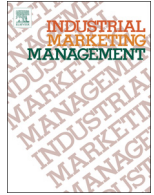




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Marketing capability, organizational adaptation and new product development performance[☆]

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ABSTRACT

The authors propose a mediated moderation model that links marketing capability from an outside-in perspective, organizational adaptation mechanism exploitation and exploration, organizational structural factors, and new product development (NPD) performance. The model is tested using survey data from USA and China. The results suggest that marketing capability is positively associated with NPD performance. Moreover, exploitation and exploration respectively mediate the positive relationship between marketing capability and NPD performance. In addition, customer-based structure, decentralization, and interfunctional integration positively moderate the relationship between marketing capability and NPD performance. The results suggest that marketing capability is important for the firm to adapt to external changes as long as the firm aligns organizational structural factors with the requirement of marketing capability for exploitation and exploration in product innovation.

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1. Introduction

Scholars from different disciplines argue that the mounting velocity, complexity, and uncertainty of exogenous market change makes adaptation essential for firm organizations to survive and prosper. One way that firms adapt to change is to allocate limited resources across both the exploitation of the known and exploration of the novel as a central strategic trade-off (March, 1991). Important contributions have been made in understanding exploitation and exploration and their impact on performance (e.g., Gupta, Smith, & Shalley, 2006; Hoang & Rothaermel, 2010; March, 1991; Nohria & Gulati, 1996). However, the literature continues to be constrained by the question of what lead to exploitation and exploration¹ (e.g., Day, 2011; Gupta et al., 2006; Levie & Rosenkopf, 2006; Voss, Sirdeshmukh, & Voss, 2008; Zhou & Wu, 2010; Zhou & Li, 2010). Without knowing the antecedents of exploitation and exploration, a firm may not know how to allocate resources to strike a balance between exploitation and exploration (e.g., Gupta et al., 2006; Jansen, Frans, Den Bosch, & Volberd, 2006; Zhou & Wu, 2010).

The marketing literature has established the role of marketing capabilities in firm performance outcome such as firm performance

generally and new product development performance more specifically (e.g., Akdeniz, Gonzalez-Padron, & Calantone, 2010; Theodosiou, Kehagias, & Katsikea, 2012; Vorhies & Morgan, 2005; Yu, Ramanathan, & Nath, 2014). Although the contributions of previous studies are substantial, research from outside-in perspective has suggested that existing marketing capabilities cannot meet the requirement for firms to compete and prosper in the accelerated complex and changing external environment (Day, 2011; Day & Moorman, 2010). The growing gap is unquestionably costing firms profitability now and competitiveness in the future (Day, 2011). Noting this, both marketing scholars and practitioners are interested in understanding the mechanisms by which marketing capability can enhance firm adaptability while also producing the great productivity and competitiveness.

Recognizing the critical roles marketing capability in profit creation and competitive advantage, scholars suggest that firms develop a new marketing capability from an outside-in perspective to adapt to the accelerated changing market complexity and velocity (Day, 2011; Day & Moorman, 2010). However, no comprehensive construct exists in the literature that captures the key elements of a marketing capability from an outside-in perspective. Given the strategic importance of marketing capability in firm performance (Day, 2011; Fang & Zou, 2009; Vorhies & Morgan, 2005), research that considers its dimensions and its distinct contributions to organizational adaptation seems appropriate if we are to examine how marketing capability matters in organizational adaptation and product innovation performance.

In order to address these research gaps, in this research, we intend to shed light on these issues based on the new proposed construct marketing capability from an outside-in strategic perspective (e.g., Day, 2011).

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¹ Though marketing literature has few studies on the antecedents of organizational adaptation, in strategy and international business literature, a few studies have explored the antecedents of exploitation and exploration from different perspectives, e.g., Jansen et al. (2006), Levie and Rosenkopf (2006), Voss et al. (2008), Zhou and Wu (2010). We discussed their findings in theoretical implication section.

Our study aimed at helping to narrow the gap between what little is known about marketing capability from an outside-in perspective and its potential importance to performance. We intend to extend marketing capability theory from an outside-in perspective to examine organizational adaptability. We build a mediated moderation model that links marketing capability, exploitation and exploration, and organizational structural factors with NPD performance. Specifically, we explored if marketing capability from an outside-in view can help firms adapt to external environment through exploitation and exploration, which in turn, improve NPD performance.

Moreover, scholars have recognized the importance of organization structural design in firm performance and adaptation (Chandler, 1962; Day, 2006; Eisenhardt & Brown, 1999; Galbrith, 1973; Miller, Droge, & Toulouse, 1988; Nickerson & Zenger, 2002; Siggelkow & Levinthal, 2003; Teece, 2007; Thompson, 1967). Thus, organizational structural factors should play critical roles in the relationship between firm capability, adaptation and performance outcomes. Therefore, answering the call to study how organizational structural factors and marketing capability affect firm performance (Day, 2011; Marketing Science Institute (MSI), 2012), grounded on structural alignment theory (e.g., Day, 2006; Homburg, Workman, & Jensen, 2000; Kaplan & Norton, 1992), we explored three organizational factors (decentralization, customer-based structure, inter-functional integration) under which marketing capability affect exploitation and exploration that affect NPD performance.

Based on extensive review of literature and executive interviews, we develop marketing capability from an outside-in perspective as a composite construct that consists of an organization's fundamental belief for value creation in an increasingly open market environment: Market sensing, customer engaging and partner linking. Although scholars have highlighted the importance of customers, partners and sensitivity to market change for superior performance, the simultaneous consideration of customer engaging, market sensing and partner linking capability and the consequence of customer engaging, market sensing and partner linking capability have not received systematic investigation. Moreover, prior research explores the problem from an inside-out rather an outside-in perspective (Day, 2011). We argue that marketing capability from an outside-in review can help firms to adapt to external changes through exploitation and exploration. We also argue that three organizational factors decentralization, customer-based structure, inter-functional integration respectively moderate the relationship between marketing capability, and exploitation and exploration on NPD performance. To test the ideas, we utilized the survey data from both USA and China.

Our contributions to literature are three-fold. First, we advance marketing capability from an outside-in perspective. By developing the construct of marketing capability from an outside-in perspective, this research articulates and operationalizes, perhaps for the first time in the literature, one of the most fundamental notions of marketing and empirically demonstrates the impact of this notion on a firm's NPD outcome relative to its competitors.

Second, this study takes one step forward in bridging two separate streams of research on firm's adaptability and marketing capability. How a firm's marketing capability drives its adaptability has rarely been examined. This study is thus among the first to leverage marketing capability argument from an outside-in perspective (Day, 2011) and suggests that marketing capability drives performance by enabling the exploration and exploitation of market opportunities (March, 1991).

Third, recognizing that the organizational structures under which marketing capability from an outside-in perspective operate affecting exploitation, exploration, and performance outcome, grounded on organizational structural alignment theory, we examined the moderating role of customer-based structure, decentralization and interfunctional integration in the relationship between marketing capability, exploitation and exploration, and new product development performance. We

demonstrated that customer-based structure, decentralization, and inter-functional integration are important in determining how marketing capability affects exploitation, and exploration, and ultimately innovation performance. Thus, we answered the call to study how organizational structural factors influence marketing capability on firm performance (Day, 2011; Marketing Science Institute (MSI), 2012). Moreover, marketing activities need to be integrated into other business functions (Kumar, 2015). By answering how organizational structural factors affect marketing capability on firm performance, we also partially answered the call regarding how to completely integrate marketing activities with other business functions for superior firm performance (Kumar, 2015).

2. Theoretical foundation and framework

2.1. Outside-in perspective

The traditional view on business operation is inside-out, which suggests that a firm starts with its internal resources and asks what the market can do for itself (Day, 2011). As market power shifts to customers and the mounting complexity, velocity and unpredictability of market changes accelerate, inside-out perspective constrains a firm from adapting to the rapidly changing market environments (Day, 2011; Day & Moorman, 2010). The outside-in perspective mandates that a firm should start with a market and ask what it can do for the market (e.g., Day, 2011; Haeckel, 1999). Marketing scholars have the tradition to study marketing problems from an outside-in perspective. For example, the role of a market orientation was to shift the organization toward an explicit outside-in orientation (Day, 2011; Ketchen, Hult, & Slater, 2007; Srivastava, Shervani, & Fahey, 1998).

Market orientation emphasizes the importance of customers and external information in creating customer value and firm competitive advantage. However, market orientation has an implicit tendency toward exploitation (Day, 2011). Building on the literature of market orientation, the central tenet of outside-in perspective is that superior firm performance emanates from sensing, setting and managing customer expectations, and delivery of superior customer values and successful customer outcomes (Day, 2011; Day & Moorman, 2010; Srivastava et al., 1998). By becoming a customer value leader and innovating new values for both current and new customers, a firm would be able to cultivate strong customer bonds, consequently generating customer loyalty, which is the key to firm profitability.

Delivery of customer value and successful customer outcomes is premised on deep market insights into customer needs, partners' and competitors' moves, and market evolution (Day, 2011). Sensing and responding to these market requirements and events eventually turns a firm into an adaptive enterprise. The market information that gives rise to the deep insights is garnered from interactions with customers, network ties with business partners, and sensitivity to market signals. External connections not only provide firms access to complementary skills, resources and capabilities but also afford firms a wide spectrum of information, thus fostering the growth of market insights (e.g. Day, 2011; Dyer & Singh, 1998; Mu & Di Benedetto, 2012). In summary, the outside-in perspective centers on insights from customer engaging, partner linking and market sensing as the sustainable source of superior firm performance, where efficiency and effectiveness are prerequisites for superior business performance. In this research, we develop a new construct: Marketing capability from an outside-in perspective. We intend to explore the role of marketing capability in organization adaptability and new product development performance.

2.2. Exploitation versus exploration

The overall strategy of an organization for adaptation is to invest resources in activities and processes that promote exploration or

exploitation (March, 1991; Siggelkow & Levinthal, 2003). The ambidextrous view (e.g., Gupta et al., 2006) suggests firms should strike a balance between exploration and exploitation. He and Wong (2004) find support for such a view. Exploratory activities such as search, variation, experimentation, play, flexibility, discovery, and innovation generally result in new competency development (Atuahene-Gima, 2005; March, 1991). However, exploration requires significant investment with uncertain payoff (Gupta et al., 2006). Exploitation involves activities such as refinement, improvement, production, efficiency, selection, implementation, and execution (Atuahene-Gima, 2005; March, 1991; Voss et al., 2008; Zhou & Wu, 2010) that sustain long-term viability through existing or minimally modified competencies. Exploitation is less risky and can help firms to reap the benefits from exploration. Integrating these ideas, we define *exploration* as an organizational emphasis on introducing radical innovations that create new product development competencies for value creation. We define *exploitation* as an organizational emphasis on marketing existing or incrementally modified products that deploy existing product competencies for value creation.

