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How does boundary-spanning search matter in China's new technology venture? The role of external relationship and internal competence

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Following the resource-advantage theory, this study advances the existing research of boundary-spanning search by examining which configuration of a new venture's boundary-spanning search can obtain successful venture performance and how a founding team's external relationship and the internal firm competences shape the relationship between the distant search and new venture performance. This paper is based on a questionnaire survey/analysis of a sample of 178 new ventures from China, and it offers insight to entrepreneurs with regard to the importance of building external managerial ties and developing idiosyncratic internal competences on boundary-spanning search. In addition, this study also reveals that the effectiveness of the supply-side, demand-side and spatial-side boundary-spanning search on venture performance depends on investing resource at a rational level.

Key words: Boundary-spanning search strategy, new venture, managerial tie, firm competence.

INTRODUCTION

Recently, studies have shown that the ability to explore is considered to be a key to an organization's long-term survival, particularly in a more dynamic environment (Jansen et al., 2006). Therefore, many scholars have dedicated considerable efforts to understanding the nature of exploration (O'Connor and DeMartino, 2006; Sidhu et al., 2004; Vassolo et al., 2004). Several literature seems to converge around the idea that exploration has been characterized as a non-local or distant search for discovering new approaches to technologies, business, processes or products and a pursuit of new knowledge (Bierly and Daly, 2007; Rosenkopf and Nerkar, 2001). A key feature of exploration in the information-processes perspective is a

distant search, also called boundary-spanning search. It is defined as the extent to which a firm searches for solutions by moving away from the existing routines or knowledge base to local organizational and technological domains to obtain information and knowledge.

As defined, boundary-spanning search in this study reflects that information from the external environment is sought to be brought into the boundary of the organization. It expands the scope of external information acquisition for firms, thereby accumulating and transforming the distant knowledge that ensures a better understanding of the external environment and can become embodied into new firm innovation. More recently, researchers have debated and found the relationship between boundary-spanning search and innovativeness (Sidhu et al., 2007). Given the liabilities of newness, new ventures need to be creative and learn new roles and task. Accordingly, new ventures may likely pursue boundary-spanning search, which can bring

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about a variety of novel insights in many aspects, such as: the ability to create innovativeness and make new roles in markets, the ability to create idiosyncratic competitive advantages, and the ability to identify and seize tremendous new business opportunities from a more dynamic environment.

Despite its importance, little is currently known about the relationship between boundary-spanning search and performance, particularly in a new venture. As mentioned earlier, this paper argued that boundary-spanning search is likely positively related to venture performance since it can help new ventures to gain from first-mover advantages and capitalize on emerging opportunities. On the other hand, new ventures generally face more competitive pressures in a more dynamic environment because they, unlike larger or established firms, lack the amount of slack resource, immature organizational processes, several kinds of hierarchical administrative systems and limited operational experience that can help larger firms cope with boundary-spanning knowledge processes; as such, they affect attainment of superior performance. Therefore, the issue about what sources can influence the effectiveness of boundary-spanning search on firm performance is also important for new ventures.

Due to the lack of these facilitating mechanisms, our study argued that new ventures have to rely more on the inherent value and ability of their top management team to gain the benefits of boundary-spanning search than larger or established firms. In particular, because of the lack of slack resource in new ventures, the external relationships of senior management teams may likely play the role of important sources. Therefore, to sustain the viability of boundary-spanning search, they need to leverage their external relationships to the extent that boundary-spanning will positively influence performance, which is largely facilitated by the senior management team's external relationship, as suggested by Park and Luo (2000). Hence, this study states that the level of senior management team's external relationship in new venture is pivotal in effectively coping with and capitalizing on these boundary-spanning searches. In addition, some studies on resource-base view have argued that firm performance is enhanced when firms own their idiosyncratic competences that enable them to foster advantage-seeking behaviors (Ireland et al., 2003) and identify innovation opportunities. Similarly, as new ventures have their idiosyncratic competences, they are also likely to use these strategic resources to translate the advantages of boundary-spanning search into high performance (Hitt et al., 2001).

As mentioned earlier, and following the resource-advantage theory, which stresses the heterogeneous resources owned by the firm attribute intra-industry differentials in financial performance, this paper carried out a test on the thesis whose effects of boundary-spanning search on new venture performance are

dependent upon its top management team's external social capital and internal strategic competences in an emerging economic environment. As a result, this study contributes to the literature in three important areas. First of all, scholars are aware of the fact that the senior team's external ties are particularly important sources of valuable resources and information, more especially for new technology ventures that can enhance firm performance in transitional economies (Gao et al., 2008). Drawing on the resource-advantage theory (Hunt and Morgan, 1995), this study contributes to this tradition by investigating how the social capital of a new venture founding team that is embedded in its external relationships influences the link between the firm's boundary-spanning search and its performance. Secondly, Hitt et al. (2001) have argued that firms are often unsuccessful in translating the benefits of some strategies into higher performance due to lack of strategic resources. Thus, based on the resource-advantage theory, our study advances the literature by investigating organizational idiosyncratic competences in an attempt to uncover their moderating effects between boundary-spanning search and performance. In addition, given the costs involved in achieving a high level of exploration and possible diminishing returns to its benefits (March, 1991), it is likely that a level of boundary-spanning search that is either too low or too high may alter performance. As a result, following this insight, this study extends our understanding about the performance implication for boundary-spanning search by examining whether the effect of boundary-spanning search on new venture performance is non-linear or not.

THEORETICAL BACKGROUND AND HYPOTHESES

Researchers have indicated that the survival of new ventures may depend largely upon creating process and marketing innovativeness, and delivering new and differentiated products resulting from their liability of newness. Consistent with the argument of resource-advantage theory (Hunt and Morgan, 1995), which argued that since firms occupy positions of competitive disadvantage, they attempt to neutralize and even leapfrog the advantaged firms by innovation. In addition, many studies (Abernathy and Clark, 1985) have shown that a firm pursuing exploration can obtain radical innovation, offer new designs, create new markets and develop new channels of distribution. In other words, following the resource-advantage theory, most firms, particularly those in new ventures, will tend to pursue exploration-oriented activities such as boundary-spanning search to develop exploratory innovation and offer process or product innovativeness in order to occupy market place positions and gain a competitive advantage in some market segments. However, such strategies typically involve high risks and cost resulting

from variation and experimentation, like product features and benefits that are underdeveloped or incompatible with customers' needs. Due to lack of resources and immature organizational processes, the risks and costs of boundary-spanning are more onerous for new ventures than larger or established firms.

