

Article

Developing Knowledge-Based Resources: The Role of Entrepreneurs' Social Network Size and Trust

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Abstract: Entrepreneurs' social networks play a crucial role in developing knowledge-based resources for their new ventures. Although most studies in an entrepreneurship context find that trust is very important when entrepreneurs develop social networks, limited research examines how trust can explain the variation in the relationship between an entrepreneur's social networks and a firm's knowledge-based resources. Therefore, the major objective of the paper is to understand the effects of the size of an entrepreneur's social network on his or her firm's knowledge-based resources with high and low levels of trust. Our data were collected from surveys administered to 476 entrepreneurs in China in 2018. Our multiple regression analysis indicates that social networks reinforce knowledge-based resources in a situation where entrepreneurs highly trust their major networks partners in their business environment (e.g., family, close friends, consultants, suppliers, peers, etc.). However, with a low level of trust, the relationship between social network and knowledge-based resources is curvilinear (inverse U-shaped). Our empirical validations showed that the relationship between social network and a firm's knowledge-based resources is highly contingent to the level of trust among network members.

Keywords: social network; entrepreneurs; knowledge-based resources; new venture; trust; sustainability; China

1. Introduction

The utilization of knowledge-based resources by newly established firms enhances the possibility of discovering and taking advantage of entrepreneurial opportunities [1,2]. Furthermore, knowledge-based resources are among a firm's resources which are inherently difficult for competitors to imitate [3]. Therefore, these types of resources are crucial for new ventures because they can improve a firm's overall performance [4,5] and provide competitive advantages [6]. To understand how newly established firms have developed knowledge-based resources over time, we examined the impact of an entrepreneur's social network size and considered the important role of trust.

Some scholars have suggested that large social networks positively influence the development of knowledge-based resources among new ventures [7,8]. The larger the social network, the more opportunity to acquire knowledge; and new ventures have had more chances to contact other people or firms and have been exposed to different knowledge and skills [9–11]. Other scholars have argued that there is a cost to developing social networks (in terms of a new venture's time, effort and funding). Therefore, when the costs of developing a large social network are greater than the benefits of the network, large social networks may negatively affect a new venture's knowledge-based resources [12]. One possible reason for these diverging results is that scholars might ignore the

effects of trust [13]—whether high or low—among members of a social network. Trust refers to the willingness to be vulnerable to the actions of another party based on the expectation that the latter will perform a particular action important to the former party—regardless of the former’s ability to monitor or control the latter [14]. Trust plays an important role in networks as the “social glue” [15] or “social lubricant” [16]. Some studies have found that trust between partners is fundamental for entrepreneurial network development [17,18]. Therefore, when trust exists, partners are more willing to engage in cooperative activities and exchange useful market and technology information [17–20].

On the other hand, without some level of trust in network relationships, interactions among network members may not go smoothly. Some scholars have found that when the level of trust is low, network members and partners are less willing to share useful market and technology knowledge [21]. A low level of trust can increase the likelihood of other parties acting opportunistically within the network [22]. Furthermore, a lack of trust between parties within a social network may lead to its failure [23]. A low level of trust increases the uncertainties between parties and makes it difficult to predict how the size of the social network will influence a firm’s knowledge-based resources. Therefore, the major objective of the current study is to test the effects of social network size on firms’ knowledge-based resources in situations with high and low levels of trust in a Chinese context.

First, we provide an overview of network theory, trust and entrepreneurship, and we use relevant theories to generate hypotheses regarding social network size and knowledge-based resources in new ventures. Then we identify high and low trust situations, and we test our hypotheses using data from a sample of new ventures in China. We conclude by discussing our paper’s theoretical and managerial implications.

