

Entrepreneurial Networking Actions and Innovativeness of Opportunities: The Moderator Role of Venture Stage

創業網絡行動與機會創新性：創業階段的調節效果

Ru-Mei Hsieh, Program in Interdisciplinary Studies, National Sun Yat-sen University
謝如梅 / 國立中山大學人文暨科技跨領域學士學位學程

Shih-Chieh Fang, Department of Business Administration, National Cheng Kung University
方世杰 / 國立成功大學企業管理系

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Abstract

Developing a social network requires entrepreneurs to perform proactive and strategic actions. This study uses a 2-phase study design to investigate the effects of the performance of two social networking actions by entrepreneurs on the innovativeness of opportunities. During the first phase of the study, we interview 20 entrepreneurs from Taiwan's information and communication technology (ICT) firms. Using qualitative analysis, the result indicates that venture stage changes the effect of the two networking actions on the innovativeness of opportunities. The second phase, retrieves 86 complete questionnaires for an empirical analysis. The results indicate that the action of social network broadening exerts a significant positive effect on the innovativeness of opportunities. Furthermore, the positive effects of social network broadening on the innovativeness of opportunities is greater among early-stage ventures than late-stage ventures. Conversely, the positive effects of social network deepening on the innovativeness of opportunities is significantly greater among late-stage ventures than early-stage ventures.

【Keywords】 entrepreneurship, networking action, innovativeness of opportunities, venture stage

摘要

本研究指出創業者發展社會網絡應是主動且有策略性之行動，以兩階段研究調查創業者採取之社會網絡行動（網絡擴展與網絡深化）對機會創新性之影響。第一階段針對20位台灣資通訊產業（ICT）創業者，進行深度訪談與質性分析，結果發現前述關係會因為創業階段而受到影響。在第二個階段以2000位資通訊產業創業者為問卷發放對象，共回收86份問卷進行實證分析。研究結果發現網絡擴展行動對機會創新性呈現正向顯著影響效果；但在同樣採取網絡擴展的情況下，新設企業對創新機會的影響會比現有企業來的高。相反地，採取網絡深化的情形下，現有企業在創新機會的影響上則會比新設企業來的顯著。

【關鍵字】 創業、網絡行動、機會創新性、創業階段

1. Introduction

Social networks have been among the key topics in entrepreneurship for a long time (Hoang and Antoncic, 2003; Hoang and Yi, 2015; Stuart and Sorenson, 2007). Previous studies primarily focus on network content, governance and structure, and network processes to understand the purposes and applications of social networks (Hoang and Antoncic, 2003; Slotte-Kock and Coviello, 2010). However, most studies regard the social networks of entrepreneurs exogenous to their entrepreneurial work, focusing on investigating the information or resource efficiency accorded by existing networks (Ma, Huang, and Shenkar, 2011; Ozgen and Baron, 2007) but overlooking the formation and evolution of networks by entrepreneurs in the early stages of forming a business (Newbert, Tornikoski, and Quigley, 2013; Stuart and Sorenson, 2007).

In a “from nothing to something” context, social networks of entrepreneurs are different from the abundant network relationships and positions that established firm owners can apply. Entrepreneurs must have a strong understanding of how to develop and engage in networking actions (Stuart and Sorenson, 2007; Vissa, 2012). Recent entrepreneurship and network studies address the agentic perspective (Vissa and Bhagavatula, 2012). This stream of research highlights how relevant the actions of entrepreneurs is to creating and shaping personal network ties. For example, Ozcan and Eisenhardt (2009) analyze network strategies and strategic actions to fill the research gaps created by treating network structures as exogenous. They indicate that actors strategically develop and evolve their network relationships on the basis of their capabilities. Vissa (2012) investigates the differences in the dependency of entrepreneurs on referrals when selecting various networking actions (i.e., network deepening and broadening) and searching for new economic exchange partners.

This study suggests that the social networks of entrepreneurs are actively and strategically constructed by performing networking actions. We address recent requests for a more complete understanding of networking actions (Vissa, 2012; Vissa and Bhagavatula, 2012). The actions that entrepreneurs perform to develop their personal networks are solely focused on existing or new ties.

Social networks are a source of acquiring tangible and intangible resources, such as social capital, emotional support, and reputation (Ma et al., 2011). In addition, many actors use social networks to enter particular industries and understand major technology, market, and policy changes in those industries (Ozgen and Baron, 2007). Therefore, social networks are crucial for new ventures because networking influences resource

mobilization and opportunities through personal network contacts (Vissa, 2012; Vissa and Bhagavatula, 2012). Marvel and Lumpkin (2007) suggest that a high degree of innovation is associated with opportunities that enhance the potential of venture creation. Ucbasaran, Westhead, and Wright (2009) report that innovative opportunities are an indicator of value creation.

Opportunities arise in changing external environments when disequilibrium occurs between market supply and demand, or when resources are neglected or inadequately used (Shane, 2000). Entrepreneurs typically innovate using the means–ends framework, enabling the creation of value (Ardichvili, Cardozo, and Ray, 2003). Studies indicate that information asymmetry facilitates the procurement of information and resources by using the structural positions of social networks, various types of networks, or contact ties, which enable innovative opportunities to be identified (Ozgen and Baron, 2007; Shane and Venkataraman, 2000; Hsieh and Kelley, 2016).

The general findings from prior research on the benefits of networking actions and innovative opportunities is mixed. Prior research determines that broadening a network reduces reliance on referrals when searching for new exchange partners. Furthermore, deepening a network causes a greater reliance on referrals (Vissa, 2012). Nascent entrepreneurs with diverse networks more commonly encounter promising opportunities than those without such networks do (Stuart and Sorenson, 2007; Hsieh and Kelley, 2016). However, the relationship between the networking actions of entrepreneurs and the innovativeness of opportunities is less clear in different contexts. Because of the significance of costs and benefits associated with both broadening and enriching networks, many believe that successful entrepreneurs are those who leverage both actions.

To address the aforementioned literature gap, this study uses an action perspective to frame the first research question: *how do different networking actions (network broadening and deepening) of entrepreneurs influence the innovativeness of opportunities?* Additionally, this study further explores whether any moderators exist in the relationship between networking actions and the innovativeness of opportunities. The study investigates these topics by using a mixed method research approach. The process includes in depth interviews with 20 entrepreneurs from the Taiwanese information and communications technology (ICT)¹ industry. The results of the interviews are used to

1 ICT refers to technologies that provide access to information through telecommunication. The sector includes software, hardware, and telecommunication companies.

identify possible moderators of the relationship between networking actions and the innovativeness of opportunities in an entrepreneurial process. The results show that the stage of a venture is a critical moderating variable that influences the relationship between networking actions and the innovativeness of opportunities. Therefore, the second research question follows by asking: *how does venture stage moderate the relationship between networking actions and the innovativeness of opportunities?* A survey questionnaire method is used in Study 2 to examine three hypotheses.