Some studies have showed that top management teams play the most important role for new ventures or small- and medium- firms in terms of implementing strategies, and acquiring and configuring resources. Research on social capital (Stam and Elfring, 2008) have argued that managers' external relationship, which enable them to access technical, market and managerial expertise, can buffer pervasive uncertainties and high level of risk especially in transitional economies (Peng and Luo, 2000). Based on the resource-advantage theory, a venture's external relationships, which are key resources for new ventures in enabling mobile financial resources, information and support by managers' relationship inside and outside the industry, and with officials of government and financial institutions, could constitute a comparative advantage in resources for new ventures through augmenting their meager resource in implementing strategic innovations. As mentioned earlier, since new ventures adopt boundary-spanning search to create competitive advantages, their senior teams' external social capital can contribute to the effectiveness of such information search strategy by mitigating transaction cost and try-and-error risks about being a first market entrant, and experimenting them with emerging trends and technologies by providing additional information and financial supports. Hence, this study suggests that senior team's external relationships could provide comparative advantage in capturing the opportunities found by boundary-spanning search, thereby influencing the effect of boundary-spanning search in new venture performance. Similarly, the resource-advantage theory argues that firms' core competences, used for providing a comparative advantage in creating strategic innovations, are critical for the effectiveness of strategic management on firm performance, and due to the lack of slack resources in new ventures, these competences are valuable since they provide these ventures with the ability to efficiently and/or effectively produce a comparative advantage in identifying and grasping new business opportunities found by boundary-spanning search. Therefore, these competences can provide a required resource basis for new ventures to redeem the disadvantage of lack of financial resource in successfully implementing boundary-spanning search, and then influence the effectiveness of such search strategy on venture performance. In addition, since new ventures in transition economics have relatively weak core competence as compared to larger or established firms, they hold more vigorous core competence in technology and/or marketing, which are more likely to identify and capture

new business opportunities found by boundary-spanning search, and then achieve better performance than those ventures without core competences.

The role of the top manager's external relationship

Drawn from the research of Lee et al. (2001), it was indicated that external relationships are capabilities that are not imitated by competitors due to their social complication. Thus, they can facilitate new ventures to augment their informational database and to raise the probabilities of finding new insight. Managers' external relationships may reduce transactional costs within or between firms such as information search and decision-making costs to increase the effectiveness of organizational action. Also, based on the institutional theory, managers' external ties serve as conduits for information constructing managerial views about the environment and the strategic choice they make. The strategies and practices of firms are embedded in social relationships and may have its social meaning. Finally, due to the influence of conformity and legitimacy pressure, new ventures' managers would adopt new insight learning from external relationships to capture their domination (DiMaggio and Powell, 1983).

Extra-industry relationships refer to the degree to which the top management teams have contacts with managers outside the firms' own industry. Managers of the new ventures build more extra-industry relationships with managers outside the focal new ventures' industry; as such, they have more probabilities in acquiring exploratory ways to solving problems. If the new insights are deployed in the industry of new ventures, the competitors could hardly imitate or reproduce the advantage built by new ventures because of the high level of entrance or aggregating barrier of knowledge. Through the effect of extra-industry relationships, these relationships can complement the lack of the competitive resource as well as find and even remove potential errors (Atuahene-Gima et al., 2006). Then, new ventures become better and are enhanced, and even capture new chance out of the existing industry being the dominant.

For instance, new ventures take on supply-side boundary-spanning search to improve the input-output conversion of organization or the technique for raising their performance. New ventures with high extra-industry managerial ties easily obtain novel technology and special organizational process out of their focal domain. However, these technologies or routines are hard to be imitated by competitors, due to their uniqueness, thereby increasing new ventures' performance. As a result, extra-industry managerial ties can stimulate new ventures exposed to a diversity of approaches, perspectives and ideas (Hargadon, 2002), and in turn facilitate them more speedily by catching key and valuable knowledge and resources, and also displaying fast

familiarity to local markets against unnecessary search costs. Therefore, the following hypothesis is presented:

H₁: When extra-industry managerial ties are high, the boundary-spanning search (supply-side, demand-side and spatial-side) has a positive effect on new technology venture performance.

Intraindustry relationships are defined as the degree to which the top management team has built connection with managers of other firms operating within the same industry as their own firm. Managers can utilize intra-industry relationships in capturing deeper knowledge and understanding of the strategies of competitors. Nevertheless, in the same industry, new ventures face familiar opportunities; hence, they imitate the strategic behaviors of each other to acquire the equal competitive status. Such competitive activities make it difficult for new ventures to augment their new insight; thus, they go backwards in growth or fail when competitors launch new ideas or innovativeness (Atuahene-Gima et al., 2006). Therefore, if managers of new ventures have more intra-industry relationships, such connections might bring the positive effect of strategic activities on the performance of new ventures since their social capital cannot contribute novel insights into their knowledge database.

Examples of new ventures partaking in spatial-side boundary-spanning search activities are those that can grab new possibilities, localized know-how and operational experience existing at different geographic regions. With high intra-industry relationships, managerial ties may make new ventures to be accustomed to obtaining success through reproducing competitors' advantages and ignoring the importance of external search of new insights, thereby, further diminishing sufficient capability to spatial-side search. Due to the high costs of partaking in a spatial-side search, the convenience of imitation and in obtaining equal success in comparison with competitors appeal more to most new ventures, in which case, such concept might weaken the motivation of new ventures endeavoring to partake in a spatial-side search to enhance new ventures' performance. In brief, high intra-industry managerial ties could reduce the motivation and probable search for new insights, and finally, decrease the impact of search activities on new venture performance. Therefore, hypothesis two is proposed thus:

H₂: When intra-industry managerial ties are high, the boundary-spanning search (supply-side, demand-side and spatial-side) has a negative effect on new technology venture performance.