2. Literature Review

Knowledge-based resources are important for new ventures’ survival and growth [7,9,24,25]. According to a knowledge-based view, a firm’s ability to achieve competitive advantage is highly contingent on its ability to collect, accumulate, integrate and most importantly use knowledge from the market in order to develop new products, services and processes [26,27]. Knowledge-based resources typically refer to the firms tangible input resource [1], and the accumulation, combination and use of this knowledge is a prerequisite for pursuing entrepreneurial and innovative activities [28]. Having these types of knowledge puts firms in a better position to anticipate the nature and commercial potential of changes in the business environment, and accordingly, apply a proper set of strategic response actions [29,30]. There are two common types of knowledge; tacit or procedural knowledge and explicit or declarative knowledge [26,27]. Tacit or procedural knowledge can be achieved through direct experience, but explicit or declarative knowledge can be obtained from formal education and training programs [31]. Following References [1,32], we focused on knowledge about market and technology as two main representatives of a firm’s tacit or procedural knowledge. Market knowledge can increase new ventures’ ability to discover and exploit opportunities because it helps new ventures be aware of customer problems, find ways to serve the market, and thus constitutes real market opportunities [1]. Technological knowledge is important for entrepreneurs because such knowledge enhances new ventures’ ability to effectively exploit market opportunities into viable products, processes or services [33–35]. There are different ways for entrepreneurs to enrich such knowledge within their new ventures [36,37]. Affiliating with a large social network has been considered an important method for new ventures to develop knowledge-based resources [7,8]. According to social network theory, social networks help new ventures obtain scarce and valuable information about market and technological progress.

Network theory suggests that the ability of entrepreneurs to access valuable market and technical knowledge in a cost-effective way via social networks can eventually facilitate the success of new ventures [38,39]. Social network size refers to the number of parties within a network [40,41]; it can reflect the value of being part of the network for new ventures [42] and can influence the flow of information and knowledge within the network [36,43,44]. The extant literature about networks has

focused on network structure [36,45], network dimensions, and strong and weak ties [20,46]. Scholars also have studied how a social network develops [47]; the value produced by a social network in an uncertain environment [48,49]; and how it influences individual health [50], job performance [51] or a firm's performance [47]. But most of these studies were conducted in Western countries [52], while little has been done in a country with a transitional economy such as that found in China [53].

China is moving toward a type of network capitalism defined by long-term trust relationships [54]. Network relationships are a deeply ingrained institution in China [48,53] and provide a pervasive means to access knowledge for new ventures [55]. When China transfers from a plan-based economy toward a market-based economy, a central issue will be how network relationships will influence new ventures' acquisition of knowledge [56]. From the perspective of social capital, when emerging markets become highly competitive, network relationships become more important because these enable companies to maintain the position through favored relationships with exchange partners or through political relationships with governments [57,58].

The extant research about trust has announced its importance for new ventures to build a network or other ties [18] and its influence on frequency and types of knowledge and information flows [17,59]. Trust can be defined as "the willingness of a party to be vulnerable", and it plays an important role in knowledge acquisition [47]. Until now, little has been known about how a low or high level of trust between network members influences the relationship between social network size and a firm's knowledge-based resources. In addition, little research has been conducted on how different levels of trust play a role within network relationships [60].

3. Hypotheses

We expected that a high level of trust between entrepreneurs and their partners would enrich firms' knowledge-based resources. Trust is a central component of a social network [20,23,61]. Morgan and Hunt [62] found that trust within networks was key in helping focal firms cooperate with others and form interfirm alliances. Levin and Cross [52] reported that when entrepreneurs highly trusted their social network members, they were more likely to listen and absorb market and technology knowledge from their partners. Several studies have found that the existing trust in social networks has enhanced the firms' commitment to network relationships [62–65]. Therefore, it is expected that a high level of trust will accelerate the knowledge flow within networks [66].

Increasing the size of a social network depends on how well partners trust each other [67]. Large social networks can help focal firms get more varied knowledge [59], because large networks provide the focal firm with more chances to interact with various knowledge providers [68]. Trust can be viewed as an instrument that helps focal firms select the right knowledge sources.

