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Does Social Capital Increase Innovation Speed? Empirical Evidence from China

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Abstract: Past studies have suggested that social capital is a sustainable competitive advantage that leads to sustainable organizational growth and performance. However, few studies have explored how innovation speed moderates the relationship between social capital and sustainable organizational performance in China where the government plays key roles in promoting sustainable development goals. This paper develops a "social capital-innovation speed-performance" framework to investigate the mechanism of social capital influencing innovation speed, which in turn affects sustainable organizational growth and performance. Based on data collected from 125 Chinese firms, hierarchical moderated regression analyses indicate that structural social capital positively affects sustainable organizational performance but has no significant impact on sustainable innovation speed; relational social capital has no significant impact on sustainable organizational performance and is negatively correlated with innovation speed; cognitive social capital positively correlates with sustainable organizational performance and affects innovation speed, and government ties affect sustainable organizational performance and positively impact innovation speed. The study findings suggest that in China, increasing government ties is the most important social capital in creating sustainable organizational growth and performance. Both cognitive social capital and government ties are conducive to accelerating innovation speed, which gives firms a sustainable competitive advantage to achieve sustainable organizational performance.

Keywords: social capital; sustainability; innovation speed; government ties; sustainable growth; sustainable organizational performance; China

1. Introduction

The concept of social capital was developed by Bourdieu in the field of sociology [1]. Bourdieu defined social capital as the advantage or opportunity gained by social members through their connection and ties [1]. Social capital has become a hot topic in the management field. As an important form of capital, alongside economic capital and cultural capital [1], social capital comprises the real and potential resources embedded in social networks (e.g., trust, norm, and institution) [2,3]. Much of the literature is devoted to understanding the measurement and the antecedents of social capital, and the causal and moderated relationships between social capital and organization management [4–7].

Organizations are embedded in the social network, so that social capital affects sustainable organizational growth [8]. Except for a few studies that report negative effects and mixed results [4,9], previous research in sustainability literature suggests that social capital has positive effects on sustainable organizational growth [10,11]. Past studies suggest that the characteristics of social capital lead to the core competitive advantages of organizations. For example, social capital increases the quantity and quality of resources possessed by organizations [12,13], enhances level of supports and privileges obtaining from stakeholders [14], increases the efficiency and effectiveness of

innovation [15,16], increases the opportunities of supply and sales [17], influences the organizational strategy, decision-making and operation [18], improves the quantity and quality of knowledge [19–21]. Therefore, social capital can lead to sustainable innovation and developments [22–24]. Recently, several scholars in sustainability have focused on social capital as a key factor in explaining how resources, norms, and trust lead to sustainability [11,25]. However, there remain three areas that require further research.

First, despite the aptness of the dimensions of social capital that have been identified in the literature, we believe that the common dimensions need to be further verified and the distinctive ones need to be further refined. The definition of social capital dimensions is an important prerequisite for the study of the relationship between social capital and sustainable organizational performance. The expressive modalities and practical roles of social capital are closely and inseparably related to the social, economic, cultural, and institutional contexts of a country or region [26], and thus the common and distinctive dimensions of social capital need to reflect these contextual elements [27]. Common dimensions of social capital (e.g., trust and norms) are evident from research across countries and regions while social capital dimensions distinctive to a specific area (e.g., government policy) can be identified only within concrete contexts of specific countries or regions [28,29]. However, compared with the studies from developed countries, the roles of social capital in developing countries need further investigation [17,30,31]. We suggest that if the universality and particularity of social capital are investigated at the same time, new knowledge and insights would be found and the understanding of social capital would be advanced.

Second, although the rationale of the social capital–research framework is sound, the effect of social capital on sustainable organizational growth, whether facilitative or causative, warrants further investigation [32]. A widely discussed view is that the strategic value of social capital may be tied to the success of innovation en route to sustainable organizational development [33–36]. Although numerous studies have considered the types of innovation or innovation capability in the social capital–sustainability relationship, few have considered innovation speed in this context, and the issue of whether and how social capital affects innovation speed is yet to be addressed explicitly in the literature [37]. Based on the resource-based view, time is a scarce resource and speed is a sustainable competitive advantage that will lead to sustainable organizational performance [38–40]. Some strategic perspectives emphasize the importance of innovation speed in reaping consumer-based and producer-based advantages [41], and the networks factor is an important driving force of innovation speed. Especially in the face of fierce market competition, fast-changing user needs, and shortened technology life-cycle times, innovation speed is becoming a key factor and an important strategy for firm survival and growth [37]. Yet, some scholars have argued in favor of slower innovation speed [42–44]. Accordingly, analyzing the effects of social capital on innovation speed and how innovation speed affects sustainable organizational performance will clarify the path and explain the mechanism by which social capital affects sustainable organizational performance.

Third, although there are many empirical studies on social capital and organizational sustainability, there is still a lack of evidence about how social capital impacts sustainability innovation speed in China. This study focuses on Chinese firms for three reasons. First, China has become the world's second-largest economy and one of the most important countries for sustainability. By studying the Chinese business environment, new knowledge and new insights about social capital, speed, and sustainable organizational performance can be derived [17,30,31]. Second, despite the improvement of its market economy, Chinese government officials and bureaucratic institutions still have considerable power in policy formulation, resource allocation, supervisory and regulatory actions, approval, and support, which increase the value of government ties [30]. Third, innovation speed assumes increased importance for organizational sustainability facing the fierce competition and environmental turbulence of China's economic transformation [17].

Given the important impact of social capital on sustainable organizational performance and the gaps of existing research, the objective of our study is to investigate whether and how

social capital leads to faster and sustainable innovation speed, which in turn affects sustainable organizational performance. In exploring these relationships, we take a component-based approach and, following Nahapiet and Ghoshal's (1998) research and investigation in China, we consider the social capital dimension of government ties in addition to the structural, relational, and cognitive dimensions. Regarding sustainable organizational performance as an important indicator of sustainable organizational growth, we develop a social capital–innovation speed–performance research model and assess the impact of each of these four social capital dimensions on innovation speed. We employ multiple linear regression analyses to investigate our research hypotheses using survey data from China. We focus on the following three research questions:

RQ1: What are the effects of the different dimensions of social capital on sustainable organizational performance?

RQ2: What are the effects of the different dimensions of social capital on innovation speed?

RQ3: Does innovation speed increase sustainable organizational performance?

Our study aims to answer these research questions in two ways. First, we add government ties as a social capital dimension in the Chinese context, thereby expanding the literature on social capital [45]. Second, we examine the different impacts of the four components of social capital on innovation speed, which in turn affects sustainable organizational performance, thus providing insight into these relationships in the Chinese context.

