Recognition of Entrepreneur's Social Ties and Firm Innovation in Emerging Markets: Explanation from the Industrial Institutional Environment and Survival Pressure

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Abstract

Despite the extensive attention to the role of entrepreneurs' business or political ties, few studies have distinguished the basis of those social ties. The aim of this study is to explore the different roles of the entrepreneurs' personalized and formal social ties on the firms' innovation performance. Based on *renqing* and formal rules, this study extends the social ties' typology into four categories, namely, transactional business ties, transactional political ties, *guanxi* business ties, and *guanxi* political ties. Using data collected from 209 Chinese firms, we further identify the distinctive contributions of the different ties on the entrepreneurial firm's innovation performance under different institutional environments and entrepreneurs' survival pressure. This paper will help researchers and managers better understand the function of social ties in innovation in emerging markets, such as China.

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Abstract

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Keywords Social ties · *Guanxi* · Enforcement inefficiency · Survival pressure · Innovation performance

Introduction

Innovation is crucial for entrepreneurial organizations to expand their R&D abilities, maintain their innovative advantages, and strengthen their competitive positions (Lumpkin & Dess, 2001; Luu & Ngo, in press). Because resource gaps that are difficult to fill (Brouthers, Nakos, Hadjimarcou, & Brouthers, 2009), entrepreneurs have to obtain the necessary financial, technical, and managerial resources through their social ties (Freel, 2000; Gao, Shu, Jiang, Gao, & Page, 2017), which can benefit the innovation of small and medium-sized enterprises (Baum, Calabrese, & Silverman, 2000). Previous research has shown that social ties, commonly distinguished as business and political ties, can improve the organizational performance in emerging markets (i.e., Boso, Story, & Cadogan, 2013; Luo, Huang, & Wang, 2012; Peng & Luo, 2000).

Despite the increasing research focus on the relationship between social ties and firm performance, the role of social ties on innovation performance is still underdeveloped. On the one hand, insufficient attention has been paid to innovation under the entrepreneurial situation in emerging markets. Innovation activities require entrepreneurs to overcome risks and uncertainties, unlike the resource requirements for the long-term performance of enterprises (Freel, 2005; Kreiser, Marino, Kuratko, & Weaver, 2013; Lumpkin & Dess, 2001). Accordingly, we argue that it is critical to explore the innovational effect of social ties. On the other hand, regarding the classification of social ties, the existing studies just considered the connecting agencies or exchange objects (i.e., business ties vs. political ties) but did not consider the basis of social ties. We believe that it is equally important to probe the effects of the basis of social ties on innovation because it has been found that some personal business or political ties are relatively loose, open or general, which are likely to be built from the basis of the formal market rules. Meanwhile, other personal business or

2

political ties deal more with privacy and specialization, with a high degree of

personalization tendencies, which are probably formed based on the close acquaintance

relationship of the *renqing* (Yu & Wu, 2012), known as *guanxi* in Chinese. As a result,

differences in the source of the relationship will result in distinct costs and efficiencies in

the utilization of social ties. Clearly, the existing classification of business or political ties

(i.e., Dong, Li, & Tse, 2013; Sheng, Zhou, & Li, 2011; Zhou, Li, Sheng, & Shao, 2014),

will not lead to a complete and profound understanding of social ties. Taken together, our

theoretical framework integrates the two-dimensional classification of social ties with four

types of ties. The aim of this study is to compare the different roles of these four types of

ties on the entrepreneurial firms' innovation under different outside institutional

environments and inside pressures.

This paper contributes to the existing literature in the following ways. First, unlike the

simple classification of business and political ties (i.e., Luo et al., 2012; Peng & Luo, 2000;

Sheng et al., 2011), we refined this dominant classification by addressing the social ties'

renqing or the formal rule basis that has been overlooked in extant studies. We argue that,

whether they are business or political ties, they both can be further divided based on the

different *renqing* or the formal rule. This two by two matrix extends this line of inquiry in

Chinese market transition studies (i.e., Chen & Wu, 2011; Peng & Luo, 2000; Li, Poppo, &

Zhou, 2008; Sheng et al., 2011; Shu, Albert, Gao, & Jiang, 2012; Xin & Pearce, 1996) by

providing the distinct explanatory effect of these four types of ties. Second, despite the

extant literature paying more attention to the organizational performance of social ties (see

a recent meta-analysis: Luo et al., 2012), few studies address the innovational outcome of

social ties. Since innovation is a central driver of a firm's entrepreneurial growth (Lumpkin

& Dess, 2001), this study provides another perspective to explore the distinguished

3

consequences of social ties. Third, using evidence on how institutional contexts and the

entrepreneurs' cognition influence the effects of social ties on innovation performance, this

study contributes to the extant literature about social ties by better elucidating when

different types of ties are beneficial or detrimental to entrepreneurial firms in emerging

economies.

Theoretical framework and hypotheses

Entrepreneur's social ties and typology

From the perspective of the connecting agency, the entrepreneur's social ties can be defined

as the frequency of contact with various network members (e.g., Barrera, 1986; Pollack,

Vanepps, & Hayes, 2012). Simply put, these are persons with whom the entrepreneurs meet

on a face-to-face basis, and from whom they obtain services, advice, and moral support

(Dubini & Aldrich, 1991). Business ties contain social exchanges with partners, suppliers,

customers, venture capitalists, bankers, distributors, trade associations, etc. (Dong, Li, &

Tse, 2013; Dubini & Aldrich, 1991; Peng & Luo, 2000; Sheng et al., 2011; Shu et al.,2012).

Moreover, social exchanges with government officials in central and local governments,

regulation agencies, tax or stock market administrative bureaus, and so on, are included in

the political ties (Gao et al., 2017; Peng & Luo, 2000).

Nevertheless, according to social capital theory, although social ties can be regarded as

a kind of special social resources (Granovetter, 1985), the costs of adopting those ties are

different based on a different trust basis (Dakhli & Clercq, 2004; Granovetter, 1973; Welter

& Kautonen, 2005), and relational embeddedness (Hite, 2003; Li, 2007). According to

Parsons and Shils (1951), social relationship can be generally divided into "universalism"

and "particularism". Universalism refers to a value orientation toward institutionalized

4

obligations to society, while particularism represents a value orientation toward institutionalized obligations of friendship (Zurcher, Meadow, & Zurcher, 1965: 540). Thus, we can infer that if a network member is placed in a situation in which he must choose between particularism and universalism, his choice will reflect the impact of the emotional involvement embedded in these ties. Particularism determines the supremacy of value in the object by virtue of its special relationship with the attribute of the act, while universalism is independent of the special relationship between the actor and the object in identity (Parsons & Shils, 1951). Yu and Wu (2012) also argue that the relationship between firms and the other agencies in the West is highly formalized and legalized, while this kind of relationship in China is highly personalized. It is obvious that the extant classification according to the connecting agencies (i.e., business ties vs. political ties) did not consider the basis of social ties. Hence, we refine business and political ties into *guanxi* (*renqing*-based) and transactional (formal rules-based) ties. *Guanxi* business/political ties means a relatively close, private and specific *renqing*-based (particularism oriented) relationship in social exchange with business/political partners. Transactional business/political ties means a relatively loose, open and formal rule based (universalism oriented) relationship in social exchange with business/political partners.