There are several explanations why a high level of trust can positively influence knowledge acquisition for large social networks: (a) A high level of trust reduces the perception of risk associated with knowledge providers' opportunistic behaviors within the network, which is helpful for new ventures to build more relationships with those providers and enlarge potential knowledge sources; (b) a high level of trust increases the confidence that will diminish short-term uncertainty within the network, which encourages new ventures to form more alliances with knowledge providers; therefore, the focal new venture would find more potential knowledge sources and acquire knowledge; (c) a high level of trust reduces the cost of knowledge searching and transfer [63], which helps new ventures acquire knowledge quickly and at a lower cost. Thus we propose:

Hypothesis 1. *Under high-level trust conditions, there is a positive linear relationship between social network size and knowledge-based resources.*

It is known that large social networks positively influence knowledge acquisition under high-level trust conditions. Scholars have shown that simply communicating and interacting among companies

does not guarantee the development of trust [69]. However, when the level of trust is low, there will be complicated relationships between social network size and knowledge acquisition.

When the level of trust is low, there will be more risks and uncertainties within network relationships. If the network expands, the cost of searching for knowledge sources would increase [70]. A focal new venture that decides to acquire knowledge needs to find knowledge sources. This search process includes seeking, identifying and evaluating knowledge sources within networks [9]. When the size of the network enlarges, search costs increase. When there is a low level of trust, new ventures may not believe the potential knowledge providers, and they may not be believed either. Therefore, when the network is large, new ventures should spend more time and effort identifying potential knowledge sources. Thus when the level of trust is low, the relationship between social network size and knowledge-based resources has an inverse U shape.

Besides the search costs, there are transfer costs during the process of knowledge acquisition for focal new ventures within the social network. When the level of trust is low within network relationships, transfer costs increase. This is because a focal firm should transfer knowledge from knowledge providers through interactive activities and problem-solving, which involves modifying, editing and incorporating the knowledge [9,20]. When the level of trust is low, the focal new venture should spend more time and effort interacting with other partners in its network. Consequently, the larger the network, the more time and effort should be spent on the process of knowledge acquisition for a focal new venture. If the cost of knowledge transfer is higher than the value of acquired knowledge, it will weaken the desire of a focal firm to acquire knowledge. Therefore, when there is a low level of trust, the relationship between social network size and knowledge-based resources has an inverse U shape.

When the level of trust is low, new ventures may not believe information from indirect relationships [9]; instead, the focal firm would prefer to acquire knowledge from direct relationships. Therefore, if network relationships include more indirect contacts—even though the size of the network is large—the focal firm cannot easily get more knowledge or access to potential knowledge sources. That means that when the level of trust is low within the network, if the number of direct relationships enlarges, then the focal firm may get more knowledge providers. Further, when developing more indirect relationships under such conditions, large social networks may negatively influence knowledge acquisition for focal firms, because those indirect relationships will damage channels and sources of knowledge. Therefore, large social networks including more indirect relationships may not have a positive effect on knowledge acquisition for focal firms; but small social networks—including more direct relationships—would positively influence knowledge acquisition for focal firms. This also shows that when there is a low level of trust, there is an inverse U-shaped relationship between social network size and knowledge-based resources. Therefore, we propose:

Hypothesis 2. *Under low-level trust conditions, there is an inverse U-shaped relationship between social network size and knowledge-based resources.*

4. Research Methods

4.1. Sampling and Data Collection

In order to test the two hypotheses, we selected samples from three major areas in China: Beijing city, Jilin province and Fujian province. These areas reflect varying levels of entrepreneurial activity during China's transition period [71]. Specifically, Beijing city represented a highly active entrepreneurship area; Fujian province represented an active entrepreneurship area; and Jilin province represented a non-active entrepreneurship area [72]. Some scholars have suggested that face-to-face interviews generate more valid information than other types of data collection [48]. Therefore, we conducted the survey using on-site, personal interviews. All interviewers had at least 1 day

of interview training and were divided into several groups. All the firms were younger than 8 years old, which is a criterion for new ventures [73–75].

