In the Eye of the Beholder: Top Managers’ Long-Term Orientation, Industry Context, and Decision-Making Processes

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Time orientation matters. While a temporal perspective is widely recognized as an important lens in strategic management research, few studies have explored how top managers’ temporal orientation affects strategic decision-making processes. We propose that top managers’ subjective perception of time, specifically, their long-term orientation, positively affects the comprehensiveness, speed, and creativity of strategic decision-making processes and that industry context moderates these relationships. Drawing on the organization-environment fit perspective and associated compatibility and temporal fit mechanisms, we found considerable support for our hypotheses in the semiconductor and pharmaceutical industries in China. Our findings reinforce the perspective that temporal referent points act as anchors for strategic decision-making processes.

Keywords: temporal perspective; long-term orientation; strategic decision-making; top management

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Does the temporal orientation of top managers influence their firm’s strategic decision-making processes? To answer this question, prior research has predominantly focused on the leaders’ personality characteristics, firm structure, and resources as important antecedents of strategic decision-making processes (e.g., Forbes, 2005; Souder & Bromiley, 2012). Recently, a new stream of research has emerged to examine this question using a temporal orientation lens (Ancona, Okhuysen, & Perlow, 2001; Bluedorn, 2002; Nadkarni & Chen, 2014; Shi, Sun, & Prescott, 2012; Souitaris & Maestro, 2010). In the context of strategic decision-making processes, temporal orientation refers to a manager’s subjective preference toward the present or future (e.g., Bluedorn & Martin, 2008; Crossan, Cunha, Vera, & Cunha, 2005; Lumpkin & Brigham, 2011). More specifically, our focus is on top managers’ long-term orientation (LTO), defined as top managers’ subjective preference to focus on and value the future. We treat top managers’ LTO as a proxy for firms’ LTO and ask how top managers’ LTO influences the comprehensiveness, speed, and creativity (Forbes, 2005; Fredrickson, 1984; Menon, Bharadwaj, Adidam, & Edison, 1999) of strategic decision-making processes (Laverty, 1996).

We contend that understanding the relationship between top managers’ LTO and strategic decision-making processes is important because there is growing evidence that managers align strategic behavior with their value systems (Carpenter, Geletkanycz, & Sanders, 2004; Child, 1997; Hambrick & Mason, 1984) and, in particular, their temporal value system (Bluedorn & Martin, 2008; Nadkarni & Herrmann, 2010; Souitaris & Maestro, 2010). For example, the CEO of Haidilao, a Chinese-based hotpot restaurant, explained how treating employees as future investments affects important strategic decision-making processes. Haidilao pays higher than industry average wages, subsidizes housing allowances for employees, and focuses on developing a long-term family-oriented culture rather than short-term individual store sales and profit. This is in sharp contrast to GE, which has used short-term results to identify the bottom ranking 10% of managers that often resulted in their termination (Dowd & Hutchinson, 2010: 150). Operating as a subjective referent point anchor (Mosakowski & Earley, 2000), top managers with an LTO focus their strategic decision-making processes on extended time horizons (Lumpkin & Brigham, 2011) and the building of long-term stakeholder relationships and emphasize long-term effectiveness over current benefits (Bearden, Money, & Nevins, 2006; Hodgetts, 1993; T. Y. Wang & Bansal, 2012).

We know that an LTO is positively associated with personal ethical values (Nevins, Bearden, & Money, 2007), trusting relationships (Cannon, Doney, Mullen, & Petersen, 2010), reductions in perceived dependence in buyer-supplier relationships (Ganesan, 1994), and other associated organizational outcomes (Hansen & Hill, 1991; Laverty, 1996). We also have learned that decision makers and, thus, their firms, differ in their subjective experience of time (Das, 1987), their interpretation of temporal pace (Mohammed & Nadkarni, 2011), rhythm, and temporal fit (Shipp & Jansen, 2011). In other words, time is essentially in the eye of the beholder (Durkheim, 1965; E. Hall, 1983) and varies across top managers.

However, few empirical investigations employ a subjective temporal lens to examine how top managers’ temporal orientation affects their strategic decision-making processes or how environmental context moderates this relationship. In a survey of new technology ventures, Souitaris and Maestro (2010) found that polychronicity (i.e., the extent to which top management teams allocate time to one or several issues) and firm performance were partially
mediated by strategic decision speed and comprehensiveness. On the basis of letters to shareholders, Yadav, Prabhu, and Chandy (2007) showed that bank CEOs with a future temporal focus more quickly detected, developed, and deployed new products when faced with a technological opportunity. Using psycholinguistic analysis of CEO texts, Nadkarni and Chen (2014) found that environmental dynamism positively moderated CEOs’ future focus of time and the rate of new product introduction.

While this growing evidence suggests that a subjective temporal orientation affects important strategic outcomes, it remains unclear whether and under what conditions top managers’ subjective LTO affects decision-making processes. As noted above, the limited studies on the consequences of LTO have mainly focused on the direct effect of a firm’s future focus on new product introduction (e.g., Nadkarni & Chen, 2014; Yadav et al., 2007), while the underlying temporal value mechanism explaining the relationship between an LTO and strategic decision-making has seldom been examined. This is an important omission because temporal referent points, as decision criteria or anchors for decision-making (Mosakowski & Earley, 2000; Venkatraman, 1989), “constitutes a fundamental component of strategy making” (Das, 2004: 58). Focusing on this research gap, we ask two questions. First, does the subjective LTO of top managers influence three critical facets of the strategic decision-making process: comprehensiveness (Fredrickson, 1986), speed (Baum & Wally, 2003; Forbes, 2005), and creativity (Menon et al., 1999)? We focus on these characteristics because they are important constructs in the strategic decision-making process literature and have performance implications (Forbes, 2005; Fredrickson, 1984; Menon et al., 1999; Souitaris & Maestro, 2010). Second, how does industry context moderate the LTO–strategic decision-making process relationship? We focus on three industry characteristics that are theoretically congruent with the three decision-making processes: complexity is associated with comprehensiveness-related constructs (Judge & Miller, 1991), industry clock speed is associated with speed-related constructs (Kim, Burns, & Prescott, 2009), and innovativeness is associated with creativity (Baum, Calabrese, & Silverman, 2000). We theorize that these industry characteristics enhance or attenuate the effect of top managers’ LTO–strategic decision-making process relationship. To examine our research questions, we integrate the temporal and strategic decision-making process literatures with the organization-environment fit perspective (Lawrence & Lorsch, 1967; Prescott, 1986). On the basis of compatibility and temporal fit mechanisms (Ancona & Chong, 1996; Pérez-Nordtvedt, Payne, Short, & Kedia, 2008), our core premise is that top managers’ LTO affects decision-making processes and the manner of which hinges on the external context in which firms are embedded.

We test our hypotheses in the semiconductor and pharmaceutical industries in China, using a questionnaire collected from 750 firms. We selected these high-technology industries because they differed on our environmental moderators: complexity, clock speed, and innovativeness. At the same time, they had similar levels of dynamism and munificence consistent with high-tech settings (see the Method section). We found that top managers’ LTO was positively and significantly associated with strategic decision-making comprehensiveness, speed, and creativity. In other words, an LTO is associated with three decision-making processes that most scholars and managers endorse as good practice (Fredrickson, 1986; Mintzberg, 1994; Pfeffer & Sutton, 2000). For our interaction hypotheses, industry complexity positively moderated the LTO–comprehensiveness relationship and industry innovativeness positively
moderated the LTO–creativity relationship. Industry clock speed did not moderate the LTO–strategic decision-making speed relationship.

We contribute to research in two major ways. First, building on the temporal perspective (Bluedorn & Martin, 2008; Crossan et al., 2005; Shi et al., 2012), we join a nascent research stream exploring the antecedents of decision-making processes (Nadkarni & Chen, 2014; Souitaris & Maestro, 2010). Prior research has focused on leaders’ personality characteristics, firm structure, and resources as important antecedents of decision-making processes. We contribute by shedding new light on this conversation by theorizing how top managers’ LTO, serving as a temporal referent point, explains why firms have decision-making processes characterized by comprehensiveness, speed, and creativity. Theoretically, temporal considerations represent an important foundation for understanding how critical strategic decision-making processes manifest within a firm (Mosakowski & Earley, 2000). We also complement studies advocating a subjective view of time using secondary data (Nadkarni & Chen, 2014) with primary data collected from top managers (Souitaris & Maestro, 2010). Top managers’ subjective LTO resonates well with the perspective that strategic decision-making processes are socially constructed based on the characteristics of strategists as representatives of their firms (Child, 1997; Chiles, Bluedorn, & Gupta, 2007; Crossan, Vera, & Nanjad, 2008).

Second, we contribute to the temporal fit research stream by theorizing that industry characteristics moderate the relationships between top managers’ temporal orientation and strategic decision-making processes. In doing so, we highlight the importance of examining the impact of top managers’ temporal orientation on firm-level decision-making processes under different industry contexts—an approach advocated by theoretical scholars (Mosakowski & Earley, 2000; Ofori-Dankwa & Julian, 2001) as essential to providing more nuanced explanations of the effects of time-related constructs (Fey & Denison, 2003).