This study provides the following contributions to related literature. First, previous social networking studies focus on the effects of existing network structures and content on entrepreneurship instead of examining networking actions (Newbert et al., 2013). A study by Vissa (2012), contributes to the literature on the network agentic perspective by providing evidence that networking actions (network broadening and network deepening) influence the innovativeness of opportunities.

Second, the contingencies which govern when certain networking actions are the most beneficial to the innovativeness of opportunities are ambiguous. Study 1 observes that the personal networking action requirements of entrepreneurs may change over time (Slotte-Kock and Coviello, 2010). Therefore, how the optimal networking actions differ in early and late stages need to be considered. Using the two-stage research method to verify the results, the study determines that the venture stage plays an essential moderating role. This study contributes to network theory and entrepreneurship by introducing the effect of the venture stage. Theoretical and practical implications of this study are described according to the results.

2. Literature Review

2.1 Innovativeness of Opportunities

An opportunity is the potential to create new products or services, which may involve new markets or technology (Baron, 2006). Baumol (1993) states that innovation is not always necessary to start a business, but businesses that focus on productivity and economic growth require an innovating entrepreneur. This emphasizes the value of innovation-based entrepreneurship. More specifically, through innovation, entrepreneurs can improve their efficiency and effectiveness in existing markets, or create new business models in these markets (Gaglio, 2004). Therefore, the study agrees that “Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or a different service” (Drucker, 1985).

The innovativeness of an opportunity may reflect the quality of the opportunity (Ucbasaran, Westhead, and Wright, 2008; Hsieh and Kelley, 2016). Holmén, Magnusson, and McKelvey (2007) emphasize that innovative opportunities are a critical element of entrepreneurship and continual enterprise growth. Ucbasaran et al. (2009) examines the inverse U-shaped relationship between proportion of failed businesses relative to innovativeness of the latest opportunity exploited, but does not find the business failure experience associated with the innovativeness of exploited opportunities.

The innovativeness of opportunities involves developing technological innovations, providing customers with novel products or services, inducing changes in current industries, and helping customers solve their problems (Birley, 1985; Smeltzer, Van Hook, and Hutt, 1991). Entrepreneurs typically experience difficulty in surviving in the market due to numerous challenges associated with sustaining growth. If the innovativeness of opportunities identified in the early venture stage cannot drive new venture growth, then entrepreneurs must use various industry dimensions and experiences to seek new market opportunities. The concept of the innovativeness of opportunities comprises aspects related to the potential of a market and knowledge required to serve this specific market (Holmén et al., 2007).

2.2 Entrepreneurs' Networking Actions

Mitchell (1969) defines social networks as the specific ties or connections among people within a group, comprising formal and informal interpersonal relationships. Specifically, networks are structures created by the ties or connections among nodes. Nodes can represent people, teams, or organizations (Borgatti and Foster, 2003). Kristiansen (2004) suggests that social networks are composed of the formal and informal links between core actors and the people they are familiar with. In this study, social networks are defined as the relationships formed between two or more people or organizations. Networks are vital channels through where entrepreneurs obtain external information and resources.

Network broadening refers to “the extent to which an entrepreneur reaches out to new people and establishes interpersonal knowledge about them” (Vissa, 2012). Vissa (2011) uses matching theory to gain a deeper understanding of dynamic networks by examining the intentions of entrepreneurs to add ties to individual social networks. Vissa also suggests that task complementarity and social similarity are critical matching criteria because they influence an entrepreneur's interpersonal tie formation intentions, and examines whether matched relationships increase the potential for economic exchange.

Network deepening refers to “the extent to which an entrepreneur strengthens ties to existing personal network contacts by time pacing interactions with them, overlaying friendships over purely business relations, and preserving existing ties” (Vissa, 2012). Entrepreneurs practicing network deepening typically depend on the benefits provided by referrals. These entrepreneurs generally interact with their existing ties (e.g., family, friends, and colleagues), leading to the establishment of fewer new economic exchange activities (Vissa, 2012). Moreover, these entrepreneurs tend to favor time-based pacing and network preserving activities to develop deep and long-term relationships with their existing ties, and expand their networks by using existing ties based on the relational embedding approach.

2.3 Networking Actions and the Innovativeness of Opportunities

Recent opportunity studies treat social networks and information as critical antecedents to opportunities. Singh, Hills, Hybels, and Lumpkin (1999) observe that large social networks facilitate the identification of opportunities for entrepreneurs. Shane (2000) suggests that opportunity recognition develops from social information. These assertions are consistent with the hypothesis that not all people can identify opportunities (Kirzner, 1997), indicating the relevance of information to opportunity recognition.

Network broadening actions comply with a type of social networking strategy where entrepreneurs interact with people other than their current ties (e.g., participating in industry forums and business-related networking events), actively meet new friends, and establish business relationships (Vissa, 2012). When executing network broadening actions, entrepreneurs contact a wider collection of relevant new people. These new people are particularly relevant because they share social similarities and task complementarities (Vissa, 2011). Grossman, Yli-Renko, and Janakiraman (2012) assert that entrepreneurs seek network contacts who are perceived to offer potential access to the widest variety of resources.

In summary, network broadening actions increase exposure to new people and create heterogeneous ties which enable access to various resources. Entrepreneurs can obtain diverse, novel, and cross-field business information and resources, increasing the level of innovativeness of opportunities by undertaking actions such as creating new means–end frameworks in new markets. In accordance to this, this study proposes Hypothesis 1.

H1: Entrepreneurs who engage in more interpersonal network broadening actions are associated with greater innovativeness of opportunities.

Network deepening actions refer to actions which constantly strengthen relationships with existing ties and involve the exploitation of existing referrals to expand relationships. Thus, entrepreneurs who are involved in network deepening actions engage in interpersonal activities to maintain long-term relationships. Entrepreneurs applying this strategy frequently interact with existing ties to increase cohesion, which then facilitates the sharing of private information (Uzzi, 1996).

Performing more network deepening actions involve more frequent interactions with existing contacts. Entrepreneurs create friendships through work-related interactions. Because relationships are based on trust and relational embedding, entrepreneurs involved in network deepening actions can easily access required resources from their current network ties (Vissa, 2011).

The innovativeness of opportunities refers to the realization of new resources combinations and market requirements. An actor pursuing an opportunity can approximate the economic value it generates (Holmén et al., 2007). When entrepreneurs engage in network deepening actions, they obtain private information that is not easily accessible and facilitate innovation, thereby increasing the possibility of creating innovative opportunities.

H2: Entrepreneurs who engage in more interpersonal network deepening actions are associated with greater innovativeness of opportunities.