In order to get a high response rate, our interviewers gave respondents some gifts (such as a notebook or a pen) after the interview—which seemed like a successful strategy. There were 600 questionnaires distributed to the entrepreneurs as agents of the firm [76]. Respondents were assured that their answers would remain anonymous. After deleting a few invalid questionnaires due to missing data, 476 usable questionnaires were used for data analysis, which represented a response rate of 79.3%. Non-response bias does not appear to have been a threat in this study. In the final analysis, we mostly include those businesses which were established and managed by one or two entrepreneurs. Accordingly, 93.6% of our final selected firms were owned by only one or two entrepreneurs and about 6.4% of new ventures have more than two founders. The details of the sample characteristics are shown in Table 1.

Table 1. Profile of Responding Organizations and Respondents.

1. Sample Area	Percent
Jilin Province	50.2
Fujian Province	26.9
Beijing city	22.9
2. Sample Age	Percent
≤3 years old	35.9
3–5 years old	20.6
6–8 years old	43.5
3. Number of Entrepreneurial Team	Percent
≤2 members	93.6
>3 members	6.4
4. Number of Employees	Percent
≤20	51.5
21–50	24.8
51–200	13.3
201–500	5.2
501–1000	1.8
>1000	3.4
5. Industry	percent
Manufacturing industry	26.2
Commercial and Service Industry	9.0
High technology industry	42.1
Others	22.7

Common method bias was examined via Harman’s one-factor test [77]. An unrotated factor analysis showed that there was no general factor, and the first factor accounted for only 40.34% of total variance. Finally, the explaining and explained variables were loaded on different factors. Therefore, there was little threat from common method bias.

4.2. Measures

4.2.1. Social Network Size

Social network size refers to the number of ties within it—including the number of people whom entrepreneurs or founders regularly interact with in the course of running their businesses [78]. Based on prior research [79,80], this study measured entrepreneurs’ social network size by asking them the following nine items: “For running my own business, as a founder of this company I talk regularly with many ... ” (1) relatives and friends; (2) former colleagues; (3) suppliers;

(4) competitors; (5) industry associations (e.g., industry research offices, quality certification agencies); (6) financial organizations (e.g., banks); (7) governmental organizations (e.g., insurance companies); (8) management consulting professionals and organizations (e.g., tax departments and business administration departments); and (9) intermediary organizations (e.g., accounting, auditing and law firms). The Cronbach's alpha coefficient for the entrepreneurs' social network was 0.85.

4.2.2. A Firm's Knowledge-Based Resources

We wanted to learn about new ventures' knowledge-based resources (market and technology) which represent two kinds of procedural knowledge. Therefore, we adopted 11 items from Reference [1] and asked each entrepreneur to compare his or her business with similar companies in the industry in terms of (1) staff with a commitment to the company's development; (2) technical expertise; (3) product/service development expertise; (4) staff productivity; (5) marketing expertise; (6) customer service expertise; (7) management expertise; (8) market innovation; (9) staff training in customer service; (10) staff contributions for new products/services; and (11) staff marketing the firm's products/services. A higher score meant that new ventures in the industry had more knowledge-based resources. The Cronbach's alpha coefficient for the knowledge-based resources was 0.933, which showed strong internal reliability.

4.2.3. Trust

Trust exists among partners and is reciprocal [13]. According to previous studies, we measured trust in terms of beliefs and feelings among partners [81]: (1) We believe that our partner keeps our best interests in mind; (2) We would feel a sense of betrayal if our partner leaves us only for economic reasons; (3) We have shared values/beliefs with our partners; (4) Our partner cares about our company's problems, feelings and concerns; (5) We feel secure in sharing business-related information with our partner; and (6) We feel free to share those things that do not directly relate to business with our partners (e.g., ideas, feelings, hopes or problems). The Cronbach's alpha coefficient for the trust scale was 0.844, which showed relatively strong internal reliability.