Theory and Hypotheses

The Temporal Construct LTO

There are several frameworks regarding temporal orientation, including monochromic versus polychromic (Souitaris & Maestro, 2010), sequential versus synchronic (Trompenaars & Hampden-Turner, 1998), clock time versus event time (Ancona et al., 2001; Crossan et al., 2005), and past and present versus future (Das, 1987; Mohammed & Nadkarni, 2011).

In this study, we focus on managers’ temporal orientation toward time: short-term orientation (STO) versus LTO (Flammer & Bansal, 2017; Souder & Bromile, 2012). Theoretically, STO versus LTO reflects preference-driven variations (Kotter, 1982; Whittington, 1988) in the temporal pattern of top managers’ activity (Finkelstein, Hambrick, & Cannella, 2009) that affect their strategic decision-making processes (Souitaris & Maestro, 2010). While an LTO is top managers’ subjective preference to focus on and value the future, an STO anchors the opposite end of the temporal orientation spectrum. An STO is top managers’ subjective preference to focus on and value the present. An STO emphasizes proximate returns rather than future returns and values efficiency and planning for the moment (Hofstede, 1993; Hoskisson & Hitt, 1988; T. Y. Wang & Bansal, 2012). Consistent with prior literature, top managers’ view of time-sensitive decisions depends, in part, on how they use temporal referent points (i.e., present or future) as decision criteria or anchors in their decision-making
processes (Mosakowski & Earley, 2000). In other words, top managers’ temporal orientation provides a dominant logic for decisions (Lumpkin & Brigham, 2011; Nadkarni & Herrmann, 2010). We adopt the perspective that the temporal orientation of top managers is a reflection of their organization (Hambrick & Mason, 1984).

Top managers with an LTO value extended time horizons and assign great importance to the future (Lumpkin & Brigham, 2011). They are likely to build long-term relationships with stakeholders, view time as connected, and prioritize future benefits over current benefits (Bearden et al., 2006; Hodgetts, 1993; T. Y. Wang & Bansal, 2012). Prior research has found that top managers with an LTO are likely to counteract managerial myopia and enhance firm value through the pursuit of innovation, the engagement of stakeholder relationships (Flammer & Bansal, 2017), and the cultivation of entrepreneurial activity (Hofstede, 1991). Top managers with an LTO are more open to change and view adaptation as a necessity to ensure continued success (Geletkanycz, 1997).

In contrast, top managers with an STO are more reflective and respect traditional practices (Hofstede, 1991), promote fewer new initiatives (Geletkanycz, 1997), and focus on the “here and now” (Nevins et al., 2007). An STO often results in underinvestment in technologies (Marginson & McAulay, 2008), R&D, and capital assets (Souder & Bromiley, 2012). However, research also found that an STO is not necessarily detrimental. It is associated with positive outcomes such as efficiency and immediate returns (Bearden et al., 2006). Covin and Slevin (1989) found that an STO was significantly correlated with firm performance in benign environments. Furthermore, Cuñat, Gine, and Guadalupe (2012) showed that short-term corporate governance is value enhancing.

**LTO and Strategic Decision-Making Processes**

Research has focused on leaders’ personality characteristics (e.g., risk tolerance), firm structure (e.g., centralization), and resources (e.g., slack) as important antecedents of decision-making processes. We contend that top managers also base decision-making processes on their preferred value system (Carpenter et al., 2004) and, in particular, their preferred temporal value system (Bluedorn & Martin, 2008; Lumpkin & Brigham, 2011; Souitaris & Maestro, 2010). Top managers’ preferred temporal value system affects their strategic choices, including decision-making processes (Child, 1997). Recognizing that the subjective value system of a firm’s dominant coalition influences and constrains choice, Child (1997) drew on Whittington’s (1988) concept of action determinism. Action determinism asserts that “actions are selected according to in-built preference[s] [of managers acting on behalf of their firms]” (Whittington, 1988: 524). Thus, a characteristic of top managers with an LTO is a preference for anchoring strategies far into the future that shape and constrain strategic decision-making processes.

A few recent empirical investigations have focused on how top managers’ subjective view of time affects their strategic decision-making processes or the moderating role of environmental context. For instance, Souitaris and Maestro (2010) found that polychronicity has an impact on firm performance through its influence on strategic decision speed and comprehensiveness. Nadkarni and Chen (2014) found CEOs’ future focus significantly affects the rate of new product introduction. Whereas prior studies pointed to the importance of top managers’ temporal lens, the underlying temporal value mechanism explaining the relationship between an LTO and strategic decision-making has seldom been examined. This gap is
especially important because top managers’ temporal value system, such as LTO, may not directly affect organizational outcomes but exert its role through strategic decision-making.

An LTO is one of the most salient values that directly influence top managers’ preferences for strategic-making processes, including strategic decision comprehensiveness (Fredrickson, 1984), strategic decision speed (Eisenhardt, 1989; Forbes, 2005; Wally & Baum, 1994), and strategic decision creativity (Menon et al., 1999). We focus on these constructs because they represent key dimensions of strategic decision-making processes and have important performance implications. For example, prior research has found that decision comprehensiveness is positively related to change in profitability and sales (Simons, Pelled, & Smith, 1999), as well as new product quality (Atuahene-Gima & Li, 2004). A fast decision speed predicts subsequent firm growth and financial performance (Baum & Wally, 2003; Souitaris & Maestro, 2010). In addition, decision creativity leads to more radical innovations (Baron & Tang, 2011), organizational learning, and market performance (Menon et al., 1999). In the following section, we first hypothesize the direct impact of an LTO on these processes and then explore the contingent effect of industry context.

**Decision comprehensiveness.** Decision-making comprehensiveness refers to the extent to which decision makers utilize an extensive decision process, including simultaneous consideration of multiple and alternative solutions, extensive search and analysis of the external environment, and extensive utilization of quantitative and qualitative information (Fredrickson, 1986; Priem, Lyon, & Dess, 1999). We contend that top managers’ LTO has a positive impact on decision-making comprehensiveness.

Top managers who have an LTO tend not to develop a “here-and-now” mindset (Nevins et al., 2007) as the future takes center stage in the temporal horizon for decision makers. A long-term temporal horizon implies that there is less of a sense of urgency around meeting deadlines (Eisenhardt & Brown, 1998). Decision makers care less about immediate results and are more concerned about the future consequences of committing resources. Without a central focus on deadlines, top managers can better handle multiple tasks (Saunders, Slyke, & Vogel, 2004)—a key component of decision-making comprehensiveness. In addition, imposing deadlines hampers interpersonal, nontask communication (Saunders et al., 2004) and generates increased internal resource competition (Ozbas, 2005).

Managers with an LTO understand that their decisions, once made, should address fundamental issues that may have a lasting effect on their long-term viability. Therefore, their information search should go beyond the vicinity of their burning problems and, instead, consider factors that indirectly or remotely affect their future viability. For example, managers with an LTO may not only attend to competition in their current industry but also be aware of potential competitors and threats from other industries. An LTO thus expands managers’ horizon to multiple sources of information and motivates them to engage in extensive analysis of the information accessed, leading to comprehensive decision-making.

*Hypothesis 1:* There is a positive relationship between top managers’ LTO and strategic decision-making comprehensiveness.

**Decision speed.** Decision speed refers to the pace with which organizations implement all aspects of the decision-making process, spanning the initial consideration of alternative
courses of action to the time at which a commitment to act is made (Eisenhardt, 1989; Forbes, 2005). Theoretically, an STO is associated with obtaining and meeting performance expectations in the immediate future and social pressures to keep pace with peers. However, it does not mean that an LTO leads to slow decision-making for two reasons.

First, an LTO increases one’s time horizon and allows for a clear vision of the future without short-term pressures to conform to institutional stakeholders (Saini & Martin, 2009). Top managers with an LTO perceive that performance is related to a series of multiple and often cyclical decision processes (Shi & Prescott, 2011) rather than a single decision-making process. Furthermore, building on Eisenhardt’s (1989) study in a high velocity industry, Judge and Miller (1991) argued that the simultaneous development and evaluation of multiple alternatives accelerates cognitive processing and, hence, decision speed. They found that regardless of environmental context, the number of alternatives simultaneously considered was positively associated with decision speed. Given this logic, top managers with an LTO will speed up a single decision-making process when the consequence of a speedy decision is an integral part of a coherent overall program of decisions. For example, in deciding on acquisition targets, managers with an LTO will move quickly to identify target companies as long as they understand how this specific decision fits into the firm’s overall acquisition program.

Second, slow decision-making consumes more resources in the form of managerial time and human capital. This builds unnecessary internal conflict and politics that hinder effective communication and instead promotes rent-seeking behavior. This is especially true when decisions involve major changes that require reorientation (Hinings & Greenwood, 1988). In contrast, fast decisions consume fewer resources since they create synergy where information and resources pull together in a common direction (Amis, Slack, & Hinings, 2004). Since top managers with an LTO propel their firms toward a common direction, it saves resource consumption in decision-making processes as well as for the linkages among decisions, enhancing decision-making speed.