Though prior research provides evidences that both exploitation and exploration are positively associated with performance (e.g., He & Wong, 2004), the relationship between marketing capability, exploitation and exploration has not been probed. Without a full understanding of the relationship between marketing capability, exploitation and exploration, and firm performance outcomes, our appreciation of the role of marketing capability in firm adaptation and productivity would be incomplete given the strategic prominence of marketing capability in firm adaptation and productivity (Day, 2011). In this research, we argue that marketing capability can help firms adapt to external changes through exploitation and exploration.

2.3. Organization structural alignment

Organizational structures in which marketing capability functioning affects performance and organizational structure should be consistent with the goal of firm objectives and organization operating context (Day, 2011; Homburg et al., 2000). Organization structural choices and decisions affect the manner in which knowledge is articulated or codified may affect how a firm creates and builds its resource base to adapt to external changes (Day, 2006; Nickerson & Zenger, 2002; Siggelkow & Levinthal, 2003; Teece, 2007). Therefore, which organizational structure to adopt in the search for an appropriate strategic response to the competitive landscape is a nontrivial question. Recent research suggests that managers may be able to use organization structure as a lever for improving the balance between exploration and exploitation (e.g., Benner & Tushman, 2003; Nickerson & Zenger, 2002; O'Reilly & Tushman, 2004; Siggelkow & Levinthal, 2003), emphasizing the benefits of organization structural alignment.

Organization structural alignment refers to the extent to which managers execute their tasks and projects in line with strategic business objectives (Kaplan & Norton, 1992). Structural alignment helps firms provide structure and concrete guidelines pertaining to how a firm should implement its business strategy (Day, 2006; Kaplan & Norton, 1992). Prior research suggests that the full function of marketing capability from an outside-in perspective calls for the alignment of marketing capability deployment with appropriate organizational design elements: Decentralization, customer-based structure and interfunctional integration.

Organization theorists have suggested that organizations faced with uncertain and complex environments characterized by rapid rates of market change tend to have a less centralized organization structure (Burns & Stalker, 1961; Chandler, 1962; Eisenhardt & Brown, 1999; Galbrith, 1973; Miller et al., 1988; Thompson, 1967). The logic behind this is that organizations are not likely to be continuously responsive to customers, competitors, and new technologies absent a high degree of decentralization (Teece, 2007). Thus, prior research suggests that

the role play of marketing capability needs decision authority to be decentralized. This is because new product development ideas and insights are widely distributed in different internal and external sources such as employees, customers and partners (Matsuno, Mentze, & Ozsomer, 2002; Menon, Bharadwaj, Adidam, & Edison, 1999; Mu, 2013; Ullrich & Wieland, 1980). By exposing to and navigating a variety of ideas and insights, decentralization stimulates new directions for creative thinking, and thus can boost the ability of new product development firm to deploy widely distributed market ideas and insights from different sources to respond rapidly to the perceived new market opportunities associated with new product development (Harvey, 2014; Teece, 2007). Therefore, decentralization may influence the effect of marketing capability on new product development performance.

Marketing theorists suggest that to better serve customer needs, organizational structure should be adapted to customer groups (Homburg et al., 2000). As such, prior research suggests that a customer-based structure should enhance an organization's ability to address the specific needs of its customers (Homburg et al., 2000; Kirca, Jayachandran, & Bearden, 2005; Kumar, Venkatesan, & Reinartz, 2008). With a customer-based structure, the new product development firm can assess the industry value chain including customers, customer's customers, and partners and then differentiate the new offerings on the basis of insights from different information sources (Homburg, Droll, & Totzek, 2008). This suggests that the full function of marketing capability on new product development needs the organizational structure to mirror the needs for customer engaging, partner linking and market sensing. A customer-based structure enhances the ability of new product development firm to act and coordinate the needs of given customer segments based on information from diverse sources (Day, 2006; Reinartz, Krafft, & Hoyer, 2004). Therefore, the full function of marketing capability elevates the importance of customer-based structure in its relationship to new product development performance.

In addition, scholars have long argued that interfunctional integration can integrate ideas and insights from changing external environment (Gatignon & Xuereb, 1997). Interfunctional integration is important for marketing capability to play its role in new product development because the success of new product development project is functionally interdependent, depending upon functionally different organizational units for accomplishment a common objective too large to be achieved by any single unit (Day & Moorman, 2010; Olson, Orville, Jr, & Ruekert, 1995). For example, the value of market insights from various information sources are interdependent where the meaning of one insightful observation from one source in one organizational unit is dependent upon other insightful observations from other sources in other organizational units. Thus, interfunctional integration generates linkages between points of views from different organizational units, enabling ideas and insights from different sources to exchange and flow (Troy, Hirunyawipada, & Paswan, 2008).

The information exchange and flow not only stimulate information elaboration and enable the new product development firm to possess a more complete set of insights, but also make the firm in a better position to fully understand the meaning of the insights from different sources, judge their relevance to new product development tasks, and formulate integrative courses of action for new product development projects (Atuahene-Gima, 2005; Gatignon & Xuereb, 1997). Thus, interfunctional integration helps the new product development firm to recognize the implications, and discuss relevant information from different sources such as customer engaging, partner linking and market sensing. As a result, the new product development firm is able to integrate market insights from different sources, and form novel understanding of the marketplace to develop new products. Therefore, when the new product development firm needs market insights from different sources such as customer engaging, partner linking and market sensing to be accurately integrated, the role of interfunctional integration in new product development firm on marketing capability, and

consequently new product development performance, will be highly important.

The outside-in view suggests that the ability of the firm to best manage resources and capabilities according to external market and environment requests will show the highest levels of performance (Day, 2011). Thus, the design of compatible structure–environment–performance organizational architecture is necessary to maximize company profit (e.g., Chandler, 1962; Eisenhardt & Brown, 1999; Galbrith, 1973; Kaplan & Norton, 1992). Therefore, organizational structural factors consist of structural sources of marketing capability. Marketing capability will have greater leverage when it is housed in a supportive organization that is structured to be aligned with the market (Day, 2011). Premised on these ideas and our above discussions, this research looks into the moderating role of decentralization, customer-based structure and interfunctional integration in the linkage between marketing capability and performance outcome.

In the linkage between marketing capability and new product development performance, decentralization can help the new product development firm to maximally ignite search for ideas and solutions from different information sources such that the new product development firm has novel ideas and insights for its new product development projects; Interfunctional integration increases the chances of coordination among different organizational units such that new product development firm can integrate ideas and insights from different information sources and create integrative solutions for new product development projects and therefore to be efficient product producers; Customer-based structure ensures that integrative new product solutions and ideas developed from different sources meet both the expressed and latent needs of customers such that the new product development firm can successfully meet the requirements for customer value creation and value appropriation.

Fig. 1 illustrates our conceptual framework, depicting both the moderating and mediating processes we theorize. This theoretical account offers a novel perspective on the mechanism by which marketing capability can impinge its impact on new product development performance. Organizational structural factors aligned with marketing capability can enable the firm to exploit what it already has and prepare for new wave of competition, which in turn lead to new product development success. This argument links constructs at multiple disciplines to shed light on organizational adaptation. We test this theory with large-scale, survey-based studies from both USA and China.

3. Research hypotheses

3.1. Marketing capability: An outside-in perspective

As we discussed earlier, outside-in view (Day, 1994, 2011; Srivastava et al., 1998) suggests that a firm’s market sensing, engaging with customers, and linking with partners consists of market-based capability. Accordingly, from an outside-in perspective, marketing capability is a constellation of three distinct capabilities: Market sensing, customer engaging, and partner linking. These three capabilities are interdependent and complementary in functions to one another. Customer engaging – the core marketing capability – puts pressure on firms to deliver superior customer value, which in turn strengthens customer intimacy to a company and its product offerings (Day & Moorman, 2010). With the market sensing capability, a firm is able to anticipate and act on market trends, weak signals and events that inform the changing customer needs and market environment (Day, 1994; Du & Kamakura, 2012), thus providing a basis for creating superior customer value. Partner linking nurtures organizational sense-making by offering opportunities of communications with network ties and access to diverse information sources and resources (e.g., Dyer & Singh, 1998; Mu & Di Benedetto, 2012; Teece, 2007).

3.1.1. Market sensing

Market sensing refers to the ability of a firm to anticipate future evolution of markets and detect emerging opportunities based on information collected from its business ecosystem (Day, 1994; Teece, 2007). The sensing capability is rooted in knowledge about market and its development, but it is based on such organizational information processing activities as scanning, filtering, evaluating, and interpreting information (Mu & Di Benedetto, 2012; Teece, 2007). Market sensing can help firms turn circumstances into a situation that is comprehended explicitly in words and that serves as a springboard into action (Weick, et al. 2005). This suggests that market sensing allows shifting from management under uncertainty into a structured risk analysis process, avoiding potential losses and achieving superior results. Sensing capability encapsulates the logic that in complex, unpredictable and volatile market environment, the capacity to sense market changes and opportunities before they are fully materialized (Day, 2011; Mu & Di Benedetto, 2012). Market sensing capability thus helps a firm to be alert and vigilant to market trend and opportunity discovery. By mapping out the trajectory of market trend, encoding and assigning meaning to

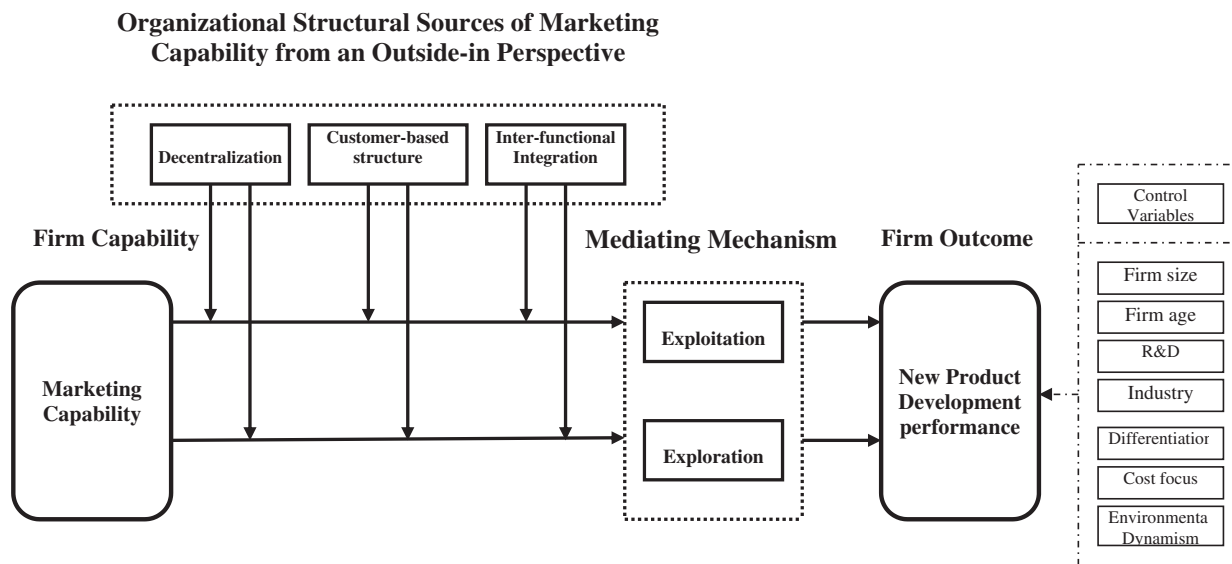


Fig. 1. Research framework.

environmental cues, a firm is able to recognize emergent patterns in market environment, detecting and creating opportunities for successful development of new products that can capture both existing and latent customer needs and respond to changes in market conditions ahead of competitors (Day, 1994; Du & Kamakura, 2012; Teece, 2007).