Acquiring financial resource is an important capability for enterprises since many organizational activities are operated by firms that require financial supports, such as

R&D, marketing, or innovative activities. In terms of the new ventures' characteristic being a lack of many resources, they need financial resource to drive and complement organizational activities. Therefore, the new venture's top management team needs to establish financial ties to buffer the financial strain of organizational activities since financial slack can facilitate firms for product expansion (Mishina et al., 2004), organization reforming, and market exploring. Financial slack makes a new venture to have the ability to maximize the benefits attained from obtaining missing capabilities (Patzelt et al., 2008). In order to survive, a new venture often want to speed up new product launch due to the profit created by product launch, buffering competitive risk and pressure. In addition, the performance of new product launch is decided by attractive technology, solid marketing, or distinctive know-how. A new venture needs sufficient financial resource to support the expenditure of these organizational activities. Hence, the new venture's managers with more financial ties could buffer the costs and pressure of exploring or executing strategic activities to increase new venture performance.

For instance, a new venture sometimes borrows the distinction of local know-how from different geographies by using a spatial-side search to enhance their performance. The knowledge of local know-how, however, could be held by local key persons or companies due to human knowledge embedded in certain context or task done by persons (Knorr-Cetina, 1999). The new venture's top management team with more financial ties can help them to hire critical individuals or buy local know-how owned by local companies to strengthen the new venture performance. Consequently, this study assumes that if the new venture's managers have more financial ties, a new venture can gain more financial slack to execute search strategy to promote their performance. Therefore, hypothesis three is proposed:

H₃: When financial ties are high, the boundary-spanning search (supply-side, demand-side and spatial-side) has a positive effect on new technology venture performance.

In transitional economies, new ventures face a very uncertain market environment (Zhou et al., 2003). The uncertainty results from the weak legal system and powerful governmental intervene (Fong and Chen, 2007). Under the condition of an uncertain environment, governments usually control important resources which are needed by new ventures. Hence, new ventures encounter many resource constraints and are forced to make contact with government officials to secure their required resources. It is highlighted that government plays a crucial role in the task environment of new ventures and, in turn, the new ventures would become proactive to shape this external environment and strive for the competitive resources which they need (Schuler

and Rehben, 1997). For emerging markets, more and more new ventures understand that the key of establishing competitive advantages is to influence the formulation and implementation process of government policies and regulation, so as to construct the favorable external environment for their business activities (Tian and Deng, 2007). Thus, if new ventures build high degree of government tie with officials, they are able to obtain crucial information or funding to establish successful performance (Fong and Chen, 2007).

Governments, in such economies, have great power over the control of input, product and credit markets (Brandt and Li, 2003). For instance, new entrepreneurs in transitional economies are in the face of changeable regulations in addition to the unstable legal mechanism, which result in the difficulty of implementing the demand-side search. In such an emerging market, customers' choice is influenced by government policies, thereby causing the exploration of market information by the demand-side boundary-spanning search which becomes invalid due to the market variation induced by instable policies. Thus, when the top management team of new ventures builds a strong connection with the government, it becomes more powerful in carrying out governmental policies and then creates beneficial policies or environment in order to buffer the risk of executing the demand-side search, thereby promoting new ventures' performance. Consequently, when managers of new ventures attain good and close government ties, this relation can assist their firms in enhancing the effectiveness of enforcing search strategies and further establishing a firm performance for the new ventures. Therefore, hypothesis four is proposed:

H₄: When government ties are high, the boundary-spanning search (supply-side, demand-side and spatial-side) has a positive effect on the new technology venture performance.

The role of internal organizational competences

As mentioned earlier, new ventures lack the amount of slack resource, immature organizational processes, several kinds of hierarchical administrative systems and limited operational experience. Following the resource-advantage theory, this study argued that new ventures are more likely to successfully capture new opportunities found by boundary-spanning search; as such, they achieve better performance if they have idiosyncratic competences, such as technology-based and marketing-based competences. In other words, new ventures which engage in boundary-spanning search require the support of both technological and marketing competences. Prior research (Moorman and Slotegraaf, 1999) suggested that technological competences refer to the abilities to develop substantial technological resources and use

them in the development of new products such as developing high quality new products or proposing pioneering technologies; whereas, marketing competences indicate the abilities to generate and disseminate organization-wide information through appropriate response related to current and future customer needs and competitive situations, such as superior market forecasting or excellent distribution channels.

Technological capability is referred to as the ability to develop and design new products and processes, and also upgrade the knowledge about the physical world in unique ways, thereby transforming this knowledge into designs and instructions for the creation of desired outcomes (Wang et al., 2006). Based on the resource-advantage theory, a firm is a bundle of resources that can gain the sustainable competitive advantage through applying valuable resources and capabilities owned by the firm in distinctive ways into new products.

New ventures can use the boundary-spanning search, such as the supply-side search, to pursue more valuable resources and knowledge in order to improve the input-output conversion of technology and organization. Following the absorptive capability theory (Jansen et al., 2005), since new ventures possess a problem-solving process in the new product development, they can advance the operational efficiency of the organization and integrate new knowledge into their new products so as to create technology innovation. Moreover, in the intensive competition, the market confronted by new ventures presents a saturated situation which is full of rivals and similar imitable technologies. They often want to make breakthrough innovation to build up their dominant, competitive advantage; so, they take action on the boundary-spanning search to explore new knowledge, ways, technologies and skills. If new ventures own a pioneering technology-basis, they might assimilate such novel knowledge to capture new business opportunities identified by boundary-spanning search. Consequently, hypothesis five is proposed:

H₅: When technological competences are high, the boundary-spanning search (supply-side, demand-side and spatial-side) has a positive effect on new technology venture performance.

Based on the extant literature, marketing competence can be defined as the integrative processes by which skills and knowledge are mingled with tangible resources to transform marketing inputs to outputs (Day, 1994). Specifically, marketing capability provide a firm with an integrative process designed to utilize collective knowledge, skills and resources of the firm to meet the market-related needs of the business, enabling the business to add value to its goods and services, and finally satisfy customers' demand (Krasnikov and Jayachandran, 2008). Furthermore, the purpose of marketing competence is used to make a firm deal with

market knowledge to adapt to market changes so that the core value of marketing competence is to acquire, interpret and apply market knowledge to decipher the trajectory of customers' needs.

If a new venture can better analyze and understand the unmet customer needs, they are likely to understand the source of market change, customer preference and market structure. Such idiosyncratic competences can assist new ventures to successfully occupy the distinct market position identified by boundary-spanning (Johnson et al., 2009). Premised on the characteristics of a new innovation, it must be exposed among customers and must be frequently used by customers; and as expected, it must be accepted by customers. As new ventures have superior customer service, great promotion programs and good channel management in disseminating their new innovation and in satisfying customers' demand, they have higher marketing competence. As such, the concept of new innovation coming from other geographies or foreign markets can be faster in connecting with customer values than their rivals. Consequently, hypothesis six is proposed:

H₆: When marketing competences are high, the boundary-spanning search (supply-side, demand-side and spatial-side) has a positive effect on new technology venture performance.