[Insert Fig. 1]

As Fig. 1 shows, in our taxonomy, the entrepreneurs' social ties can be divided into four types. First, we consider *guanxi* vs. transactional business ties. It is widely recognized that *guanxi* is a significant business determinant influencing firm performance in China (Luo & Chen, 1997). Basically, people in Confucian culture prefer to care for human desire, and business actors who build the *guanxi* business ties share a close consanguinity identity, trust foundation or a personal friendship (e.g., Fei, 1992; Hwang, 1987). For instance,

5

regarding entrepreneurs in Wenzhou from Zhejiang Province in China, they go out to work together and cooperate with each other to form trade relationships, and even set up their own sales agencies to market local products nationwide (Nee & Opper, 2012). Unlike *guanxi* business ties, transactional business ties tend to have equal value tendencies ruled by calculation and fairness, and entrepreneurs and stakeholders are more likely to achieve market profits through formal rules, economic cooperation, exchange and negotiations.

Second, we consider *guanxi* vs. transactional political ties. Zhang and Zhang (2005) argue that the political strategy for entrepreneurs in China may have two different styles. Some entrepreneurs are just reactive to avoid being "legally harmed" by the government, have a relatively narrow communication circle, and just focus on money investment. Other entrepreneurs actively build close personal relationships with government officials to obtain key resources or special protection. Those actors endeavor to broaden a wider communication circle, pay more attention to long-term investment and act more tactfully. Thus, we believe that transactional or *guanxi* political ties are used to address different issues for entrepreneurs. Regarding transactional political ties, the actors care about the economy of interpersonal activities, and this is a kind of transaction-oriented exchange. Meanwhile, most activities between these actors are based on the formal rules of economic exchange. In contrast, *guanxi* political ties require longer investment in social capital accumulation, and their exchange demonstrates a more personal, emotionally engaged and intimate relationship.

Social ties and innovation performance

Innovation, a central driver of a firm's entrepreneurial growth (Lumpkin & Dess, 2001), is concerned with generating, accepting, and implementing new ideas, processes, products, or services (Atuahene-Gima, 2005; Sosa, 2016). Due to the "liability of newness" (Politis,

6

2005; Shepherd, Douglas, & Shanley, 2000) and the "liability of size", however, many entrepreneurial enterprises in emerging markets find it more difficult to raise money, recruit and train staff, and pay administrative fees than large organizations (Aldrich & Auster, 1986). According to the resource-dependency theory, a lack of critical resources may drive entrepreneurs to seek additional resources from other market participants (Hillman, Withers, & Collins, 2009). Those partners can be a source of "critical" resources to overcome a part of the liability. Previous studies have proven that both business and political ties play a positive role in promoting firm performance (Sheng et al., 2011). This phenomenon is because business connections with distributors, customers, suppliers and strategic partners help firms to share marketing resources and activities, which can enable each firm to accomplish more together than it could achieve on its own (Chen & Huang, 2004; Yu, Gilbert & Oviatt, 2011). Furthermore, an alliance with large and famous cooperators (i.e., business ties) or recognition by government (i.e., political ties) can help firms obtain network legitimacy (Rao, Chandy, & Prabhu, 2008). Nevertheless, we do not understand the innovational effect of business and political ties when considering their differences on this basis (i.e., *guanxi* and transactional ties). We argue that when predicting innovation performance, transactional business ties and *guanxi* political ties will be more important in this two by two matrix. The reasons are as follows.

First, innovation activities require more heterogeneous knowledge and collaboration, breaking through existing market and product limitations to exploit new territories or make major changes to the existing resource mix (Cohen & Levinthal, 1990). In that case, a broader transactional business relationship, rather than friendship, will be highly necessary. Marketing studies have suggested that firms should take a customer-oriented strategy and strengthen their marketing and sales activities when pursuing innovation (Atuahene-Gima,

7

2005; Day, 1994; Hurley & Hult, 1998). This high level of resource dependency pushes entrepreneurial firms construct wilder business network to achieve innovative growth. On the other side, the important function of transactional political ties is to provide technology licenses or legal endorsements for entrepreneurial firms, which are more homogeneous than business ties for innovation performance. Thus, we infer that transactional business ties have a stronger predicting power on innovation performance than transactional political ties.

Second, compared to the *guanxi* business ties, we believe *guanxi* political ties have a stronger effect on the innovational performance. In many cases, the government needs to balance the uncertainty of innovation and the foreseeable short-term benefits, since innovation activities mean risks, uncertainties and unclear returns. The government is more willing to favor innovation policies for state-owned enterprises with a rich resource base, and less supportive for small and medium-sized enterprises in the entrepreneurial period. As a result, it is difficult for private entrepreneurial firms with a low risk tolerance and a resource shortage to obtain innovational resource support through transactional government ties. In contrast, *guanxi* political ties may create opportunities for entrepreneurs and their firms to obtain more trustable and valuable resources. For instance, the Chinese government requires a firm to obtain a new Industrial Manufacturing Permit each time it introduces a new product, which will add extra time and resource costs. When entrepreneurs engage in technological innovation, the time investment in cultivating political ties with government officials will facilitate their negotiation (Peng & Luo, 2000). Furthermore, the *guanxi* political ties may also reduce the uncertainty caused by arbitrary government intervention in innovation (Zhang, Tan, & Wong, 2015). Mutual help and resource pooling within business networks can evolve as effective survival strategies (Opper, Nee, & Holm, 2017). However, many *guanxi* business ties are formed by close

8

relative, friend, fellow villager, etc., with whom it is difficult to provide enough support to break through the limitation of homogenous information. Therefore, we propose the following hypotheses:

Hypothesis 1a: Transactional business ties have a stronger positive effect on innovation performance than transactional political ties.

Hypothesis 1b: *Guanxi* political ties have a stronger positive effect on innovation performance than *guanxi* business ties.

The moderating effect of the institutional environment

According to institutional theory (North, 1990, 2005), the allocation of resources for the exploitation of business opportunities cannot be considered in isolation from the broader institutional context in which such an opportunity for exploitation occurs (Autio & Acs, 2010; Clercq, Lim, & Chang, 2013). Previous studies have proved that institution can be the complementation or substitution of market mechanisms (e.g., Peng, 2003; Sheng et al., 2011). Compared with the transactional ties, we argue that the external environment incompletion and uncertainty may more significantly affect the function of *guanxi* ties to innovation performance. In a relatively well-regulated market, entrepreneurs and stakeholders can corporate through a formal system or contract, which can help entrepreneurs save the cost of exploring and maintaining the social ties. In contrast, when the environment lacks an institutional guarantee, entrepreneurs are more likely to rely on the informal system to seek legitimacy and asylum for firm operation, which requires more flexible *guanxi* ties rather than market rules to promote sharing and cooperation.