2. Literature Review

2.1. Social Capital

Social capital refers to a kind of strategic resource, actual or virtual, that is embedded in and accessed through organizational networks of working relationships [1,46]. A multidimensional approach has generally been employed in conceptualizing social capital. For example, social capital has been characterized by trustworthiness, information channels, and social norms [47]; social networks, the norms of reciprocity, and trustworthiness [48]; structural, relational, and cognitive dimensions [2]; and collective and individual factors [46]. Among these, Nahapiet and Ghoshal's three-dimensional approach, which considers both collective and individual aspects and internal and external forms of social capital, has been widely accepted and applied in the existing literature [49]. In addition to the three core dimensions, organizations operating in emerging or transitional economies develop and maintain ties with government officials and bureaucratic executives at various levels in regulatory, supporting, investment, and industrial bureaus [50–53]. Therefore, social capital for these organizations also includes business and political relations capital [30,54]. In China, in particular, establishing ties with government agencies gives firms privileged access to sustainable financial resources, high-value information, certifications and licenses, projects, and contracts [50]. Taking the general and specific facets of social capital into account, we extend the current research in social capital by adding government ties to the conception of three dimensions, resulting in four dimensions: structural, relational, cognitive, and government ties [2,30].

In the past few years, scholars in sustainability have also emphasized the importance of social capital to sustainable development and sustainable growth of organizations [10,11,15,25]. However, the existing conclusions are inconsistent or contradictory. On the one hand, some studies propose that social capital endows firms with sustainable financial or intellectual resources, high-quality information, or opportunities for knowledge acquisition and application, which lead to improved sustainable organizational performance [1,2,12,51]. On the other hand, recent studies suggest that social capital may undermine sustainable organizational performance due to the high costs of maintaining social network ties, costly efforts needed to acquire strategic resources, and the effect of firms being locked into the status quo [55]. Laursen, Masciarelli, and Prencipe (2012) have also posited that there is an inverted U-shaped relationship between social capital and sustainable organizational performance [56]. These mixed results suggest that examining only the direct causative role of

social capital on sustainable organizational performance provides an incomplete picture of the social capital–performance link.

To address these conflicting results, several studies have identified mediating variables, such as knowledge management [30], organizational learning [57], organizational structure [58], and uncertainty [59]. These past studies have offered some initial insights into how these variables mediate the effects of social capital on sustainable organizational performance. Among these variables, sustainable innovation is widely recognized and supported mediator [60]. Much attention has been paid to innovation activities, innovation capabilities, and innovation decision making [24], but innovation efficiency—and in particular the most basic element of efficiency, innovation speed—remain understudied.

We propose that social capital influences not only the activities, capabilities, and decisions involved in innovation but also the efficiency of firms' innovation [61], especially innovation speed. Based on this reasoning, we posit that innovation speed may be a missing link in the examination of the social capital–performance relationship.

2.2. Innovation Speed

Innovation speed refers to the time that elapses from the generation of innovative ideas and the formation of innovative concepts to the commercialization of innovative products or services launched in the market [43]. With the shortening of product cycles, time is becoming a scarce resource, so the speed is becoming an essential factor for survival, growth, and renewal of firms [37,44]. Innovation speed reflects firms' capability to capture opportunities, implement new product development projects, and launch innovations into the market [41]. Therefore, innovation speed has become an important concept in the field of business strategy, marketing, and new product development [62].

Many studies have focused on the antecedents and outcomes of innovation speed in an effort to understand its role in sustainable organizational performance [41]. One research stream argues that social capital is an important driver of sustainable innovation both inside and outside firms [2,47,63]. For example, Doh and Acs (2010) confirmed that social capital—consisting of institutional trust, associational activities, and civic norms—has a positive impact on national sustainable innovation [64]. Valeriano, Amaia, and Txomin (2017) found that both family social capital and nonfamily social capital has important effects on sustainable innovation [65]. Despite originating from different perspectives, these studies demonstrate that social capital affects sustainable innovation activities, capabilities, and decision making, which in turn closely relate to innovation speed. These, therefore, provide strong support to justify further study of the social capital–innovation speed link.

2.3. Social Capital, Innovation Speed, and Sustainable Organizational Performance

Although there are still differences and controversy in the literature, it is obvious that social capital and innovation speed do affect sustainable organizational performance [41] Moreover, research has shown that social capital is an important driver of sustainable innovation. As a reflection of innovation efficiency, innovation speed will also be affected by social capital. Therefore, incorporating innovation speed into the social capital–performance association should be helpful for a better understanding of the relationship between social capital and sustainable organizational performance both theoretically and practically.

3. Theoretical Model and Research Hypotheses

We present a theoretical model in Figure 1. The model treats dimensions of social capital as the antecedents of innovation speed and assumes that innovation speed mediates the relationship between social capital and sustainable organizational performance.
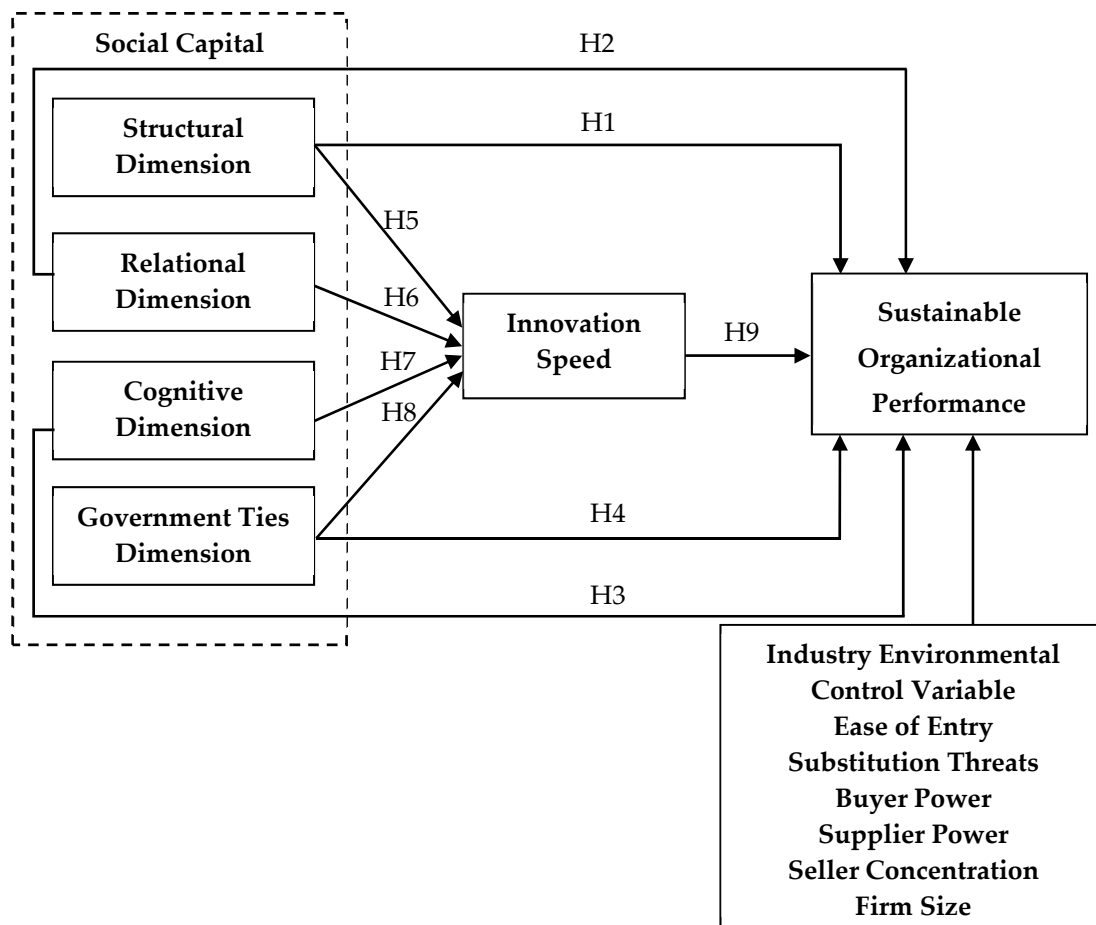
Figure 1. A theoretical model for social capital, innovation speed and sustainable organizational performance.