**Hypothesis 2**: There is a positive relationship between top managers’ LTO and strategic decision-making speed.

**Decision creativity.** Both strategy and marketing scholars acknowledge decision creativity as a key component of decision-making processes (Menon et al., 1999; Mintzberg, 1994). Decision creativity is defined as the degree to which the decision-making process is novel, radical, and different from prevailing industry practices (Menon et al., 1999). We reason that there is a positive relationship between top managers’ LTO and decision creativity.

As noted earlier, an LTO increases the time horizon for decision-making. Prior research shows that an overconcern with deadlines hampers creative tasks. Saunders et al. contend that “because of limited attention to resources, the more one’s consciousness focuses on succession, the less attention it invests into the task itself” (2004: 27). The feeling of timelessness therefore increases the likelihood of creativity with regard to the task. Scholars also reason that both radical and incremental innovations pay off after an appreciable time delay (Lumpkin, Brigham, & Moss, 2010). Generally speaking, long time frames encourage experimentation and creative efforts (Zellweger, 2007) that involve a conservative commitment of resources until uncertainty is sufficiently reduced. For instance, researchers found that when adopting longer time frames, entrepreneurs create opportunities through expectations of an imagined
future and exploit these opportunities through creative resource (re)combination (Chiles et al., 2007) before making major resource commitments (McGrath & MacMillan, 2009).

Both LTO and STO are associated with tradition (Bearden et al., 2006). While an STO respects traditions and its constraints, an LTO adapts tradition to a modern context (Peterson, Dibrell, & Pett, 2002). Following this logic, top managers with an STO are more likely to emphasize historical core capabilities and traditional strategic decision-making tools, which may turn into “core rigidities” or “competency traps” (Leonard-Barton, 1992). Core rigidities are a major source of lower creativity in organizations (Moorman & Miner, 1997). Top managers with an LTO, however, are able to mix existing knowledge and skill sets with new ones, which greatly enhances creative decision-making (Slater & Narver, 1995). As Nerkar (2003) contends, the creative act is the product of recombination of existing knowledge within a broader time horizon.

Hypothesis 3: There is a positive relationship between top managers’ LTO and strategic decision-making creativity.

Moderating Role of Industry Context

Drawing on the literature, we identified three industry characteristics that are theoretically congruent with the three decision-making processes: complexity is associated with comprehensiveness-related constructs (Judge & Miller, 1991), industry clock speed is associated with speed-related constructs (Kim et al., 2009), and innovativeness is associated with creativity (Baum et al., 2000). In this section, we theorize that higher levels of industry complexity and innovativeness enhance the positive LTO–comprehensiveness and LTO–creativity relationships. In contrast, higher levels of industry clock speed attenuate the positive relationship between an LTO and decision-making speed.

Our theorizing links the organization-environment fit perspective with the strategic decision-making process literature. Our premise, based on compatibility and temporal fit mechanisms (Ancona & Chong, 1996; Pérez-Nordtvedt et al., 2008), is that the strength of top managers’ LTO on decision-making processes hinges on the firm’s context. The interplay between firms and their environment is a central premise of the strategic choice perspective. Thus, top managers should adapt their strategic decision-making processes to their context—a form of “bounded” autonomy (Child, 1997: 53). Temporal scholars have also reasoned that the environment constrains and facilitates relationships between top managers’ temporal orientation and decision-making processes (Fey & Denison, 2003). Failure to maintain congruence is associated with suboptimal strategic behavior (Hambrick, Finkelstein, & Mooney, 2005).

Alignment between top managers’ temporal orientation and the external environment and its strategic processes allows them to better understand key contingencies and take action (Gibson, Waller, Carpenter, & Conte, 2007). Therefore, it is important for top managers’ temporal orientation to be commensurate with industry demands. As Nadkarni and Chen pointed out, “An inconsistency between the two is associated with miscalculation of environmental demands and misalignment of actions with these demands” (2014: 1810). The implication central to our work is that when top managers’ temporal orientation is compatible with the characteristics of its industry’s context (Bakker & Knoben, 2015; Nadkarni & Chen, 2014), the relationship between LTO and strategic decision-making processes is enhanced; otherwise, the relationship will be attenuated.
**Decision comprehensiveness and industry complexity.** Our interaction-based logic is that an LTO has a stronger positive affect on decision-making comprehensiveness in industries characterized by a high level of complexity. Competing in a complex industry, firms interact with a large number and heterogeneous set of institutions and groups and, thus, face growing demands for comprehensive information processing. Managers need to search broadly before locking in on a set of choices (Siggelkow & Rivkin, 2005) and develop various and flexible solutions to match the requisite variety associated with the level of industry complexity (Ashby, 1956). Decisions, to a large degree, are interdependent (Levinthal, 1997; Rivkin, 2000) in complex environments. Thus, an LTO-oriented temporal horizon reduces the need for meeting deadlines and tends to be more effective in a complex environment than in a less complex, homogeneous environment. In addition, when an industry is complex, it is particularly important for firms to have a broad pool of managerial knowledge and capabilities. Accumulating these capabilities is usually historical, reproductive, and path dependent (Schreyögg & Sydow, 2010). The nature of complexity thus provides a compelling rationale for the strategic value and relevance of an LTO in cultivating a broad pool of capabilities (Schreyögg & Sydow, 2010).

A complex environment significantly raises the need for interpersonal communication across different organizational units (Siggelkow & Rivkin, 2005) and sets the tone for decision makers to view a particular decision as interdependent with the overall decision program. Managers need to spend significant effort in analyzing a complex environment because there are multiple dimensions to consider (D. Miller & Friesen, 1983). Hence, complexity heightens the requirement for decision comprehensiveness. This suggests that a time orientation that anchors strategies in the future is valuable in a highly complex environment. Consequently, decision-making needs to incorporate the concerns of a wide set of stakeholders with interrelated interests, all of which demands requisite variety (Ashby, 1956; Volberda & Lewin, 2003). Conversely, a low complexity industry context makes it less pressing for top managers with an LTO to increase decision comprehensiveness. In other words, the impact of LTO on decision comprehensiveness will be stronger in a complex industry.

**Hypothesis 4a:** The positive relationship between top managers’ LTO and strategic decision-making comprehensiveness is stronger in industries characterized by a high level of complexity than a low level of complexity.

**Decision speed and industry clock speed.** Industries differ by their clock speed (Fine, 1998), defined as the rate at which an industry evolves based on its products, processes, and organizational clock speeds. For example, the pharmaceutical industry has a slow clock speed characterized by significant investment in R&D and long investment cycles (Pisano, 1994). Fine (1998) documented that the product-technology clock speed is usually 7 to 15 years in pharmaceuticals and 1 to 2 years for semiconductors. Similarly, the fast pace in the semiconductor industry is the result of frequent replacements of process technologies (2–3 years vs. 10–20 years in the pharmaceutical industry; Nadkarni & Narayanan, 2007). We reason that the relationship between an LTO and decision-making speed is weaker in industries characterized by fast clock speed than by slow clock speed because an LTO sensitizes top managers to the perils of speed traps (Perlow, Okhuysen, & Repenning, 2002).

Although a fast industry clock speed may heighten the need for making quick decisions, the perceived pressure for making quick decisions needs to consider top managers’ LTO strategy-making context (Perlow et al., 2002). We contend that top managers with an LTO are
likely to view decisions in the context of long-term goals and avoid speed traps imposed by a changing environment (Perlow et al., 2002). In contrast, top managers with an STO are likely to speed up their decision process, as they are more concerned with an immediate response to environmental pressures.

In an industry characterized by a fast clock speed like the semiconductor industry, a temporal fit with industry demands requires firms to come up with new products and technologies. Otherwise, technological shifts will adversely affect the firm (Huy, 2001). In this sense, top managers in an industry with a fast clock speed are subject to consistent disruptions to their routines that challenge their LTO and reduce the connectedness among multiple decisions, thereby increasing the difficulty of every decision. Swiftly changing industry demands also put pressure on firms. A single mistake may have significant implications if technological shifts are inconsistent with their capabilities (Christensen, Anthony, & Roth, 2004).

Conversely, in an industry characterized by a low clock speed like the pharmaceutical industry, top managers have the temporal luxury of sorting out the connections among different decisions and developing a clear vision for long-term performance. However, top managers with an LTO will speed up a single decision-making process when the consequence of the decision is an integral part of an overall coherent sequence of decisions. For example, in the pharmaceutical industry, individual decisions are often part of a set of interdependent sequential decisions (Hess & Rothaermel, 2011) involving feedback, reevaluation, and reconceptualization, which speed up the time for a single decision.

**Hypothesis 4b:** The positive relationship between top managers’ LTO and decision-making speed is weaker in industries characterized by fast clock speed than slow clock speed.

**Decision creativity and industry innovativeness.** We reason that the LTO–decision creativity relationship is stronger in industries characterized by higher levels of innovativeness, such as the pharmaceutical industry, rather than lower levels of innovativeness as in the semiconductor industry. As noted above, an LTO increases top managers’ time horizon, and research shows that deadline concerns hamper creative tasks (e.g., Saunders et al., 2004). In industries characterized by lower levels of innovativeness, efficiency concerns usually dominate creativity (Souder & Shaver, 2010) as managers seek efficiency-oriented solutions. In a context where the external demand for innovativeness is low, top managers with an LTO will likely place more emphasis on efficiency-based innovation, such as the exploitation of existing innovative capabilities. Firms are not pressed to be as creative in their decision-making processes but, rather, follow existing routines (Christensen et al., 2004). Conversely, an industry high in innovation requires top managers to embrace flexibility. Within an innovative industry, creative acts are essentially the product of recombination of existing knowledge within a longer time horizon (Nerkar, 2003). An innovative environment propels top managers with an LTO to connect their current viability with future viability and local
searches with distal searches to enhance exploratory innovations. Simply put, top managers with an LTO are more compatible with industries characterized by high levels of innovativeness to enhance strategic decision creativity.