2.4 Moderating Role of the Venture Stage

Entrepreneurship is a dynamic and discontinuous process of change (Bygrave and Hofer, 1991); therefore, due to internal and external factors of continuous change, the resource demands of entrepreneurs vary according to their venture stage (Eckhardt and Shane, 2003; Newbert et al., 2013). Resource demands vary during entrepreneurial processes because of uncertain or unknown factors (Hofer and Bygrave, 1992). Hence, the network ties of entrepreneurs are critical channels for procuring required resources (Stam, Arzlanian, and Elfring, 2014; Sullivan and Ford, 2014). However, when the resource requirements of entrepreneurs vary, existing network ties may not be able to fulfill them; in such a case, entrepreneurs must employ diverse social networking actions to obtain the necessary resources and solve various problems encountered in different venture stages (Klyver and Terjesen, 2007; Newbert et al., 2013).

Koberg, Uhlenbruck, and Sarason (1996) studies 326 high-tech enterprises in the United States and identifies the enterprise life cycle as a crucial moderating variable

which influences organizational innovation. Their results indicate that the processing of external information is critical to both new and established enterprises. During early venture stages, enterprises typically lack resources and do not have fully established social networks in their industries (Grossman et al., 2012; Koberg et al., 1996). Thus, they often leverage ties on the basis of necessity rather than convenience (Newbert et al., 2013). Nascent entrepreneurs perform extremely strategic social networking actions to seek and develop the innovativeness of opportunities (Vissa, 2012).

Previous empirical studies produce similar results. Greve and Salaff (2003) suggest that a large network is more beneficial to early-stage ventures than to late-stage ventures. Sullivan and Marvel (2011) conduct an investigation on 174 owners of enterprises that were less than 1 year old and indicate that the number of network ties positively moderate the relationship between the knowledge sets of entrepreneurs and the number of employees. Newbert et al. (2013) observes that the more heterogeneous the strengths provided by a nascent entrepreneur's network of ties, the more likely it is that an organization would emerge. In other words, nascent entrepreneurs should be vigilant in their networking efforts throughout the emergence phase to ensure success.

On the basis of resource dependency theory, Sullivan and Ford (2014) analyze differences in network size during the venture-launch and early developmental stages. The results indicate that network size is positively correlated with enterprise success during the two stages. A large network during the early stage of development benefits entrepreneurial resources because it enables entrepreneurs to mitigate the limitations imposed by an overdependence on resources. Therefore, when problems such as survival concerns and high levels of uncertainty arise, new enterprise entrepreneurs must acquire novel information from various domains by broadening their social networks to create the innovativeness of opportunities which can be used to access new clients or markets (Vissa, 2012). Consequently, this study posits that applying network broadening actions during the early stage of a venture exerts a more positive effect on the innovativeness of opportunities than applying network broadening actions during the late stage (Hypothesis 3a).

H3a: The positive effects of network broadening actions on the innovativeness of opportunities are greater among early-stage ventures than among late-stage ventures.

Entrepreneurs from late-stage firms develop many types of ties in their industries. These entrepreneurs must use these ties to maintain interactions and obtain more exclusive or valuable information to recognize innovative opportunities (Koberg et al., 1996). Although enterprises in the growth and stability stage have already gradually expanded and determined their place in markets, this stability reduces their level of organizational innovation (Koberg et al., 1996; Mueller, 1972; Wu, Wang, Chen, and Pan, 2008). As organizations mature, entrepreneurs concurrently develop more complete social network relationships in their industries and, thus, engage in network deepening actions and maintain excellent interactions with their ties based on their existing network relationships to obtain information and resources.

Wu et al. (2008) explores the competitiveness of the external networks of Taiwanese high-tech ventures that were in the growth stage and discovers that these enterprises require high levels of trust as they enter the stability stage to increase their intention to cooperate, which encourages competitiveness and enhances innovation. Consequently, ties developed through network deepening reflect long-term interaction and trust, which facilitate subsequent innovativeness of opportunities. This study proposes that the application of network deepening activities by entrepreneurs from established enterprises exerts a greater positive effect on the innovativeness of opportunities than by entrepreneurs from new enterprises (Hypothesis 3b).

H3b: The positive effects of network deepening actions on the innovativeness of opportunities are greater among late-stage ventures than among early-stage ventures.

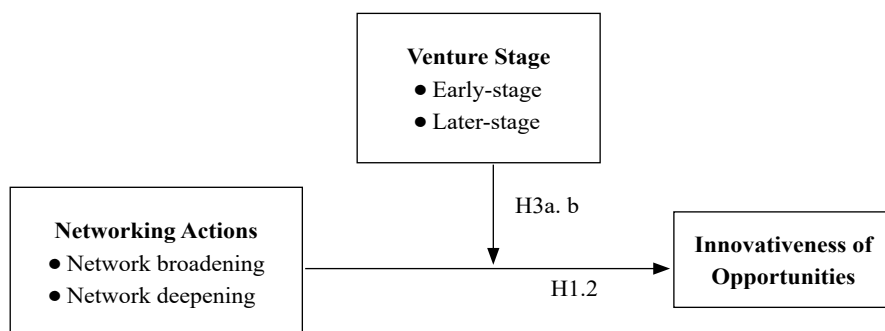


Figure 1 Theoretical Framework

3. Methodology

3.1 Study 1

The purpose of Study 1 is to generate contingency variables, which involve interviewing entrepreneurs on their network actions and the innovativeness of opportunities in various situations. The study interviews 20 Taiwanese ICT entrepreneurs on the networking actions taken during the new venture creation process. In order to capture a full range of network-related strategic actions, the participants include entrepreneurs of different experience levels.

Each participant is a founder of an ICT company still currently operating in the market. Interviewees are asked to describe their actions and thoughts regarding social networking. The interview data are collected from each entrepreneur during an in-person meeting through recordings and note taking. The interviews have taken place between October 2010 and November 2011. The study begins with 60–90 minutes of semi-structured interviews, where the entrepreneurs describe how their networking actions contribute to the development of their individual businesses. Each interview begins with a discussion on the entrepreneur's background and his or her entrepreneurial experience. To proceed, the entrepreneurs are asked a general question: "Did you network in your effort to start your business, and if so, for what reason?" Of the 20 participants, 90% are men and have an average age of 45 years old. On average, the participants have 17 years of full-time work experience, and the average age of their companies is 10 years.

3.1.1 Data Analysis

Upon the review of the transcripts of all of the interviews, the analysis files are developed. Subsequently, this study identifies interview texts related to entrepreneurial network formation and actions. The coding process involves several steps. During the first-order analysis, the authors and two MBA students produce three sets of data by separately coding the interview data. This analysis process yields a data set of 77 codable statements related to networking actions, the innovativeness of opportunities, and venture stages. Each statement consists of a sentence or a sequence of sentences conveying a coherent point (Weber, 1990). During the second cycle of analysis, 18 first-order categories and four second-order themes and aggregate dimensions are also coded. Venture stages are identified to be highly related to the networking actions and the innovativeness of opportunities.

