2017)
R&D intensity$_{t+1}$	Industry-adjusted R&D expenses scaled by total sales	Chen and Miller (2007), Greve (2003), Hoskisson et al. (1993)
Independent variables		
Performance (when below social aspiration)	Equal to industry-adjusted ROA if firm ROA is less than industry average ROA, and 0 otherwise	Audia and Greve (2006), Greve (1998, 2003), Harris and Bromiley (2007), Iyer and Miller (2008), Mishina et al. (2010)
Performance (when above social aspiration)	Equal to industry-adjusted ROA if firm ROA is greater than or equal to industry average ROA, and 0 otherwise	
Performance (when below historical aspiration)	Equal to history-adjusted ROA if firm ROA is less than last year's firm ROA, and 0 otherwise	
Performance (when above historical aspiration)	Equal to history-adjusted ROA if firm ROA is greater than or equal to last year's firm ROA, and 0 otherwise	
Moderators		
Legal development	Subdimension of National Economic Research Institute index on market intermediaries' development and law enforcement	Jia (2014), Zhou et al. (2017)
Industry competition	Herfindahl–Hirschman index, which equals the sum of squares of the percentages of sales of individual firms in each industry based on the three-digit standard industry classification code. We reverse-coded it so that higher values indicate higher levels of competition	Barth et al. (2009), Zhou et al. (2017)
Controls		
CEO age	Year *t* minus CEO birth year	Desai (2016), Martin et al. (2016), Mishina, et al. (2010)
CEO tenure	Number of years since the current CEO took the CEO position	
Board size	Number of board members of firm *j* in year *t*	
Political ties	Coded as 1 if either the chairman or CEO served in the People's Congress or People's Political Consultative Conference in a year	Jia (2014)
Firm size	Natural log of total number of employees of firm *j* in year *t*	Greve (2003)
Listing age	Natural logarithm of 1 plus the number of years since firm *j* obtained listing status	Ref and Shapira (2017)
SGA/Sales	Sales, general, and administrative expenses divided by total sales of firm *j* in year *t*	Bromiley (1991), Greve (2003), Iyer and Miller (2008), Mishina et al. (2010)
Current ratio	Current assets divided by current liability of firm *j* in year *t*	
Equity ratio	Total equity divided by total debt of firm *j* in year *t*	
SOE	Equals 1 if firm *j* is ultimately owned by the government in year *t*, and 0 otherwise	Zhou et al. (2017)
Foreign sales percentage	Foreign sales divided by total sales of firm *j* in year *t*	Birhanu et al. (2016), Luo (2002)
Organization change	Equals 1 if firm *j* appoints a new chair and/or CEO in year *t*, and 0 otherwise	Hayward and Shimizu (2006)
Donation	The percentage of corporate donations over sales of firm *j* in year *t*	Coffey and Wang (1998), Muller and Kräussl (2011),
Number of firms in city	Log of the number of listed firms in city *i* in year *t*	Kim, Delios, and Xu (2010)