**Hypothesis 4c:** The positive relationship between top managers’ LTO and strategic decision-making creativity is stronger in industries characterized by a high level of innovativeness than a lower level of innovativeness.

**Method**

**Research Setting and Data Collection**

To test our hypotheses, we focused on two high-technology industries in China—pharmaceutical and semiconductor. We selected these industries because they are often studied in strategy research and because we were able to obtain pertinent data regarding their industry characteristics for comparison purposes. The two industries differ (see below) on the three industry-level characteristics used to test our moderator hypotheses, namely, complexity, clock speed, and innovativeness.

We contacted all firms appearing in an industry directory covering both the semiconductor and the pharmaceutical industries in Guangdong province. With the help of a local consulting agency, we contacted 1,300 firms and secured cooperation from 750 firms with relatively the same number of firms in each industry. The research instrument was hand delivered to the informants by trained personnel and completed on site or collected by hand afterward. We performed preliminary screening of the completed questionnaire and reconducted the survey for some of the disqualified questionnaires. For example, for questionnaires not completed by top managers, we reconducted the survey. To ensure data integrity, we telephoned each informant to verify that he or she had completed the questionnaire. The informants consisted of CEOs and vice presidents and department heads in R&D, marketing, or other areas. They represented key decision makers within the firms. We collected valid responses from 463 firms (36% response rate) covering 243 firms in the semiconductor industry and 220 firms in the pharmaceutical industry. Each firm had two respondents, resulting in 926 usable questionnaires. The number of employees for our sample firms ranged from 16 to 6,700 with a mean of 415. We averaged the responses from the two respondents (intrarater reliability for each variable was .89 or greater; see details below). We compared a sample of 200 responding firms with a sample of nonresponding firms for which we had data on research and development expenses and number of employees. Analysis of variance (ANOVA) tests indicated no significant differences. A test of early (150) versus late respondents did not indicate significant differences.

**Measures**

**Dependent variables.** We measured decision comprehensiveness using five items from Atuahene-Gima and Li (2004). These items assessed whether managers developed multiple alternative courses of action, considered many different criteria, thoroughly examined multiple explanations for problems, conducted multiple examinations of suggested actions, and searched extensively for possible alternative actions. The Cronbach’s alpha was .80.
Decision creativity was measured using the three items in Menon et al. (1999). These items examined whether decisions created significant changes in policy or procedure, whether the managers developed new approaches that were different from prevailing industry practices, and whether managers came up with radical new ideas. The Cronbach’s alpha was .74.

Decision speed was measured using the three items listed by Baum and Wally (2003). The items examined whether key questions were resolved quickly, whether there was little waste of time in making decisions, and whether issues were identified rapidly. The Cronbach’s alpha was .90.

**Independent variable.** LTO was measured using three items from Atuahene-Gima and Li (2006) assessing whether top managers perceived that they were more concerned with long-term performance than with short-term performance, with long-term success than with immediate success, and whether they had made it clear that building long-term relationships with stakeholders was important. The Cronbach’s alpha was .87. A subjective assessment of top managers’ LTO resonates well with the perspective that strategic decision-making processes are socially constructed based on the characteristics of strategists as representatives of their firms (Chiles et al., 2007; Crossan et al., 2008). The items and standardized factor loadings for each construct are provided in the appendix. Variables were measured on a 7-point Likert scale from 1 (low) to 7 (high).

**Moderating variables.** Industry complexity captures the amount of industry heterogeneity. Dess and Beard found that “the complexity factor in both factor structures was dominated by measures of geographical concentration” (1984: 63). Studies following their lead have validated this approach and used industry concentration to reflect industry complexity (Keats & Hitt, 1988; Rasheed & Prescott, 1992). The underlying logic is that in a high concentration industry, there are a few strong and relatively homogeneous firms that generate less heterogeneous information and have established norms of interaction, whereas in an industry with low concentration, there are many heterogeneous firms and there are multiple pathways to competitive advantage (Palmer & Wiseman, 1999). An inverse of the industry concentration ratio corresponds to a high degree of industry complexity (Jansen, Van den Bosch, & Volberda, 2006).

We used the annual surveys of industrial firms conducted by the National Bureau of Statistics of China from 1998 to 2008 to measure industry complexity. This data set included all firms (both state-owned and non-state-owned firms) with annual sales revenue of no less than 5 million Chinese yuan (RMB; around $600,000 based on the 2005 exchange rate). It provided firm-level accounting information on total sales, new product sales, number of employees, ownership type, and so forth. The annual number of firms ranged from 146,121 to 319,772, and their total industry sales exceeded 90%. Studies published in leading journals have demonstrated the validity and reliability of this data set (e.g., Chang & Xu, 2008; Zhang, Li, Li, & Zhou, 2010). Since our survey data were collected in 2006, we used the archival data set to compute industry complexity in 2005, assuming a 1-year lag between the industry variables and decision-making processes.

Specifically, we measured industry complexity by the reversed score of industry concentration based on a standard Herfindahl measure:
Industry Complexity = (-1) * \sum_{i=1}^{n} \left( \frac{Sales_i}{\sum_{i=1}^{n} Sales_i} \right) ^ n

where \( i \) is any firm in an industry and \( n \) is the total number of firms in that industry.

Industry clock speed was the growth rate of industry-level patenting, which reflects the pace of innovation. An industry with a high growth rate of patenting indicates that it is experiencing fast technological change and that its firms face obsolescence pressure. Conversely, a low growth rate of patenting reflects that the industry is experiencing less technological change. Patent data have often been used to measure technological knowledge created by a firm and its industry (Silverman, 1996; Sorensen & Stuart, 2000). A growing rate of patenting equates with a growing body of technological knowledge. While patents capture only codified knowledge, Patel and Pavitt (1997) found that patented knowledge and uncodified knowledge are often highly correlated. Following Keats and Hitt (1988), we collected patent data from China’s State Intellectual Property Office from 1998 to 2008 and regressed the number of industry patents for the 5 years preceding a focal year (including the focal year) on the year variable. Industry clock speed was the antilog of the regression slope coefficient. Since industry clock speed and the rate of new product introduction are correlated (Nadkarni, Chen, & Chen, 2016), we also used an alternative measure: the rate of new product sales over total sales. This measure produced consistent findings.

Fine (1998) found that product-technology clock speed was greater than 8 years in the pharmaceutical industry compared with around 1 year in the semiconductor industry. We conducted interviews with two top executives in each industry to gauge their clock speed. The interviewees’ perceptions of their industry clock speed did not differ from Fine’s results.

Industry innovativeness was the total number of patents generated in each industry over the past 5 years (unit: 10,000). Patent, as a proxy of innovativeness, has been widely used in prior research (e.g., Ahuja & Katila, 2001; Srivastava & Gnyawali, 2011). In knowledge-intensive industries such as pharmaceuticals, it is well-established that patenting influences firm innovation (B. H. Hall, Jaffe, & Trajtenberg, 2005). Patents provide firms with safeguards that stimulate long-term innovative activity (Caner, Bruyaka, & Prescott, 2018). Furthermore, the pharmaceutical industry was identified by Cohen, Nelson, and Walsh (2000) as one of the few industries where patenting was an effective mechanism encouraging innovation. A \( t \) test showed that the pharmaceutical industry was more innovative than the semiconductor industry (\( p < .05 \)). Further evidence of the role of innovation was provided by the profit difference between the industries during the 2000s, with semiconductors averaging 3% (Chesbrough & Liang, 2008) and the pharmaceutical industry averaging 8% (China Economic Information Network, 2011).

While China’s pharmaceutical industry has traditionally been perceived as having low levels of innovation, this situation has changed significantly since the 2000s for two reasons. First, health-care reforms by the Chinese government created a variety of incentive policies to attract foreign pharmaceutical firms. For example, local governments have sponsored numerous pharmaceutical industry parks. Guandong province, our geographic setting, has one of the top eight pharmaceutical industry parks in China (KPMG, 2011). Second, the new corporate income tax law encouraged R&D activity. As of 2010, the top
10 global pharmaceutical firms have established R&D centers in China. Sanofi, one of the global pharmaceutical giants, set up its ASPAC R&D center in Shanghai. AstraZeneca moved its Asia Pacific headquarters from Singapore to Shanghai. These inflows of foreign direct investment significantly enhanced the innovation capability of local firms through spillover effects (Chang & Xu, 2008).