4.2.4. Control Variables

Companies of different sizes and ages may exhibit different organizational and environmental characteristics [82], which may influence knowledge-based resources. Therefore, we included firm size and age as control variables. Different industries have different demands about knowledge, so we also controlled for industry. We measured firm size as the number of employees, while firm age was measured by the number of years that a new venture was in operation. Industries included the manufacturing industry, the commercial and service industry, and the high tech industry. In order to control the influence of districts, we controlled for Jilin province, Fujian province and Beijing city. We treated industries and areas as dummy variables. For the individual control variables, we controlled for entrepreneur's age and education. For the entrepreneurs' age, we asked the respondents to select their year of birth: (1) 1980 or later; (2) 1980–1970; (3) 1970–1960; (4) 1960–1950; (5) 1950–1940. For the entrepreneur's education, we asked the respondents to select (1) primary school; (2) junior high school; (3) senior high school; (4) junior college; (5) college; (6) graduate student and above.

4.3. Construct Validity

We assessed the construct validity by running a confirmatory factor analysis with structural equation modeling using LISREAL software. Table 2 shows the goodness-of-fit index ($\chi^2 = 1669.39$, $df = 296$, $p = 0.000$, $GFI = 0.945$, $CFI = 0.94$, $NFI = 0.93$, $RMSEA = 0.11$), which indicates that the model was acceptable; all factor loadings were highly significant ($t > 1.96$), which indicates the unidimensionality of the measures. The composite reliabilities of all multi-item measures (ranging from 0.88 to 0.95) exceeded the usual 0.70 benchmark. The AVE values ranged from 0.51 to 0.63. All factor

loadings were higher than 0.5 except for the first item of social network size (loading = 0.36), which was deleted in the following statistics. Thus, these measures demonstrated sufficient convergent validity.

Table 2. Convergent validity.

Variables	Items	Loadings	T-Values	AVE	CR
Social network size	ND1	0.36	7.16	0.51	0.89
	ND2	0.57	11.82		
	ND3	0.54	11.15		
	ND4	0.68	16.02		
	ND5	0.79	18.42		
	ND6	0.77	17.57		
	ND7	0.78	18.1		
	ND8	0.78	18		
	ND9	0.73	16.53		
Knowledge-based resources	K1	0.74	17.05	0.63	0.95
	K2	0.8	19.14		
	K3	0.85	20.97		
	K4	0.83	20.32		
	K5	0.78	18.35		
	K6	0.8	18.93		
	K7	0.77	18.09		
	K8	0.79	18.59		
	K9	0.78	18.37		
	K10	0.8	19.22		
	K11	0.78	18.51		
Trust	T1	0.83	19.75	0.57	0.88
	T2	0.79	18.44		
	T3	0.83	19.87		
	T4	0.85	20.51		
	T5	0.65	14.04		
	T6	0.51	10.51		

Chi-Square = 1669.39, df = 296, p -value = 0.00, RMSEA = 0.11, NFI = 0.93; NNFI = 0.94; CFI = 0.94.

Discriminant validity means the degree to which measures of different latent constructs are unique enough to be distinguished from other constructs; this can be demonstrated if the AVE value for each construct (within-construct variance) is greater than the squared correlations between constructs (between-construct variance). Table 3 shows that all the correlations between constructs were lower than 0.85, and all the square roots of AVE values were higher than the correlations between constructs. Overall, the discriminant validity was sufficient for this study.

Table 3. Discriminant validity.

Variables/AVE	Network Scale	Knowledge-Based	Trust
Social network size	0.71		
Knowledge-based resources	0.574	0.79	
Trust	0.415	0.501	0.75

4.4. Analysis and Results

In order to examine the hypotheses, we performed a regression analysis. We split the sample into two parts according to the level of trust (high or level). To reduce the potential threat of multicollinearity, we mean-centered all variables. To examine the hypotheses under different contexts, we included the variables in the model block by block. We reported the estimated effects of social network size

on knowledge-based resources under high-level—and low-level—trust conditions, respectively (see Table 4).

Table 4. Regression analysis.