The performance implication of boundary-spanning search

Boundary-spanning search is a power aid for new ventures to establish their competitive advantages. It is argued that boundary-spanning search gives firms access to obtain new knowledge, augment a firm's knowledge base, and increase the internal variety of a firm to make successful innovation (McGrath, 2001). Researches about organizational learning indicate that firms can obtain competitive advantages in the process of searching and processing aggregated information (Rosenkopf and Nerkar, 2001; Katila and Ahuja, 2002).

Past researches about the boundary-spanning view also specified that competitive advantages of firms depended more heavily on their capability to move beyond local searches (Kogut and Zander, 1992). Through pursuing boundary-spanning search, new ventures absorb new knowledge about technological, market or spatial information and increase the capability of adaptation to make firms' new launch successful. Despite these advantages, there are high risks and costs associated with boundary-spanning search, such as too much reliance on supply-side boundary-spanning search, which encompasses all intelligence about the input-output conversion from the technological and organizational aspects. This could also result in ignoring whether or not the quality of the outcome is good and if it

meets the expectation of the market, while undertaking the supply-side search to improve the efficacy and speed of the new venture's production (Levinthal and March, 1993). Such innovations resulting from boundary-spanning search may lead to the development of new product features and benefits that are underdeveloped or incompatible with customers' needs. On the other hand, based on an evolutionary argument (van de Ven and Poole, 1995), excessive exploration may generate more variation that cannot be effectively assimilated. For instance, the greater amount of new ideas associated with high information loading may be difficult for top management team members to coordinate. As mentioned earlier, although undertaking boundary-spanning search can help a new venture acquire the success of innovation, new product development or new launch, it may be beyond some level that might incur the failure of the new venture's performance. In other words, excessive levels of boundary-spanning search activities over the proper level might engender the effect of myopia. Therefore, hypothesis seven is proposed:

H₇: Boundary-spanning search (supply-side, demand - side and spatial-side) has a nonlinear relationship with the performance of new technology ventures, such that at extremely high and low levels, its effect on performance is negative

RESEARCH METHODS

Sample and data collection

We used a survey methodology to gather the data for the research. This study used a sample framework of 300 firms selected randomly from the list of 650 new technology ventures located in Shenzhen, provided by a local consulting and market research company. We contacted the senior manager of each firm by phone to solicit their participation in this study, and to ask if they would be willing to provide access to two or three key informants, including CEOs, managing directors, or senior managers who were involved in engineering or business development.

In this study, we used face-to-face onsite interview approach to conduct the survey. Three trained interviewers from the located market research company scheduled appointments, presented the key informants with the survey questionnaire and collected the questionnaire on completion. In addition, each interview which lasted an average of ninety minutes was conducted with two or three key informants. Although the onsite interview approach was time consuming, it can take greater supports from the sample to increase the response rate of ventures, especially in emerging economy. Following the suggestions of Miller et al. (1997), we asked these key informants to restrict the recall time frame to three years, thus minimizing biases associated with the retrospective data collection. Besides, this study used the consensus approach to rate each questionnaire item from key informants. We asked two or three founding team members to deliberately assign a single rating based on consensus among those informants. More specifically, the approach allowed the respondents to request clarifications in the interview, and then ensure a more explicit interpretation of the study, which facilitated the decrease of the retrospective bias in reporting.

We obtained 178 usable questionnaires from different firms, which yielded a 27.4% response rate in this study. All key informants had average company tenures of 3.6 years and average industry experience of 9.3 years. The average venture age was 3.78 years; the average number of employees was 118 employees; and the average number of founding team members was 4.76. Of the participating firms, 68% were from the electronic information industry (for example, telecommunications, electronics and information technology) and 32% were from other industries (for example, new energy and new materials, biotechnology and pharmaceuticals). The sampling frame was divided into two categories: participating firms and nonparticipating firms, to assess the degree of response bias. Then, we compared the participating and nonparticipating firms on age, number of employees and sales data. It was observed that there were no significant differences between groups. The result, therefore, inferred that those key informants who responded were not very different from those who did not respond.

Measures, reliability and validity of constructs

The measures for the independent, dependent and control variables are presented in this study's Appendix. All the multi-item variables were measured with seven-point scales. In this study, we measured new technology venture performance in two ways as the multiple measures can address the issue of capturing the multidimensionality of the new ventures' performance (Wiklund and Sheperd, 2005). As such, we developed subjective measures for "new technology venture performance" ($\alpha = 0.84$). Informants accessed their performance on sales growth, market share, net profit growth, innovation in products and services, quality of products and services, speed in development of new products and services, and cost control, and compared it with that of their major competitors. We also asked the informants to report their firm's actual sales' growth and net profit growth rate over the previous year as the indicators of objective measure. Due to the fact that objective indicators are difficult to obtain in the context of new ventures, we can only obtain these objective indicators from 146 firms in our sample. These significantly correlated with the subjective new venture performance ($r = 0.41$, $p < 0.01$; and $r = 0.32$, $p < 0.01$, respectively) supported by the validity of the subjective performance.

In this study, the demand-side search ($\alpha = 0.88$) was measured with a six-item scale asking the informants to assess the degree to which a venture devoted efforts to the discovery of new insights regarding market segments, product use and substitution patterns, and customer preferences and needs in their markets. The six-item scale, measuring the supply-side search ($\alpha = 0.82$), asked informants to indicate the degree to which a venture dedicated resources to search for new knowledge about technological and organizational routine aspects. Also, spatial search ($\alpha = 0.66$) was measured with four items that tapped the extent to which a venture searched for opportunities with the regional know-how about operation and marketing in different geographic locations. Technological competences ($\alpha = 0.86$) were measured with four items that asked about the abilities of a new venture to develop substantial technological resources and apply them in new product development. Using six items, we measured marketing competence ($\alpha = 0.89$) by asking the informants to assess the extents of abilities to which a new venture generate, disseminate and appropriately respond to market information. We captured intra-industry managerial ties ($\alpha = 0.77$) with four items by asking the informants to indicate the extent to which TMT members devoted their effort to maintain close contract with executives of other firms in their industry over the last three years. More so, extra-industry managerial ties ($\alpha = 0.81$) were measured with four items and the TMT members were asked to assess the degree that tapped the

resource investment in the maintenance of close ties with top managers of firms outside their own industry in the last three years. Government ties ($\alpha = 0.79$) were measured with a three-item scale that asked the informants to indicate the degree to which TMT members have developed close connections with officials in government institutions over the last three years. Using four items, we measured financial ties ($\alpha = 0.85$) by asking the informants to assess the extent to which TMT members invested resource in building relationships with financial officials.