3.1. Social Capital and Sustainable Organizational Performance

The structural dimension of social capital has the function of linking external and internal relationships. First, close relationships with suppliers may guarantee the reliability and availability of sustainable materials and optimize the procurement process [50]. Second, close relationships with customers may improve responsiveness to their needs, enhancing customers' satisfaction and loyalty [66,67]. Third, close relationships with competitors may provide information about the market and technology to reduce environmental uncertainty [51,66]. Fourth, close relationships with the local community may enhance firms' reputation and therefore attract more users, suppliers, and employees [51]. Thus, we hypothesize:

Hypothesis 1 (H1). *The structural dimension of social capital is positively related to sustainable organizational performance.*

The relational dimension of social capital refers to the strength of organizational network ties where the key element in each connection is trust. Trust between parties can help to simplify the cooperation process and improve efficiency [47,58] because trust reduces the uncertainty of relationships. When people know each other well, they feel free to perform related actions. Many conflicts arise when there are questions raised about colleagues or partners, but trust can significantly reduce this phenomenon [68]. Thus, we hypothesize:

Hypothesis 2 (H2). *The relational dimension of social capital is positively related to sustainable organizational performance.*

The cognitive dimension of social capital refers to the shared norms and understanding between local elements of a targeting contact. The higher the level of cognitive social capital, the more understanding and norms there will be between the parties, thus increasing the sustainable trust and connection among network actors and reducing obstacles in making decisions about production and operation [49,58]. Thus, we hypothesize:

Hypothesis 3 (H3). *The cognitive dimension of social capital is positively related to sustainable organizational performance.*

To achieve sustainable development goals, government ties are the relationships between organizations and local government officials, which is a key element of doing business in China [54,69,70]. There is dramatic economic growth ongoing in China, but areas such as institutions and legitimacy remain underdeveloped, to the detriment of intellectual property protection and development of innovative capabilities [54]. There are also many sustainability projects initiated by the Chinese government [30]. Having stronger government ties thus allows firms to gain sustainable access to information to build a better understanding of the sustainable economic and institutional environment and protect knowledge privacy and intellectual property [51,54]. Firms with stronger government ties can also gain access to sustainable financial resources [30,51] and firsthand knowledge about government policies [54]. Thus, we hypothesize:

Hypothesis 4 (H4). *The government ties dimension of social capital is positively related to sustainable organizational performance.*

3.2. Social Capital and Innovation Speed

Cultivating structural social capital can open channels and gates for acquiring different people and diverse thoughts that help accelerate the generation of new ideas [12]. Structural social capital also helps to reach not only new sustainability technology and inventions but also the information, knowledge, and resources necessary for sustainability inventions [16], which can save a lot of time on search and speed up the innovative process [63]. In addition, structural social capital plays an important role in firms establishing a deep knowledge of their suppliers, customers, and competitors, which can enable innovative products or services to be put on the market as fast as possible [51]. Thus, we hypothesize:

Hypothesis 5 (H5). *The structural dimension of social capital is positively related to innovation speed.*

As the core of relational social capital, trust can reduce concerns related to knowledge dissemination in a changing environment, which will foster reliable and sustainable supplies of knowledge resources and allow firms to carry out innovation projects in accordance with their established schedules [47,58,71]. With mutual trust, the quality of sustainable communication and collaboration between actors will be improved, overcoming the stickiness and ambiguity of knowledge and shortening the time required for each step of the innovation process [72,73]. Thus, we hypothesize:

Hypothesis 6 (H6). *The relational dimension of social capital is positively related to innovation speed.*

Cognitive social capital is helpful to encourage cooperation, sharing, and reciprocity among innovation participants with different industries and educational backgrounds. This will result in improvement of behavioral integration and consistency, which in turn improves the speed of innovation

decision making and avoid the delay or shelving caused by excessive friction and opportunistic behaviors [63,68]. Thus, we hypothesize:

Hypothesis 7 (H7). *The cognitive dimension of social capital is positively related to innovation speed.*

Firms with strong government ties are able to improve the quantity and quality of the resources required for sustainable innovation, thus relieving the resource pressure of sustainable innovation, avoiding the delay or shelving caused by resource shortages, and thereby providing better innovative products or services to consumers more quickly [30]. Firms can also obtain sustainable protection and support from government agencies [74], which may reduce the uncertainty and risk of innovation and ensure the completion of tasks in each stage of innovation on schedule, thus shortening the innovation cycle [52,75]. We therefore hypothesize:

Hypothesis 8 (H8). *The government ties dimension of social capital is positively related to innovation speed.*

3.3. Innovation Speed and Sustainable Organizational Performance

Increasing innovation speed can result in consumer-, producer-, and supplier-based advantages for firms. Consumer-based advantages include winning more consumers' favor and loyalty, reaping higher profits as a pioneer or first-mover, and becoming the established standard in the product category [44]. Producer-based advantages include reducing production costs through economies of scale, improving core capabilities through organizational learning, getting more opportunities to innovate, sharing the cost of a single mistake to thus improve the benefit, introducing better products through technological leadership, and getting priority access to scarce assets through long-term contracts with prospective suppliers and distributors [41,62]. We thus hypothesize:

Hypothesis 9 (H9). *Innovation speed has a positive relationship with sustainable organizational performance.*

4. Materials and Methodology

4.1. Research Design

We designed our research design to avoid applying a Western bias to measure the social capital constructs in the Chinese context. Therefore, we adopted the cross-cultural research design of Song and Parry (1996,1997) [76,77] and conducted six case studies in Shanxi Heavy Duty Automobile Co., Ltd. and Baoji Huashan Construction Vehicle Co., Ltd. over six months to assure that the study measures adopted from the literature capture the underlying social capital in the Chinese context. In addition, these case studies were conducted to explicitly investigate that the proposed four dimensions of social capital have any validities in Chinese organizations. Specifically, we followed the procedures of Song and Parry (1996,1997) to evaluate the "theory-in-use" categorization of the four dimensions of the social capital and sampling and survey administration techniques and procedures [76,77]. We conducted 24 interviews. During the interviews, managers were requested to provide their evaluations of their social capital. Next, NPD team members were asked to discuss how social capital affects innovation speed and sustainable organizational performance using most recent NPD projects as an example. After the group interviews, we presented the proposed theoretical model and ask for their evaluation of whether or not the proposed theoretical model is consistent with their experiences and any suggestions for modifications. We also presented managers with the scale items compiled from the literature and requested them to evaluate whether or not each measure is clear. Finally, these case studies were used to evaluate the initial data collection procedures.