Here, we choose industrial enforcement inefficiency to reflect the institutional environment. As Ho (2001) and Sheng et al. (2011) note, enforcement inefficiency refers to the extent to which the enforcement of legislation and regulations is problematic, as reflected by unlawful or unethical corporate behaviors. Briefly, we believe that, although both types of ties have positive impacts on the innovation of entrepreneurial firms, transactional ties play a stronger role in innovation in a low enforcement inefficiency environment, while informal *guanxi* ties plays a stronger role in a high enforcement inefficiency environment.

First, compared with transactional ties, when in an undeveloped institutional environment, an exchange conducted by *guanxi* ties can reduce innovation cost. While in a market lack of regulation, given the absence of established business practices, norms, and reliable legal recourse through litigation (Nee & Opper, 2012), the innovation cost caused by conflicts between economic actors over contracts is frequent. By engaging in an informal marketing alliance and political connection, entrepreneurs and their firms have the potential to overcome institutional imperfection (Shou, Chen, Zhu, & Yang, 2014) and develop effective opportunity identification and resource collaboration activities. Innovation activities require strong learning and knowledge exchange to facilitate the creation and use of heterogeneous information (Rodan & Galunic, 2004; Suzuki & Kodama, 2004). When neither formal laws nor exchange rules are effectively secure economic transactions between private actors, it is through a gradual and silent learning process that mutually beneficial business norms develop. In addition, friends, former classmates, coworkers, and relatives often serve as role models and provide similar trial-and-error processes, which help entrepreneurs to pursue innovation opportunities, improve product deficiencies, learn the practical skills and seek political protection. Thus, the

positive relations between *guanxi* ties and innovation will be strengthened under an inefficacy enforcement environment.

In addition, building from the resource-based view, entrepreneurs of private enterprises are challenged to seek out novel and creative combinations of resources as a foundation for stimulating the efforts to innovate (Carnes & Ireland, 2013; Carney, 2005; Carrasco-Hernandez & Jimenez-Jimenez, 2012), and they will turn to *guanxi* ties to acquire a sound investment or potentially unique technologies. However, with the gradual liberalization of the market and the enforcement of legislation and regulations improvement, the *guanxi*-oriented development strategy will lead to the lock-in effect and hinder the creation of innovation-oriented practices (Zhang & Zhong, 2016), meaning that the positive relationship between *guanxi* ties and innovation will be weakened in a relatively developed institutional environment. In this case, the effect of transactional ties on innovation performance will be strengthened because the needs of the innovation-oriented practices can be safeguarded when enforcement efficiency improves. Enterprises can make use of the possibility of technology introduction, transfer at a lower transaction cost, and obtain stronger legal intellectual property protection. Accordingly, the efficiency of transactional economic exchange will be improved, and therefore it will be unnecessary to over-rely on the means of *guanxi* ties to guarantee innovation. Therefore, we propose the following hypothesis:

Hypothesis 2: Industrial enforcement inefficiency positively moderates the relationship between (a) *guanxi* ties and innovation performance and (b) transactional ties and innovation performance, such that *guanxi* ties have more positive effects on innovation

11

performance than transactional ties when the enforcement inefficiency is relatively high rather than low.

The moderating role of survival pressure

It is often observed that organizations in certain environments respond to experience by making decisions conditional upon their history (Cyert & March,1963; Levitt & March, 1988), and the firm strategy that is formed is compared with the actual performance and an expected performance level that the decision maker would view as reasonable (March & Simon, 1958; Wanous, Poland, Premack, & Davis, 1992). The high aspiration of the development creates a met-expectation problem, which causes pressure to search for solutions (Cyert & March, 1963). For entrepreneurial firms, the most important thing generated from the entrepreneurs' expectations is to sustain the survival of their enterprises. When entrepreneurs hold higher expectations beyond their capabilities of firm growth, which means, under a higher level of survival pressure, the possible unmet expectation problem will drive them to take a more active strategy in acquiring entrepreneurial resources and applying more operational relationships to overcome obstacles or the liability of newness (Politis, 2005). Therefore, it can be expected that entrepreneurs under higher survival pressure will, through adopting a more active social network strategy, build the necessary relationships to overcome innovational obstacles. However, we propose that this adjustment of social ties for innovation under survival pressure mainly influences the network agent, which means that the effect of business ties or political ties on constructing the innovation strategy will be different under varied survival pressures. The reasons are as follows.

First, when under a higher level of survival pressure, firms and their entrepreneurs must solve the problem of product marketing, service improvement, resource utilization and technology import and seek entrepreneurial opportunities to dispense with the survival difficulties. In other words, obtaining basic market advantages is more important for those firms than seeking political rents. Since most entrepreneurial firms are at a disadvantage when seeking to exploit entrepreneurial opportunities with limited resources by themselves, or by partnering with suppliers, distributors or a peer company, even competitors can, for example, provide the entrepreneurial firms with product information (Heide & John, 1992), pertinent events in the market (Lusch & Brown, 1996), and technology acquisition information (Rindfleisch & Moorman, 2001). Hence, cooperation formed by business ties helps to facilitate the necessary learning, knowledge exchange and opportunity identification of innovation activities and alleviates resource constraints when entrepreneurial firms struggle to survive (Baum et al., 2000) and overcome some size-related liabilities of the newness that they face. In this stage, political ties are not as powerful as business ties because their important function is to provide institutional compensation, status consolidation and legitimacy support, rather than exploit market opportunities and provide access to market resources.

Second, when survival pressure is lower, the problems faced by the firm change to how to grow longer and be more competitive. In this stage, diversified cooperative networks can reduce the cost of innovation, provide nonredundant resources and help entrepreneurial firms acquire tacit knowledge in innovation activities (Baum et al., 2000). At this point, the achievement of innovation performance is not only dependent on business cooperation but also on consolidating their own advantages and legitimacy endorsement in the field of competition. For example, Liu, Tang and Tian (2013) found that political connection

increased the probability of IPO approval and the market premium of entrepreneurial firms, which alleviates the financing constraint of innovation that requires a large amount of resource investment in the growth stage of enterprises. Additionally, entrepreneurs and firms will seek a more powerful government asylum for sustainable growth in this stage. For instance, when in an early stage for entrepreneurship, Tencent's CEO Huateng Pony Ma and his partners did not receive any help from the government in their struggle for years before the company went public. Thus, Tencent was not bothered by the organizational inertia and government wills that would stymie breakthrough innovation. When Tencent grew away from the pressure to survive, Ma became a representative of the National People's Congress and began to build positive political relationships to expand his territory. Therefore, innovation benefits from political ties need to have a stronger resource investment base, which is difficult to maintain in the short-term for firms with high survival pressure. Entrepreneurs faced with higher level pressure must turn to seek broader cooperation with business partners to create the opportunity to make incremental or radical innovations. Once the survival dilemma is solved and the abundant resource base is accumulated, they can adversely influence the government's choice. Hence, we further hypothesize the following:

Hypothesis 3: Survival pressure moderates the relationship between (a) business ties and innovation performance and (b) political ties and innovation performance, such that business ties have more positive effects than political ties on innovation performance when the survival pressure is relatively high rather than low.