3.1.2 Study 1: Findings

Entrepreneurship is a dynamic and discontinuous process of change which involves

numerous unknown factors, continually changing internal, and external factors that cause entrepreneurs to have various resource demands and apply strategic actions at different venture stages. Several entrepreneurs have indicated that they apply different social network behaviors at different venture stages. Thus, the venture stage is added as a moderating variable.

As new venture operations grow and stabilize, entrepreneurs focus on leveraging external relationships to achieve continual growth and address the challenge of developing new products or markets (Wu et al., 2008). By using the classification systems adopted by Koberg et al. (1996) and Sullivan and Ford (2014), ventures are sorted into new businesses and established firms categories to examine the effects of various venture stages (i.e., early and late stages) on social networking behaviors and the innovativeness of opportunities.

3.2 Study 2

3.2.1 Research Design

The purpose of Study 2 is to examine the influence of venture stage on the relationship between networking actions and the innovativeness of opportunities. Studies are conducted on the individual founders of new ventures to avoid complications from the multiple networks challenges encountered by start-up teams. To test the hypotheses, a survey was conducted from March 2012 to September 2012. First, two ICT entrepreneurs were survey to do preliminary testing of the questionnaire and formatting and wording were revised based on their suggestions. Preliminary testing is also conducted with the modified questionnaire by administering it to 30 ICT entrepreneurs from a university-affiliated business incubator in Taiwan. At last, 2000 questionnaires are randomly mailed to registered ICT companies identified using the databases of the Taiwanese Ministry of Economic Affairs, science parks, and a university-affiliated business incubator. The mailed questionnaire consists of a cover letter, the questionnaire, and a stamped return envelope.

The final sample consists of 86 complete questionnaires with a response rate of 4.3%. Of the respondents, 87% are men. The average age of the respondents is 43.2 years (standard deviation; SD = 8.6). In terms of education level, 63% of the respondents hold a 4-year college degree (20.5% hold a master's degree). On average, the participants have 10.66 years of full-time work experience (SD = 6.94). Most ventures are small and medium-sized enterprises, and 33.3% and 75% of the participants established their

enterprises using capital worth less than USD 35,000 and USD 350,000, respectively. Of the ventures, 42% are early-stage ventures (registered fewer than 5 years ago) and 58% are late-stage ventures (registered more than 5 years ago).

3.2.2 Measures

Independent variables: Networking actions

This study uses the measures for networking actions described by Vissa (2012). Network broadening is measured using three items relevant to accessing new networks ($\alpha = 0.888$). The items are, “When I attend industry forums and other business-related networking events, I build connections with people I did not know before,” “When I attend social events, I build connections with people I did not know before,” and “When meeting a new person, I find out how he or she will benefit from our (potential) relationship.” Responses to the questions range from 1 (*strongly disagree*) to 7 (*completely agree*).

Three items on relational embedding (the extent to which an entrepreneur seeks to combine social and business relations with existing contacts) are used to measure network deepening ($\alpha = 0.851$). The items are, “I take actions to build personal friendships with my business contacts”, “I socialize with my business contacts”, and “I convert work relationships to personal relationships in stages.”

Dependent variable: Innovativeness of opportunities

The innovativeness of opportunities is measured by using items adapted from Baron (2006), Holmén et al. (2007), and Koellinger (2008). The innovativeness of opportunities is defined as the possibility of realizing the potential economic value inherent in a new combination of resources and market demands that emerges from changes in the scientific or technological knowledge base, customer preferences, or relationships between economic actors.

Four items are used to measure the innovativeness of opportunities: technology or service, provision of a new product or service, the level of industry change represented by the product or service, and solving customer problems ($\alpha = 0.876$). Responses range from 1 (*strongly disagree*) to 7 (*strongly agree*).

Moderator: Venture stage

This study separates the venture life cycle into two stages: the early stage and the late stage (Koberg et al., 1996; Sullivan and Ford, 2014; Stam et al., 2014). The year that a company is registered with the Ministry of Economic Affairs in Taiwan determines the venture stage. Businesses are classified as early-stage ventures if they were registered

fewer than 5 years ago (1), and as late-stage ventures if they have been registered for more than 5 years (2). This cutoff point ensures a balanced distribution of early- and late-stage ventures in the sample.

Control variables

This study includes controls for the variables that may affect the examined relationships: age, education, work experience, and capital. Work experience is measured by asking the participants to indicate how many years they have worked in a full-time job. Variables for age and education are controlled because these variables can be linked to prior knowledge and social networks (Ozgen and Baron, 2007, Sullivan and Marvel, 2011). Studies indicate that the level of education and work experience can exert a strong effect on opportunity recognition (Marvel and Lumpkin, 2007). The amount of available capital may also affect the model.

3.2.3 Reliability and Validity Assessment

Feedback from the pretest interviews is used to increase the construct validity of the questionnaire measures. The entrepreneurs discuss their interpretations of each questionnaire item to identify any ambiguous phrasing. Their comments are incorporated into the structured questionnaire revision, thus increasing the scale validity. Furthermore, the interrater reliability to test the agreement of the items. The responses of three assistant professors of management with PhDs were consistent with the factor analysis (an agreement rate of at least 80% existed among multiple raters; Hinkin, 1998). No major problems have been detected with the structured questionnaire.

3.2.4 Common Method Variance

Self-report questionnaires are used to collect participant responses and Harman's one-factor test to test the common method variance (Podsakoff and Organ, 1986). Common method variance is not identified: three factors account for 72.56% of the variance, with the first factor accounting for 26.9% of the variance (Podsakoff, Mackenzie, Lee, and Podsakoff, 2003). The use of objective data (the registration year) to measure the venture stage might reduce the risk of common method variance.

4. Results

Table 1 shows a summary of the descriptive statistics and correlations for all of the variables used in the analysis. The results confirm the original expectations. Age is significantly correlated with work experience, capital, and the venture stage. Network broadening and deepening are correlated with the innovativeness of opportunities.

Table 1 Descriptive Statistics and Correlations

	Mean	S.D.	1	2	3	4	5	6	7
1. Age	43.21	8.59							
2. Education	2.76	.99	-.044						
3. Work experience	10.66	6.94	.420**	-.009					
4. Capital	2.48	1.44	.523**	.204	.248*				
5. Network broadening	4.37	1.55	.123	.187	.028	.165			
6. Network deepening	4.84	1.37	-.104	.225*	.107	.159	.488**		
7. Venture stage	1.58	.496	.528**	-.233*	.157	.316**	-.219	-.276*	
8. Innovativeness of opportunities	3.89	.64	.042	-.101	.251*	-.014	.282*	.262*	-.077

Note: * $p < 0.05$; ** $p < 0.01$

Hierarchical multiple regression analyses are used in testing the hypotheses; the results are reported in Table 2. The regression analyses use three models comprising the control variables (age, education, work experience, and capital), predictor variables (network broadening and network deepening actions), and moderating variable (venture stage).