3.1.2. Customer engaging

Customer engaging refers to the ability of a firm to create intimate relationships with customers (e.g., McEwen, 2005; Park, MacInnis, Priester, Eisingerich, & Iacobucci, 2010; Yim, Tse, & Chan, 2008). Customer engaging represents a strategic imperative for generating enhanced corporate performance, including new product development, superior profitability and firm performance (Brodie, Hollebeek, Jurić, & Ilić, 2011). Customer engaging is at the forefront of the ability of the firm to detect and adapt to changing market conditions (Day, 1994, 2011; Vorhies, Orr, & Bush, 2011). Customer engaging reflects a customer-centric focus. Customer engaging serves as a conduit for creating and maintaining customer expectations. Such customer engagement can be developed through showing honesty, genuine care and sincerity to customers. Engagement accumulates through customer satisfaction, loyalty, influence, and excitement about a firm's products and service (Mu & Di Benedetto, 2012). Customers, in turn, become psychologically, emotionally and behaviorally linked to the firm in the pursuit of benefits (e.g., Bhattacharya, Rao, & Glynn, 1995; Park et al., 2010; Yim et al., 2008) such as utilitarian benefits, hedonic and emotional benefits (e.g., Park et al., 2010). If customers are satisfied with the benefits derived from firm offerings, they tend to identify with what the organization represents, perceiving a sense of connectedness and gratitude to the company (Bhattacharya et al., 1995; Palmatier, Jarvis, Bechhoff, & Kardes, 2009), which increases customer loyalty to the organization and positive word of mouth.

3.1.3. Partner linking

Partner linking refers to the ability of a firm to connect with partners and leverage the resources and capabilities of partners in value creation. This ability becomes increasingly important in an increasingly open market environment because delivering complex customer solutions require the management of complicated interactions and exchange of knowledge and resources between many partners (Mu, 2014). Partner linking capability can help a firm to orchestrate the capabilities and resources of network partners by providing the firm access to a diverse deeper set of resources and specialized skill set, and market and customer knowledge for customer value creation (e.g., Dyer & Singh, 1998; Hoang & Rothaermel, 2010; Mu & Di Benedetto, 2012). The logic behind this is that value creation needs multiple partners to integrate their resources and capabilities for product innovation and customer experience creation (Mu, 2013). The ability to coordinate and leverage the resources and capabilities of diverse actors thus enable the firm to create a value creation ecosystem to serve the need of customers. The more the focal firm can creatively (re)combine or (re)bundle the resources and capabilities from different partners, the more successful new products and services it will introduce into the marketplace, and the more customer value it will create. Therefore, the ease of the focal firm interacting and (re)configuring resources and capabilities of diverse partners facilitates the focal firm to adapt to environmental changes. In brief, partner linking provides two different benefits: 1) capitalization on the partner's non-redundant knowledge and resources to discover new opportunities, build up new competencies, and adapt to environmental changes (Day, 2011; Dyer & Singh, 1998; Srivastava et al., 1998); 2) refining firms' existing knowledge and capabilities to maximize the value of existing resources (Mu & Di Benedetto, 2012; Srivastava et al., 1998).

In summary, marketing capability from an outside-in perspective can provide fact-based evidences for firms to anticipate rapid market shifts and becomes more resilient in face of increasing velocity and complexity of market changes (e.g., Day, 1994, 2011). The three aspects of marketing capability from an outside-in perspective are intertwined

and complementary. Customer engaging provides the firm customer relational assets for customer value creation and value appropriation. Insights from market sensing offer the intellectual assets for the firm to anticipate and response to external changes. The interactions and communications with partners offer rich insights into the trajectory of market trends, and in doing so, foster organizational sense-making about customer requirements and market conditions (Day, 2011; Teece, 2007). Thus, customer engaging, market sensing and partner linking provide opportunities for new product development firm to draw on resources and capabilities from diverse sources to capitalize ideas for the successful development of new product. We hypothesize:

H1. *Marketing capability is positively associated with NPD performance.*

3.2. The moderating role of customer-based structure

Consistent with prior research (e.g., Homburg et al., 2000), in this research, we define customer-based structure as the extent to which a firm's organizational structure aligns with customer groups. Customer-focused structure enables firms to respond and adapt more quickly to customer needs, and make more customer-centric decisions (Day, 2006). Organization theorists argue that appropriate organizational structures should be depicted if a company wants to maximize its profit (Miller et al., 1988). A customer-oriented structure creates a shared commitment to customers, increases accountability for managing customer relationships, which increase employees' motivation to efficiently communicate and quickly respond to customers (Reinartz et al., 2004). This suggests that a customer-based structure can bring customer knowledge deep into the company and reinforce marketing capability on new product development performance.

First, customer-based structure enables employees to be able to better identify trends, unique needs and common problems of customers (Reinartz et al., 2004), which then enable them to better interpret and predict customer behaviors and satisfy customer needs better by designing and developing customer-focused products (Homburg et al., 2008). Thus, customer-based structure enables new product development firms to quickly respond and adapt to customer needs and make customer-focused decisions (Day, 2006). Moreover, a customer-focused structure enables the firm to integrate partners' feedback into its new product development process, which has been considered as one of most important success factors in new product development (e.g., Mu & Di Benedetto, 2012).

In addition, new product development firms must quickly respond to market intelligence and insights generated from market sensing. A customer-based organization is more likely to sensitively integrate market intelligence and insights from its marketing sensing activities in a timely manner than those firms that do not have a customer-based structure (Day, 2006; Homburg et al., 2008). Consequently, customer-based structure allows firms to better focus on particular businesses and speed-up decision making for new product development activities by integrating insights from customer engaging, partner linking and marketing sensing. Therefore, as firms align their structures more effectively with their market goals, they would be more successful in that market because they can adapt more readily to the market insights from market sensing, customer engaging and partner linking for exploitation and exploration. As a result, a firm with marketing capability can organize its product development activities more appropriately and efficiently. We hypothesize:

H2. *The effect of marketing capability on NPD performance will be positively moderated by customer-based structure.*

3.3. The moderating role of decentralization

Centralization or decentralization refers to degree of the delegation of decision-making authority among members of an organization

(John, 1984). Decentralization essentially means that decision-making power involves individuals at various organizational levels (Ullrich & Wieland, 1980). Decision-making information regarding market opportunities for exploitation and exploration is widely distributed among different individuals, organizational units, and external sources such as customers and partners. Decentralization allows new product development team members to engage with one another of ideas and insights from different sources that change their understanding and allow new ideas to develop (Kirkman & Rosen, 1999). Involving stakeholders from various organizational levels thus benefits an organization by integrating diverse information generated from various organizational units, individuals, and external sources (Matsuno et al., 2002; Menon et al., 1999; Ullrich & Wieland, 1980). This is because a more decentralized decision-making structure may act as a safeguard by ensuring that a range of viewpoints and ideas from customer engaging, partner linking and market sensing is brought to the attention of managers. With centralized structures, strategic decisions made at the top tend to become isolated from marketplace realities. For example, Jansen et al. (2006) find decision-making centralization weakens innovation. Therefore, decentralization must be favored because it brings the firm closer to new technologies, customers, and markets (Teece, 2007).

Moreover, by accumulating and circulating information derived from engaging with customers, linking with partners and market sensing, decentralization can help managers of all ranks to be able to integrate insights, inspirations, models, and expertise from external sources such as customers and partners to develop appropriate products that meet the needs and expectation of customers (Lynn, Morone, & Paulson, 1996). In addition, in decentralized firms, organizational members share decision-making power (Ullrich & Wieland, 1980). Decision-making power sharing increases organizational members' empowerment and subsequently their proactivity (Kirkman & Rosen, 1999), which should lower the possibility that "groupthinking" (Janis, 1972) will adversely affect new product development performance. Thus, without decentralization, centralization of decision authority creates a nonparticipatory environment that reduces communication among participants, commitment, and involvement with projects and is associated negatively with innovation success (Damanpour, 1991). In summary, we hypothesize:

H3. *The effect of marketing capability on NPD performance will be positively moderated by decentralization.*

3.4. The moderating role of inter-functional integration

Successful development and commercialization of new products require that knowledge and insights from market sensing, customer engaging and partner linking be integrated and embedded into NPD process. Interfunctional integration typically involves coordinating communication and integrating knowledge and insights generated from different functional sources (Gatignon & Xuereb, 1997). Interfunctional integration should positively moderate the relationship between marketing capability and new product development performance.

On the one hand, creative new products, processes and ideas are more likely to occur when the new product development firm can draw on a variety of ideas from different sources (Harvey, 2014). By increasing both information communication frequency and amount of information flow in the organization, interfunctional integration enhances the communication, novel understanding and further (re)interpretation of insights from customer engaging, partner linking, and market sensing among different organizational units and new product development teams. Interfunctional integration therefore can allow insights from different sources to diffuse and integrate within the new product development team as team members learn and integrate new insights in addition to existing task information in the course of interfunctional integration (Gatignon & Xuereb, 1997; Mu & Di Benedetto, 2011).