The joint moderating effect of enforcement inefficiency and survival pressure

Whereas the enforcement inefficiency emphasizes the external institutional influence on the use of social ties, the survival pressure highlights the internal cognition effect on the ties' utilization, so a joint moderating effect should be analyzed here. On the one hand, the reaction to the external institutional environment comes from the firm's own foundation and development perception. When the entrepreneur is at a cognitive disadvantage for the firm's survival and sustenance, this situation would enlarge the impact on the adverse effects of the environment, and then the entrepreneur would actively build informal *guanxi* ties, and even pursue rent-seeking behavior (Antony, Klarl, & Lehmann, 2017). In addition, under the mixed development context, the business and political ties' function will change. For instance, although political ties are very important to the firms that are facing lower pressure, when they act in a more legal operating context, the ties' influence may weaken because the need for political protection would be reduced in a mature market. Therefore, we can infer that under certain circumstances, combined with external dysfunctional competition and an internal pressure environment, the above influence of social ties on firm innovation will strengthen or weaken.

We consider at a higher level of enforcement inefficiency, how a high-pressure versus low-pressure firm uses different ties to achieve innovation. High pressure will motivate entrepreneurs to take on exploratory innovation, which requires new technological and market knowledge to break through the dilemma; it bears an inherently high uncertainty (March, 1991; Volberda & Lewin, 2003). Such uncertainty combines underdeveloped market institutions, which makes acquiring technology support, new knowledge and skills through conventional means more difficult (Hoskisson, Eden, Lau, & Wright, 2000), requiring firms to seek other mechanisms for the private exchange of resources (e.g., Li &

Zhang，2007). Therefore, we can expect that, under the dual effects of high survival pressure and enforcement inefficiency, the positive effect of *guanxi* ties on innovation performance will be further enhanced. If we further consider the relationship type, it is obvious that, compared with the *guanxi* political ties' function to gain a long-term resource facilitating innovation investment, entrepreneurs should think more about how to match the opportunity development and resource bricolage through business connections when the survival pressure is high (Baker & Nelson, 2005; Baker, 2007). Business partners or agencies, especially, can actually provide informational, technological or marketing support. Meanwhile, the allocative efficiency of political ties is often lower and slower than that of business ties. Thus, we can assume that, at a high level of enforcement inefficiency, *guanxi* ties, especially the *guanxi* business ties, will have a more positive influence on innovation performance for high-pressure firms.

Hypothesis 4a: At high levels of enforcement inefficiency, the positive relationship between *guanxi* ties and innovation performance will be strengthened for firms under higher survival pressure compared to firms under lower survival pressure. Moreover, *guanxi* business ties have more positive effects than *guanxi* political ties on innovation performance when the survival pressure is relatively high rather than low.

However, for lower-pressure firms, although *guanxi* ties can also be useful in overcoming the enforcement inefficiency problem, when firms do not have the greater pressure to survive, entrepreneurs will moderately reduce their environmental disadvantages and concerns. In other words, when entrepreneurs have a strong anti-risk or

development ability, the perception of the disadvantages of the external environment will be weakened for entrepreneurs, and their response to the uncertainty of the innovation will be muted. In this situation, entrepreneurs will pursue more exploitative innovation according to their inertia, instead of making major changes to seek a breakthrough. To improve work efficiency and productivity to a greater extent, entrepreneurs and firms will endeavor to sell more by building more transaction ties but not just confined to close relationships. At this point, the positive effects of *guanxi* ties on innovation activities will be diminished, and in contrast, the positive role of transactional ties linkages will be further enhanced. In addition, as we argued in Hypothesis 3 above, entrepreneurial firms will build more political ties to form innovation activates under lower survival pressure. High enforcement inefficiency will strengthen this positive effect with lower pressure firms, and to some extent, political ties will act as an alternative to the absence of the institution (Sheng et al., 2011). Hence, we hypothesize the following:

Hypothesis 4b: At high levels of enforcement inefficiency, the positive relationship between transactional ties and innovation performance will be strengthened for firms under lower survival pressure compared to firms under higher survival pressure. Moreover, transactional political ties have more positive effects than transactional business ties on innovation performance when the survival pressure is relatively low rather than high.

Methodology

Sample and data collection

We surveyed the entrepreneurs or core entrepreneurial team members in China's private firms to test our hypotheses. The data in our study was derived from questionnaires, which

17

were sent to areas including Guangzhou, Shanghai, Hangzhou cities and other cities in the Ningxia and Liaoning provinces in China. These places are areas where China's private economy is developing. To increase participation: (1) we carried out the survey together with the Liaoning Industry and Commerce Federation and the Guangdong Chamber of Commerce during March 2014 to April 2015. In return, we provided these businesses with reports on the development of the private sector in the region; (2) we also offered to provide respondents participating in the survey with a summary of the research findings. As key informants, these entrepreneurs are assumed to be able to provide valid and reliable information about their businesses in ways that allow us to assemble these data in a cost-effective manner (Du, Kim &Aldrich, 2016).

To enhance survey reliability and validity, we distributed questionnaires through two steps: first, in March 2014, we sent the questionnaires including the variables of social ties, industrial environment, survival pressure and control variables. Three months later, we collected innovation performance data to commit the longitudinal study requirements. Second, we used the back-translation method to reduce the bias of language and cultural differences (Brislin, 1980). Specifically, we translated the English version of the scales into Chinese, then two experts in our research field conducted the back-translation (Du et al., 2016). Third, questionnaires were mainly collected through two stages: in the early test stage, we inducted an on-the-spot investigation from EMBA entrepreneurs with a typewritten version. We explained the survey purpose and research concept to them and invited them to provide feedback; then, two researchers evaluated these questionnaires at the same time, in order to guarantee the recovery rate and accuracy. In the second stage, E-mail and web page data collection with electronic version questionnaires were adopted.

Five hundred questionnaires were sent out and 326 were returned, representing a 65.2% response rate. A total of 209 available questionnaires were employed in our data analysis. The rest of the questionnaires were excluded, because: first, there was a large amount of missing data for key indicators in these questionnaires, which could affect the validity of the data analysis; second, the questionnaires were not completed seriously by respondents; for example, all test items were marked with the same score; third, we selected the firms with private ownership to match our theoretical analysis. We tested for a nonresponse bias in terms of firm age, size, patent and industry between the early and late respondents (Armstrong & Overton, 1977; Mihalache, Jansen, Bosch & Volberda, 2012). We found no significant differences ($p < .05$) between the early and late respondents. The analyses indicate that nonresponse bias is not a likely issue in our study.