Hypothesis 1 is used to examine the association between network broadening actions and the innovativeness of opportunities. Table 2 shows the results of the analyses of the three models. Age, education, work experience ($\beta = 0.297$, $p < .05$), and capital are included in Model 1 as control variables ($R^2 = 0.089$). Network broadening and network deepening actions are introduced as a step change in Model 2. The regression results for Model 2 suggest that the overall model is significant ($R^2 = 0.22$, $F = 2.707$, $p < .05$). The results indicate that network broadening actions ($\beta = 0.305$, $p < .05$) significantly contribute to the explanation of the variance. These results support Hypothesis 1. However, network deepening results do not support Hypothesis 2.

Hypotheses 3a and 3b state that venture stage moderates the relationship between networking action and the innovativeness of opportunities. This study uses a moderated hierarchical regression analysis to test the hypotheses (Cohen, Cohen, West, and Aiken, 2003) and applies a mean-centering procedure to the independent and moderating variables to minimize the effects of multicollinearity (Aiken and West, 1991; Paccagnella, 2006). The set of moderators are introduced as a step change in Model 3 ($R^2 = 0.282$, $F =$

2.838, $p < .01$). Network broadening actions and the venture stage are determined to be significant when testing Hypothesis 3a ($\beta = -0.256$, $p < .05$), and network deepening actions and the venture stage are determined to be significant when testing Hypothesis 3b ($\beta = 0.269$, $p < .05$). The results suggest that the moderating relationship is significant, supporting Hypotheses 3a and 3b.

Table 2 Regression Analysis Results: Interaction Effects of Networking Action and Venture Stage

Variables	Innovativeness of Opportunities		
	Model 1	Model 2	Model 3
Age	-0.085	-0.087	-0.096
Education	-0.117	-0.192	-0.146
Work Experience	0.297*	0.288*	0.250*
Capital	0.035	-0.009	-0.035
Network Broadening		0.305*	0.351**
Network Deepening		0.113	0.055
Venture Stage		-0.005	0.008
Network Broadening \times Venture Stage			-0.256*
Network- Deepening \times Venture Stage			0.269*
R ²	0.089	0.22	0.282
ΔR^2	—		
F Value	1.703	2.707*	2.838**

Note: * $p < 0.05$, ** $p < 0.01$

To further understand the nature of this relationship, the interaction is plotted on the basis of procedures described by Cohen et al. (2003). Figure 2 depicts the interaction plot and shows that the relationship between network broadening actions and the innovativeness of opportunities is strengthened in the early stage. By contrast, the relationship between network broadening actions and the innovativeness of opportunities weakens in late stages. This result indicates that network broadening actions increase the innovativeness of opportunities of a new venture in the early stage.

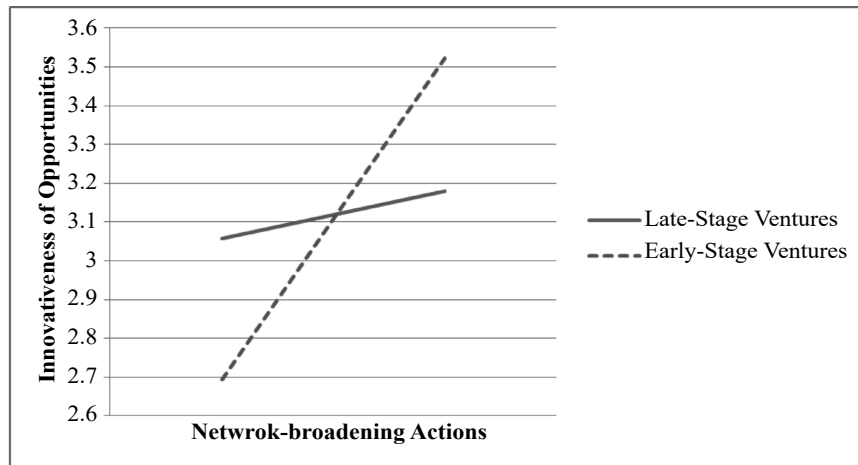


Figure 2 Effects of Network Broadening and Venture Stage on Innovativeness of Opportunities

Figure 3 reflects a contrasting pattern for the moderating effect of the venture stage. The relationship between network deepening actions and the innovativeness of opportunities is strengthened by the late stage. In contrast, the relationship between network deepening actions and the innovativeness of opportunities is weakened by the early stage. Although the relationship between network deepening actions and the innovativeness of opportunities do not support Hypothesis 2, it is observed that the venture stage exerts a significant moderating effect.

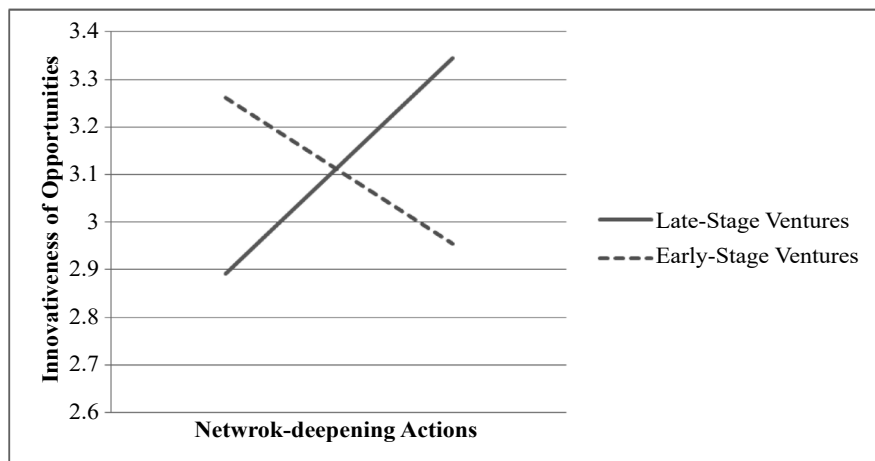


Figure 3 Effects of Network Deepening and Venture Stage on Innovativeness of Opportunities

5. Discussion

5.1 Relationship between Networking Actions and Innovativeness of Opportunities

Entrepreneurs notice changes and trends around them, especially those regarding new technologies and customer preferences in the field (Ozgen and Baron, 2007). They acquire information that influences whether and how they recognize opportunities (Singh, 2000). The acquisition of information from the environment is particularly critical for stimulating innovative outcomes (Escribano, Fosfuri, and Tribó, 2009).

The empirical results supporting Hypothesis 1 show that network broadening actions positively and significantly influence the innovativeness of opportunities. Entrepreneurs engaging in network broadening activities obtain diverse and novel information by interacting with new network ties. This result corresponds with the findings of previous studies (Granovetter, 1977; Newbert et al., 2013; Singh et al., 1999; Sullivan and Marvel, 2011) which assert that weak ties, a large network, and heterogeneous strengths provided by the network can provide novel information and resources. Furthermore, entrepreneurs can use information from various domains or industries to identify innovative opportunities, thereby significantly and positively influence the innovativeness of opportunities.