In addition, the continuous inflow of returnee entrepreneurs significantly increased the amount of new knowledge and skill sets that have elevated the innovation bar. As Frank Grams, executive director of Roche, observed:

Innovation is the key success factor in the pharma sector. Increasingly more returnees are bringing their innovative projects to China—and bringing the results to markets. That’s great for China’s pharmaceutical market. (KPMG, 2011: 24)

Control variables. We controlled for variables that were theoretically associated with the temporal orientation–decision-making process relationship. Firm size was the log of employees. Firm age was measured from the date of a firm’s founding. Since firm ownership influences decisions (Peng, Tan, & Tong, 2004), we assessed whether the firm was once a state-owned enterprise using a dummy variable. We measured R&D intensity by asking the respondents the ratio of their firm’s R&D expenses to total sales. To control for slack and risk-taking effects in decision-making (Singh, 1986), we measured a firm’s slack resources using Tan and Peng’s (2003) five-item scale and a firm’s risk-taking preference using Covin and Slevin’s (1989) three-item scale. Their Cronbach alphas were .70 and .77, respectively.

Structural dimensions of a firm, such as centralization and formalization, affect strategic decision-making processes (Fredrickson, 1986). We measured centralization using the Jansen et al. (2006) five-item scale to assess whether decision-making was pushed upward in the organization. Formalization was assessed with the five-item scale in Jansen et al. The Cronbach’s alphas for the measures were .71 and .78, respectively. We also controlled for a firm’s international orientation by using the items in De Clerq, Sapienza, and Crijns (2005) because many manufacturing firms in China are heavily involved in exports. Temporal era was a dummy variable with the year 2000 as a dividing point. Firms founded before year 2000 were classified as pre–World Trade Organization era, while firms founded after 2000 were classified as post–World Trade Organization era. A firm’s stage of development influences the way it frames short- or long-term horizons for important decisions (Hite & Hesterly, 2001). We measured organizational life cycle by asking which stage best represented their firm: emergence, early growth, late growth, maturity, or declining, with the value ranging from 1 to 5, respectively.

To eliminate alternative explanations, we calculated other possible “difference” variables across the two industries. Following Dess and Beard (1984), we calculated dynamism and munificence scores for our industries. Specifically, we used archival data to generate industry sales and then regressed industry sales over the 5 years preceding the focal year (including the focal year) on the year variable. Munificence was measured as the regression slope coefficient divided by the average value of industry sales, while dynamism was measured as the standard error of the regression slope coefficient divided by the average value of industry sales (Keats & Hitt, 1988), consistent with other strategy studies (Nadkarni & Chen, 2014; H. L. Wang & Chen, 2010). Results from t tests of the industry indices from 2000 to 2005 showed that there were significant differences between the two industries in terms of industry

...
complexity (−5.92, \( p < .001 \)), clock speed (5.12, \( p < .001 \)), and innovativeness (−2.39 \( p < .05 \)) but not in terms of dynamism (−0.09, n.s.) and munificence (1.61, n.s.). These results suggest that both industries have attributes of high-technology industries (dynamism and munificence) and that it is appropriate to compare the two industries in terms of industry complexity, clock speed, and innovativeness.

**Assessment of common method bias.** We conducted two tests to assess whether common method variance was a threat to validity. First, we conducted the measured latent method factor approach (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Specifically, we identified one construct—“threat interpretation”—as our marker factor. We defined a threat as the extent to which managers perceive an external environment as negative, where loss is likely and over which they have relatively little control. We followed the approach of White, Varadarajan, and Dacin (2003) and used four items in measuring threat: (1) describe the environment overall as a threat, (2) perceive the overall environment as negative, (3) perceive the environment as having negative implications for the future of your firm, and (4) perceive the overall environment as uncontrollable. This construct had sufficient reliability and validity (average variance extracted = .62, composite reliability = .87, \( \alpha = .84 \), factor loadings of four items ranged from 0.65 to 0.91). The threat construct was not related to our substantive factors. We ran a measurement model with all substantive factors and the method factor, allowing substantive factors to covary but not allowing our method factor to covary with any other factors. We then ran the same measurement model but allowed all substantive items to “double load” on both the substantive factor and the method factor. The chi-square difference test showed that the model that included threat method loadings fit the data better than the baseline model—\( \Delta \chi^2(23, N = 463) = 112.93, p < .0001 \). However, we further compared the variance decomposition between substantive factors and the method factor, following the formula in Williams, Hartman, and Cavazotte (2010: 500). It showed that the average proportion of variance attributable to substantive factors (95.35%) was much higher than that attributable to the threat (0.66%) method variance. These analyses suggested that common method variance was not a significant concern because substantive relationships, rather than common method bias, accounted for the observed relationships (Wayne, Butts, Casper, & Allen, 2017).

Second, when there are multiple respondents, researchers sometimes use one respondent for the dependent variables and another respondent for the independent variables. We conducted our analysis using this approach and the results were consistent. In addition, we calculated an interrater agreement score (\( r_{\text{wg}} \)) for each variable. This measure ranged from 0 (“no agreement”) to 1 (“complete agreement”; James, Demaree, & Wolf, 1984). The lowest interrater agreement was .89 for firm slack, well above the .70 benchmark suggested by James et al. (1984). We examined intraclass correlation coefficients (ICCs) for each variable through a one-way random-effects ANOVA where the individual rating of each variable was the dependent variable and firm membership was the independent variable. The ICC(1) ranged from .31 to .92 (\( p < .01 \)), while the ICC(2) ranged from .47 to .96. Although the lower end of the ICC(2) is less than satisfactory, the significant \( F \) tests and the high interrater agreement scores suggested that it was appropriate to aggregate the data (Kirkman, Chen, Farh, Chen, & Lowe, 2009). These results further supported the high reliability of the informants’ responses and the high quality of the data. Given the results of the common method bias assessment, rather than using one respondent for the independent variables and the other
respondent for the dependent variable, we decided that averaging the two respondents’ scores was appropriate because it contributed to the reliability of the measures.

Results

We used hierarchical regressions to test our main effect and interaction hypotheses in separate models. Table 1 presents the descriptive statistics. Given that we used 1 year of data for the two industries and that the t-tests indicated that the industries significantly differed in terms of complexity, clock speed, and innovativeness, the industry-level variables are thus highly correlated. Specifically, the pharmaceutical industry had high values for industry complexity and industry innovativeness, while the semiconductor industry had low values for these indices, suggesting a perfect correlation between industry complexity and industry innovativeness. To avoid multicollinearity, we entered each of the industry variables separately in the regression models in Table 2. As a robustness analysis, we used an industry dummy variable (0 = semiconductor, 1 = pharmaceutical industry) in Table 3. The findings were consistent.

The results of the hierarchical regression analyses for the effect of top managers’ LTO on the dependent variables decision comprehensiveness, decision speed, and decision creativity, respectively, are shown in Table 2. The control variables served as a baseline model. We mean-centered the predictor variables before creating the interaction term (Aiken & West, 1991). The average variance inflation factor was 1.53, well below the critical value of 10.

In Table 2, the baseline Models 1, 4, and 7 included our controls. We examined the direct effects of top managers’ LTO on decision comprehensiveness, speed, and creativity in Models 2, 5, and 8, respectively. Finally, we examined the interaction effects in Models 3, 6, and 9. The hierarchical models allowed us to identify the unique contributions of LTO and its interaction terms. For each strategic decision-making process dependent variable, we reported the controls, the direct effects of LTO, and then the interaction of LTO with its respective industry moderator.

For decision comprehensiveness, in baseline Model 1, firm size, slack resources, risk-taking preference, firm centralization, and firm formalization were positive and significant. Prior SOE, international orientation, and organizational life cycle were negative and significant. Hypothesis 1, predicting a positive and significant relationship between top managers’ LTO and decision comprehensiveness, was supported ($\beta = 0.21, p < .01$) in Model 2. The predicted positive interaction of industry complexity and LTO on decision comprehensiveness in Model 3 was significant ($\beta = 0.55, p < .01$), supporting Hypothesis 4a. As a further test of the interaction hypotheses, we conducted a simple slope analysis following the steps outlined by Aiken and West (1991). The simple slope test suggests a significant relationship between LTO and decision comprehensiveness when industry complexity is both high (simple slope: $\beta = 0.32, p < .01$) and low (simple slope: $\beta = 0.11, p < .05$). Our hypothesis reveals that in the highly complex pharmaceutical industry context, evaluating multiple and alternative courses of action strengthens the positive relationship between top managers’ LTO and decision comprehensiveness.