Variables	Knowledge-Based Resources					
	Low-Level Trust			High-Level Trust		
Control variables	M1	M2	M3	M1	M2	M3
Entrepreneur age	−0.226 **	−0.179 **	−0.170 **	−0.156	−0.115	−0.110
Entrepreneur education	−0.021	−0.024	−0.016	−0.162 *	−0.159 **	−0.162 **
Manufacturing industry	−0.005	0.043	−0.013	−0.119	−0.121	−0.127
Service industry	−0.341	−0.341	−0.356	−0.145	−0.158	−0.125
High-tech industry	−0.010	0.001	−0.027	0.159	0.163	0.163
Firm age	−0.106	−0.078	−0.074	0.050	0.020	0.017
Firm size	0.152 **	0.138 *	0.118 *	0.067	0.075	0.071
Jilin province	0.134	0.140	0.143	0.022	0.075	0.078
Beijing city	0.122	0.124	0.138	0.019	0.059	0.074
Fujian province	0.423 **	0.329 *	0.304	0.204	0.171	0.173
<i>Independent variables</i>						
Network size ¹		0.256 ***	0.138		0.550 ***	0.533 ***
(Network size) ²			−0.339 **			−0.078
R ²	0.212	0.277	0.327	0.106	0.329	0.331
F	2.208 **	7.323 ***	5.832 **	0.88	24.247 **	0.241
df	10/82	1/81	1/80	10/74	1/73	1/72
R ² change		0.065	0.049		0.223	0.002

¹ Under high-level trust conditions. ² Under low-level trust conditions. *** $p \leq 0.001$; ** $p \leq 0.01$; * $p \leq 0.05$.

Hypothesis 1 pertains to a high level of trust. As Table 4 shows, model 1 is the basic model that includes only control variables. None of the control variables—except for entrepreneur education—had a significant effect on knowledge-based resources. The significance of a change in the square of the multiple correlation coefficients was examined using an F-test [83] to test the impact of an increment in the proportion of variance. The increase in R^2 from model 1 to model 2 was $\Delta R^2 = 0.223$ ($p < 0.05$). Social network size had a statistically significant, positive effect on knowledge-based resources ($\beta = 0.550$, $p < 0.01$). However, the variance increment from model 2 to model 3— $\Delta R^2 = 0.002$ ($p > 0.1$)—was not statistically significant. It also showed that the squared term of social network size did not have a significant effect on knowledge-based resources ($\beta = -0.078$, $p > 0.1$). These results fully support hypothesis 1. Thus, when the level of trust was high, social network size had a positive linear effect on knowledge-based resources.

Hypothesis 2 pertains to a low level of trust. As Table 4 shows, in model 1, only three control variables—entrepreneur age, firm size and Fujian province—positively influenced new ventures' knowledge-based resources. The increase in R^2 from model 1 to model 2 was $\Delta R^2 = 0.065$ ($p < 0.01$). Social network size had a significantly positive effect on knowledge-based resources ($\beta = 0.256$, $p < 0.01$). Similarly, the variance increment from model 2 to model 3 was $\Delta R^2 = 0.049$ ($p < 0.05$), which was also statistically significant. In addition, it shows that the squared term of the network size had a significant effect on knowledge-based resources ($\beta = -0.339$, $p < 0.05$). That is, under low-trust conditions, a curvilinear (inverted U-shaped) relationship existed between social network size and knowledge-based resources for new ventures. This seems to indicate diminishing returns for a large network in the low-level trust context. Figure 1 further depicts the relationships between social network size and knowledge-based resources for new ventures under the high- and low-level trust conditions. These results fully support hypotheses 1 and 2.