The results fail to support Hypothesis 2, which pertains to the effects of network deepening actions on the innovativeness of opportunities. The results indicate that although entrepreneurs who apply network deepening actions tend to share exclusive information and thus increase their probability of identifying opportunities, they also focus on maintaining network relationships to develop mutual trust (Wu et al., 2008). According to Singh et al. (1999) and Sullivan and Ford (2014), an excessive number of strong ties typically lead to the procurement of redundant information and an overreliance on a select few ties, limiting new resources, partners, and opportunities. Consequently, network deepening actions do not significantly affect the innovativeness of opportunities.

This study indicates that entrepreneurs should focus on expanding their networks and increasing new ties to improve the innovativeness of opportunities, and engage in network broadening actions to reinforce their sources of internal information and resources. Network deepening actions oriented toward maintaining existing relationships do not significantly benefit the innovativeness of opportunities. The results of this study show that by using more network broadening actions, entrepreneurs are likely to increase the innovativeness of opportunities.

5.2 Relationship between Venture Stages and Networking Actions

The results relevant to Hypothesis 3 suggest that network broadening actions performed by newly established enterprises affect the innovativeness of opportunities more than network broadening actions performed by established enterprises do, and that network deepening actions performed by established enterprises affect the innovativeness of opportunities more than network deepening actions performed by new enterprises do. Thus, the results of this study indicate that the venture stage moderates the relationship between entrepreneurial networking actions and the innovativeness of opportunities, suggesting that different networking actions should be applied on the basis of the venture stage.

When encountering survival challenges and high levels of uncertainty, new enterprises require many more connections than established enterprises do to procure new information and resources and, thus, overcome the liability of being new (Newbert et al., 2013; Stam et al., 2014; Sullivan and Ford, 2014). Therefore, network broadening actions exert a stronger effect on the innovativeness of opportunities than network deepening actions do. This finding is consistent with the results of Sullivan and Ford (2014). During the early stages of enterprise planning and establishment, large social networks facilitate the procurement of new information and opportunities.

Studies indicate that organizations evolve and encounter new challenges over time (Slotte-Kock and Coviello, 2010). For example, the primary problem experienced by newly established enterprises is survival; therefore, these enterprises typically focus on concerns such as raising capital, research and development, and marketing and sales (Cooper, Gimeno-Gascon, and Woo, 1994; Koberg, Uhlenbruck, and Sarason, 1996). However, additional uncertainties emerge over time, changing the resource demands of enterprises (Delmar and Shane, 2004; Gartner, 1985).

The results of this study indicate that network deepening actions affect the innovativeness of opportunities more when they were applied by established enterprises than when they were applied by new enterprises. Recent research has shown that entrepreneurs initially tend to search intensively for resources by forming many new ties, but only some of these ties are later transformed into strong ties (Stam et al., 2014). Social networks tend to increase in size, leading to an excess of new ties as enterprises enter the growth and stability stage. Therefore, long-term development and extended relationships are required for increased interaction and cooperation with existing ties to procure beneficial information.

The results of this study suggest that different networking actions should be applied on the basis of the life cycle stage of an enterprise. In the early stage, entrepreneurs should endeavor to broaden their network by increasing their interactions with external firms or industries and developing new ties. This contributes to the innovativeness of opportunities. In the late stage, as the number of ties and the number of people referring acquaintances or providing information increases, entrepreneurs should focus on deepening interactions with existing ties to strengthen current relationships and develop embedded relationships (Vissa, 2012).

6. Conclusion

The research model in this study is based on insights from the entrepreneurship, social network, and life-cycle literature. By reviewing and compiling the results of previous studies, the study determines that social network research typically concentrates on the benefits of networks to entrepreneurs and organizations, and rarely explores the networking strategies and actions of entrepreneurs (Newbert et al., 2013; Vissa, 2012). Therefore, this study focuses on the networking actions applied by entrepreneurs, investigating the effects that the interactions of various networking ties exert on the innovativeness of opportunities.

Qualitative interview data are collected during Study 1. The finding indicates that the venture stage is a crucial variable that influences networking actions and the innovativeness of opportunities. The results of Study 2 indicate that entrepreneurs who perform network broadening actions interact with new network ties (e.g., by participating in conferences or associations to establish cross-domain connections), and combine these ties with ties from other industries or domains, thereby increasing their cross-domain ties and innovativeness of opportunities. In contrast, entrepreneurs who employ network deepening actions tend to focus on developing relationships with existing ties. These circumstances facilitate the establishment of trusting relationships between entrepreneurs and network ties; however, overreliance on relationships may limit the potential benefits of networking (Sullivan and Ford, 2014), negatively influencing innovation. Therefore, the focus of networking actions should be adjusted on the basis of the venture stage to increase the innovativeness of opportunities.

6.1 Implications

This study has the following theoretical implications. First, on the basis of recent social network research, from an active perspective, this study investigates how entrepreneurs engage in social networking actions rather than examines the effects of network structures and content. Thus, the findings of this study address the research gaps that are related to this topic.

Second, the studies verify that social networking significantly and positively influences opportunities. This study reveals that engaging in network broadening actions increase the innovativeness of opportunities. Future studies should verify various dependent variables (e.g., enterprise performance and resource acquisition) (Newbert et al., 2013) to explore the effects that they exert on various social networking actions.

Third, this study uses a two-stage research method to determine that venture stages exert a critical moderating effect on the relationship between networking actions and the innovativeness of opportunities. This moderating effect occurs because social networking is highly correlated with time and situational variables. As entrepreneurs evolve with time, they constantly adjust their social network structures and strategies, changing their actions in response to situations (Newbert et al., 2013; Stam et al., 2014). This result is consistent with suggestions proposed by Vissa (2012) and Sullivan and Marvel (2011), who after investigating the effects of venture stages, recommend that future studies examine venture stages to clarify the implications of social networking action performed by entrepreneurs.

The results of this study have practical implications. Timmons (1999) states that entrepreneurs must both undertake new ventures to continually discover new opportunities in a constantly changing external environment and adjust organizational resources and operating strategies to gain a foundation in fluctuating markets. Discovering and developing innovative opportunities are challenging and cannot be accomplished by one person. In addition, the resources and abilities of new entrepreneurs are limited. Thus, these entrepreneurs tend to withdraw from markets when they encounter challenges or lack external assistance. This study suggests that entrepreneurs should establish new network relationships during the early venture stage to expand their perspectives and examine new ties for cooperation opportunities. However, expanding networks requires spending large amounts of time on social interaction and networking activities. Entrepreneurs should carefully select relevant social activities rather than indiscriminately establish relationships, which may lead to overlooking the core development of their businesses (Sullivan and Marvel, 2011).