For decision speed, in baseline Model 4, R&D intensity, slack resources, firm centralization, and firm formalization were positive and significant. Hypothesis 2, predicting a positive and significant relationship between top managers’ LTO and decision speed, was supported
### Table 1
Correlations and Descriptive Statistics

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<td>6. Prior SOE</td>
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<td>10. Centralization</td>
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<td>15. Industry Complexity</td>
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Note: N = 463; \(r > |.08|, p < .05; r > |.12|, p < .01\). SOE = state-owned enterprise.
<table>
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<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
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<td>Decision Creativity</td>
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<td>0.07** (0.03)</td>
<td>0.06* (0.03)</td>
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<td>−0.03 (0.04)</td>
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<td>Risk-Taking Preference</td>
<td>0.07* (0.03)</td>
<td>0.07** (0.03)</td>
<td>0.08** (0.03)</td>
<td>0.07 (0.04)</td>
<td>0.07 (0.04)</td>
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</tr>
<tr>
<td>Centralization</td>
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<td>0.10** (0.04)</td>
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<td>0.34** (0.05)</td>
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<tr>
<td>Formalization</td>
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<td>0.06 (0.04)</td>
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<tr>
<td>International Orientation</td>
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<td>−0.08* (0.03)</td>
<td>−0.07* (0.03)</td>
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<tr>
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<td>0.05 (0.07)</td>
<td>0.08 (0.11)</td>
<td>0.07 (0.11)</td>
<td>0.07 (0.11)</td>
<td>−0.02 (0.09)</td>
<td>−0.03 (0.09)</td>
<td>−0.02 (0.09)</td>
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<tr>
<td>Organizational Life Cycle</td>
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<td>0.02 (0.05)</td>
<td>0.02 (0.05)</td>
<td>−0.10* (0.04)</td>
<td>−0.10* (0.04)</td>
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<td>−0.15 (0.13)</td>
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<td></td>
<td></td>
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<tr>
<td>LTO × Industry Complexity</td>
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<td></td>
<td></td>
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<tr>
<td>Industry Clock Speed</td>
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<td></td>
<td></td>
<td>−0.05 (0.05)</td>
<td>−0.06 (0.05)</td>
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<tr>
<td>LTO × Industry Clock Speed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>−0.08 (0.08)</td>
<td></td>
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<tr>
<td>Industry Innovativeness</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>0.03 (0.04)</td>
<td>0.03 (0.04)</td>
<td></td>
<td></td>
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<tr>
<td>LTO × Industry Innovativeness</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.15* (0.06)</td>
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<td></td>
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<tr>
<td>Observations</td>
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<td>463</td>
<td>463</td>
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<td>462</td>
<td>462</td>
<td>463</td>
<td>463</td>
<td>463</td>
</tr>
<tr>
<td>R squared</td>
<td>.35</td>
<td>.39</td>
<td>.40</td>
<td>.61</td>
<td>.63</td>
<td>.63</td>
<td>.27</td>
<td>.30</td>
<td>.31</td>
</tr>
<tr>
<td>Log Likelihood</td>
<td>−266</td>
<td>−248.4</td>
<td>−244.1</td>
<td>−428.4</td>
<td>−419.1</td>
<td>−418.6</td>
<td>−339.5</td>
<td>−329.4</td>
<td>−326.5</td>
</tr>
</tbody>
</table>

**Note:** Unstandardized coefficients are reported with standard errors in parentheses; two-tailed test. SOE = state-owned enterprise; LTO = long-term orientation.

* *p < .05.

** **p < .01.
Table 3
Regression Analyses on the Impact of Long-Term Orientation on Strategic-Making Processes, Using Industry Dummy Variables

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
<th>Model 9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Decision Comprehensiveness</td>
<td>Decision Speed</td>
<td>Decision Creativity</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Firm Size</td>
<td>0.08** (0.03)</td>
<td>0.07** (0.03)</td>
<td>0.06* (0.03)</td>
<td>−0.02 (0.04)</td>
<td>−0.03 (0.04)</td>
<td>−0.03 (0.04)</td>
<td>0.09** (0.03)</td>
<td>0.08** (0.03)</td>
<td>0.08* (0.03)</td>
</tr>
<tr>
<td>Firm Age</td>
<td>0.00 (0.00)</td>
<td>0.00 (0.00)</td>
<td>0.00 (0.00)</td>
<td>−0.00 (0.00)</td>
<td>−0.00 (0.00)</td>
<td>−0.00 (0.00)</td>
<td>−0.01 (0.00)</td>
<td>−0.01 (0.00)</td>
<td>−0.01 (0.00)</td>
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<tr>
<td>Prior SOE</td>
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<td>−0.18** (0.06)</td>
<td>−0.16** (0.06)</td>
<td>−0.03 (0.09)</td>
<td>−0.04 (0.09)</td>
<td>−0.03 (0.09)</td>
<td>0.01 (0.07)</td>
<td>0.01 (0.07)</td>
<td>0.03 (0.07)</td>
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<tr>
<td>R&amp;D Intensity</td>
<td>0.00 (0.00)</td>
<td>0.00 (0.00)</td>
<td>0.01 (0.00)</td>
<td>0.05** (0.01)</td>
<td>0.05** (0.01)</td>
<td>0.05** (0.01)</td>
<td>0.00 (0.00)</td>
<td>0.00 (0.00)</td>
<td>0.00 (0.00)</td>
</tr>
<tr>
<td>Slack Resources</td>
<td>0.24** (0.03)</td>
<td>0.25** (0.03)</td>
<td>0.24** (0.03)</td>
<td>0.24** (0.05)</td>
<td>0.25** (0.05)</td>
<td>0.25** (0.05)</td>
<td>0.18** (0.04)</td>
<td>0.20** (0.04)</td>
<td>0.19** (0.04)</td>
</tr>
<tr>
<td>Risk-Taking Preference</td>
<td>0.07* (0.03)</td>
<td>0.07** (0.03)</td>
<td>0.08** (0.03)</td>
<td>0.06 (0.04)</td>
<td>0.07 (0.04)</td>
<td>0.07 (0.04)</td>
<td>0.06 (0.03)</td>
<td>0.06 (0.03)</td>
<td>0.06 (0.03)</td>
</tr>
<tr>
<td>Centralization</td>
<td>0.13** (0.04)</td>
<td>0.11** (0.04)</td>
<td>0.10** (0.04)</td>
<td>0.36** (0.05)</td>
<td>0.34** (0.05)</td>
<td>0.34** (0.05)</td>
<td>0.09* (0.04)</td>
<td>0.07 (0.04)</td>
<td>0.06 (0.04)</td>
</tr>
<tr>
<td>Formalization</td>
<td>0.11** (0.04)</td>
<td>0.06 (0.04)</td>
<td>0.06 (0.04)</td>
<td>0.33** (0.06)</td>
<td>0.28** (0.06)</td>
<td>0.27** (0.06)</td>
<td>0.20** (0.05)</td>
<td>0.16** (0.05)</td>
<td>0.15** (0.05)</td>
</tr>
<tr>
<td>International Orientation</td>
<td>−0.10** (0.03)</td>
<td>−0.08* (0.03)</td>
<td>−0.07* (0.03)</td>
<td>−0.05 (0.04)</td>
<td>−0.03 (0.04)</td>
<td>−0.02 (0.04)</td>
<td>−0.07* (0.04)</td>
<td>−0.05 (0.03)</td>
<td>−0.05 (0.03)</td>
</tr>
<tr>
<td>Temporal Era</td>
<td>0.05 (0.08)</td>
<td>0.04 (0.07)</td>
<td>0.05 (0.07)</td>
<td>0.08 (0.11)</td>
<td>0.07 (0.11)</td>
<td>0.07 (0.11)</td>
<td>−0.02 (0.09)</td>
<td>−0.03 (0.09)</td>
<td>−0.02 (0.09)</td>
</tr>
<tr>
<td>Organizational Life Cycle</td>
<td>−0.06 (0.04)</td>
<td>−0.06 (0.04)</td>
<td>−0.05 (0.04)</td>
<td>0.01 (0.05)</td>
<td>0.02 (0.05)</td>
<td>0.02 (0.05)</td>
<td>−0.10* (0.04)</td>
<td>−0.10* (0.04)</td>
<td>−0.09* (0.04)</td>
</tr>
<tr>
<td>Industry Context</td>
<td>−0.08 (0.05)</td>
<td>−0.07 (0.05)</td>
<td>−0.06 (0.05)</td>
<td>0.06 (0.07)</td>
<td>0.07 (0.07)</td>
<td>0.08 (0.07)</td>
<td>0.03 (0.06)</td>
<td>0.04 (0.06)</td>
<td>0.05 (0.06)</td>
</tr>
<tr>
<td>Long-Term Orientation</td>
<td>0.21** (0.04)</td>
<td>0.12* (0.05)</td>
<td>0.22** (0.05)</td>
<td>0.18* (0.07)</td>
<td>0.19** (0.04)</td>
<td>0.10 (0.06)</td>
<td></td>
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<tr>
<td>Long-Term Orientation × Industry Context</td>
<td>0.21** (0.07)</td>
<td></td>
<td>0.11 (0.11)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Observations</td>
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<td>462</td>
<td>463</td>
<td>463</td>
<td>463</td>
</tr>
<tr>
<td>R squared</td>
<td>.35</td>
<td>.39</td>
<td>.40</td>
<td>.61</td>
<td>.63</td>
<td>.63</td>
<td>.27</td>
<td>.30</td>
<td>.31</td>
</tr>
<tr>
<td>Log Likelihood</td>
<td>−264.8</td>
<td>−248.4</td>
<td>−244.1</td>
<td>−428.1</td>
<td>−419.1</td>
<td>−418.6</td>
<td>−339.4</td>
<td>−329.4</td>
<td>−326.5</td>
</tr>
</tbody>
</table>

Note: Unstandardized coefficients are reported with standard errors in parentheses; two-tailed test. SOE = state-owned enterprise. *p < .05. **p < .01.
in Model 5 ($\beta = 0.22, p < .01$). Hypothesis 4b, predicting a positive interaction of industry clock speed and LTO on decision speed, was not significant in Model 6.