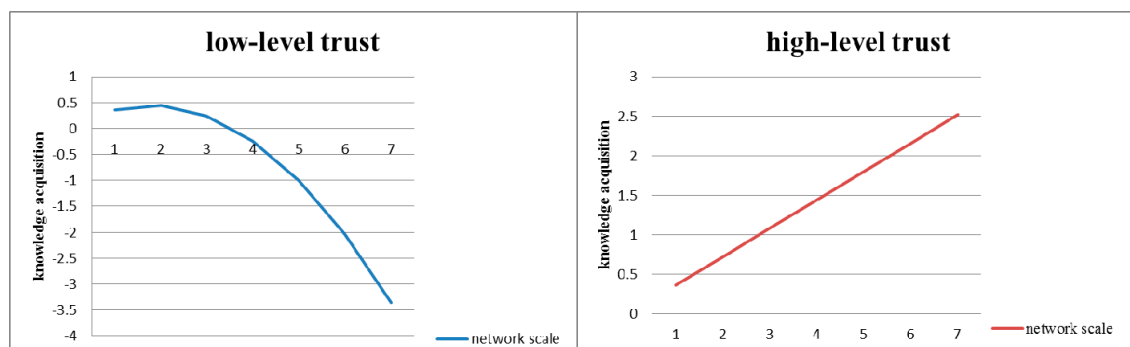


Figure 1. The relationship between social network scale and knowledge-based resources.

5. Discussion

Conceptual and empirical studies have shown that social network relationships are important for new ventures to acquire market and technological knowledge [7,9,38,70]. Network relationships act as a suitable channel for the flow of information into firms' decision-making process. Therefore, it is expected with increasing the size of social network, the firms develop their knowledge-based resources more easily [7]. Supporting this idea, the previous studies showed that social network influences knowledge-based resources acquisition directly [9,38].

In the context of China, our finding reveals that social network size indeed had a positive impact on knowledge-based resources of new ventures. However, the relationship between social network size and knowledge-based resources depended on how network partners or members trust each other. When the level of trust within the social network was high, social network size positively influenced new ventures acquiring and developing knowledge-based resources. It is worth knowing how new ventures in China develop an acceptable level of knowledge-based resources (market knowledge and technology knowledge). Having market and technological knowledge is crucial for new ventures to understand and to better predict customers' needs [1], and to identify and exploit market opportunities [33–35]. Most new ventures in China are small in size and they lack the legitimacy which it makes difficult to develop rich knowledge-based resources.

Most importantly, our results confirmed that when the level of trust within the social network was low, the relationship between social network size and knowledge-based resources was shaped like an inverted U. This means if entrepreneurs cannot be trusted by information providers, they need to establish a smaller sized social network. However, too small a social network could not bring lots of market and technology-based knowledge, and too large a social network brings in more cost to sustain the social network, which reduces the benefit. However, our study shows that there is not only a linear positive relationship between social network size and knowledge-based resources, but there is also an inverted U shape relationship between the above two variables. That is because previous studies ignored the contextual factors such as the level of trust between partners of social networks. Our research tries to reflect the unique characteristics of entrepreneurial activities under a Chinese context through examining a more specific and complex set of hypotheses which suggest the relationship between social network size and knowledge-based resources varies from high to low levels of trust. Therefore, the contingency variable—trust—played a key role for entrepreneurs to make decisions on network development. Entrepreneurs should build the proper size network to acquire knowledge-based resources in China.

This paper extended the current literature in some ways. First, developing social networks has been considered as a method to increase entrepreneurs understanding about the market and the business environment [84–86]. The larger the social networks, the more possibility to know what is going on in the market [17]. This study brought into sharper focus the impact of social network size, and examined how it influenced one specific kind of firm tangible resource, knowledge-based resource through moderating the role of trust. Trust has been considered as an important factor for

developing social networks [20]. Prior studies tended to cover general network research, but this study focused on just one of the dimensions—network size—in order to enrich the extant research. Second, providing additional richness to the extant research, this study examined the moderating effect of trust within the network on the relationship between social network size and knowledge-based resources. Third, although there are some studies that are involved in social networks and knowledge-based resources for established companies in a developed economy [9,40,87], our study contributes to this stream of research by studying the effects of social network on development knowledge resource in new ventures [84] in a transitional economy (China). Accordingly, our study enriches the Chinese contextual management theory.