4.2. Study Measures

We measured all theoretical variables using measurement items adopted from the literature. We measured structural social capital with six items that assess the linkages and social interactions between a firm and its customers, suppliers, competitors, and community (construct reliability = 0.756) [12,68]. We measured relational social capital using six items that assess the extent to which firms trust their customers and partners (construct reliability = 0.713) [12,68,78]. We measured cognitive social capital with six items that assess "the extent to which subjective interpretations of organizational values and goals" (construct reliability = 0.708) [58,63,68]. We assessed government ties using items that ascertain the firm's relationships with national and local governmental authorities, commerce bureau authorities, and financial organizations (construct reliability = 0.810) [30,57,66]. We used two items to measure the firm's innovation speed in finishing the assigned schedule and introducing the innovation into the marketplace (construct reliability = 0.607) [41]. We adopted four items from Shan, Song, and Ju (2016) to assess sustainable organizational performance (construct reliability = 0.862) [41]. Participants responded to each item using 5-point Likert-type scales, as shown in the Appendix A.

To control for the effects of industry environmental variables that may influence the sustainable organizational performance, we also included six control variables: ease of entry, substitution threats, buyer power, supplier power, seller concentration, and firm size. We adopted the measures for these variables from Narver and Slater (1990) [79].

4.3. Sample

To test our hypotheses, we collected data from firms operating in China across a range of industries with important implications for achieving sustainable development goals, including Internet technology, road and bridge design, education, garment, finance, real estate, aerospace, and machinery manufacturing. For firms operating in these industries to succeed in achieving sustainable goals in China, they need to promote sustainability innovation and persist in achieving faster innovation speed. To this end, Chinese firms must not only mobilize their structural, relational, and cognitive social capital but also cultivate their government ties as a key form of sustainable social capital in China. Thus, studying these Chinese firms in this setting is ideal for evaluating our proposed model.

4.4. Data Collection

We collected data using a questionnaire that we developed by following the six steps recommended by Song and Parry (1996, 1997) [76,77]. We used a double-translation technique to translate the questionnaire from English to Chinese. Four translators were involved in the process: two translators independently translated the English version into Chinese and the other two translators translated the Chinese version back to English. The back-translated English versions were first compared and any differences were resolved. The corrected version was compared with the original English version to evaluate the appropriateness of the translations. Some minor modifications were resolved with the help of the translators.

We also conducted a pretest to verify the clarity of the translated questionnaire and the face validity of the measurement items. The pretest was conducted at a subsidiary of Shanxi Heavy Duty Automobile Co., Ltd., Baoji Huashan Construction Vehicle Co., Ltd, and at Henan Yuxi Road Bridge Survey and Design Co., Ltd. We asked managers at these firms to indicate whether each measurement item accurately describes the concept it relates to. This procedure thereby confirmed the measurement items for each social capital dimension, innovation speed, and sustainable organizational performance. Unrelated and problematic items were deleted or modified based on the results of this pretest, resulting in a final version that was administered in Chinese to the full sample. The academic purpose of the study was clearly stated on the front page of the questionnaire.

To collect the data, we sent the questionnaire to senior or middle managers of the participating firms. When the questionnaire was delivered in person, the investigator provided information and guidance to the participants as needed. We collected the completed questionnaires from February 2018 to September

2018 by face-to-face interviews (67) and e-mails (91). The questionnaires for 33 participants were excluded due to incomplete data, resulting in a final sample of 125 firms (response rate = 79.1%).

5. Results

5.1. Data Analysis

All scale items were subjected to exploratory factor analysis. We deleted all items that had factor loading less than 0.5, had double loadings, or did not load to the correct factor. The detailed study measurement items and the factor loadings are displayed in Table 1. In Table 2, we present the descriptive statistics and correlations of the variables. To test the research hypotheses, we employed hierarchical moderated regression, the results of which are displayed in Table 3.

Table 1. Factor loadings from factor analysis.

	Structural Dimension (STRUC)	Relational Dimension (RELAT)	Cognitive Dimension (COGN)	Government Ties Dimension (GOVER)	Innovation Speed (SPEED)	Sustainable Organizational Performance (PERF)
STRUC2	**0.707**	0.222	0.102	0.168	0.019	0.147
STRUC1	**0.644**	0.004	0.082	0.105	−0.005	0.058
STRUC5	**0.597**	0.177	0.074	0.123	0.083	0.197
RELAT3	0.146	**0.662**	0.110	0.080	−0.178	0.087
RELAT2	0.040	**0.622**	0.041	−0.050	0.040	−0.054
RELAT6	0.196	**0.594**	0.291	0.152	−0.110	−0.033
COGN3	0.141	0.291	**0.607**	0.120	0.168	0.201
COGN2	−0.065	0.231	**0.579**	0.061	0.271	0.039
COGN6	0.273	0.000	**0.559**	0.068	0.075	0.177
GOVER2	0.049	−0.063	−0.018	**0.737**	0.294	0.247
GOVER1	0.227	0.096	0.207	**0.710**	−0.011	0.129
GOVER3	0.205	0.113	0.067	**0.639**	0.231	0.141
SPEED2	0.098	−0.016	0.176	0.224	**0.569**	0.218
SPEED1	−0.003	−0.188	0.206	0.157	**0.565**	−0.062
PERF2	0.185	−0.037	0.114	0.284	0.003	**0.775**
PERF1	0.233	0.023	0.242	0.176	0.137	**0.750**

Note: bold numbers indicate items that load highly for each of the six factors.

Table 2. Descriptive statistics.