For decision creativity, in baseline Model 7, firm size, slack resources, risk-taking preference, firm centralization, and firm formalization were positive and significant. Organizational life cycle was negative and significant. Hypothesis 3, predicting a positive and significant relationship between top managers’ LTO and decision creativity, was supported in Model 8 ($\beta = 0.19, p < .01$). The predicted positive interaction of industry innovativeness and LTO on decision-making creativity in Model 9 was also significant ($\beta = 0.15, p < .01$), supporting Hypothesis 4c. The simple slope test suggested a significant relationship between LTO and decision creativity when industry innovativeness was high (simple slope: $\beta = 0.30, p < .01$) and a marginally significant relationship between LTO and decision creativity when industry innovativeness was low (simple slope: $\beta = 0.10, p < .10$). In the highly innovative pharmaceutical industry context, developing new ideas and industry practices strengthens the positive relationship between top managers’ LTO and decision-making creativity. Figures 1 and 2 show the interaction plots for the significant Hypotheses 4a and 4c, respectively.

**Post hoc analyses.** First, it is debatable whether time orientation is a stable individual characteristic or a situational attribute affected by industry context. To address the potential impact of industry on top managers’ LTO, we conducted a two-stage least squares (2SLS) regression following H. C. Wang, He, and Mahoney (2009). Specifically, in the first-stage equation, we regressed LTO on the industry dummy, firm size, firm age, prior SOE, R&D intensity, slack resources, and risk-taking preference and then took the residual of LTO as a new variable to measure top managers’ LTO. This residual measure parceled out the industry effect. In the second-stage equation, we used decision comprehensiveness, decision speed, and decision creativity as dependent variables. The regressors were the newly estimated top managers’ LTO; their interaction with industry complexity, industry clock speed, and industry innovativeness; and other factors thought to affect the decision-making processes. The findings of the 2SLS were highly consistent with the results observed using hierarchical regression.

Second, we conducted several post hoc analyses to examine the performance implications of LTO and the three decision-making attributes. Specifically, we regressed firm performance on LTO, three decision-making attributes, and control variables. Firm performance was measured by managers’ evaluation of their performance relative to their target. Our findings suggested that LTO was positively and significantly ($p < .01$) associated with firm performance. Decision comprehensiveness was positively associated with performance at a significant level ($p < .05$), while decision creativity was positively associated with performance at a marginally significant level ($p < .10$). In addition, we experimented with the dependent variables exploratory and exploitative innovations, measured using the survey items in Jansen et al. (2006). The items for exploratory innovation addressed the extent to which firms seek new products and services, while the items for exploitative innovation addressed the extent to which firms refine the provision of existing products and services. Our findings suggested that LTO is significant and positively related ($p < .01$) to both exploratory and exploitative innovation. Furthermore, decision comprehensiveness was positive and significantly ($p < .01$) related to exploratory and exploitative innovation. Decision creativity was positive and significantly ($p < .05, p < .01$) related to exploratory and exploitative innovation, respectively.
Contributions

Building on the temporal theoretical perspective (Bluedorn & Martin, 2008; Crossan et al., 2005; Shi et al., 2012), we join a nascent research stream exploring the antecedents of decision-making processes (Nadkarni & Chen, 2014; Souitaris & Maestro, 2010). We make two theoretical contributions to this conversation. First, we theorized how top managers’...
subjective LTO, serving as a temporal referent point, explains the characteristics of decision-making processes in terms of comprehensiveness, speed, and creativity. While prior research has approached the antecedents of decision-making processes by examining firm structure (i.e., centralization and formalization), firm resources (i.e., slack), and leaders’ personality characteristics—such as risk tolerance (Wally & Baum, 1994), narcissism (Chatterjee & Hambrick, 2007), self-evaluation (Simsek, Heavey, & Veiga, 2010), and conscientiousness (Nadkarni & Herrmann, 2010)—fewer studies have centered on the role of temporal dimensions (Laverty, 1996). As Souitaris and Maestro (2010) recently articulated, temporal dynamics are very much at the heart of firms, and scholars still know little about how time or temporal constructs affect actors’ behavior. Our study thus offers a fresh temporal perspective to reveal how managers’ subjective value of time fundamentally affects the decision-making process. It holds promise to bridge the micro- or cognitive values of managers with firm-level outcomes. Theoretically, temporal considerations represent an important micro-foundation for understanding how critical strategic decision-making processes manifest within a firm (Mosakowski & Earley, 2000).

In fact, it is widely acknowledged that top managers differ by how they experience time (Crossan et al., 2008; Das, 1987). Top executives and their respective firms have heterogeneous temporal orientations that differentially affect strategic choices (Souitaris & Maestro, 2010). This resonates with the view that time is in the eye of the beholder and human life involves multiple meanings of time that may not necessarily correspond closely to one another (E. Hall, 1983). Our study suggests that how executives use temporal referent points such as LTO as decision criteria anchors influences the way they perceive strategic situations and predisposes them toward certain strategic processes rather than others (Child, 1997; Mosakowski & Earley, 2000). In particular, our study suggests that top managers’ LTO enhances the comprehensiveness, speed, and creativity of decision-making. Our study therefore joins a recent line of research that focuses on examining the role of decision makers’ perception of time in driving their strategic decision-making processes (Bluedorn & Martin, 2008; Nadkarni & Chen, 2014; Souitaris & Maestro, 2010).

Second, we contribute to the temporal fit research stream by theorizing that industry characteristics moderate the relationships between top managers’ temporal orientation and strategic decision-making processes. In doing so, we highlight the importance of examining the impact of top managers’ temporal orientation on firm-level decision-making processes under different industry contexts, which is an approach advocated by theoretical scholars (Mosakowski & Earley, 2000; Ofori-Dankwa & Julian, 2001) as essential to providing more nuanced explanations of the effects of time-related constructs (Fey & Denison, 2003). The temporal fit perspective suggests that the external environment both constrains and facilitates relationships between top managers’ temporal orientation and decision-making processes. Managers face “bounded” autonomy (Child, 1997) in that the effects of top managers’ temporal orientation is contingent on the industry context in which it is embedded.

Managerial Implication

Our findings highlight that top managers’ LTO, their subjective preference to focus on and value the future, finds its way into decision-making processes. This observation has important managerial implications. For example, an LTO enables top managers to engage in extensive
search and analysis of the external environment, expedite the time for each decision, and encourage experimentation and creative efforts (e.g., Bearden et al., 2006; Hodgetts, 1993; T. Y. Wang & Bansal, 2012). Furthermore, top managers with an LTO have been found to be more open to change (Flammer & Bansal, 2017), to foster entrepreneurial activity (Hofstede, 1991), and to view adaptation as a necessity to ensure continued success (Geletkanycz, 1997). Therefore, managers with an LTO will likely be popular candidates for firms that advocate comprehensive, speedy, and creative decision-making processes, which are critical in high-tech industries.

In contrast, top managers with an STO respect traditional practices (Hofstede, 1991), promote fewer new initiatives (Geletkanycz, 1997), and focus on a “here-and-now” mindset (Nevins et al., 2007). While scholars advocate the development of flexibility and renewal, particularly in high-technology industries (e.g., Arora, Fosfuri, & Gambardella, 2001; Hitt, Keats, & DeMarie, 1998), top managers with an STO often underinvest in technologies (Marginson & McAulay, 2008), R&D, and capital assets (Souder & Bromiley, 2012). However, our study does not suggest that LTO is universally always better than STO. Instead, an STO is associated with positive outcomes such as efficiency and immediate returns (Bearden et al., 2006), positive firm performance in benign environments (Covin & Slevin, 1989), and value enhancing short-term corporate governance (Cuñat et al., 2012). Thus, managers with an STO will likely be popular candidates for firms that emphasize efficiency and the exploitation of current capabilities, which are more typical in low-tech industries.

A related managerial question is whether managers in high-tech industries can have an LTO for strategic-level decision-making processes and an STO for tactical decision-making processes, such as ongoing competitive dynamics. Typically, high-technology industries require high levels of R&D intensity and/or high levels of capital investment. To achieve returns for these continuous investments, high-technology firms are expected to engage in the exploration of new growth markets (March, 1991). Top managers with an LTO are likely to develop strategic decision-making processes aligned with exploration initiatives. At the same time, high-technology firms need to exploit their current capabilities and markets to generate cash flows to fund their investment needs (March, 1991). Strategic decision-making processes aligned with an STO fit this need. The need to balance LTO and STO strategic decision-making processes raises intriguing questions for the relationship between temporal orientations, decision-making processes, and organization ambidexterity—the balancing of exploitation and exploration processes (Raisch, Birkinshaw, Probst, & Tushman, 2009).

Our industry contexts provide additional managerial implications. Complex industries require firms to interact with a large, heterogeneous, and interdependent set of stakeholders. Managers with an LTO are motivated to treat heterogeneous external factors as connected and to align them with a firm’s overall strategic thrust (e.g., Nadkarni & Chen, 2014). In a similar fashion, innovative industries propel managers with an LTO to embrace creativity in their decision-making processes. Family firms, for example, have been extolled for demonstrating LTO (D. Miller & Le Breton-Miller, 2003). However, innovative family firms are not the norm. It is likely that the traditional industries in which they operate are characterized by low levels of innovativeness, which dampens the positive effect of LTO on decision-making creativity. In this respect, we demonstrated that the interaction between firms’ LTO
and environmental context is critical for understanding a firm’s strategic decision-making processes. This leads to one final observation. When there is top management turnover, how does it affect a firm’s strategic decision-making processes? Unless the new top managers have a similar temporal orientation, it is likely that the firm will experience significant changes in its strategic decision-making processes.