Regarding the characteristics of the responding firms, 72.7% had been established and operational for less than 8 years, which could be defined as new ventures according to the former study (Zahra, Hayton，& Salvato, 2004). The total assets for each company ranged from 100,000 RMB to over 20,000,000,000 RMB, and fixed assets for each firm ranged from 50,000 RMB to 4,00,000,000 RMB. Most of the firms are middle-sized, with the employee number ranging from 4 to more than 20,000. A total of 45.7% of firms came from the manufacturing industry, and 54.3% were in the service industry. A total of 72.8% of the firms in our study were defined as high-tech companies, and 27.2% were from a traditional industry. For market competition, 93.4% of the firms believed that they were in competitive industries.

Variables and measures

Innovation performance. Innovation performance generally refers to the evaluation of efficiency and effectiveness on a firm's innovation activity. Former studies about measuring innovation performance can be divided into two methods: (1) one method measures the innovation performance based on a firm's R&D performance (Baumann & Kritikos, 2016; Bronzin & Piselli, 2016). This method emphasizes the standard technical achievements, which mainly relate to technology innovation activities, including the patent authorization number, technical market turnover, the publication number of the academic paper, the number of new products, and the number of products with major improvements, etc. (i.e., Henderson & Clark, 1990; Romijn & Albaladejo, 2002; Sørensen & Stuart, 2000); (2) Another method measures innovation performance based on a firm's financial performance, which can reflect the improvement of the financial performance triggered by innovation activities (e.g., Aas & Pedersen, 2011; Dunk, 2011; Kostopoulos, Papalexandris, Papachroni, & Ioannou, 2011). Both methods are focused on innovation results without enough consideration of the innovation process.

To have a full reflection of the innovation activity referenced in this study, we adopted the research by He and Wong (2004) on exploration and exploitation innovation in order to evaluate a firm's innovation performance through measuring both innovation process and innovation performance. These items were designed to measure a firm's innovation performance from different views (e.g., development of new product and market, improvement on existing product, and reduction of producing cost). Respondents were asked to evaluate their firm's innovation performance in the past three years on a 5-point scale, with 1 meaning 'to no extent' and 5 meaning 'to a great extent' by the following items: (1) Introduce a new generation of products; (2) Enter new technology fields; (3)

Open up new markets; (4) Improve the existing product quality; (5) Improve production flexibility; and (6) Reduce production cost and material consumption. The original scale designed by He and Wong (2004) contains 8 items. However, we have combined 'Reduce production cost' and 'Improve yield or reduce material consumption' into one item due to the semantic similarity of the concepts, and the same was done for the items 'Introduce new generation of products' and 'Extend product range'. The 6 items we applied were loaded on 2 factors in the exploratory factor analysis. The first three items express a more exploitative innovation strategy, and the others reflect an explorative innovation strategy. The coefficient α value of the scale is 0.789, which shows well the internal consistency reliability, and the final score of innovation performance was obtained by the mean value of two types of scores.

Entrepreneurs' social ties. Social ties can be measured with two aspects: First, from the perspective of the relationship object, a business tie is measured by the relationship between entrepreneurs and suppliers, consumers and competitors in the market, according to the research by Dubini and Aldrich (1991) and Peng and Luo (2000). A political tie mainly includes the social relationships between entrepreneurs and government officials at the tax bureau, industrial and commercial bureau, etc., used by Li and Zhang (2007), Peng and Luo (2000) and Xin and Pearce (1996).

Second, from the perspective of the personalization attributes of the relationship, *guanxi* ties with *renqing* attributes are based on human relations, which are mainly acquired from friends, relatives or former colleagues, basically dealing with contracts by the face and private connections, while transactional ties with market-based relationships are based on regular market economic exchange without considering the factors of favor and face. However, few empirical studies on these issues have been completed in the literature. To

differentiate the effect of *guanxi* and the transactional ties used in Chinese firms, we focus

on the differences in relationship sources and the emotional linkage of various types of ties

without making a detailed distinction of the specific objects under business or political ties,

considering that previous studies have conducted extensive research on them.

Finally, from the perspective of relationship strength, this paper reflects the degree and

closeness of such ties through the entrepreneurs' mastery of them. Likert's five-point scale

is adopted, then the average processing is carried out to obtain the score of these social ties.

The items are as follows (1-5 means very little to a lot): (1) *Business ties*: when you make

business connections with your supplier, customer, competitor, technological and market

partner, how much of them are: 1) achieved through private personal relations and informal

reciprocal rules, such as family members, relatives, close friends, hometown connections,

schoolmates and so on (*marked as guanxi business ties*); 2) achieved through a transaction-

oriented economic exchange relationship, such as recognizing the right people for a deal

(*marked as transactional business ties*). (2) *Political ties*: when you make political

connections to government agencies, such as government officials, tax bureau, state banks

and industrial and commercial administration bureaus, how much of them are: 1) achieved

through private personal relationships and informal reciprocal rules, such as family

members, relatives, close friends, hometown connections, schoolmates, and so on (marked

as *guanxi political ties*); 2) achieved through a transaction-oriented economic exchange

relationship, such as recognizing the right people for a deal (*marked as transactional

political ties*).

In addition, another reason why the one-dimensional measurement is used instead of

the analysis of multiple specific relationship activities is that the costs (such as dry shares,

commissions, entertainment expenses, 'red packet', public relations expenses, etc.) paid by

firms in the construction of social ties are very private and sensitive issues in the operation process. Many respondents refused to answer such questions directly, especially when it came to political ties, which caused those specific activities to be especially difficult to measure according to their privacy and moral sensitivity.

Enforcement inefficiency. The measurement scale we applied in this study was adopted from research by Sheng et al. (2011), which was derived from the study of the measurement of the institutional environment developed by Li and Atuahene-Gima (2001). The scale assesses enforcement inefficiency as the extent to which unlawful behaviors, such as piracy, counterfeiting and unfair competitive practices, pervade the marketplace. This scale contains two items: (1) the industry has experienced some unlawful competitive behaviors, such as illegal copying of new products, counterfeiting of our firm's own products and trademarks by other firms; (2) the firm has experienced increasingly unfair competitive behaviors from competitors in the industry. The items are anchored on a 5-point Likert scale. The coefficient α value of the scale is 0.736, which shows the internal consistency on reliability well.

Survival pressure. The survival expectation of the enterprise by the entrepreneur shows their confidence or pressure for the firm's growth and can also affect the entrepreneur's propensity for risk (for example, Kahneman, & Tversky, 1979; Schneider, 1992). The survival pressure was measured by asking entrepreneurs about their expectations and an evaluation of the firms' survival for certain years, for example, a minimum of 8 years for entrepreneurial firms (Biggadike, 1989; Ciavarella, Buchholtz, Riordan, Gatewood, & Stokes, 2004). The variable is anchored on a 5-point Likert scale (feel worried to feel confident). Finally, we reverse the item score to reflect the survival pressure: the lower the score, the lower the pressure.