As enterprises enter the growth and stability stage, entrepreneurs should have already established substantial networks. Entrepreneurs should locate and establish long-term relationships with people with mutual interests or cooperation potential among their existing networks. In particular, in Chinese society, business partners tend to regard each other as friends. This enables entrepreneurs to increase friendship based connections, constantly expand network relationships (provided that their networks are sufficiently large), and procure exclusive information and resources for the development of innovative opportunities.

Regarding policy implications, unlike traditional industries, in which product, service, and business model innovation is slow and limited, the ICT industry is characterized by rapid environmental and technological changes that must be monitored to enable responding to the emergence of new opportunities. Consequently, entrepreneurs should not limit themselves to their interpersonal networks. During the early stage, they should interact and cooperate with members of other industries according to their availability and capability. Because external information access does not necessarily require prior industry-specific experience, recognizing innovative opportunities through interactions with others in the environment may be possible for those that lack experience. For those seeking to foster entrepreneurship, there may be some value in connecting these external interactions with processes leading to the generation and assessment of innovative opportunities.

6.2 Limitations

Certain limitations to this study provide avenues for future research. First, this study examines networking actions applied at two venture stages. However, because this study used a cross-sectional method, the results do not reflect how the networking actions performed by entrepreneurs changed over various venture stages. Future studies should consider applying a longitudinal approach (e.g., Newbert et al., 2013) to investigate changes in networking actions throughout various venture stages and their resulting long-term effects.

Although this study proves that the results of Harman's one-factor test of common method variance is not significant, future studies can measure objective indicators such as opportunity value or the feasibility of implementing opportunities. Quantified concepts can be used to analyze the innovativeness of opportunities, for instance, by comparing the number of projects or new business transactions obtained within a certain time by certain

types of social networks, forms, or structures. Alternatively, a long-term study can be conducted to determine how to mitigate the problems associated with common method variance (Podsakoff et al., 2003).

Due to the difficulties in contacting entrepreneurs, this study is based on 86 valid questionnaires. This relatively low retrieval rate indicates that the sample may not sufficiently represent the studied population. In addition, the results of this study are applicable only to the ICT industry. Future studies can compare firms in various industries or countries. Finally, this study investigates individual entrepreneurs; thus, the results do not apply to the effects of social networks on higher-level organizations. Because entrepreneurship requires a team to focus the abilities of various professionals on innovation, future studies may apply team-level factors to investigate the effects of social networking strategies used by various organizational members on the innovativeness of opportunities.

References

- Aiken, L. S., West, S. G., and Reno, R. R. 1991. *Multiple Regression: Testing and Interpreting Interactions*. Thousand Oaks, CA: Sage.
- Ardichvili, A., Cardozo, R., and Ray, S. 2003. A theory of entrepreneurial opportunity identification and development. *Journal of Business Venturing*, 18 (1): 105-123.
- Baron, R. A. 2006. Opportunity recognition as pattern recognition: How entrepreneurs “connect the dots” to identify new business opportunities. *Academy of Management Perspectives*, 20 (1): 104-119.
- Baumol, W. J. 1993. *Entrepreneurship, Management, and the Structure of Payoffs*. Cambridge, MA: MIT Press.
- Birley, S. 1985. The role of networks in the entrepreneurial process. *Journal of Business Venturing*, 1 (1): 107-117.
- Borgatti, S. P., and Foster, P. C. 2003. The network paradigm in organizational research: A review and typology. *Journal of Management*, 29 (6): 991-1013.
- Bygrave, W. D., and Hofer, C. W. 1991. Theorizing about entrepreneurship. *Entrepreneurship Theory and Practice*, 16 (2): 13-22.
- Cohen, J., Cohen, P., West, S. G., and Aiken, L. S. 2003. *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences (3rd ed.)*. Mahwah, NJ: Erlbaum.
- Cooper, A. C., Gimeno-Gascon, F. J., and Woo, C. Y. 1994. Initial human and financial capital as predictors of new venture performance. *Journal of Business Venturing*, 9 (5): 371-395.
- Delmar, F., and Shane, S. 2004. Legitimizing first: Organizing activities and the survival of new ventures. *Journal of Business Venturing*, 19 (3): 385-410.
- Drucker, P. F. 1985. *Innovation and Entrepreneurship: Practice and Principles*, New York, NY: Harper and Row.
- Eckhardt, J. T., and Shane, S. A. 2003. Opportunity and entrepreneurship. *Journal of Management*, 29 (3): 333-349.
- Escribano, A., Fosfuri, A., and Tribó J. A. 2009. Managing external knowledge flows: The moderating role of absorptive capacity. *Research Policy*, 38 (1): 96-105.
- Gaglio, C. M. 2004. The role of mental simulations and counterfactual thinking in the opportunity identification process. *Entrepreneurship Theory and Practice*, 28 (6): 533-552.

- Gartner, W. B. 1985. A conceptual framework for describing the phenomenon of new venture creation. *Academy of Management Review*, 10 (4): 696-706.
- Granovetter, M. S. 1977. The strength of weak ties. In Samuel, L. (Ed.), *Social Networks*: 347-367. Cambridge, MA: Academic Press.
- Greve, A., and Salaff, J. W. 2003. Social networks and entrepreneurship. *Entrepreneurship Theory and Practice*, 28 (1): 1-22.
- Grossman, E. B., Yli-Renko, H., and Janakiraman, R. 2012. Resource search, interpersonal similarity, and network tie valuation in nascent entrepreneurs' emerging networks. *Journal of Management*, 38 (6): 1760-1787.
- Hinkin, T. R. 1998. A brief tutorial on the development of measures for use in survey questionnaires. *Organizational Research Methods*, 1 (1): 104-121.
- Hoang, H., and Antoncic, B. 2003. Network-based research in entrepreneurship: A critical review. *Journal of Business Venturing*, 18 (2): 165-187.
- Hoang, H., and Yi, A. 2015. Network-based research in entrepreneurship: A decade in review. *Foundations and Trends® in Entrepreneurship*, 11 (1): 1-54.
- Hofer, C. W., and Bygrave, W. D. 1992. Researching entrepreneurship. *Entrepreneurship: Theory and Practice*, 16 (3): 91-100.
- Holmén, M., Magnusson, M., and McKelvey, M. 2007. What are innovative opportunities?. *Industry and Innovation*, 14 (1): 27-45.
- Hsieh, R. M., and Kelley, D. J. 2016. The role of cognition and information access in the recognition of innovative opportunities. *Journal of Small Business Management*, 54 (supplement 1): 297-311.
- Kirzner, I. M. 1997. Entrepreneurial discovery and the competitive market process: An Austrian approach. *Journal of Economic Literature*, 35 (1): 60-85.
- Klyver, K., and Terjesen, S. A. 2007. Entrepreneurial network composition: An analysis across venture development stage and gender. *Women in Management Review*, 22 (8): 682-688.
- Koberg, C. S., Uhlenbruck, N., and Sarason, Y. 1996. Facilitators of organizational innovation: The role of life-cycle stage. *Journal of Business Venturing*, 11 (2): 133-149.
- Kristiansen, S. 2004. Social networks and business success: The role of subcultures in an African context. *American Journal of Economics and Sociology*, 63 (5): 1149-1171.