Limitations and Directions for Future Research

Our findings must be considered in the context of the study’s limitations, which in turn suggest future research opportunities. Given our cross-sectional design, we cannot discern the direction of cause-effect relationships. However, according to social psychology research, a person’s temporal orientation is relatively stable (Marin, 1987). We adopted this premise and measured top managers’ temporal orientation at one point in time. However, like other personality factors, contextual conditions affect temporal orientation (Kahneman, 2011). An interesting extension would be to study events (Morgeson, Mitchell, & Liu, 2015) that trigger a change in top managers’ temporal orientation, such as the recent financial crisis or major changes to a firm’s dominant coalition. In addition, different regional contexts may have a bearing on top managers’ LTO. For example, the uneven institutional development and transition economy in China may motivate top managers to pursue short-term interests, such as exploitation of fleeting institutional resources in some regions. Ample opportunities exist for intracultural comparisons in top managers’ LTO across different regions in China.

While we highlighted the importance of a subjective view of time in decision-making processes, we do not know the extent to which subjective and objective views of time are correlated or the contexts when they are likely to be correlated. There are theoretical (e.g., Boyd, Dess, & Rasheed, 1993) and empirical (e.g., Sutcliffe, 1994; Sutcliffe & Weber, 2003) debates as to why, when, and whether objective and perceptual measures diverge and whether it matters to decision-making processes and firm outcomes. It would be instructive to leverage and apply these perspectives to the time literature. For example, future research should explore how divergence between top managers’ subjective temporal orientation and objective measures of time affects strategic decision-making processes and their outcomes.

Future research might explore the proposed relationship between temporal orientation and strategic decision-making processes under different types of decision contexts. The managers we interviewed were top-level executives, and the scales in our survey clearly indicated that we were referring to strategic decisions. Prior research shows that decision-specific measures and general scales (such as ours) tend to yield similar results (Souitaris & Maestro, 2010). We wonder how top managers’ temporal orientation affects tactical decisions.

China is a country where its traditional value system encourages building relationships, maintaining a “guanxi” network (Peng, 2003), and where its language structure is grammatically associated with long-term oriented behavior (Chen, 2013). Countries also differ by managerial discretion and its impact on firm action (Crossland & Hambrick, 2011). To this end, while our theoretical model is generalizable, our findings reasonably extend to countries that share similar value systems and that have adopted related coordination and
institution mechanisms. For example, Germans tend to rely on nonmarket forms of coordination that emphasize sharing of power between unions and employers, interfirm networks, and long-term, bank-based financing and corporate governance that encourage “patient capital” (Howell, 2003). In contrast, the United States is known to rely on arm’s-length relationships among economic actors, a high degree of managerial prerogative, limited collective bargaining, and capital markets that emphasize maximizing share price in the short term.

Negative connotations are sometimes associated with an STO. For example, Kacperczyk (2009) noted that managers are subject to temporal myopia, that is, they are shortsighted (K. D. Miller, 2002) and refrain from long-term investments since the stock market consistently undervalues long-term outcomes (Charkham, 1994). However, our study does not suggest that short-termism is bad. In some cases, short-termism is a socially legitimized form of institutional behavior. For example, Marginson and McAulay (2008) found that managers’ short-termism was highly institutionalized within their embedded social environment. Digman noted that “small firms should strive to excel in short-term, not long-term planning” (1986: 338). Therefore, to better assess the performance implications of an LTO and an STO, researchers should consider context. Since firms need to attend to both immediate and future viabilities (March, 1991), they may be better off by finding the “right” balance between an LTO and an STO, as echoed by Flammer and Bansal (2017). In addition, as a result of data limitation, our study examined organizational outcomes of LTO and decision-making processes in a post hoc analysis and found promising results. Future research could explore the effectiveness of the fit between top managers’ temporal orientation and strategic decision-making processes as well as their implications for organizational outcomes such as long-term and short-term performance.

Finally, we studied two high-technology industries that had similar levels of munificence and dynamism but varied across our moderators: industry complexity, clock speed, and innovativeness. We selected these industries on the basis of an assumption that top managers’ LTO is more likely to affect decision-making processes in high-technology settings. However, we encourage others to test our assumption by using a cross section of industries or in stable industry settings (Fredrickson, 1986).

**Conclusion**

We began this paper by asking a broad question: Does the temporal orientation of top managers influence strategic decision-making processes? We then sharpened our focus to top managers’ LTO, one type of temporal orientation associated with top managers’ subjective preference to focus on and value the future, and asked how this orientation influences the comprehensiveness, speed, and creativity of strategic decision-making processes. Our answer is that (1) top managers’ LTO positively influences the three strategic decision-making processes and (2) industry-level complexity and innovativeness respectively enhance the comprehensiveness and creativity of strategic decision-making. In conclusion, we convey an important message: top managers’ temporal value system, such as LTO, along with industry context, holds a key to our understanding of critical decision-making processes in firms.
Appendix

Key Measurement Items

<table>
<thead>
<tr>
<th>Constructs</th>
<th>SFL</th>
</tr>
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<tbody>
<tr>
<td><strong>Long-Term Orientation (Atuahene-Gima &amp; Li, 2006)</strong></td>
<td></td>
</tr>
<tr>
<td>1. Our company is more concerned with long-term performance than short-term performance</td>
<td>0.83</td>
</tr>
<tr>
<td>2. Our company is more concerned with long-term success rather than immediate success</td>
<td>0.86</td>
</tr>
<tr>
<td>3. Our company made it clear that building long-term relationships with stakeholders was important</td>
<td>0.76</td>
</tr>
<tr>
<td><strong>Decision Comprehensiveness (Atuahene-Gima &amp; Li, 2004)</strong></td>
<td></td>
</tr>
<tr>
<td>1. Developed many alternative courses of action to achieve intended objectives</td>
<td>0.69</td>
</tr>
<tr>
<td>2. Considered many different criteria before deciding on which courses of action to take</td>
<td>0.75</td>
</tr>
<tr>
<td>3. Thoroughly examined multiple explanations for problems faced and opportunities available</td>
<td>0.70</td>
</tr>
<tr>
<td>4. Conducted multiple examinations of suggested courses of action</td>
<td>0.64</td>
</tr>
<tr>
<td>5. Searched extensively for possible alternative courses of action</td>
<td>0.57</td>
</tr>
<tr>
<td><strong>Decision Creativity (Menon, Bharadwaj, Adidam, &amp; Edison, 1999)</strong></td>
<td></td>
</tr>
<tr>
<td>1. Our decisions often create significant changes in policy or procedure</td>
<td>0.75</td>
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<tr>
<td>2. We develop new approaches that are different from prevailing industry practices</td>
<td>0.78</td>
</tr>
<tr>
<td>3. We come up with radical new ideas</td>
<td>0.53</td>
</tr>
<tr>
<td><strong>Decision Speed (Baum &amp; Wally, 2003)</strong></td>
<td></td>
</tr>
<tr>
<td>1. We resolve key questions quickly</td>
<td>0.85</td>
</tr>
<tr>
<td>2. Little time is wasted reaching a decision</td>
<td>0.90</td>
</tr>
<tr>
<td>3. We usually can identify the critical issues very rapidly</td>
<td>0.83</td>
</tr>
<tr>
<td><strong>Centralization (Jansen, Van den Bosch, &amp; Volberda, 2006)</strong></td>
<td></td>
</tr>
<tr>
<td>1. A person who wants to make his own decisions would be quickly discouraged</td>
<td>0.53</td>
</tr>
<tr>
<td>2. Even small matters have to be referred to someone higher up for a final decision</td>
<td>0.85</td>
</tr>
<tr>
<td>3. Unit members need to ask their supervisor before they do almost anything</td>
<td>0.77</td>
</tr>
<tr>
<td>4. Most decisions people make here have to have their supervisor’s approval</td>
<td>0.40</td>
</tr>
<tr>
<td><strong>Formalization (Jansen et al., 2006)</strong></td>
<td></td>
</tr>
<tr>
<td>1. Whatever situation arises, written procedures are available for dealing with it</td>
<td>0.72</td>
</tr>
<tr>
<td>2. Rules and procedures occupy a central place in the organizational unit</td>
<td>0.74</td>
</tr>
<tr>
<td>3. Written records are kept of everyone’s performance</td>
<td>0.75</td>
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<tr>
<td>4. Employees in our organizational unit are often checked for rule violations</td>
<td>0.60</td>
</tr>
<tr>
<td>5. Written job descriptions are formulated for positions at all levels in the organizational unit</td>
<td>0.51</td>
</tr>
</tbody>
</table>

Note: Model fit: $\chi^2(205) = 557.78$, comparative fit index = .95, goodness-of-fit index = .91, root mean square error of approximation = .06. All variables were measured on a 7-point Likert scale from 1 (low) to 7 (high). SFL = standardized factor loading.

References