23

Control variables. Several control variables were considered. Firms that were in existence longer or have a large scale may have more innovation output due to the advantage of knowledge accumulation (Coad, Segarra, & Teruel, 2016; Sorensen & Stuar, 2000). Therefore, we controlled firm age, which was defined as the number of years from foundation until 2014, and firm size controlled, as well, by the relative assets scale (Cohen & Levinthal, 1990). The patents/copyrights situation was also examined to control the firm's innovation variation. In addition, industry variation was controlled by measuring the industry's competition intensity.

Validity and the common method bias

We examined the unidimensionality and convergent validity of the constructs by confirmatory factor analysis. The fit indices indicate that the models fit the data well ($\chi 2$ = 47.32, df = 16, $\chi 2/df$ < 3, RMSEA =.073, CFI =.903, TLI =.891, RMR = .060). Next, we calculated the average variance extracted (AVE) from our two multi-item latent variables. The AVEs for innovation performance (.755) and enforcement inefficiency (.475) are much larger than the squared values of pairwise correlations between the two latent constructs. The AVE of innovation performance is higher than the benchmark of .50 (Fornell & Larcker, 1981), and enforcement inefficiency had an AVE near .50. A common method variance problem may result from collecting the dependent and independent variables from the same respondent in the same survey. We used both procedural methods and statistical techniques to reduce this potential bias. First, we carefully developed our questionnaires to avoid vague concepts and to keep questions simple and specific. These procedures likely reduced the respondents' "evaluation apprehension and [made] them less likely to edit their responses to be more socially desirable, lenient, and acquiescent, and consistent with how they think the researcher wants them to respond" (Podsakoff, MacKenzie, Lee, &

Podsakoff, 2003: 888). Second, we assured the respondents that their answers were confidential and that there were no right or wrong answers to the questions in the survey (Li, Bingham, & Umphress, 2007; Zhang & Li, 2010). Third, we created a temporal separation by introducing a time lag between the measurement of the predictor and criterion variables to reduce CMV bias (Podsakoff et al., 2003). Fourth, the correlations among all the variables are all under .50, which means there is no evidence of high correlations where CMV typically exists (Siemsen, Roth, & Oliveira, 2010: 472). Fifth, we checked this potential problem with the Harman one-factor test (Podsakoff & Organ, 1986). A factor analysis of the dependent and independent variables yielded five factors accounting for 69.4% of the variance, and the first factor only explained 25.8% of the variance, minimizing the chances of serious common method bias in our findings. Since a single factor did not emerge and one general factor did not account for most of the variance, the common method variance is unlikely to be an issue in the data. All these methods ensure that our research is not significantly affected by the common method bias.

Analysis and results

We used hierarchical moderated regression analysis to test the contingency hypotheses (Slotegraaf, Moorman, & Inman, 2003). To mitigate the potential threat of multicollinearity and clarify the interaction effects, we standardized each variable used to construct the interaction terms (Aiken & West, 1991). An examination of the variance inflation factors (VIFs) associated with each regression coefficient showed a range of from 1.01 to 2.96, suggesting no serious problems with multicollinearity. The means, standard deviations and correlations of the variables used in this study are displayed in Table 1. Table 2 reported the regression results.

As Table 2 shows, in Model 1, we only added the control variables, which explained 8% of the variance in innovation performance, and this mainly comes from firm size and patents.

In Model 2, we included the main effects of the four kinds of social ties, which significantly increased the explanation on variance in innovation performance ($R^2 = .161$). The *guanxi* political ties showed a significantly positive relationship ($\beta = .169$, $p < .05$), while *guanxi* business ties showed no significance on innovation performance ($\beta = .088$, $p > .1$). Hypothesis 1b is supported. Transactional political ties show a marginally significant positive ($\beta = .164$, $p < .1$) relationship with innovation performance, and transactional business ties showed no significance on innovation performance ($\beta = -.044$, $p > .1$), which fails to support Hypothesis 1a. A possible explanation is that for innovation activities in emerging markets, improving legitimacy is an important factor in innovation, and the business ties may have a more complex influence on innovation with a function boundary.

In Model 3, we entered the two moderator variables, and the political ties show a stable and significantly positive effect on innovation performance. Then, we add two-way interaction terms with enforcement inefficiency in Model 4. As shown in this model, the interactive effect of enforcement inefficiency and *guanxi* business ties on innovation performance is significantly positive ($\beta = -.364$, $p < .01$) similar to the interactive effect of enforcement inefficiency and the *guanxi* political ties ($\beta = -.236$, $p < .05$). R^2 significantly increases to .354 in Model 4, and the positive moderating effect is shown clearly in Fig. 2. Fig. 2 indicates a positive effect of *guanxi* ties on innovation performance at high levels of enforcement inefficiency, but when industrial institutions are relatively better, *guanxi* ties

become unimportant and even hinder innovation openness. Therefore, Hypothesis 2a is supported. However, the effect of transactional ties on innovation show no significant change at higher or lower level enforcement inefficiency, which fail to support Hypothesis 2b. Model 5 and Fig. 3 show that the interaction between survival pressure and social ties mainly occurs through transactional business ties (interaction β = .277, p < .01). Thus, Hypothesis 3a is partly supported and Hypothesis 3b is not.

[Insert Fig. 2]

[Insert Fig. 3]

Finally, in Model 6, we considered the three-way interaction term to test Hypothesis 4. As Lam, Chuang, Wong and Zhu (2019) suggested, we test the 3-way interaction using the steps above. First, the three-way interaction term should be statistically significant. We observe that the coefficient of the three-way interaction term is statistically significant with the *guanxi* business ties (β = .566, p < .01) and transactional political ties (β = −.267, p < .05). To illustrate the results more clearly, we plotted the three-way interaction results in Fig. 4 using the procedures developed by Aiken and West (1991) and Dawson and Richter (2006). Second, the simple slopes at low and high survival pressure must be significantly different. To test Hypothesis 4a, we compared slopes 1 and 2 in Fig. 4A to observe differences between high and low survival pressure and *guanxi* ties at high levels of enforcement inefficiency. We observed supportive evidence for our prediction that slope 1 shows a positive influence and slope 2 shows a negative change; the difference in slopes is statistically significant (t = 1.956, p < .05), which means that in a high enforcement inefficiency environment, firms with high survival pressure will adopt more *guanxi* (business) ties to achieve innovation performance. Thus, Hypothesis 4a is supported. For Hypothesis 4b, we find that high levels of enforcement inefficiency, the positive

27

relationship between business ties and innovation performance (slope 1 vs. slope 2 in Fig. 4A) is observed for firms facing a higher survival pressure compared to firms with lower survival pressure. As for low pressure firms, transactional political ties show a slightly more positive effect on innovation than high pressure firms (slope 1 vs. slope 2 in Fig. 4B). Thus, Hypothesis 4b is supported.