Moreover, different interpretation and novel understanding of insights from customer engaging, partner linking and market sensing enables the firm to deploy its existing competencies and resources, develop new competencies, solutions, and resources, and recombine existing competencies and resources for developing new products that meet customers' explicit and latent needs (Mu, 2014). Thus, the efficient integration of insights from customer engaging, partner linking and market sensing across different functional areas is necessary for turning a firm's exploitation and exploration activities into superior customer value and performance (Day & Moorman, 2010).

On the other hand, without interfunctional integration, conflicts and mistrust among functions stand in the way of a firm's effective use of insights from customer engaging, partner linking and market sensing across different functional areas for exploitation and exploration (Gatignon & Xuereb, 1997). Cross-functional integration pools resources and skills from different functions, promoting commitment and providing flexibility in workforce and capital resources and enhancing the utilization of organizational resources for both exploitative activities and explorative activities (e.g., Troy et al., 2008). Thus, the competitive advantage that a firm's marketing capability confer depends largely on the efficiency with which they are integrated (Day & Wensley, 1988). We hypothesize:

H4. *The effect of marketing capability on NPD performance will be positively moderated by interfunctional integration.*

3.5. The mediating role of exploitation

Exploitation requires in-depth use of the existing resources to develop incremental products to serve customers (e.g., Gatignon, Tushman, Smith, & Anderson, 2002). Market sensing can make firms be sensitive to environmental cues, e.g., competitors moves, technology development trends, such that they can effectively configure and deploy resources (Day, 1994; Teece, 2007) to better respond to a changing environment (Eisenhardt & Martin, 2000) by developing better product with new features or attributes to meet the needs of customers and compete for market space. In most cases, customer need changes, but usually it changes incrementally. Customer engaging can help firms build affectionate relationships with customers such that firms know the needs of customers and be able to anticipate customer need evolution for product development (Park et al., 2010; Yim et al., 2008). This suggests that customer engaging can help the firm to refine current products or to make incremental innovations to satisfy the needs of current customers. Partner linking can help firms get fine-grained information flow, technological innovations, and operational support from partners to facilitate the firm engaging in refining the existing products (e.g., Dyer & Singh, 1998; Mu & Di Benedetto, 2012). Thus, market sensing, customer engaging and partner linking can help firms to develop incremental products. The incremental product innovation and commercialization helps the firm to produce stable revenue flow, ensure cost reduction and economic efficiency improvement (March, 1991; Mu & Di Benedetto, 2012). In summary, marketing capability can help the firm to develop and improve the current products to serve the existing needs of customers better to ensure sound financial and economic stability of the company. We hypothesize:

H5. *Exploitation mediates the positive relationship between marketing capability and NPD performance.*

3.6. The mediating role of exploration

Exploration requires the firm to involve in experimentation, variation, and search to adapt to evolutionary and revolutionary environmental changes (Geroski, Machin, & Van Reenen, 1993; Gupta et al., 2006; He & Wong, 2004; March, 1991). Market sensing can help firms detect far-reaching new developments in marketplaces, foretell the onset of a

path-breaking shift in marketplaces or behavior emergence of a new paradigm or radical departures from the past, or allow firms not only monitor the market dynamics, but also get an early read on real-world trends (Du & Kamakura, 2012). Based on insights from market sensing, firms thus can avoid complacency with knowledge about current markets (Dickson & Giglierano, 1986), take advantage of market opportunities before they become obvious, and develop novel products to delight both existing customers and new customers. Customer engaging allows marketers to timely detect unattainable customer insights (e.g., Park et al., 2010; Yim et al., 2008), which help firms to create entirely new value propositions for customers to satisfy their latent yet emerging needs. Partner linking allows firms to access to partner resources to explore different problem frameworks, new ways of thinking and new business activities based on the market insights from market sensing and customer engaging and thus open up exploring new development prospects (Mu & Di Benedetto, 2012). Therefore, our discussion suggests that marketing capability from an outside-in perspective positively affect exploration.

However, it is worth to note that prior research in marketing and strategic management suggests that market orientation or marketing capability does not favor exploration or radical innovation (e.g., Christensen & Bower, 1996; Zhou et al., 2005). The major reason for this is that market orientation or marketing capability from an inside-out perspective (e.g., Day, 2011; Vorhies & Morgan, 2005) pays too close attention to customers' expressed needs instead of their latent needs (Christensen & Bower, 1996; Mu & Di Benedetto, 2011). Marketing capability from an outside-in view, as we argued earlier and suggested by prior researchers (Day, 2011; Day & Moorman, 2010), is to overcome the limitation of marketing capability from an inside-out view. Taken together, we hypothesize:

H6. *Exploration mediates the positive relationship between marketing capability and NPD performance.*

4. Method

4.1. Research design and data collection

To test our framework, a cross-sectional survey was conducted in two countries: USA and China. The objective was to assess the robustness of the findings. On the basis of an extensive review of relevant articles in marketing and strategy journals, the business press, and depth interviews with senior managers from six divergent technology firms, we developed our questionnaire. This process also ensures that the measurement items align with the theoretical definitions and clarity requirement. Afterwards, a pretest of the questionnaire was given to thirty-six NPD project managers and experts. The purpose was to review the questionnaire and identify any problems related to face validity, phrasing, and comprehension. We directed particular attention to the items for the new scales to ensure they were clear and captured the essence of the constructs being measured. On the basis of the inputs received, we eliminated some items, modified others, and added some new items. Another pretest of the questionnaire with seventy-one managers was administered to assess the reliability and validity of the scales. The results were satisfactory.

4.1.1. USA sample

For USA sample, we obtained the data from a large-scale mail survey. The final questionnaire was sent to a sample of 1438 companies, which we derived from a commercial list. We sent a questionnaire with a personalized letter to the executives identified in premailing telephone calls. To increase the response rate, we conducted frequent follow-up telephone calls two weeks after the initial mailing, second mailing, third mailing and fourth mailing. We obtained responses, of which 324 were usable. This resulted in an effective response rate of 22.1%.

This response rate was comparable to other studies targeted at top management in USA (Menon et al., 1999). Moreover, data on firm size, firm age and R&D investment were from archival sources. We found no differences between participating firms and nonparticipating firms in terms of firm size, firm age and R&D investment. The comparison of respondents who had been excluded from the final sample because of missing data with those whom we included across all study variables was conducted. No comparisons were significant at $p < 0.05$.

Our USA questionnaires were answered by the same informants, method bias could put a threat to our analysis. We compared a full measurement model with a latent method factor model (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003; Richardson, Simmering, & Sturman, 2009). To facilitate nested model comparison, we included a method factor (variance set to 1) in both models. Items in both models were allowed to load on their respective theoretical constructs. However, item loadings on the latent method factor were constrained to zero in the measurement model, but free to vary in the latent method factor model. The latent method factor model generated a good fit (χ^2 ($n = 324$; $df = 636$) = 1105.74, $p < 0.001$, root mean square error of approximation (RMSEA) = 0.003, comparative fit index (CFI) = 0.95, goodness-of-fit statistic (GFI) = 0.97, and Tucker–Lewis index (TLI) = 0.95). The model comparison indicated that the latent method factor model improved fit: $\Delta\chi^2 = 143.56$, $\Delta df = 19$, $p < 0.01$. Because chi-square difference test is vulnerable to sample size effect, Bryne (2001) recommended the GFI difference between models as an indicator of practical significance. The GFI difference between two models was 0.02, less than the 0.05 level suggested by Bagozzi and Yi (1990). The method factor explained only 10.8 percent of the total study variance, which is less than the median amount of method variance (25%) observed in the literature (Williams, Cote, & Buckley, 1989). Common method thus does not appear to be a problem (Podsakoff et al., 2003).

4.1.2. Chinese sample

For the Chinese sample, we obtained a mailing list of Chinese Hi-tech firms from a reputable research consulting company. From the 9835 firms, we randomly selected 1000 cases, we identified project managers or senior marketing managers to provide the information related with constructs. Because the questionnaire was originally developed in English, we followed the double-translation method, in which the survey was translated into Chinese and then back into English to evaluate the translation accuracy. We pretested the instrument using individual interviews with 20 managers who had at least ten years of business experience in China to examine understanding of the survey questions and face validity of the constructs.

We asked trained interviewers to schedule appointments with the project leader and the senior marketing manager in each firm, presented the questionnaire to them, and collected the questionnaire after completion. We offered anonymity and confidentiality to reduce socially desirable responses and assuring key informants that there were no correct or correct answers to reduce informant apprehension (Podsakoff et al., 2003). In China, this procedure is critical for ensuring quality control and reliability of the data (e.g., Atuahene-Gima, 2005; Mu & Di Benedetto, 2011). Product development leaders provided information for constructs exploitation, exploration, differentiation, cost-focus and NPD performance. The senior marketing managers (they were involved in project development) provided information for constructs marketing capability, customer-based structure, decentralization, and inter-functional integration and environmental dynamism. Data on firm size, firm age and R&D were from archival sources. Using multiple data sources reduces same-source bias concerns and enables us to collect measures from the most knowledgeable sources. We received 569 usable paired questionnaires for a participation rate of 56.9%.

To validate if the onsite interview could provide useful data as the traditional survey methods, we contacted additional informants at 57 firms randomly selected from respondent firms and compared their reports with those of their counterparts. We evaluated interrater

reliability between the onsite survey and randomly selected survey using intraclass correlation coefficient (ICC), the widely used indicator of interjudge reliability in behavioral science literature (e.g., McGraw & Wong, 1996). The ICC indicates that the respondents reliably reported the research variable information (from 0.73 to 0.96, $p < 0.001$). We compared a sample of participating and nonparticipating firms. The analysis of variance test was not significant for firm age ($F = 1.58$), number of employees ($F = 1.05$), and R&D input ($F = 1.32$), suggesting no response bias.

Though we collected data from different sources/informants, both the independent variables and dependent variable are from self-reported data for Chinese data, method bias poses threats to our study. In the questionnaire design and data collection process, we tried to mitigate such threats such as collecting data from both primary and secondary sources. We restricted the recall time frame to three years to minimize problems associated with retrospective data collection (Miller, Cardinal, & Glick, 1997). In addition, we added additional control variables to partial out alternative explanations. These variables are not highly correlated. Finally, we have interaction terms included in our hypotheses testing, common method bias would not be able to account for any statistically significant effects observed (Siemsen, et al. 2010). Although these procedural remedies and statistical tests do not eliminate the threat of common method variance, they suggest that threat of common method variance should not be a serious concern for this study (Podsakoff et al., 2003).