2.1. Construct reliability, mean and standard deviations

	Construct Reliability	Mean	S. E.
Structural Dimension	0.756	4.256	0.612
Relational Dimension	0.713	4.109	0.642
Cognitive Dimension	0.708	4.173	0.503
Government Ties Dimension	0.810	3.672	0.760
Innovation Speed	0.607	3.544	0.632
Sustainable Organizational Performance	0.862	3.397	0.815
Ease of Entry		3.648	0.786
Substitution Threats		3.088	0.852
Buyer Power		3.640	0.756
Supplier Power		3.528	0.799
Seller Concentration		3.792	0.765
Firm Size		1.544	0.838

Table 2. *Cont.*

2.2. Correlations.

	1	2	3	4	5	6	7	8	9	10	11	12
1. Sustainable Organizational Performance	1.000											
2.Structural Dimension	0.373 ***	1.000										
3.Relational Dimension	0.064	0.273 ***	1.000									
4.Cognitive Dimension	0.355 ***	0.279 ***	0.318 ***	1.000								
5.Government Ties Dimension	0.445 ***	0.334 ***	0.120	0.273 ***	1.000							
6.Innovation Speed	0.223 **	0.124	−0.101	0.331 ***	0.363 ***	1.000						
7.Ease of Entry	−0.034	0.077	0.152 *	−0.130	−0.064	−0.204 **	1.000					
8.Substitution Threats	0.135	0.013	0.149 *	0.121	−0.001	0.187 **	0.143	1.000				
9.Buyer Power	−0.141	0.161 *	0.023	0.071	0.194 **	0.041	0.016	−0.116	1.000			
10.Supplier power	−0.067	−0.008	0.182 **	0.102	0.167 *	0.025	0.247 ***	0.100	0.371 ***	1.000		
11.Seller Concentration	−0.220 **	−0.006	0.342 ***	0.066	−0.289 ***	−0.031	0.172 *	0.127	0.155 *	0.274 ***	1.000	
12.Firm Size	0.183 **	0.056	−0.062	−0.162*	0.160 *	−0.084	−0.025	−0.147	0.073	−0.096	−0.049	1.000

Note: N = 125 (two-tailed test), * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 3. Regression analyses results.

| | Model1 | | | Model2 | | | Model3 | |
| | Sustainable Organizational Performance | | | Innovation Speed | | | Sustainable Organizational Performance | |
	Coefficient Estimate	S. E.	Standardized Estimate	Coefficient Estimate	S. E.	Standardized Estimate	Coefficient Estimate	S. E.
Intercept	−0.020	0.734	0.000	1.903 ***	0.513	0.000	2.752 ***	0.715
Structural Dimension	0.329 ***	0.108	0.247	−0.003	0.091	−0.003		
Relational Dimension	−0.127	0.107	−0.100	−0.237 ***	0.084	−0.240		
Cognitive Dimension	0.457 ***	0.133	0.282	0.407 ***	0.110	0.325		
Government Ties Dimension	0.311 ***	0.095	0.290	0.253 ***	0.071	0.304		
Innovation Speed							0.285 **	0.115
Ease of Entry	0.028	0.080	0.290				0.029	0.094
Substitution Threats	0.117	0.072	0.027				0.125	0.086
Buyer Power	−0.242 ***	0.083	0.122				−0.135	0.095
Supplier Power	−0.013	0.092	−0.237				0.039	0.105
Seller Concentration	−0.095	0.093	−0.012				−0.227 **	0.095
Firm Size	0.187 **	0.073	−0.090				0.218 **	0.084
F	8.240 ***			9.560 ***			3.420 ***	
R^2	0.420			0.242			0.170	
Adjusted R^2	0.369			0.216			0.120	

Note: N = 125 (two-tailed test), * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5.2. Regression Results of Hypothesis Testing

The results for Model 1 (in Table 3) indicate that: structural social capital positively affects sustainable organizational performance ($\beta = 0.329$, $p < 0.01$), relational social capital has no significant impact on sustainable organizational performance ($\beta = -0.127$, $p = 0.236$), cognitive social capital positively affects sustainable organizational performance ($\beta = 0.457$, $p < 0.01$), and government ties positively affect sustainable organizational performance ($\beta = 0.311$, $p < 0.01$). That is, we find three of the four social capital dimensions (structural social capital, cognitive social capital, and government ties) have significant positive effects on sustainable organizational performance, providing support for H1, H3, and H4 but not H2.

The results for Model 2 (in Table 3) show that: structural social capital has no significant impact on innovation speed ($\beta = -0.003$, $p = 0.972$), relational social capital negatively affects innovation speed ($\beta = -0.237$, $p < 0.01$), cognitive social capital positively affects innovation speed ($\beta = 0.407$, $p < 0.01$), and government ties positively affect innovation speed ($\beta = 0.253$, $p < 0.01$). That is, we find that only cognitive social capital and government ties have significant positive effects on innovation speed, providing support for H7 and H8 but not H5 and H6.

The results for Model 3 (in Table 3 show that innovation speed positively affects sustainable organizational performance ($\beta = 0.285$, $p < 0.05$), thus supporting H9.

5.3. Evaluation of Alternative Model: Government Ties as a Fourth Dimension of Social Capital

To examine whether or not government ties is a necessary fourth dimension of social capital, we conducted further analyses of the following four models:

$$\text{Innovation Speed}_1 = \alpha + \beta_1 \times (\text{Structural Dimension}) + \beta_2 \times (\text{Relational Dimension}) + \beta_3 \times (\text{Cognitive Dimension}) + \varepsilon \tag{1}$$

$$\text{Innovation Speed}_2 = \alpha + \beta_1 \times (\text{Structural Dimension}) + \beta_2 \times (\text{Relational Dimension}) + \beta_3 \times (\text{Cognitive Dimension}) + \beta_4 \times (\text{Government Ties Dimension}) + \varepsilon \tag{2}$$

$$\text{Sustainable Organizational Performance}_1 = \alpha + \beta_1 \times (\text{Structural Dimension}) + \beta_2 \times (\text{Relational Dimension}) + \beta_3 \times (\text{Cognitive Dimension}) + \beta_4 \times (\text{Ease of Entry}) + \beta_5 \times (\text{Substitution Threats}) + \beta_6 \times (\text{Buyer Power}) + \beta_7 \times (\text{Supplier Power}) + \beta_8 \times (\text{Seller Concentration}) + \beta_9 \times (\text{Firm Size}) + \varepsilon \tag{3}$$

$$\text{Sustainable Organizational Performance}_2 = \alpha + \beta_1 \times (\text{Structural Dimension}) + \beta_2 \times (\text{Relational Dimension}) + \beta_3 \times (\text{Cognitive Dimension}) + \beta_4 \times (\text{Government Ties Dimension}) + \beta_5 \times (\text{Ease of Entry}) + \beta_6 \times (\text{Substitution Threats}) + \beta_7 \times (\text{Buyer Power}) + \beta_8 \times (\text{Supplier Power}) + \beta_9 \times (\text{Seller Concentration}) + \beta_{10} \times (\text{Firm Size}) + \varepsilon \tag{4}$$

Using these four equations, we performed hierarchical regressions to test whether or not including government as the fourth dimension of social capital leads to a better model for explaining the variance in both innovation speed and sustainable organizational performance. The results for Equations (1) and (2) were presented in Table 4 and the results for Equations (3) and (4) were presented in Table 5.