6. Managerial Implications

Our findings provide some important managerial implications. People typically think that social network relationships would help new ventures get more resources: The more relationships built by new ventures, the more knowledge-based resources they would have. However, the relationship between social network size and knowledge-based resources may be more complex than that. Thus, trust within a social network should be considered when acquiring knowledge-based resources through networks. While our results showed that when the level of trust was high in network relationships, new ventures should be encouraged to develop as many relationships as possible, because high-level trust helps new ventures build relationships easily and inexpensively. Entrepreneurs are more likely to believe each other when the level of trust is high. High-level trust assists new ventures make more relationships and also helps new ventures quickly gain knowledge-based resources.

When the level of trust is high in a network, new ventures can maximize the knowledge imparted by having a network of numerous partners who are not otherwise interconnected [73]. This means that a large network can unite various partners who are distinct from each other and supply various knowledge-based resources, which implies that sources of knowledge-based resources will be diverse and unique [88]. Hence, if entrepreneurs want to obtain various knowledge sources, they need to build weak relationships—involving relatively low intimacy and infrequent contact. Such network relationships are likely to provide various kinds of knowledge-based resources, enabling a broader and more complete knowledge source.

When the level of trust is low within a network, however, new ventures should build relationships according to their current state. Our results suggest that new ventures should not rely on the size of a network; otherwise, they may spend more time and money maintaining the existing relationships and exploring new relationships. This is because when the level of trust is low, entrepreneurs are less likely to believe each other. New ventures cannot get access to knowledge-based resources easily. Thus our curvilinear effect provides an obvious warning to new ventures under low-level trust conditions: Only a network with an appropriate size—not too large and not too small—is helpful for new ventures to get knowledge-based resources (see Figure 1).

Our results also suggest that entrepreneurs need to be smart and flexible in low-level trust conditions. They may rely on some market institutions, such as contracts, courts and competitive forces to coordinate knowledge-based resources [48]. It is also worth noting that, because of low-levels of trust, it is not helpful for new ventures to develop a large network. Therefore, new ventures should build some high-quality network relationships that include dense or intimate relationships. Besides trading relationships, entrepreneurs could also develop friendships or other network relationships to get knowledge-based resources [88]. Although dense or intimate relationships signify a smaller social network, they tend to be simple yet strong, which can help new ventures acquire more knowledge-based resources.

7. Limitations and Future Research

Similar to other studies, our research suffers from some limitations. The first limitation of this study is in regards to the geographical distribution of selected firms. We have collected our data

from three major provinces in China namely Beijing, Jilin and Fujian province. Future research in the context of China may consider more regions. For increasing the generalizability of our finding, future research may test our model by using data from developing countries as well. Second, this research used cross-section data to analyze the relationship among social network, trust and knowledge-based resources. However, the effect of trust may change over time and with the growth of new ventures. Therefore, longitudinal design may provide a much clearer picture about the relationships among social network, trust and knowledge-based resources. Since we collected our data from only one country, we did not include the cultural factors in our model. Future research should consider the moderating effect of culture when generalizing our results to other transitional countries. For example, future research could compare how the individual and collectivistic culture aspects effect the role of trust within a social network.

8. Conclusions

In the context of social innovation or “Education for Sustainable Development” (ESD), previous studies have highlighted the important role of social networks in enhancing the learning process [89] and in generating new ideas within network members [90]. Social networks provide great opportunities for problem-solving by accelerating the knowledge and information flow within members of networks [59]. Our theoretical approach and empirical results offer some contributions to the literature on social networks. First, our study offers new insights on the relationship between social network and knowledge-based resources by focusing on a specific dimension: network size. Our work deepens the extant research on network studies by providing an answer for critical questions of how knowledge is being generated [91].

Second, our study enriches the contingent view of social network theory by exploring different conditions. The results of our research of the relationship between network size and knowledge-based resources were more complex than many would have previously expected. Our research was based on a sampling of new ventures in China—a country which is transforming from a planned economy to a market economy. The level of trust is different from one kind of network to another, which makes the relationship even more complex. Third, our empirical study showed that under low-trust conditions, there was a curvilinear relationship between social network size and knowledge-based resources (see Figure 1). This means we cannot simply examine the role played by social networks; instead, we need to develop increasingly complex and robust methods to study social networks.

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