4.2. Variables and measures

We developed items for measuring marketing capability from an outside-in perspective. The measures for other constructs were adapted/adopted from prior studies. All indicators for constructs are listed in the Appendix. All items were measured on a seven-point Likert scale unless specified.

4.2.1. Dependent variable

4.2.1.1. New product development performance. We adapted measures from prior work (Kleinschmidt & Cooper, 1991; Song & Parry, 1997) to comprehensively measure NPD performance. Consistent with Song and Parry (1997), and Kleinschmidt and Cooper (1991), we used relative subjective measures (e.g., performance relative to competitors products) because objective measures (e.g., financial data) are often inaccurate or unavailable for firm performance (e.g., Song & Parry, 1997), especially in emerging economies (e.g., Atuahene-Gima, 2005; Mu & Di Benedetto, 2012). To assess the degree to which the subjective and the objective performance measures converge in order to lend greater credibility to our survey results (Srivastava et al., 1998), we also collected objective performance measures for the existing set of firms both in USA and China from news reports and company internal reports. In USA and Chinese samples, the correlations between perceptual measure of NPD performance and objective measure are respectively 0.86 and 0.93.

4.2.2. Independent variables

As we stated earlier, we developed measures for marketing capability.² We measured marketing capability from three dimensions: Market sensing (Drawn from the work of Day, 1994, 2011; Teece, 2007; Weick, et al. 2005), customer engaging (developed from the work of Day, 2011; Park et al., 2006; Yim et al., 2008) and partner linking (based on the work of Dyer & Singh, 1998; Mu & Di Benedetto, 2012; Srivastava et al., 1998). To ensure that these three dimensions (market sensing, customer engaging and partner linking) represented a single

² In two preliminary studies, we tested if marketing capability from an outside-in perspective is different from construct market orientation. The t-test and paired chi-square difference test showed that marketing capability from an out-in perspective and market orientation are distinctive constructs.

underlying construct of marketing capability, we conducted a confirmatory factor analysis using AMOS software version 22.0 with maximum likelihood estimation procedures. The confirmatory factor analysis revealed that our proposed three-factor model fit the data reasonably well for US sample and Chinese sample respectively ($\chi^2 = 191.68$, 216.84, $df = 111, 124$; root mean square error of approximation [RMSEA] = 0.03, 0.02, comparative fit index [CFI] = 0.97, 0.96, and Tucker–Lewis–index [TLI] = 0.99, 0.98). Comparison of this model with alternative models did not reveal a better fit for our data. Thus, the results suggest that it is appropriate to view marketing capability as a multidimensional second-order construct.

We adapted measures from Atuahene-Gima (2005) to measure exploitation and exploration. The measure for customer-based structure was based on the work of Homburg et al. (2000, 2008). The measure for interfunctional integration was adopted from Narver and Slater (1990). We adapted Matsuno et al. (2002); Menon et al. (1999) to measure decentralization.

4.2.3. Control variables

We included relevant factors that might influence new product development performance of a firm as control variables in the analysis because their omission might confound the analysis. First, we controlled firm characteristic variables: Firm size (average firm full time employees in last three years), firm age (its inception to the survey date), and firm R&D investment (in terms of average million US dollars investment in last three years) and industrial sectors. Prior studies have demonstrated the influence of firm size, firm age and R&D investment on firm performance outcomes (e.g., Atuahene-Gima, 2005; Damanpour, 1991; Narver & Slater, 1990; Song & Parry, 1997; Teece, 2007). Second, because product market strategies such as differentiation and cost focus affect product development outcomes (e.g., Porter, 1985; Zott & Amit, 2009), we controlled product innovation strategy: differentiation, cost-focus. We adopted Zott and Amit (2009) to measure differentiation and cost-focus. Third, we controlled environmental dynamism. The measure for environmental dynamism was adopted from Jaworski and Kohli (1993).

4.3. Measurement properties

We tested two confirmatory measurement models by including all latent constructs in one model for each country. We restricted each item's loading to its a priori construct and correlated each construct with all other constructs in the model. The measurement fit indexes for the confirmatory measurement models achieved the following ranges respectively for US sample and Chinese sample: $\chi^2 = 1381.95$, 1261.20, $df = 761, 685$, $p < 0.001$; root mean square error of approximation (RMSEA) = 0.005, 0.002; comparative fit index (CFI) = 0.95, 0.92; goodness-of-fit statistic (GFI) = 0.94, 0.97; and Tucker–Lewis–index (TLI) = 0.93, 0.96.

We assessed the reliability of individual items by examining the loadings of the items with their respective latent construct; loadings of less than 0.7 may represent poorly worded or inappropriate items and thus should be eliminated from the model (Hair, Black, Babin, & Anderson, 2010). As the Appendix reports, all measurement items exceeded this threshold and load significantly on the expected constructs. Furthermore, all constructs have acceptable levels of reliability, with the reliability coefficients exceeding the 0.7 recommended threshold (Nunnally, 1978). These tests support strong reliability and convergent validity of our measures for constructs.

To test for discriminant validity, we used Fornell and Larcker's (1981) approach, which requires that the square root of the AVE of each construct to be greater than the correlations between pairs of constructs. All measures for which an AVE was available filled this requirement (please see the appendix), in support of discriminant validity. Convergent validity is also evident, with the average variance

extracted (AVE) for each construct exceeded the 0.5 benchmark (Fornell & Larcker, 1981). Thus, convergent validity is evident.

5. Estimation and results

Table 1 presents descriptive statistics and correlations for USA sample and Chinese sample. Because some of our predictor variables were significantly correlated, we examined the variance inflation factor (VIF) values to determine if multicollinearity existed in these data. The VIFs of our explanatory variables, all of which are well below 10.00 (Hair et al., 2010), which suggests that multicollinearity was not a concern. To ease the interpretability of the interaction terms, we mean-centered the noncategorical independent variables (Aiken & West, 1991).

Our theoretical model suggests a mediated moderation between mediators, moderators, independent variable, and performance outcome variable. To test the mediated moderation relationships, we followed the procedure outlined by Muller, Judd, and Yzerbyt (2005). The results are reported in Table 2 for US sample and Table 3 for Chinese sample. According to Muller et al. (2005), the first requirement for mediated moderation is the association between marketing capability and NPD performance must be established, and term of interaction between the independent variable and the moderators customer-based structure, decentralization and inter-functional integration in their effects on the criterion variable new product performance must be significant. In Models 1, marketing capability is positively associated with NPD performance (USA, $b = 0.715$, $p < 0.001$; Chinese, $b = 0.586$, $p < 0.001$). This supports H1. Also, in Models 3, interaction terms of marketing capability and moderators on NPD performance are positive and significant (USA, $b = 0.371$, 0.621 , 0.459 respectively, $p < .01$; Chinese, $b = 0.301$, 0.508 , 0.331 respectively, $p < .01$) (Fig. 2 graphically depicts the interaction effects using USA sample results as an illustration). This supports H2, H3 and H4.

The second requirement is that both the interaction term between the independent variable and the moderators in their effects on the mediators, and the direct effect of the mediator on the criterion variable must be significant. This requires establishing a relationship between

the independent variable marketing capability with the mediators (exploration and exploitation), the mediators with the dependent variable NPD performance, and the interaction terms of independent variable and moderators on mediators. To meet these requirements, first we test whether marketing capability is positively associated with exploration and exploitation respectively. Marketing capability has a positive effect on the proposed mediator variables exploitation (in Models 5, USA, $b = 0.531$, $p < 0.001$; Chinese, $b = 0.495$, $p < 0.01$) and exploration (In Models 8, USA, $b = 0.309$, $p < 0.01$; Chinese, $b = 0.438$, $p < 0.01$). Moreover, we found that adding the hypothesized mediators to model 1, the explanatory power of each model significantly increased (Models 2, 3 and 4). However, the coefficient for marketing capability dropped from significance (compared models 4 with models 3 for both USA and Chinese samples), suggesting that the relationship between marketing capability and product innovation performance is fully explained by exploration and exploitation. This supports H5 and H6. In Models 2 for both USA and Chinese samples, mediators exploitation (USA, $b = 0.301$, $p < 0.05$; Chinese, $b = 0.413$, $p < 0.05$), and exploration (USA, $b = 0.359$, $p < 0.05$; Chinese, $b = 0.327$, $p < 0.05$) respectively is positively associated with NPD performance. In addition, in Models 7 and 10 respectively, the interaction terms of decentralization and marketing capability, customer-based structure and marketing capability, inter-functional integration and marketing capability on exploitation and exploration respectively are positive and significant ($p < 0.05$).

Finally, in the full model included both mediators and moderators, the interaction term of the independent variable and the moderator should not be significant in its effect on the criterion variable. In Models 4, for both US and Chinese samples, the coefficients of interaction terms between marketing capability and moderators customer-based structure, decentralization and interfunctional integration on NPD performance are not significant (not significant at $p < 0.05$). This meets the third requirement of mediated moderation test suggested by Muller et al. (2005). Therefore, the pattern of results supports our mediated moderation model in this research.

Table 1 Descriptive statistics and correlation table.