Table 4. Comparison of three dimensions and four dimensions regression analyses results (innovation speed as dependent variable).

	Model 1			Model 2		
	Coefficient Estimate	S. E.	Standardized Estimate	Coefficient Estimate	S. E.	Standardized Estimate
Intercept	2.158 ***	0.532	0.000	1.903 ***	0.532	0.000
Structural Dimension	0.086	0.091	0.083	−0.003	0.091	−0.003
Relational Dimension	−0.243 ***	0.088	−0.247	−0.237 ***	0.088	−0.240
Cognitive Dimension	0.484 ***	0.113	0.386	0.407 ***	0.113	0.325
Government Ties Dimension				0.253 ***	0.532	0.304
F	7.84 ***			9.65 ***		
R^2	0.163			0.242		
Adjusted R^2	0.142			0.217		
Change in R^2				0.079 ***		

Note: N = 125 (one-tailed test), * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 5. Comparison of 3 dimensions and 4 dimensions regression analyses results (sustainable organizational performance as dependent variable).

	Model 3			Mode 4		
	Coefficient Estimate	S. E.	Standardized Estimate	Coefficient Estimate	S. E.	Standardized Estimate
Intercept	0.270	0.759	0.000	−0.020	0.734	0.000
Structural Dimension	0.417 ***	0.109	0.313	0.329 ***	0.108	0.247
Relational Dimension	−0.088	0.111	−0.069	−0.127	0.107	−0.100
Cognitive Dimension	0.545 ***	0.136	0.337	0.457 ***	0.133	0.282
Government Ties Dimension				0.311 ***	0.095	0.290
Ease of Entry	0.009	0.084	0.009	0.028	0.080	0.027
Substitution Threats	0.127 *	0.074	0.132	0.117	0.072	0.122
Buyer Power	−0.209 **	0.086	−0.205	−0.242 ***	0.083	−0.237
Supplier Power	0.058	0.094	0.054	−0.013	0.092	−0.012
Seller Concentration	−0.219 **	0.088	−0.206	−0.095	0.093	−0.090
Firm Size	0.239 ***	0.075	0.245	0.187 **	0.073	0.193
F	7.34 ***			8.24 ***		
R^2	0.365			0.420		
Adjusted R^2	0.315			0.369		
Change in R^2				0.055 ***		

Note: N = 125 (one-tailed test), * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

The results in Table 4 (Model 1 and Model 2) indicate that when we added the government ties as the fourth dimension of social capital (Model 2), increases in R^2 ($\Delta R^2 = 0.079$) from Model 1 is significant ($p < 0.05$). This empirical result provides the support that including government ties as the fourth dimension of social capital add significant explanatory power to the innovation speed model (model 2). In addition, the relationship between government ties and innovation speed is significant ($\beta = 0.253$, $p < 0.01$). These results suggest that including government ties as the fourth dimension of social capital in our proposed theoretical model has empirical validity.

By comparing Model 3 with Model 4 in Table 5, we find that the R^2 for Model 4 (i.e., adding government ties as a fourth dimension of social capital) was significantly higher than the R^2 for Model 3 (i.e., three-dimension social capital model) ($\Delta R^2 = 0.055$; $p < 0.05$). Furthermore, the effect of government ties on sustainable organizational performance is significant ($\beta = 0.311$, $p < 0.01$). These results provide empirical supports for including government ties as the fourth dimension of social capital. In summary, the empirical evidence of the further empirical evaluations provides strong supports for our proposed four-dimension social capital model in evaluating innovation speed and sustainable organizational performance.

5.4. Evaluation of Alternative Model: Innovation Speed as a Moderator

To investigate the possibility of innovation speed as a moderator in the relationship between social capital and sustainable organizational performance, we performed further analyses using the following equation:

$$
\begin{aligned}
\text{Sustainable Organizational Performance} = \alpha + \beta_1 \times (\text{Structural Dimension}) + \beta_2 \times \\
(\text{Relational Dimension}) + \beta_3 \times (\text{Cognitive Dimension}) + \beta_4 \times (\text{Government Ties} \\
\text{Dimension}) + \beta_5 \times (\text{Innovation Speed}) + \beta_6 \times (\text{Structural Dimension}) \times (\text{Innovation} \\
\text{Speed}) + \beta_7 \times (\text{Relational Dimension}) \times (\text{Innovation Speed}) + \beta_8 \times (\text{Cognitive} \\
\text{Dimension}) \times (\text{Innovation Speed}) + \beta_9 \times (\text{Government Ties Dimension}) \times \\
(\text{Innovation Speed}) + \beta_{10} \times (\text{Ease of Entry}) + \beta_{11} \times (\text{Substitution Threats}) + \beta_{12} \times \\
(\text{Buyer Power}) + \beta_{13} \times (\text{Supplier Power}) + \beta_{14} \times (\text{Seller Concentration}) + \beta_{15} \times (\text{Firm} \\
\text{Size}) + \varepsilon
\end{aligned}
\tag{5}
$$

We performed OLS regression and found that the coefficient estimates for the interaction terms (i.e., four dimensions of social capital and innovation speed) are not significant ($p > 0.10$). Therefore, the empirical results do not support the alternative model: innovation speed moderates the relationship between social capital and sustainable organizational performance.

6. Discussion

We find that the four dimensions of social capital have different effects on sustainable organizational performance. Our results show that structural social capital, cognitive social capital, and government ties increase sustainable organizational performance, consistent with our expectations and mainstream views. First, structural social capital links external and internal relationships. Our study confirms that close relationships with suppliers, customers, competitors, and communities give organizations sustainable advantages in supply, production, technology, market, and reputation. These advantages increase the sustainable organizational performance [50,51,66,67]. Therefore, organizations should encourage their employees to spend more time attending social occasions with people from other firms and social events organized by the local community. In addition, organizations should establish informal networking among customers, suppliers, competitors, and communities.

Second, our study suggests that cognitive social capital helps organizations develop common norms, understandings, and consensus on tasks and missions and thus reduces disputes, contests, and conflicts between deferent departments. Organizations should further ensure the smooth implementation of production and operation decisions to increase sustainable organizational performance [49,58]. Managers should encourage employees to pursue the collective goals and missions of the whole organization and share the same ambition and vision with other organizations in their network [63].

Third, we find that government ties are a prominent driver of sustainable organizational performance (B = 0.29, which is the highest standardized estimate in Model 1 in Table 3). This finding not only confirms the views of Park and Luo (2001), Sheng, Zhou, and Li (2011), and Wu and Chen (2012) but also emphasizes the primary role of government ties in improving sustainable organizational performance in the Chinese context [30,54,66]. Government ties help Chinese organizations obtain scarce resources and knowledge, low-cost production factors and funds, and protection mechanisms in the absence of law [30,51,54,66]. As a result, organizations with stronger government ties have more environmental adaptability, higher sustainable growth, and better sustainable organizational performance. Top managers should establish and utilize connections with various levels of governments, industrial authorities and business bureaus.