In this study, the following demographic variables were controlled for testing the hypotheses regarding how the boundary-spanning search relates to new venture performance. Venture size was measured by the number of employees in order to control the greater complexity and economies of scale that arise in large firms. Moreover, we measured venture age by the number of years since its funding was used as a continuous variable. We controlled venture owner-ship as information-processing routines of new ventures in that they may differ in their ownership (that is, state-owned, joint share, privately owned, and foreign invested firms). As such, we coded the state-owned type of ownership as 0 and the joint share/privately owned/ foreign invested as 1. Also, we coded industry type as the electronic information industry (1) and the non-electronic information industry (0) to reveal the degree of technological sophistication (Li and Atuahene-Gima, 2001). In addition, we also included technological and market turbulence as controls due to their effects on new venture performance (McDougall et al., 1994). We measured technological turbulence with a four-item scale ($\alpha = 0.83$) that asked about the perceived magnitude of dynamics in technology, including the variety of new product introductions offered by new technology in their industry. A three-item scale measured market turbulence ($\alpha = 0.78$) that tapped the perceived speed and magnitude of change in customer demand, product preference and emergence of new customer segments in their industry.

Finally, we conducted a statistical check for the common method variance (CMV) with the Harman one-factor method (Podsakoff and Organ, 1986). If CMV is a serious research bias, a single factor should account for most of the variance. A principal component factor analysis of all measures yielded 12 factors with eigenvalues greater than 1.0, with the total explained variance of 64%. Since the first factor accounted for only 9.96% of the variance, CMV may not be a serious research bias (Menon et al., 1999). In a confirmatory factor analysis, each measure was loaded significantly on the expected constructs, which demonstrates convergent validity. Together, the factor loadings and model fit indexes ($\chi^2/df = 1.09$, RMR = 0.04, CFI = 0.96, and RMSEA = 0.02) presented in Table 1 suggest that the model fit is acceptable. The chi-square difference test for all the constructs in pairs showed that in each case, a two factor model was better than a single-factor model. Table 1 reveals that the diagonal elements representing the square roots of the average variance extracted (AVE) from each of the constructs is greater than the off-diagonal elements, which satisfy the criterion of discriminant validity (Fornell and Larcker, 1981). Lastly, the previously reported alpha and composite reliabilities (CRs) of the constructs presented in Table 1 indicate that each exceeded the accepted reliability threshold of 0.70. However, Table 1 presents the correlations and descriptive statistics of the constructs. We used the average score of measures of each construct for further analysis.

ANALYSES AND RESULTS

The study's hypotheses were tested with a moderated regression analysis. Based on Aiken and West (1991) approaches, the centered relevant variables were made before the interaction terms were created. The variance

Table 1. Correlation matrix and descriptive statistics of measures.

| Variable | Mean | S.D. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|------------------------------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| (1) New venture performance | 4.71 | 0.63 | 0.66 | | | | | | | | | | | | |
| (2) Supply-side search | 4.63 | 0.58 | 0.22 | 0.66 | | | | | | | | | | | |
| (3) Demand-side search | 4.72 | 0.71 | 0.05 | 0.02 | 0.73 | | | | | | | | | | |
| (4) Spatial search | 4.57 | 0.65 | 0.20 | -0.05 | 0.02 | 0.57 | | | | | | | | | |
| (5) Extra-industry managerial ties | 4.72 | 0.68 | -0.02 | 0.05 | 0.02 | 0.18 | 0.72 | | | | | | | | |
| (6) Intra-industry managerial ties | 5.02 | 0.61 | 0.10 | 0.07 | -0.42 | -0.03 | 0.08 | 0.68 | | | | | | | |
| (7) Governmental ties | 4.71 | 0.78 | -0.17 | -0.07 | 0.22 | 0.01 | 0.09 | 0.01 | 0.75 | | | | | | |
| (8) Financial ties | 4.76 | 0.77 | 0.20 | 0.01 | 0.26 | 0.12 | 0.06 | 0.25 | 0.09 | 0.77 | | | | | |
| (9) Technological competence | 4.58 | 0.84 | -0.08 | 0.26 | 0.05 | -0.25 | 0.01 | 0.11 | 0.12 | 0.01 | 0.78 | | | | |
| (10) Marketing competence | 4.60 | 0.81 | -0.04 | 0.09 | 0.12 | -0.01 | 0.02 | 0.07 | 0.10 | 0.17 | -0.01 | 0.75 | | | |
| (11) Technological uncertainty | 4.88 | 0.73 | -0.10 | -0.18 | -0.19 | 0.15 | 0.01 | 0.10 | -0.06 | 0.06 | -0.12 | -0.04 | 0.75 | | |
| (12) Market uncertainty | 4.84 | 0.74 | 0.08 | 0.17 | 0.09 | -0.13 | -0.01 | -0.27 | -0.07 | -0.04 | 0.10 | 0.09 | -0.20 | 0.74 | |
| (13) Venture size (log) | 5.56 | 0.43 | 0.08 | -0.10 | 0.04 | -0.01 | -0.03 | 0.03 | 0.08 | 0.01 | -0.09 | 0.01 | 0.06 | 0.08 | N.A. |
| Composite reliability (CR) | | | 0.84 | 0.82 | 0.88 | 0.71 | 0.86 | 0.82 | 0.79 | 0.85 | 0.89 | 0.89 | 0.86 | 0.78 | N.A. |

The diagonal elements are square roots of the AVE.

inflation factors in each regression model were all below two, indicating that multicollinearity was not a serious problem in this study. Table 2 contains the results.