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
<i>Part A: USA (N = 324)</i>															
1. NPD performance	5.42	1.73	1.00												
2. Marketing capability	5.07	1.01	0.238***	1.00											
3. Decentralization	5.25	0.851	0.172**	0.104**	1.00										
4. Customer-based structure	5.03	1.37	0.105*	0.101*	0.106*	1.00									
5. Inter-functional integration	5.07	1.08	0.101*	0.107*	0.095*	0.131*	1.00								
6. Exploitation	5.16	1.05	0.153**	0.161**	0.107*	0.092	0.103*	1.00							
7. Exploration	4.79	0.772	0.104*	0.097	0.102*	0.045	0.037	0.101*	1.00						
8. Differentiation	5.03	1.11	0.061	0.026	0.039	0.028	0.009	0.012	0.008	1.00					
9. Cost-focus	4.09	0.833	0.072	0.039	0.055	0.031	0.023	0.055	0.046	0.004	1.00				
10. Firm age	48	15.39	0.083	0.008	0.017	0.025	0.019	0.043	0.021	0.053	0.006	1.00			
11. Firm size	213	47.82	0.013	0.019	0.031	0.020	0.015	0.072	0.008	0.012	0.011	0.007	1.00		
12. R&D	5.08	1.06	0.131*	0.006	0.072	0.048	0.007	0.023	0.031	0.029	0.007	0.019	0.038	1.00	
13. Environmental Dynamism	4.96	0.826	0.007	0.005	0.013	0.055	0.043	0.009	0.025	0.006	0.018	0.009	0.011	0.021	1.00
<i>Part B: China (N = 569)</i>															
1. NPD performance	5.21	1.02	1.00												
2. Marketing capability	3.45	.953	0.273***	1.00											
3. Decentralization	5.01	0.728	0.201**	0.106**	1.00										
4. Customer-based structure	5.07	1.27	0.109**	0.155**	0.095*	1.00									
5. Inter-functional integration	5.11	0.902	0.105**	0.096**	0.107*	0.101*	1.00								
6. Exploitation	4.96	0.861	0.103**	0.203**	0.113*	0.097*	0.103*	1.00							
7. Exploration	4.38	1.24	0.104**	0.109**	0.105*	0.095*	0.112*	0.108*	1.00						
8. Differentiation	5.42	0.991	0.092	0.047	0.031	0.016	0.062	0.073	0.006	1.00					
9. Cost-focus	4.46	0.593	0.081	0.032	0.018	0.031	0.019	0.107	0.019	0.006	1.00				
10. Firm age	37.8	11.85	0.009	0.007	0.112	0.005	0.004	0.038	0.063	0.103	0.003	1.00			
11. Firm size	338	95.62	0.048	0.031	0.005	0.028	0.031	0.009	0.017	0.042	0.027	0.013	1.00		
12. R&D	3.14	1.01	0.117*	0.019	0.013	0.017	0.025	0.043	0.157*	0.041	0.009	0.033	0.019	1.00	
13. Environmental Dynamism	5.59	0.597	0.004	0.103*	0.102*	0.006	0.045	0.072	0.019	0.030	0.017	0.011	0.022	0.005	1.00

Notes: † $p < 0.1$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

Table 2
Hierarchical regression results: USA sample.

Independent variables	Dependent variables									
	New product development performance				Exploitation			Exploration		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Intercept	2.032* (0.615)	1.817* (0.832)	1.858* (0.807)	1.755 (0.755)	1.638 (0.639)	1.794 (0.849)	1.732** (0.403)	2.571** (0.375)	1.809** (0.407)	1.92** (0.413)
Size	−0.303 (0.209)	−0.221 (0.275)	−0.201 (0.247)	−0.255 (0.301)	−0.205 (0.303)	−0.197 (0.308)	0.049 (0.052)	0.008 (0.042)	0.007 (0.049)	0.005 (0.046)
Age	−0.005 (0.003)	−0.002 (0.007)	−0.004 (0.006)	0.003 (0.005)	0.004 (0.008)	0.005 (0.009)	0.102 (0.131)	0.059 (0.107)	0.051 (0.115)	0.049 (0.108)
R&D	0.172 (0.123)	0.104 (0.152)	0.037 (0.135)	0.119 (0.131)	0.107 (0.133)	0.105 (0.138)	0.035 (0.029)	0.048 (0.027)	0.041 (0.031)	0.039 (0.033)
Environmental dynamism	0.016 (0.017)	0.011 (0.012)	0.008 (0.017)	0.013 (0.015)	0.009 (0.013)	0.015 (0.010)	0.113 (0.125)	0.107 (0.109)	0.101 (0.107)	0.092 (0.106)
Differentiation	.195* (0.061)	0.175* (0.060)	0.109 (0.067)	0.182* (0.062)	0.193* (0.068)	0.181* (0.070)	0.101 (0.082)	0.135* (0.033)	0.132* (0.038)	0.118* (0.035)
Cost focus	0.172* (0.069)	0.147* (0.060)	0.108 (0.069)	0.153* (0.065)	0.171* (0.075)	0.168* (0.077)	0.103 (0.069)	0.113 (0.085)	0.101 (0.075)	0.092 (0.077)
Industry 1: Bio-tech	0.840 (0.801)	0.655 (0.804)	0.572 (0.775)	0.681 (0.803)	0.728 (0.791)	0.649 (0.757)	0.638 (0.881)	0.644 (0.813)	0.639 (0.809)	0.629 (0.807)
Industry 2: Machinery	0.702 (0.786)	0.681 (0.771)	0.577 (0.649)	0.697 (0.782)	0.627 (0.677)	0.638 (0.705)	0.619 (0.712)	0.809 (0.744)	0.803 (0.751)	0.827 (0.761)
Industry 3: Electronics	0.652 (0.739)	0.651 (0.728)	0.471 (0.595)	0.638 (0.741)	0.662 (0.719)	0.601 (0.708)	0.683 (0.805)	0.677 (0.809)	0.681 (0.803)	0.669 (0.817)
Industry 4: Information	0.299 (0.905)	0.212 (0.901)	0.271 (0.851)	0.198 (0.900)	0.208 (0.892)	0.653 (0.885)	0.572 (0.807)	0.802 (0.901)	0.761 (0.875)	0.754 (0.762)
Marketing capability	0.715*** (0.069)	0.119 (0.105)	0.114* (0.052)	0.073 (0.061)	0.531*** (0.085)	0.418*** (0.082)	0.419*** (0.157)	0.309* (0.109)	0.305* (0.108)	0.291* (0.107)
Exploitation		0.301* (0.078)		0.227* (0.081)						
Exploration		0.359* (0.074)		0.271* (0.052)						
Decentralization			0.101 (0.093)	0.105 (0.087)		0.303** (0.075)	0.158 (0.131)		0.352** (0.069)	0.133 (0.127)
Customer-based Structure			0.073 (0.062)	0.065 (0.059)		0.316* (0.088)	0.109 (0.085)		0.341** (0.072)	0.112 (0.077)
Inter-functional integration			0.117 (0.083)	0.108 (0.079)		0.275* (0.083)	0.101 (0.092)		0.298** (0.057)	0.109 (0.073)
Marketing capability × Decentralization			0.371** (0.051)	0.101 (0.077)			0.417** (0.071)			0.529** (0.079)
Marketing capability × Customer-based structure			0.621** (0.077)	0.109 (0.072)			0.549** (0.085)			0.677** (0.064)
Marketing capability × Inter-functional integration			0.459** (0.063)	0.112 (0.076)			0.436** (0.088)			0.572** (0.081)
R ²	0.307	0.392	0.485	0.561	0.314	0.425	0.471	0.302	0.352	0.485
F Value	5.83***	6.16***	6.93***	7.19***	5.05***	6.02***	7.12***	5.19***	5.85***	6.47***

Notes: N = 324.

The dependent variable for Models 1–4 are new product development performance, for Models 5–7 are exploitation, 8–10 are exploration. Columns contain estimated coefficients and their associated standard errors (in parentheses).

†p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001.

6. Discussion

Scholars have placed significant emphasis on the importance of marketing capability in innovation and firm performance. However, most studies analyze the phenomenon from an inside-out perspective. A firm needs to be able to comprehend market competition from an outside-in perspective (Day, 2011). Based on this notion, we propose marketing capability as an important analytical tool from an outside-in perspective to analyze how firms respond and adapt to external changes through adaptive mechanisms proposed by prior research and organizational structural factors under which marketing capability affect NPD performance.

6.1. Theoretical implication

We believe that this research makes several important theoretical contributions. First, we study marketing capability from an outside-in perspective. Drawing on insights from outside-in strategic view (e.g., Day, 1994, 2011; Srivastava et al., 1998), we conceptualized marketing capability. Our conceptualization of marketing capability

from an outside-in view expands prior approach on marketing capability and firm performance analysis (e.g., Theodosiou et al., 2012; Vorhies & Morgan, 2005; Vorhies et al., 2011). Specifically, we grouped the key elements of marketing capability from an outside-in perspective in terms of three primary dimensions: Market sensing, customer engaging, and partner linking. Prior studies did not examine customer engaging, partner linking and market sensing simultaneously and integrate the constructs related with customer engaging, partner linking and market sensing into a coherent analytical research framework. Our study thus represents a first step toward development of what constitutes a marketing capability from an outside-in perspective.

Our empirical evidence suggests that marketing capability from an outside-in perspective is instrumental to improving NPD performance. We argue that a focal firm with marketing capability from an outside-in perspective has a good understanding of marketplace can correctly predict the direction and trend of market change in terms of exploitation and exploration, which in turn allows the firm to perform better. The results seemed to provide evidences to support our argument. It appears that a firm with marketing capability from an outside-in perspective is able to make judicious judgments in resource allocations for

Table 3
Hierarchical regression results: Chinese sample.

Independent variables	Dependent variables									
	New product development performance				Exploitation			Exploration		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
Intercept	1.905* (0.751)	1.259** (0.255)	1.973* (0.748)	1.807* (0.835)	1.705* (0.319)	1.555* (0.648)	1.593* (0.412)	1.722** (0.409)	1.615* (0.472)	1.732* (0.481)
Size	-0.385 (0.327)	-0.295 (0.351)	-0.301 (0.336)	-0.409 (0.413)	0.043 (0.058)	-0.208 (0.318)	0.027 (0.031)	0.032 (0.036)	-0.253 (0.350)	-0.249 (0.357)
Age	-0.002 (0.003)	-0.002 (0.004)	0.001 (0.003)	-0.003 (0.004)	0.103 (0.115)	0.001 (0.005)	0.049 (0.107)	0.051 (0.104)	0.021 (0.102)	0.013 (0.105)
R&D	0.259* (0.101)	0.095 (0.082)	0.107 (0.103)	0.308* (0.107)	0.059* (0.021)	0.809* (0.082)	0.066* (0.031)	0.071* (0.031)	0.058† (0.039)	0.052† (0.031)
Environmental dynamism	0.030 (0.028)	0.021 (0.022)	0.027 (0.025)	0.035 (0.029)	0.115 (0.127)	0.013 (0.018)	0.109 (0.115)	0.106 (0.112)	0.015 (0.016)	0.013 (.015)
Differentiation	0.172* (0.080)	0.159* (0.071)	0.161* (0.079)	0.205* (0.083)	.130 (0.071)	0.181* (0.070)	0.111 (0.078)	0.109 (0.071)	0.192* (0.071)	0.181* (0.073)
Cost focus	0.185* (0.080)	.149* (0.059)	0.151* (0.062)	0.203* (0.085)	0.172* (0.065)	0.154* (0.061)	0.107 (0.069)	0.152* (0.052)	0.159* (0.068)	0.141* (0.063)
Industry 1: Bio-tech	0.612 (0.704)	0.601 (0.702)	0.607 (0.701)	0.655 (0.713)	0.702 (0.771)	0.609 (0.712)	0.729 (0.779)	0.609 (0.743)	0.606 (0.711)	0.612 (0.715)
Industry 2: Manufacturing	0.205 (0.425)	0.206 (0.418)	0.203 (0.419)	0.209 (0.427)	0.407 (0.509)	0.210 (0.415)	0.414 (0.513)	0.249 (0.507)	0.207 (0.425)	0.201 (0.439)
Industry 3: Electronics	0.536 (0.493)	0.533 (0.495)	0.527 (0.482)	0.555 (0.497)	0.649 (0.587)	0.531 (0.490)	0.657 (0.591)	0.531 (0.513)	0.538 (0.491)	0.457 (0.482)
Industry 4: Telecommunication	0.432 (0.506)	0.402 (0.507)	0.391 (0.502)	0.405 (0.511)	0.508 (0.571)	0.383 (0.505)	0.526 (0.575)	0.519 (0.573)	0.396 (0.503)	0.309 (0.528)
Marketing capability	0.586*** (0.069)	0.108 (0.072)	0.207* (0.062)	0.066 (0.059)	0.495** (0.086)	0.401* (0.071)	0.403** (0.092)	0.438** (0.095)	0.318** (0.073)	0.209* (0.071)
Exploitation		0.413* (0.094)		0.203* (0.055)						
Exploration		0.327* (0.065)		0.195* (0.057)						
Decentralization			0.085 (0.071)	0.096 (0.078)		0.285* (0.065)	0.052 (.039)		0.348** (0.075)	0.041 (0.035)
Customer-based structure			0.064 (0.068)	0.067 (0.072)		0.161* (0.043)	0.071 (0.048)		0.251* (0.049)	0.069 (0.050)
Inter-functional integration			0.075 (0.079)	0.059 (0.068)		0.149* (0.055)	0.105 (0.081)		0.152* (0.051)	0.101 (0.083)
Marketing capability × Decentralization			0.301** (0.065)	0.043 (0.075)			0.429** (0.077)			0.531** (0.082)
Marketing capability × Customer-based structure			0.508** (0.061)	0.071 (0.082)			0.508*** (0.105)			0.547*** (0.109)
Marketing capability × Inter-functional integration			0.331** (0.052)	0.085 (0.093)			.331*** (0.073)			0.373*** (0.075)
R ²	0.302	0.381	0.471	0.553	0.315	0.392	0.438	0.299	0.386	0.471
F Value	4.09***	5.86***	6.48***	7.33***	5.19***	6.08***	6.54***	5.39***	6.07***	6.83***