Contrary to previous studies, our results indicate that relational social capital has no significant effect on sustainable organizational performance in China. There may be two main reasons for this finding: First, Chinese firms focus more on establishing relationships with the government and its

agencies than on the cultivation of business relationships. Second, as suggested by Uzzi (1996) and Laursen, Masciarelli, and Prencipe (2012), once a firm's close relationships with other actors increase beyond a certain threshold, networks may tend to close off, locking the firm into a situation where it is difficult for it to maneuver and innovate [56,72].

We also find several differences in the effects of four social capital dimensions on innovation speed. First, consistent with our hypothesis and previous studies, we find that cognitive social capital and government ties increase innovation speed. Cognitive social capital has the greatest positive impact on innovation speed (B = 0.325, which is the highest standardized estimate in Model 2 in Table 3). A plausible explanation is that innovation is a complex process. It is necessary for all parties involved in innovation to work together and solve problems. The common values, vision, and goals of the participants in the innovation processes can promote the emergence of collective actions, formation of consensus, reducing disputes, and improving coordination [30,52,74,75]. Therefore, managers should encourage and motivate employees to form common norms, vision, and consensus on their innovative tasks, and pursue the collective goals and mission in the entire innovation process [68].

Second, government ties are found to faster innovation speed. Chinese organizations established strong ties with the government are more likely to have access to sustainable resources, protection, and support in business and policy areas [30,74]. It is helpful to break through the shortcomings or bottlenecks of innovation, reduce the uncertainty and risk of innovation, and ultimately shorten the time of innovation [52,75]. As mentioned before, organizations should actively set up and take advantage of guanxi connections with governments.

Counter to our hypothesis, the empirical results reveal that neither structural nor relational social capital is helpful to accelerate innovation speed. First, although structural social capital can endow organizations with the knowledge, technology, information, and other resources, organizations need capabilities (e.g., absorption capacity, integration capacity, and application capability) to transform these resources into effective outputs [80]. Second, relational social capital reduces innovation speed because trust can result in "less monitoring and greater groupthink" [81] and impedes the generation, diffusion, and application of new knowledge, new technology, and new information. As a result, the higher the relational social capital, the slower the innovation speed.

We confirm the positive effect of innovation speed on sustainable organizational performance. Faster innovation speed acts as a key factor to achieve sustainable competitive advantages, such as becoming a leader in establishing industry standards [44], reducing direct costs due to a larger-scale economy, enhancing market share and reputation by taking the lead in innovation, and securing scarce assets through long-term contracts with suppliers and distributors [41,62]. These sustainable competitive advantages lead to sustainable organizational performance. Organizations should consider shortening innovation speed as a driver to yield sustainable superior performance.

7. Implications

7.1. Theoretical Implications

Our study offers three theoretical implications. First, we link three common dimensions of social capital—structural social capital, cognitive social capital, and relational social capital—with sustainable organizational performance in China. Consistent with the views of Peng and Luo (2000) and Park and Luo (2001), our findings confirm the positive role of structural social capital and cognitive social capital in improving sustainable organizational performance in the Chinese context [50,66]. However, we also find that relational social capital does not lead to a higher sustainable performance in China. Our study further verifies the aptness of structural social capital, cognitive social capital, and relational social capital in the Chinese context, which adds to current knowledge of how social capital affects sustainable organizational performance in different cultural, economic, and social contexts [30].

Second, our study advances extant social capital literature by introducing and demonstrating the effect of a new dimension of social capital, namely, government ties. Recent studies have

highlighted the important role of government ties for sustainable innovation and organizational performance in Asian contexts in light of how strong government ties can lead to greater access to sustainable resources and support for innovation and operations [30,52]. Consistent with these studies, we theoretically and empirically demonstrate that in the Chinese government ties are an important driver of sustainable organizational performance and a main positive antecedent of accelerating sustainable innovation. These findings enrich the connotations of social capital and provide a more comprehensive understanding of social capital in the Chinese context.

Third, our study contributes to the social capital literature by elucidating and demonstrating the role of innovation speed in the relationship between social capital and sustainable organizational performance. Our findings confirm that there is a positive effect of innovation speed on sustainable organizational performance [41,62] and that cognitive social capital and government ties positively impact innovation speed [30,63]. But surprisingly, our findings show that structural social capital does not lead to faster innovation and relational social capital may even inhibit innovation speed. Our study thus provides new insights into the understanding of how social capital affects innovation speed and sustainable organizational performance and also suggests new directions for future research.

7.2. Managerial Implication

Our findings provide a better understanding of how different types of social capital affect sustainable organizational performance in the Chinese business environment, which can help managers to develop effective social capital strategies for achieving their desired performance outcomes. Our findings indicate that, during the ongoing period of economic transition in China, government ties are the most influential form of social capital for promoting sustainable organizational performance and thus managers should establish close relationships with Chinese government agencies. At the same time, managers should focus on investment and cultivation of structural social capital and cognitive social capital. Managers should keep in mind that the importance of trust stemming from relational social capital has been weakened and replaced by government ties, which enable organizations to access sustainable knowledge and resources and obtain sustainable organizational performance protection, thus greatly reducing the risks of uncertainty that challenge sustainable organizational performance.

Our results also recommend that managers of Chinese organizations allocate their social capital to accelerate innovation and thus gain competitive advantage and achieve superior sustainable performance. Our findings bolster previous assertions in the literature that faster innovation can significantly improve sustainable organizational performance and thus Chinese managers should prioritize the acceleration of innovation over pursuing late-development advantages. To this end, managers need to focus on accumulating cognitive social capital and government ties because the former can reduce conflicts, eliminate differences, and improve cooperation while the latter can provide sustainable resources, information, and policy support, which are all beneficial to accelerating innovation. Moreover, managers should be wary of relational social capital because the excessive maintenance it requires can lead to the firm being closed off and locked in, resulting in reduced innovation speed and weaker sustainable organizational performance.

8. Limitations and Future Research

Three limitations of this study should be noted. First, the sample data were derived from firms across eight industries in China. In future research, we plan to collect more data to expand the generalizability of our results. Second, we examined only the relationship between social capital, innovation speed, and sustainable organizational performance. Future research should also consider other factors of innovation efficiency, such as innovation quality and innovation cost. Third, our innovation speed construct includes only two dimensions adopted from the study of Shan, Song, and Ju (2016) [41]. As suggested by a reviewer, absorptive capacity helps to quickly transform external knowledge into internal knowledge, thus it can increase innovation speed [82]. Future research should add absorptive capacity as the third dimension to measure innovation speed.