Additionally, we compared slopes 3 and 4 in Fig. 4B and slope 3 versus 4 in Fig. 4A to observe differences between high and low survival pressure and transactional ties at low levels of enforcement inefficiency. At low levels of enforcement inefficiency, a more positive relationship between transactional political ties and innovation performance (slope 3 vs. slope 4 in Fig. 4B, t value for slope difference = 2.803) is observed for firms facing higher survival pressure compared to firms with lower survival pressure. However, for the *guanxi* ties, at low levels of enforcement inefficiency, the positive relationship between business ties and innovation performance for low pressure firms is changed to negative for firms facing higher survival pressure (slope 3 vs. slope 4 in Fig. 4A, t value for slope difference = –4.952). The slope change indicates that at low levels of enforcement inefficiency, the relationship of transactional ties and innovation performance appears to be positively related for firms facing higher survival pressure compared to firms with lower survival pressure.

[Insert Fig. 4A and 4B]

For the robustness test, we (1) replace 8 years in the measurement of survival pressure with 5 years; (2) winsorize all the variables at the 1st and 99th percentiles to avoid the influence of extreme observations (Flannery & Rangan, 2006); (3) change the method of dealing with the missing data from excluded cases listwise to replace them with the mean.

28

All the results show no significant difference with what we received in previous models. Thus, our findings can be regarded as robust.

Conclusion and discussion

Theoretical contributions

Management issues and the entrepreneurship environment in emerging markets such as China are recognized as being different from what has been studied in mature markets. By drawing on the social network, institutional and resource-dependence theories, this study examined the relationship between specific social ties and innovation performance in China. Our findings revealed that the effects of social ties are conditional on the institutional environments and survival pressure. Several important implications have been made to contribute our understanding in the research of social relationship and innovation.

First, our study enriches the research of social ties by distinguishing them from the duality aspect of business/political ties and transactional/*guanxi* ties taxonomy. Based on this distinction, we disclosed the contributions of different ties on the entrepreneurial firm's innovation performance in various environments. Although there is a growing amount of literature studying the relationship between social ties and innovation or firm performance, our study contributes by considering the different personalization levels of those ties. We find that only specific kinds of social ties are directly useful for innovation activity (transactional political ties), and others have functional boundaries (e.g., *guanxi* business ties under high-level environment uncertainty and cognitive survival pressure), which means that the mixture of *guanxi* business ties and transactional political ties may be a wiser strategy in conducting business in China. Additionally, this relationship will change in a different institutional environment.

Second, based on the previous research findings, our study explores new findings and new insights and gives a more realistic and specific reflection of Chinese private firms' development. The studies share some similar findings with Sheng et al. (2011) that, for instance, both the business and political ties' effects on firm performance will be strengthened when facing enforcement inefficiency. We found this observation to also be true for firm innovation performance. However, the studies differ in many aspects with previous research.

As previous studies have demonstrated the important role of business ties for the firm performance (e.g., Kotabe, Jiang, & Murray, 2011; Sheng et al. 2011; Shu et al. 2012; Zhou, Gao & Zhao, 2017) of other nonprivate firms, such as MNCs or SOEs, our findings support a different strategy of using ties of private firms on innovation performance. Kotabe et al. (2011) pointed out that high levels of managerial ties can increase knowledge acquisition to promote new product performance for MNC firms. However, above all, we find that transactional political ties have a stronger and more stable positive effect than business ties on innovation performance in those firms directly. This finding suggests that the innovation activities of private firms need more protection of their core technology, knowledge intellectual property and government involvement, rather than obtaining new knowledge just rely on business partners. This finding means that, compared with other types of firms, for private startups, legitimacy and institutional support from government endorsement remain key elements for their innovative growth.

Next, only *guanxi* ties show more important effects under an incomplete industrial environment. When the environment improves, those ties will carry significant costs that will be counterproductive. In other words, firms with highly personified political or business relations are difficult to break through, with the limits of scale and family culture,

thus, forming an obstacle to innovation. Most previous research considered only the political ties which can lead to "private official-manager collusion" when the market is developed (Li, 2005). In fact, business *guanxi* ties can also generate opportunism in such environment, which is also worth the attention of entrepreneurs.

Third, the joint moderating effect of enforcement inefficiency and survival pressure suggests that entrepreneurs in the marketplace can be active opportunists with proactive choice tactics rather than a purely passive institution accepter. Most previous studies believe that companies can only have passive adaption in the institutional environment, which is normally considered an external variable in relevant research. In other words, most of the time, firms can only bear the effect of the institutional environment on themselves. However, our study points out that the entrepreneurs' subjective cognition can initiatively interact with the effect of the institutional environment through the adaption of different strategies. The analysis results show that, when the entrepreneur is under a high-level of survival pressure, industrial enforcement inefficiency has a stronger moderating effect on the relationship between the *guanxi* business ties and innovation performance; however, for low pressure firms, the influence of the *guanxi* ties is weakened and the transactional ties becomes important to innovation. Meanwhile, when the institution agencies can efficiently enforce exchanges, transactional ties start replacing the *guanxi* ties above to act on innovation performance, especially for high pressure firms. These results show that the entrepreneurs' subjective cognition drive them to accelerate the process of depersonalization of social ties utilization as the industrial institution environment improves. Therefore, even under the same institutional environment, entrepreneurs with different subjective cognition might trigger different interaction results between social capital and the firm's innovation performance. This finding also suggests that more

31

attention should be paid to the apply the behavioral theory of firm to innovation and entrepreneurship research on private firms in emerging markets.

Practical implications

Our study hints at larger implications for conducting business and making innovations in an emerging market such as China. First, marketers must distinguish the differences between *guanxi* and transactional ties and understand their distinct roles. Especially in innovative firms, entrepreneurs should pay attention to the management of relationships with different agencies. However, at the same time, firms must be cautious about the application of the *guanxi* business ties and transactional political ties when they are launched in a different institution environment. Second, entrepreneurs need to adjust their application of ties to reflect industrial uncertainty and adjust their expectation. Finally, entrepreneurs and firm managers should establish positive beliefs to overcome the adverse effects of the external environment. Although the external environment cannot be changed by the individual, the cognition of such an environment can the affect selection and adoption of the firm's social network strategy, which further influence the firm's innovation performance, resulting from the different applications of relationships.

Limitations and future directions

Despite its strengths, this study has several limitations that should be noted for future research. First, the measurement of the social ties still needs to be elaborate and designed to better grasp the characteristics of social networks, especially for the *renqing*-based ties. Deeper field study may be helpful for further research.

Second, the study chooses enforcement inefficiency as one representative of the variables of the industrial environment but considers the differentiated economic

environment in different regions of China. Thus, more factors beyond enforcement should

be considered in further research, for instance, regional market development, and so on.

Third, our study reveals that entrepreneurs need to effectively choose a favorable

type of relationship and approach to network construction in order to meet the changes in

the external industry environment, and entrepreneurs need to recognize the risks that may

arise from the embedding of different relationships and establish a reasonable prevention

mechanism. In addition to considering the dynamic changes in the industry environment,

we can further analyze the relationship between different stages of entrepreneurship and the

network evolution path, which will help researchers to better evaluate the effectiveness of

the entrepreneur relationship from the internal and external aspects.