Notes: N = 569.

The dependent variable for Models 1–4 are new product development performance, for Models 5–7 are exploitation, 8–10 are exploration. Columns contain estimated coefficients and their associated standard errors (in parentheses).

†p < 0.1; *p < 0.05; **p < 0.01; ***p < 0.001.

exploitation and exploration competencies based on market insights generated from customer engaging, partner linking and market sensing.

Second, the marketing capability from an outside-in perspective construct advanced and tested in this study contributes to research in marketing capability analysis and firm adaptability analysis through exploitation and exploration reinforcing the theoretical link between the two related but distinct lines of work: Marketing capability study and organizational adaptability research. Previous studies on firm performance generally and NPD performance more specifically have mostly centered on a focal firm's adaptability (e.g., He & Wong, 2004; March, 1991) or on marketing capability (e.g., Vorhies & Morgan, 2005). We found that marketing capability from an outside-in perspective on NPD outcomes are mediated by exploitation and exploration, which are in turn associated with higher levels of NPD performance. The mediating role of exploitation and exploration sheds new light on the mechanism by which marketing capability from an outside-in perspective affect NPD performance. More importantly, marketing must be an integral part of the organization's decision-marketing framework (Kumar, 2015). Thus, our finding highlights the significance of the construct marketing capability for organizational adaptability research and resource

allocation decision-making for organizational adaptability: Organization needs to allocate sufficient resources to develop appropriate marketing capability for adaptability and superior performance.

Prior studies have provided some explanations for exploitation and exploration. For example, some researchers suggest that exogenous industry conditions may drive exploration and exploitation (e.g., Levie & Rosenkopf, 2006). Jansen et al. (2006) find that connectedness within organizational units supports both exploratory and exploitative innovation. Other researchers report mixed effects of slack resources on exploitation and exploration variables such as innovation and risk taken (e.g., Voss et al., 2008). Zhou and Wu (2010) empirically indicate that technological capability has a negative quadratic effect on exploration but a positive quadratic effect on exploration. Moreover, Zhou and Li (2010) demonstrate that strategic orientation (customer orientation, technological orientation and competition orientation) positively affects adaptive capability. Fang and Zou (2009) suggest that resource magnitude and complementarity positively affect marketing dynamic capabilities. Our research adds new understanding to the small but growing stream of research in the antecedents of organizational adaptability literature.

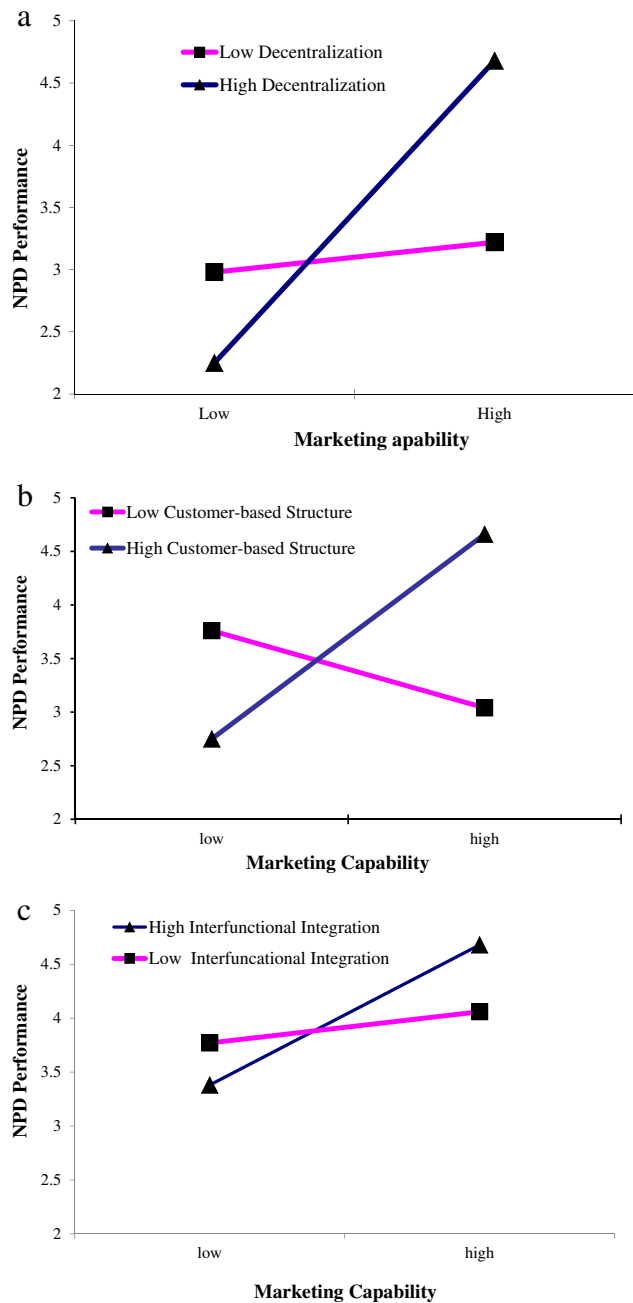


Fig. 2. Joint effects of moderators and marketing capability on NPD performance. (a) Interaction effects of marketing capability and decentralization on NPD performance. (b) Interaction effect of marketing capability and customer-based structure on NPD performance. (c) Interaction effect of marketing capability and interfunctional integration on NPD performance.

Moreover, we are not aware that studies have explored what leads to exploitation and exploration from marketing capability based on an outside-in perspective. Our research suggests that marketing capability from an outside-in perspective not only can help firms to exploit existing resources, but also to explore new possibilities (Gupta et al., 2006; Hoang & Rothaermel, 2010; March, 1991). One potential explanation for the mediating effects in the relationship between marketing capability and NPD performance is that exploitation or exploration must reflect the knowledge, skills and market insights captured from customer engaging, partner linking and market sensing. Our results indicate that exploitation or exploration driven by marketing capability

from an outside-in perspective is possible and does relate positively to NPD performance.

The empirical results from two countries suggest that marketing capability from an outside-in perspective leads more to exploitation rather than exploration. This finding is consistent with the insights agreed by both academic researchers and practitioners that it is hard to develop radical innovation than incremental innovation (e.g., Fleming & Sorenson, 2004; Gersick, 1991). Also, marketing capability contributes more to sample firms of USA new product development performance than to that of Chinese sample firms. This might reflect gaps in deployment of marketing capability for product innovation by the firms in the two countries. Firms in developed economies might be more adept at marshalling marketing capability for innovation than that of firms in developing countries. However, compared to USA, marketing capability contributes more to exploration in Chinese firms but more exploitation in USA firms. This reflects the stages of the economic development in the two countries. In developed economies like USA, radical innovation is rare. In developing economies, a lot of innovations and new products introduced into the market seem completely new to local consumers and companies. Thus, the marketing capability contribution differences to exploitation and exploration might reflect the perceptual differences of managers in terms of product innovation radicalness in the two countries. Nevertheless, the findings suggest that marketing capability from an outside-in perspective creates the capacity for exploitation or exploration that performance gains are realized. This suggests that it is not enough to simply emphasize exploitation or exploration. The results suggest that marketing capability from an outside-in perspective is a critical firm capability for both exploitation and exploration.

Third, our results advance scholarly understanding of the influence of organizational structural factors in the relationship between marketing capability, exploitation, exploration and NPD performances. In examining the interaction between organizational structural factors and marketing capability on NPD performance, we attempt to address the recent calls to consider the organizational factors in the relationship between marketing capability, exploitation and exploration, and new product development performance (Day, 2011; Marketing Science Institute (MSI), 2012). Building on structural alignment theory, we investigate how three organizational structural factors affect performance outcome. Specifically, we demonstrate significant interactions between organizational structural factors decentralization, customer-based structure and interfunctional integration and marketing capability on exploitation and exploration. Thus, our results suggest that a proper organizational structure in place is a necessary condition for marketing capability from an outside-in perspective to produce the desired effects. Thus, it is not enough for a company simply to develop marketing capability from an outside-in perspective without considering the facilitating variables such as organizational structural variables in the relationship between marketing capability from an outside-in perspective and firm performance. Thus, development of marketing capability from an outside-in perspective is more likely to improve performance when the company develops an appropriate organizational scheme to it. By answering how organizational structural factors affect marketing capability on firm performance, our research is one of the first studies that answered the call regarding how to completely integrate marketing activities with other business functions (Kumar, 2015).