Model 1 in Table 2 tests the effects of the control and independent variables on new technology venture performance. Addition of the two-way interaction terms in Model 2 contributed 15% ($\Delta F = 1.86$, $p < 0.05$) more than those of the variance explained by the control and independent variables. The addition of the squared terms for the supply-side, demand-side and spatial boundary-spanning search in Model 3 resulted in an increase in R^2 of 8% ($\Delta F = 6.40$, $p < 0.001$).

The results suggest that the extra-industry managerial tie positively moderates the effect of supply-side search ($\beta = 0.14$, $t = 1.93$, $p < 0.1$) and spatial search ($\beta = 0.23$, $t = 2.86$, $p < 0.01$) on new venture performance, in support of H_1 ; but the finding was unable to show that extra-industry

managerial tie bolstered the effect of demand-side search on new venture performance. H_2 is supported by the fact that intra-industry managerial tie negatively moderated the effect of supply-side search ($\beta = -0.14$, $t = -2.03$, $p < 0.05$) and spatial search ($\beta = -0.18$, $t = -2.25$, $p < 0.05$) on new venture performance. However, the interaction term of the demand-side search and the intra-industry managerial tie is negative but not significant. Table 2 shows that the supply-side search ($\beta = 0.20$, $t = 2.69$, $p < 0.01$) and spatial search ($\beta = 0.13$, $t = 1.81$, $p < 0.1$) have positive effects on new venture performance when governmental tie is higher, in support of H_3 . The product of governmental ties and demand-side search is positively but not significantly related to new venture performance. As such, the moderating effect of financial tie on the relationship between the supply-side ($\beta = -0.07$, $t = -1.08$, n.s.) and spatial search ($\beta = -0.03$, $t = -0.34$,

n.s.) and the new venture performance was not significant, but financial tie ($\beta = 0.18$, $t = 2.19$, $p < 0.05$) positively moderated the relationship between demand-side search and new venture performance; thus, H_4 was supported.

The interaction of technological competence and supply-side search is positively related to new venture performance ($\beta = 0.18$, $t = 2.29$, $p < 0.05$), in support of H_5 . The data found that technological competence ensures a positive relationship between the demand-side ($\beta = -0.01$, $t = -0.14$, n.s.) and spatial search ($\beta = -0.05$, $t = -0.68$, n.s.) and the new venture performance. The results showed that marketing competence ($\beta = 0.17$, $t = 2.50$, $p < 0.01$) positively moderated the relationship between demand-side search and new venture performance, thus supporting H_6 . However, the moderating effect of marketing competence on the relationship between the supply-side ($\beta = -0.01$, $t = -0.08$, n.s.) and spatial

Table 2. Results of moderated regression analysis: Standardized path coefficients (t-values).

| Variable | Model 1 | | Model 2 | | Model 3 | |
|-------------------------------------|---------|-----------|---------|-----------|---------|------------|
| | β | (t-value) | β | (t-value) | β | (t-value) |
| Control variable | | | | | | |
| Venture size | 0.11 | (1.48) | 0.13 | (1.85)† | 0.14 | (1.98)* |
| Venture ownership | 0.02 | (0.25) | -0.04 | (-0.52) | -0.04 | (-0.62) |
| Industry type | -0.05 | (-0.64) | -0.01 | (-0.14) | 0.00 | (0.06) |
| Technology uncertainty | -0.12 | (-1.55) | -0.19 | (-2.42)* | -0.16 | (-2.17)* |
| Market uncertainty | 0.08 | (1.07) | 0.10 | (1.25) | 0.03 | (0.34) |
| Independent variable | | | | | | |
| Supply-side search (SSS) | 0.22 | (2.89)** | 0.20 | (2.56)* | 0.12 | (1.61) |
| Demand-side search (DSS) | 0.08 | (.40) | 0.13 | (1.29) | 0.09 | (0.90) |
| Spatial search (SPS) | 0.21 | (2.81)** | 0.28 | (3.60)*** | 0.26 | (3.33)*** |
| Extraindustry managerial ties (EMT) | -0.07 | (-.98) | -0.09 | (-1.18) | -0.03 | (-0.47) |
| Intraindustry managerial ties (IMT) | 0.14 | (1.58) | 0.22 | (2.31)* | 0.14 | (1.36) |
| Governmental ties (GT) | -0.18 | (-2.35)* | -0.14 | (-1.79)† | -0.16 | (-2.10)* |
| Financial ties (FT) | 0.17 | (2.06)* | 0.09 | (1.03) | 0.07 | (0.91) |
| Technological competence (TC) | -0.08 | (-1.09) | -0.04 | (-0.53) | -0.01 | (-0.07) |
| Marketing competence (MC) | -0.10 | (-1.38) | -0.06 | (-0.52) | -0.07 | (-0.67) |
| Interactive effects | | | | | | |
| EMT * SSS | | | 0.15 | (2.01)* | 0.14 | (1.93)† |
| EMT * DSS | | | 0.09 | (1.17) | 0.06 | (0.86) |
| EMT * SPS | | | 0.17 | (2.21)* | 0.23 | (2.86)** |
| IMT * SSS | | | -0.11 | (-1.50) | -0.14 | (-2.03)* |
| IMT * DSS | | | -0.01 | (-0.10) | -0.15 | (-1.46) |
| IMT * SPS | | | -0.20 | (-2.45)* | -0.18 | (-2.25)* |
| GT * SSS | | | 0.16 | (2.08)* | 0.20 | (2.69)** |
| GT * DSS | | | 0.03 | (0.40) | 0.02 | (0.32) |
| GT * SPS | | | 0.14 | (1.87)† | 0.13 | (1.81)† |
| FT * SSS | | | -0.08 | (-1.00) | -0.08 | (-1.08) |
| FT * DSS | | | 0.06 | (0.78) | 0.18 | (2.19)* |
| FT * SPS | | | -0.03 | (-0.37) | -0.03 | (-0.34) |
| TC * SSS | | | 0.09 | (1.23) | 0.18 | (2.29)* |
| TC * DSS | | | -0.06 | (-0.78) | -0.01 | (-0.14) |
| TC * SPS | | | -0.06 | (-0.82) | -0.05 | (-0.68) |
| MC * SSS | | | 0.01 | (0.09) | -0.01 | (-0.08) |
| MC * DSS | | | 0.15 | (2.07)* | 0.17 | (2.50)** |
| MC * SPS | | | -0.01 | (-0.07) | -0.02 | (-0.21) |
| SSS squared | | | | | -0.27 | (-3.31)*** |
| DSS squared | | | | | -0.26 | (-2.34)* |
| SPS squared | | | | | -0.13 | (-1.58) |
| R ² | 0.21 | | 0.36 | | 0.44 | |
| Adjusted R ² | 0.14 | | 0.22 | | 0.30 | |
| F-Value | 3.31 | | 2.55 | | 3.14 | |
| Incremental R ² | 0.21 | | 0.15 | | 0.08 | |
| Partial F value | 3.31*** | | 1.86* | | 6.40*** | |

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

search ($\beta = -0.02$, $t = -0.21$, n.s.) and the new venture performance was not significant.