- Koellinger, P. 2008. Why are some entrepreneurs more innovative than others?. *Small Business Economics*, 31 (1): 21-37.
- Ma, R., Huang, Y. C., and Shenkar, O. 2011. Social networks and opportunity recognition: A cultural comparison between Taiwan and the United States. *Strategic Management Journal*, 32 (11): 1183-1205.
- Marvel, M. R., and Lumpkin, G. T. 2007. Technology entrepreneurs' human capital and its effects on innovation radicalness. *Entrepreneurship Theory and Practice*, 31 (6): 807-828.
- Mitchell, J. C. 1969. *Social Networks in Urban Situations: Analyses of Personal Relationships in Central African Towns*. Manchester, UK: Manchester University Press.
- Mueller, D. C. 1972. A life cycle theory of the firm. *The Journal of Industrial Economics*, 20 (3): 199-219.
- Newbert, S. L., Tornikoski, E. T., and Quigley, N. R. 2013. Exploring the evolution of supporter networks in the creation of new organizations. *Journal of Business Venturing*, 28 (2): 281-298.
- Ozcan, P., and Eisenhardt, K. M. 2009. Origin of alliance portfolios: Entrepreneurs, network strategies, and firm performance. *Academy of Management Journal*, 52 (2): 246-279.
- Ozgen, E., and Baron, R. A. 2007. Social sources of information in opportunity recognition: Effects of mentors, industry networks, and professional forums. *Journal of Business Venturing*, 22 (2): 174-192.
- Paccagnella, O. 2006. Centering or not centering in multilevel models? The role of the group mean and the assessment of group effects. *Evaluation Review*, 30 (1): 66-85.
- Podsakoff, P. M., Mackenzie, S. B., Lee, J. Y., and Podsakoff, N. P. 2003. Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88 (5): 879-903.
- Podsakoff, P. M., and Organ, D. W. 1986. Self-reports in organizational research: Problems and prospects. *Journal of Management*, 12 (4): 531-544.
- Shane, S. 2000. Prior knowledge and the discovery of entrepreneurial opportunities. *Organization Science*, 11 (4): 448-469.
- Shane, S., and Venkataraman, S. 2000. The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25 (1): 217-226.

- Singh, R. P. 2000. *Entrepreneurial Opportunity Recognition Through Social Networks*. Princeton, NJ: Garland Publishing, Inc.
- Singh, R., Hills, G. E., Hybels, R. C., and Lumpkin, G. T. 1999. Opportunity recognition through social network characteristics of entrepreneurs. In Ronstadt, R., Churchill, N., Bygrave, W., Sexton, D., Slevin, D., Vesper, K., and Wetzel, W. (Eds.), *Frontiers of Entrepreneurship Research*: 228-241. Wellesley, MA: Babson College.
- Slotte-Kock, S., and Coviello, N. 2010. Entrepreneurship research on network processes: A review and ways forward. *Entrepreneurship Theory and Practice*, 34 (1): 31-57.
- Smeltzer, L. R., Van Hook, B. L., and Hutt, R. W. 1991. Analysis of the use of advisors as information sources in venture startups. *Journal of Small Business Management*, 29 (3): 10-20.
- Stam, W., Arzlanian, S., and Elfring, T. 2014. Social capital of entrepreneurs and small firm performance: A meta-analysis of contextual and methodological moderators. *Journal of Business Venturing*, 29 (1): 152-173.
- Stuart, T. E., and Sorenson, O. 2007. Strategic networks and entrepreneurial ventures. *Strategic Entrepreneurship Journal*, 1 (3-4): 211-227.
- Sullivan, D., and Marvel, M. 2011. How entrepreneurs' knowledge and network ties relate to the number of employees in new SMEs. *Journal of Small Business Management*, 49 (2): 185-206.
- Sullivan, D. M., and Ford, C. M. 2014. How entrepreneurs use networks to address changing resource requirements during early venture development. *Entrepreneurship Theory and Practice*, 38 (3): 551-574.
- Timmons, J. A. 1999. *New Venture Creation: Entrepreneurship for the 21st Century*. Burr Ridge, IL: Irwin.
- Ucbasaran, D., Westhead, P., and Wright, M. 2008. Opportunity identification and pursuit: Does an entrepreneur's human capital matter?. *Small Business Economics*, 30 (2): 153-173.
- _____. 2009. The extent and nature of opportunity identification by experienced entrepreneurs. *Journal of Business Venturing*, 24 (2): 99-115.
- Uzzi, B. 1996. The sources and consequences of embeddedness for the economic performance of organizations: The network effect. *American Sociological Review*, 61 (4): 674-698.

- Vissa, B. 2011. A matching theory of entrepreneurs' tie formation intentions and initiation of economic exchange. *Academy of Management Journal*, 54 (1): 137-158.
- _____. 2012. Agency in action: Entrepreneurs' networking style and initiation of economic exchange. *Organization Science*, 23 (2): 492-510.
- Vissa, B., and Bhagavatula, S. 2012. The causes and consequences of churn in entrepreneurs' personal networks. *Strategic Entrepreneurship Journal*, 6 (3): 273-289.
- Weber, R. P. 1990. *Basic Content Analysis (2nd ed.)*. Thousand Oaks, CA: Sage.
- Wu, L. Y., Wang, C. J., Chen, C. P., and Pan, L. Y. 2008. Internal resources, external network, and competitiveness during the growth stage: A study of Taiwanese high-tech ventures. *Entrepreneurship Theory and Practice*, 32 (3): 529-549.

Author Biography

***Ru-Mei Hsieh**

Ru-Mei Hsieh is an associate professor of Program in Interdisciplinary Studies, National Sun Yat-sen University in Taiwan. She received her doctoral degree from the National Sun Yat-sen University in the area of entrepreneurship management. Her research interests focus on entrepreneurial opportunities, entrepreneurial ecosystem, and entrepreneurship education. She has published papers in *Journal of Small Business Management*, *Entrepreneurship Research Journal*, and other Chinese academic journals.

Shih-Chieh Fang

Shih-Chieh Fang is a professor in the department of Business Administration, National Cheng Kung University in Taiwan. He received his Ph.D. from National Taiwan University. His current research interests include value co-creation, knowledge governance, organizational learning, and strategy management. His works have appeared in *Technological Forecasting & Social Change*, *Asia Pacific Journal of Management*, *Journal of Management and Organization*, *Industrial Marketing Management*, and other Chinese academic journals.

*E-mail: rmhsieh@mail.nsysu.edu.tw

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