9. Conclusions

In this study, we introduced government ties as a new dimension of social capital, investigated the effects of four social capital dimensions on innovation speed and on sustainable organizational performance, and examined the important role of innovation speed on sustainable organizational performance. Our study answers the three research questions: (1) what are the effects of the different dimensions of social capital on sustainable organizational performance, (2) what are the effects of the different dimensions of social capital on innovation speed, and (3) does innovation speed increase sustainable organizational performance. Based on data collected from 125 Chinese firms, we make the following conclusions: (1) government ties are the most important antecedent of sustainable organizational performance; (2) cognitive social capital is the most significant driver of innovation speed; (3) structural social capital and relational social capital are shown to positively impact sustainable organizational performance, but structural social capital has no significant effect on innovation speed and relational social capital decrease, not increase, innovation speed; and (4) faster innovation speed increases sustainable organizational performance. The outcomes of our study expand the connotations of social capital in the Chinese context and deepen our understanding of the differential impact of the four social capital dimensions on innovation speed and sustainable organizational performance.

Appendix A. Study Measures and Sources

1. Structure Dimensions (STRU) (1 = Strongly disagree; 5 = Strongly agree)

(1) STRU 1: We maintain close social relationships with this customer. (adopted from Ylirenko, Autio & Sapienza, 2001 [12])

(2) STRU 2: We know this customer's people on a personal level. (adopted from Ylirenko, Autio & Sapienza, 2001 [12])

(3) STRU 3*: People from your company spend a considerable amount of time on social occasions with people from other firms. (adopted from Molina-Morales & Martínez-Fernández, 2010 [68])

(4) STRU 4*: People from your company spend a considerable amount of time on social events organized by the local community. (adopted from Molina-Morales & Martínez-Fernández, 2010 [68])

(5) STRU 5: A local origin and common academic background of the employees at local firms allow social interactions to take place. (adopted from Molina-Morales & Martínez-Fernández, 2010 [68])

(6) STRU 6*: There is an informal network among customers, suppliers and competitors. (adopted from Molina-Morales & Martínez-Fernández, 2010 [68])

2. Relational Dimension (RELAT) (1= Strongly disagree; 5= Strongly agree)

(1) RELAT 1*: In this relationship neither side takes advantage of the other even if the opportunity arises. (adopted from Ylirenko, Autio & Sapienza, 2001 [12])

(2) RELAT 2: The customer always keeps its promises to us. (adopted from Ylirenko, Autio & Sapienza, 2001 [12])

(3) RELAT 3: Suppose your company is seeking to be a business partner in a joint project. You are confident that you will go what is required in the agreement. (adopted from Molina-Morales & Martínez-Fernández, 2010 [68])

(4) RELAT 4*: You consider that other firms feel a special duty to stand behind you in times of trouble, so you consider it only fair that your company should also give support to other firms. (adopted from Molina-Morales & Martínez-Fernández, 2010 [68])

(5) RELAT 5*: Our project team members and their colleagues in our company could always trust that each would decide and act professionally and competently. (adopted from Maurer, Bartsch & Ebers, 2011 [78])

(6) RELAT 6: Our project team members and their colleagues in our company could always trust that each would receive necessary and reliable information and service. (adopted from Maurer, Bartsch & Ebers, 2011 [78])

3. Cognitive Dimension (CONG) (1= Strongly disagree; 5= Strongly agree)

(1) CONG 1*: Our unit shares the same ambitious and vision with other units at work. (adopted from Tsai & Ghoshal, 1998 [63])

(2) CONG 2: People in our unit are enthusiastic about pursuing the collective goals and missions of the whole organization. (adopted from Tsai & Ghoshal, 1998 [63])

(3) CONG 3: You and the people in your company share the same ambitions and vision as other companies in your local area. (adopted from Molina-Morales & Martínez-Fernández, 2010 [68])

(4) CONG 4*: People in your company are encouraged and motivated to pursue the collective goals and mission of the whole local area. (adopted from Molina-Morales & Martínez-Fernández, 2010 [68])

(5) CONG 5*: You consider that your company's future is related to other firms in the area. (adopted from Molina-Morales & Martínez-Fernández, 2010 [68])

(6) CONG 6: There is some kind of collective strategy or plan for firms in the whole area. (adopted from Molina-Morales & Martínez-Fernández, 2010 [68])

4. Government Ties Dimension (GOVER) (1= Strongly disagree; 5= Strongly agree)

(1) GOVER 1: Please circle the number best describing the extent to which you and your firm have utilized guanxi connections with various levels of political governments. (adopted from Park & Luo, 2001 [66])

(2) GOVER 2: Please circle the number best describing the extent to which you and your firm have utilized guanxi connections with industrial authorities. (adopted from Park & Luo, 2001 [66])

(3) GOVER 3: Please circle the number best describing the extent to which you and your firm have utilized guanxi connections with other government authorities, such as taxation bureaus, banks, industrial and commercial administrative bureaus, and the like. (adopted from Park & Luo, 2001 [66])

(4) GOVER 4*: Our top managers have good personal relationship with relevant business bureau (e.g., State Administration on Industry and Commerce, Ministry of Foreign Trade and Economic Cooperation). (adopted from Wu & Chen, 2012 [30])

5. Innovation Speed (SPEED) (adopted from Shan, Song, & Ju, 2016 [41])

(1) SPEED1: In our industry, our company has a reputation of being . . . . (1= Among the last to introduce new products into the marketplace; 5= Among the first to introduce new products into the marketplace)

(2) SPEED2: Relative to the assigned schedule, our development "on-time performance" is often . . . (1= Behind the assigned schedule; 5= Ahead the assigned schedule)

6. Firm Performance (PERF) (1= Far less than our competition; 5= Far greater than our competition) (adopted from Shan, Song, & Ju, 2016 [41])

(1) PERF1: Our company has met all of our predefined goals and objectives (such as profitability, sales, etc.).

(2) PERF2: How successful is your company from an overall profitability standpoint?

(3) PERF3*: Relative to competition, our company's sales growth is:

(4) PERF4*: Relative to competition, our company's market share gains are:

7. Control Variables

(1) Ease of Entry: How easy is it for new entrants to start competing in this industry? (adopted from Narver & Slater, 1990 [79])

(2) Substitution Threats: How easy can a product or service be substituted in this industry? (adopted from Narver & Slater, 1990 [79])

(3) Buyer Power: The size of our annual sales revenues in the principal served market segment in relation to those of our largest competitor is: (adopted from Narver & Slater, 1990 [79])

(4) Supplier Power: The extent to which we are able to negotiate lower prices from our suppliers in this industry. (adopted from Narver & Slater, 1990 [79])

(5) Seller Concentration: The extent to which there is a strong competition between the existing players in this industry. (adopted from Narver & Slater, 1990 [79])

(6) Firm Size: The full-time employees of the company are:

　　① <100　② 100–499　③ 500–1000　④ >1000

Note: "*" indicates that the measurement item was deleted based on factor analysis.

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