Following the suggestion of Aiken and West (1991), a positive (negative) sign for coefficient of the squared term indicates a U-shaped (inverted U-shaped) relationship. H_7 predict that the squared term of boundary-spanning search is negatively related to new technology venture performance. Model 3 shows that the coefficient for the squared term of the supply-side search is negative and significant ($\beta = -0.27$, $t = -3.31$, $p < 0.001$). The data in Model 3 show that the coefficient for the squared term of the demand-side search is negative and significant ($\beta = -0.26$, $t = -2.34$, $p < 0.01$), in support of H_7 .

DISCUSSION

The goal of this paper is to advance the literature by untangling the relationship between boundary-spanning search and new venture performance.

First, this study examined the role of a founding team's external ties between boundary-spanning search and new venture performance. As expected, we found that the manager's extra-industry ties strengthened the effectiveness of boundary-spanning search on firm performance, while the manager's intra-industry ties weakened the effectiveness of boundary-spanning search on firm performance. These results suggest that a founding team's external relationship may have both positive and negative impacts on performance implication of a firm's boundary-spanning search. Hence, new ventures benefit from their manager's extra-industry relationship in acquirement and assimilation of the knowledge gained by boundary-spanning search. New ideas, new insights and new approaches from the extra-industry relationship are likely to inform the managers about new ways of applying "new" supply-, demand- and spatial-side knowledge from boundary-spanning search, and not just to challenge the benefit of existing knowledge (Stam and Elfring, 2008). In contrast, intra-industry relationship is likely to limit the horizon of a founding team that may interfere with the utilization of boundary-spanning search (Atuahene-Gima et al., 2006). On the other hand, our results suggest that governmental and financial relationship may enhance the effectiveness of these new ventures boundary-spanning search. Due to the inadequate institutional infrastructure in transitional economy, a support from government institutions and local financial agencies play a significant role in accessing the available resource to enhance the effectiveness of the new venture's strategy, which is consistent with theoretical arguments made by Peng and Heath (1996). When a comparison was made with previous research on small firms in the West (Covin and Slevin, 1989), our results suggest that building governmental relationship in transitional economy may also enhance performance. Furthermore, the findings indicated that building deeper connections with officials

of financial institutions provides the efficient approach of obtaining financial resource for new ventures, which may be the best means to overcome the liabilities of newness.

Secondly, this paper also extended the literature by investigating the role of internal firm competences under which a new venture pursues boundary-spanning search. The results suggested that the effect of boundary-spanning search on new venture performance may be strengthened when a new venture has high level of internal competences. These findings support the propositions in the RBV (Hamel and Prahalad, 1994) because these boundary-spanning searches enable a new venture to acquire new knowledge from the supply-side, demand-side and spatial side; although internal firm competences are essential for the venture to assimilate and internalize these new ideas and knowledge into their knowledge expertise. Nevertheless, it is noted that internal firm competences merely partially moderated the relationship between boundary-spanning search and new venture performance. The findings revealed that the impact of supply-side search on new venture performance was strengthened only when technological competence was high, whereas marketing competence merely moderated the relationship between demand-side search and new venture performance. This implies that since different types of boundary-spanning search have distinctive features on the requirement of resources, the use of different types of boundary-spanning search may need a variety of specific resources and skills.

Finally, this paper investigated the performance implication of boundary-spanning search for new ventures in China. This study advances the dark side knowledge of the boundary-spanning search (exploration), where we discovered that both the supply and demand-side boundary-spanning searches have significant inverted U-shape relationship on performance, while the spatial boundary-spanning search has an inverted U-shape relationship but no significance. This implies that there are positive returns on boundary-spanning search activities but these boundary-spanning searches become detrimental to new venture performance beyond a certain level. The results highlighted the fact that by examining the product term of different types of boundary-spanning search, we gained a better understanding of the conditions under which boundary-spanning search was detrimental to performance at a higher level. This finding is consistent with the results of Li et al. (2010) that too much exploration (distant search) in new information and emergent insights may be associated with high risk and cost, such as expenditures for acquiring and using new knowledge (that is, latent and emerging market needs), thereby harming performance. Another possible explanation for this result according to the information-processing theory is that such distant search activities may create cognitive

barriers for TMT in processing many new ideas for the amount of time spent in the coordination of these new ideas that may decrease the effectiveness of boundary-spanning search on performance.

MANAGERIAL IMPLICATION

The findings of this study have implications on entrepreneurs. As such, this study cautions managers that the impact of boundary-spanning search on new venture performance is moderated by TMT external relationship and internal firm competence. First, the findings reveal that entrepreneurs can enhance the performance of their ventures by simultaneously applying different types of boundary-spanning search and building external ties to other firms outside their own industries and to local governmental and financial agency. Furthermore, entrepreneurs should understand that the effectiveness of boundary-spanning search may be limited when TMT overemphasized intra-industry ties. Entrepreneurs should encourage TMT members to cultivate external ties with people outside their own industries and with officials from local administrative agency to gain new insights and specific resource to facilitate the application of boundary-spanning search. In addition, our findings urge entrepreneurs to pay more attention to the specific resource or competence requirement of effective boundary-spanning search. The results of this study revealed that new ventures should build specific firm competence for specific type of boundary-spanning search to enhance the performance.

Since boundary-spanning search have curvilinear effects on new product performance, entrepreneurs may heed the recommendation that an absolutely positive view may be naively oversimplified. For their firms to survive and prosper, by using boundary-spanning search strategy, top management team members must be cognizant with the potential disadvantages of the distant search behaviors and, in particular, the costs of high level of supply-, demand- and spatial-side boundary-spanning search, such as the assimilation of unfamiliar knowledge. Consequently, as indicated by the results, new ventures may need to pay careful attention to allocating their limited resources among the supply-, demand- and spatial-side boundary-spanning search to attain a desirable new venture performance.