6.2. Managerial implication

The results of our study have several implications for managers. First, our research provides a systematic outline of the three dimension of marketing capability from an outside-in perspective. Customer engaging, partner linking, and market sensing allow a focal firm to comprehend the marketplace change and eventually increases the focal firm's chances of adapting to the external market change. Our study suggests that firms can develop marketing capability from an outside-in perspective as an adaptive tool for exploitation and exploration to

meet external changes. Second, managers need to pay greater attention to the conditions under which marketing capability from an outside-in perspective affect NPD performance. Our results suggest that the alignment of customer-based structure, decentralization and inter-functional integration are critical elements in nurturing marketing capability effort from an outside-in perspective through exploitation and exploration. Firms must organize in such ways that ensure the design of the organization reflects and reinforces the customer centric focus with marketing capability development.

6.3. Limitations and future research

The use of two samples from two countries increases confidence in our results. However, the contributions and practical implications should be viewed in light of the study's limitations. The first limitation is that our results cannot completely rule out mediating mechanisms other than the ones we proposed. We focused on marketing capability from an outside-in perspective at only one point in time. Our results merely suggest the plausible mediation pathways through which marketing capability from an outside-in perspective leads to exploration and exploitation, our data limits our ability to draw definite conclusions about empirical causality, future research could benefit greatly from longitudinal work that uses quantitative panel data.

Second, our study examined marketing capability from an outside-in perspective from a focal firm perspective. Our study could be extended in a number of other ways. A fruitful area might involve the study of how the asymmetry of marketing capability from an outside-in perspective between two firms affects the likelihood and speed of their actions and responses to external changes and events; another might examine how marketing capability from an outside-in perspective shapes the subsequent development of market-engagement relationships and competitive behavior.

Third, we demonstrated that marketing capability is positively associated with both exploitation and exploration, yet organizations often tend to eschew competency destroying exploration in favor competency exploitation. Clearly, there are factors that affect managerial characteristics (such as decision makers' expertise and personal connections), and internal processes (such as training, learning, and socialization) that may help a firm cultivates its marketing capability from an outside-in perspective, exploitation and exploration. Future research could examine such factors to advance understanding of the relationship between marketing capability from an outside-in perspective and firm adaptability behavior on performance.

Appendix A. Variables, measures and statistics

A.1. New product performance

How would you evaluate your firm's new product performance in the following areas over the last three years (Please focus on a specific most recent new product development project) (1 = "far below the competitors," and 7 = "far above the competitors"):

A. Relative Sales, Relative Market Share, Relative Return on Investment (three-item scale each, adopted from Song & Parry, 1997; Cronbach's α s = 0.83, 0.85, 0.89, respectively; composite reliability = 0.81, 0.85, 0.92, respectively, AVE = 0.57, 0.63, 0.61 respectively)

1. Compared to your major competitors, relative to your firm's other new products, this product is very successful in terms of [sales, market share, return on investment] (1.00, 0.79, 0.82).
2. Compared to your major competitors, relative to competing products in the market, this product is very successful in terms of [sales, market share, return on investment] (0.81, 1.00, 0.77).
3. Compared to your major competitors, relative to your firm's original

objectives for this product, this product is very successful in terms of [sales, market share, return on investment] (1.00, 0.79, 0.80).

- B. Meeting Objectives** (adapted from Kleinschmidt and Cooper, 1991) (Cronbach's α = 0.82, composite reliability = 0.87, AVE = 0.71)
1. Compared to your major competitors, relative to your firm's original objectives for this product, this product is very successful in terms of customer satisfaction (0.83).
 2. Compared to your major competitors, relative to your firm's original objectives for this product, this product is very successful in terms of technological advancement (0.85).
 3. Compared to your major competitors, relative to your firm's original objectives for this product, this product is very successful in terms of overall performance (1.00).

A.2. Marketing capability from an outside-in perspective (new scale)

A.2.1. Market sensing

(Drawn from the work of Day, 1994, 2011; Teece, 2007; Weick, et al. 2005) (CA = 0.81; CR = 0.86; AVE = 0.73)

1. We can continuously scan emerging market trends and events (0.75).
2. We are quite alert to changing market conditions (0.72).
3. Everyone in our company is sensitized to listen to latent problems and opportunities in the market (0.77).
4. We can anticipate market trends and events accurately before they are fully apparent (0.75).
5. We can triangulate market information from different sources (1.00).
6. We can effectively listen to, understand, and rapidly respond to relevant marketplace conversations (0.82).

A.2.2. Customer engaging

(developed from the work of Day, 2011; Park et al., 2010; Yim et al., 2008) (CA = 0.83; CR = 0.87; AVE = 0.76)

1. We can provide reliable and timely responses to customers' needs (0.81).
2. We can proactively respond to customer expectations (0.71).
3. We can invest resources necessary to closely connect with customers (0.72).
4. We can seriously attend to customers' ideas (0.74).
5. We can genuinely care to customers' circumstances (0.77)
6. We can take customers' viewpoint to consider how to design and improve business process (0.73).
7. We are able to immerse in customer reality (1.00).
8. We can focus on customer from the customer's point of view (0.82).

A.2.3. Partner linking

(based on the work of Dyer & Singh, 1998; Mu & Di Benedetto, 2012; Srivastava and his colleagues, 1998) (CA = 0.80; CR = 0.83; AVE = 0.75)

1. We are quite accessible to partners (e.g., distributors, retailers) when needs arise (0.75).
2. We have a formal system in place that can help us find right partners (e.g., distributors, retailers) with which to work (0.78).
3. We can dynamically fine-tune and adjust our relationships with partners (e.g., distributors, retailers) over time (0.83).
4. We can effectively coordinate and orchestrate network partner relationships (e.g., distributors, retailers) over time (0.71).
5. We can effectively mobilize partners resources (e.g., distributors, retailers) to create value for customers (1.00).

A.3. Exploitation

(adapted from Atuahene-Gima, 2005) (CA = 0.89; CR = 0.92; AVE = 0.72).

1. Upgraded current knowledge and skills for familiar products and technologies? (0.85)
2. Invested in enhancing skills in exploiting mature technologies that improve productivity of current innovation operations? (0.82)
3. Enhanced competencies in searching for solutions to customer problems that are near to existing solutions rather than completely new solutions? (0.76)
4. Upgraded skills in product development processes in which the firm already possesses significant experience? (0.71)
5. Strengthened our knowledge and skills for projects that improve efficiency of existing innovation activities? (1.00)

A.4. Exploration

(adapted from [Atuahene-Gima, 2005](#)) (CA = 0.92; CR = 0.93; AVE = 0.76)

1. Acquired manufacturing technologies and skills entirely new to the firm? (1.00)
2. Learned product development skills and processes entirely new to the industry? (0.72)
3. Acquired entirely new managerial and organizational skills that are important for innovation? (0.75)
4. Learned new skills in areas such as funding new technology, staffing R&D function, training and development of R&D, and engineering personnel for the first time? (0.71)
5. Strengthened innovation skills in areas where it had no prior experience? (0.80)

A.5. Customer-based structure

(based on [Homburg et al., 2000](#); [Homburg et al., 2008](#)) (CA = 0.86; CR = 0.89; AVE = 0.69).

1. We have an organization structure that is based on customer segments (0.75).
2. We organize our company around customer-based groups rather than product or functional-based groups (0.76).
3. In our organization, managers use their resources (budgets, staff) in line with market targets (0.82).
4. Organizing people to deliver differentiated treatment and product to different customer segments is strength of our company (0.81).
5. Our organization structure is designed around our customers (0.77).
6. Our business unit is designed to optimally respond to customer groups with different profitability (1.00).

A.6. Decentralization

(based on [Matsuno et al., 2002](#); [Menon et al., 1999](#)) (CA = 0.82; CR = 0.87; AVE = 0.76).

1. In our organization, decisions tend to be made at a high level (R) (0.81).
2. The individual decision maker has wide latitude in the choice of means to accomplish goals (1.00).
3. Managers are allowed flexibility in getting work done (0.72).
4. A person who wants to make his own decision would quickly be discouraged (R) (0.73).
5. Even small matters are referred to someone higher in the marketing organization for a decision (R) (0.76).
6. Many important decisions are made locally rather than centrally (0.77).
7. Middle- and lower-level managers have substantial autonomy (0.70).

A.7. Inter-functional integration

(adopted from [Narver & Slater, 1990](#)) (CA = 0.79; CR = 0.83; AVE = 0.68).

1. The activities of functional units are tightly coordinated to ensure better use of our knowledge from different sources (0.78).
2. The information about customer experiences was freely communicated across all business functions (0.75).
3. The business functions are integrated in serving target market needs (1.00).
4. Managers understand how all business functions contribute to customer value creation (0.82).
5. All functional groups work hard to jointly solve problems (0.77).
6. There is a high level of cooperation and coordination among functional units in setting the goals and priorities for the organization to ensure effective response to market conditions (0.75).
7. In our organization, various functional areas coordinate their activities to enhance the quality of customer experience (0.72).

A.8. Differentiation

(adopted from [Zott & Amit, 2009](#)) (CA = 0.87; CR = 0.93; AVE = 0.77).

Our product development strategy is to focus on ...

1. the development of new markets relative to competitors (0.81).
2. offering specialized product (0.91).
3. innovation in product delivery (0.85).
4. providing the distinctive product (0.75).
5. providing unique product not offered by competitors (1.00).

A.9. Cost-focus

(adopted from [Zott & Amit, 2009](#)) (CA = 0.80; CR = 0.85; AVE = 0.70).

Our product development strategy is to focus on ...

1. leadership in developing new operating procedures relative to competitors (0.72).
2. operating efficiency relative to competitors (1.00).
3. emphasizing economies of scale and scope with product development (0.81).
4. minimizing product-related expenditures (0.83).

A.10. Environmental dynamism

(adopted from [Jaworski & Kohli, 1993](#)).

A.10.1. Technology turbulence

(CA = 0.91, CR = 0.93, AVE = 0.69)

1. It was difficult to forecast technology developments in our industry (1.00).
2. The technology environment was uncertain (0.71).
3. Technological development was predictable (R) (0.75).
4. The technology environment was complex (0.83).

A.10.2. Market turbulence

(CA = 0.90, CR = 0.92, AVE = 0.72).

1. Customer needs and preferences changed rapidly (0.78).
2. Product demands and preferences were uncertain (1.00).
3. It was easy to predict change in customer needs and preferences (R) (0.76).
4. Market competitive conditions were unpredictable (0.81).

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