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

There are several limitations that should be noted. First, one of the potential problems is the limited recall by key informants due to the use of self-reported data. However, the recall lapses were not a serious problem in this paper since the consensus approach was used in gathering consensus ratings from multiple knowledgeable

knowledgeable informants, which minimized such memory lapses. Secondly, the generalizability of our results is limited since this paper used data from a sample of firms located in a single high technology development zone in China. Although performance measures were reported by informants rather than been derived from archival records that may be a potential limitation concern, some researches (Autio et al., 2000) indicated that such alternative measure approaches were credible when archival measures were unavailable. Another potential problem is the bias of the common method since our results relied on the subjective measure of the independent variables. Since such a bias statistically increases the shared variance among the independent variables, it may reduce the chances of detecting moderating effects. However, our findings found significant interaction effects from our independent variables. Hence, we believe that the CMV was not a serious limitation in this paper. In addition to addressing the limitation, there are several promising avenues for further research. First, future research should explore other internal firm competences that may influence the effectiveness of spatial-side boundary-spanning search and new venture performance. Prior research has identified several types of internal capability such as absorptive capabilities (Jansen et al., 2005). Secondly, the results of this study suggest that the development of the boundary-spanning search in the first place will not be understood much. Thus, the issue should be examined in a future research such that the heterogeneous team may influence the pursuit of boundary-spanning search.

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APPENDIX

Measures and confirmatory factor analysis results.

| Construct and source | Operational measure | SFL ^a | t-value |
|----------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------|
| Supply-side search ^c (Sidhu et al., 2007) | Over the last three years, to what extent has your venture gone? | | |
| | 1. We are well aware of technological and technical developments within our industry | 0.74 | 10.48 |
| | 2. Our information-gathering efforts cover all industries that employ that sort of technology that we use. | 0.67 | 9.36 |
| | 3. A careful watch is kept on industries that are technologically related to ours (e.g., telecom and computer industries are technologically related). | 0.67 | 9.21 |
| | 4. We acquire little information on opportunities to employ our existing production facilities in new product domains. (R) | 0.62 | 8.46 |
| | 5. We closely monitor companies not active in our product area, but that have skills and know-how comparable to ours. | 0.59 | 7.85 |
| Demand-side search ^c (Sidhu et al., 2007) | 6. In our company, there is close surveillance of advancements in product and process technologies in supplier industries. | 0.68 | 9.45 |
| | Over the last three years, to what extent has your venture gone? | | |
| | 1. Marketing strategies of companies targeting our customers are closely followed by us. | 0.70 | 10.16 |
| | 2. We have a finger on the pulse as far as changes in the product preferences of our customers are concerned. | 0.74 | 11.05 |
| | 3. Little information is gathered on product preferences of customer groups that we do not currently serve. (R) | 0.71 | 10.41 |
| | 4. Developments in industries that fulfill the same customer need as we do, albeit with a completely different product, are well known to us (e.g., air and train transport both fulfill customer need for mobility). | 0.75 | 11.13 |
| Spatial search ^c (Sidhu et al., 2007) | 5. We keep close track of activities of companies that offer complementary products (e.g., cameras and film rolls are complementary products because they are used together by customers). | 0.72 | 10.50 |
| | 6. We know the product and process innovation efforts of our customers well. | 0.79 | 12.14 |
| | Over the last three years, to what extent has your venture gone? | | |
| | 1. We are knowledgeable about all important opportunities in the geographic regions in which we operate. | 0.53 | 6.28 |
| Extraindustry managerial ties ^c (Atuahene-Gima et al., 2006) | 2. We hardly acquire any intelligence about potential opportunities in new geographic markets. (R) | 0.58 | 6.85 |
| | 3. We are well informed about the price and quality aspects of products in neighboring geographic regions. | 0.52 | 6.14 |
| | 4. We closely follow the activities of companies in our industrial sector but operating outside our geographic area. | 0.65 | 7.79 |
| | To what extent do you agree with the following statements about your top management team members over the last three years? | | |
| Intraindustry managerial ties ^c (Atuahene-Gima et al., 2006) | 1. Our team members put a lot of effort into communicating with knowledgeable people outside our industry | 0.75 | 10.57 |
| | 2. Our team members maintained close contacts with knowledgeable people in firms outside our industry | 0.72 | 10.07 |
| | 3. Our team members learned a lot from knowledgeable people in firms not operating in our industry | 0.73 | 10.20 |
| | 4. Our team members received useful information from knowledgeable people outside our industry | 0.68 | 9.30 |
| | To what extent do you agree with the following statements about your top management team members over the last three years? | | |
| | 1. Our team members communicated frequently with knowledgeable executives within our industry | 0.74 | 10.48 |
| | 2. Our team members had close interactions with knowledgeable people about conditions in our industry | 0.65 | 8.87 |

| | | | |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|------|-------|
| | 5. We have a very strong marketing team in this industry | 0.78 | 11.82 |
| | 6. We poll end-users frequently to assess the quality of our products and services | 0.73 | 10.70 |
| | Please indicate your agreement with each of the following statements with respect to your industry's Environment: | | |
| | 1. The technology in the market environment was changing rapidly. | 0.71 | 10.09 |
| | 2. Technological changes provide big opportunities in the industry. | 0.71 | 10.11 |
| | 3. A large number of new product ideas have been made possible through technological breakthroughs in our industry. | 0.76 | 11.04 |
| | 4. There are major technological developments in the industry. | 0.80 | 11.67 |
| | Please indicate your agreement with each of the following statements with respect to your industry's Environment: | | |
| Market uncertainty ^b (Jaworski and Kohli, 1993) | 1. The product-market competitive conditions are highly unpredictable. | 0.67 | 8.94 |
| | 2. Customers' preferences change quite rapidly. | 0.77 | 10.43 |
| | 3. Customers' needs in our industry are changing quite rapidly. | 0.78 | 10.64 |

^aSFL = standardized factor loading; ^bthe items were measured on a seven-point scale, anchored by 1 = strongly disagree and 7 = strongly agree; ^cthe items were measured on a seven-point scale, anchored by 1 = no extent and 7 = to a great extent; ^dthe items were measured on a seven-point scale, anchored by 1 = much worse and 7 = much better.