Fourth, we focused on a single transition economy, and future research can include

more countries representing both developing and developed nations to improve

generalizability across different populations.

Finally, we chose private firms as our subject, according to our research design.

However, state-owned firms may have stronger political ties and government support for

pursuing innovation strategies. Future research could more closely examine the firm-level

difference to determine whether the benefits of social ties do vary due to different firm

types.

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Table 1 Descriptive statistics and correlations

Variables	1	2	3	4	5	6	7	8	9	10	11
Innovation performance	(.755)										
guanxi business ties	.171*	—									
guanxi political ties	.174*	.049	—								
Transactional business ties	.004	−.021	.370**	—							
Transactional political ties	.260**	.486**	.088	−.055	—						
Enforcement inefficiency	−.110	.394**	.005	.060	.256**	(.475)					
Survival pressure	−.322**	0.114	.077	−.028	.111	.063	—				
Firm age	.151	.097	.026	−.055	.230**	.074	−.029	—			
Firm size	.192*	−.147*	−.049	−.150**	.140*	−.161*	−.369**	.261**	—		
Patent	.212*	.036	.086	.062	−.017	−.019	−.088	.114	−.018	—	
Industry	−.084	−.053	.130	.001	−.039	.174*	.213**	−.028	−.225*	−.026	—
Mean	3.15	3.25	3.05	3.39	2.96	3.28	1.96	2.63	2.76	3.23	2.6
SD	.73	1.20	1.05	1.01	1.11	1.04	0.73	1.27	1.01	1.24	1.22

Notes: N = 209. *p < .05, **p < .01.

Table 2 Standardized regression results

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Controls						
Firm age	.093	.036	.083	.057	.101	.025
	(1.111)	(.436)	(1.049)	(.749)	(1.283)	(.321)
Firm size	.154^	.144	.001	.062	.021	.144
	(1.757)	(1.621)	(.013)	(.631)	(.217)	(1.437)
Patent	.183*	.183*	.143^	.101	.125	.082
	(2.278)	(2.326)	(1.888)	(1.365)	(1.629)	(1.071)
Industry	−.012	−.029	−.018	−.018	−.004	.029
	(-.140)	(−.349)	(−.221)	(−.230)	(−.050)	(.372)
Direct Effects						
guanxi business ties		.088	.095	−.079	.118	−.100
		(1.011)	(1.128)	(−.818)	(1.391)	(−.868)
guanxi political ties		.169*	.167*	.066	.194*	.180^
		(1.955)	(2.037)	(.759)	(2.382)	(1.770)
transactional business ties		−.044	−.085	−.100	−.097	−.162^
		(−.532)	(−1.051)	(−1.130)	(−1.203)	(−1.747)
transactional political ties		.164^	.213*	.269**	.228*	.237*
		(1.798)	(2.386)	(2.786)	(2.541)	(2.205)
Enforcement inefficiency			.108	.033	.056	−.062
			(1.298)	(.382)	(.662)	(−.594)
Survival pressure			−.338**	−.275**	−.398**	−.313**
			(−3.882)	(−3.183)	(−4.480)	(−3.201)
2-way Moderating Effects						
Enforcement inefficiency × *guanxi* business ties				.364**		.376*
				(3.052)		(2.260)
Enforcement inefficiency× *guanxi* political ties				.236*		.175
				(2.408)		(1.365)
Enforcement inefficiency× transactional business ties				.106		.221
				(.928)		(1.640)
Enforcement inefficiency× transactional political ties				−.084		.038
				(−.761)		(.288)
Survival pressure × *guanxi* business ties					−.022	−.167
					(−.254)	(−1.632)
Survival pressure × *guanxi* political ties					−.130	−.095
					(−1.321)	(−.858)
Survival pressure × transactional business ties					.277**	.112
					(2.831)	(.967)
Survival pressure × transactional political ties					.077	.148
					(.858)	(1.353)
Enforcement inefficiency × Survival pressure						−.142
						(−1.262)
3-way Moderating Effects						
Enforcement inefficiency× *guanxi* business ties× Survival pressure						.566**
						(3.363)
Enforcement inefficiency× *guanxi* political ties× Survival pressure						.019
						(.139)
Enforcement inefficiency× transactional business ties× Survival pressure						.258
						(1.461)
Enforcement inefficiency× transactional political ties× Survival pressure						−.267*
						(−1.891)
Adjust R^2	.054	.113	.208	.287	.237	.332
ΔR^2	.008*	.081**	.100**	.093**	.048*	.082**
F-statistic	3.125*	3.363**	4.883**	5.252**	4.289**	4.201**

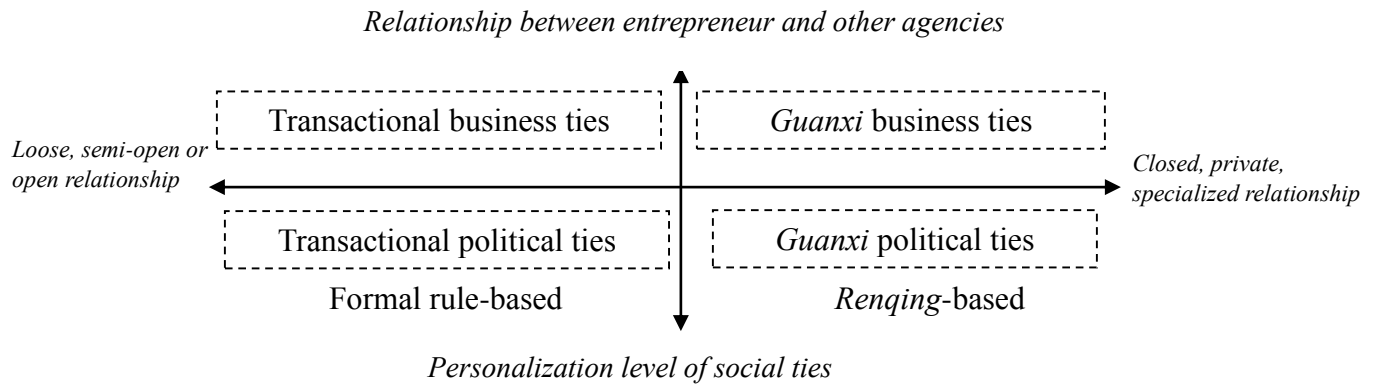*Notes:* N = 209. *p < .05,**p < .01, ^p < .1. *Standardized coefficients are reported; t-values are in parentheses*

41

Relationship between entrepreneur and other agencies

Loose, semi-open or
open relationship

| Transactional business ties | *Guanxi* business ties |

Closed, private,
specialized relationship

| Transactional political ties | *Guanxi* political ties |

Formal rule-based   *Renqing*-based

Personalization level of social ties

Fig. 1 A theoretical model of two-dimensional matrix of social ties
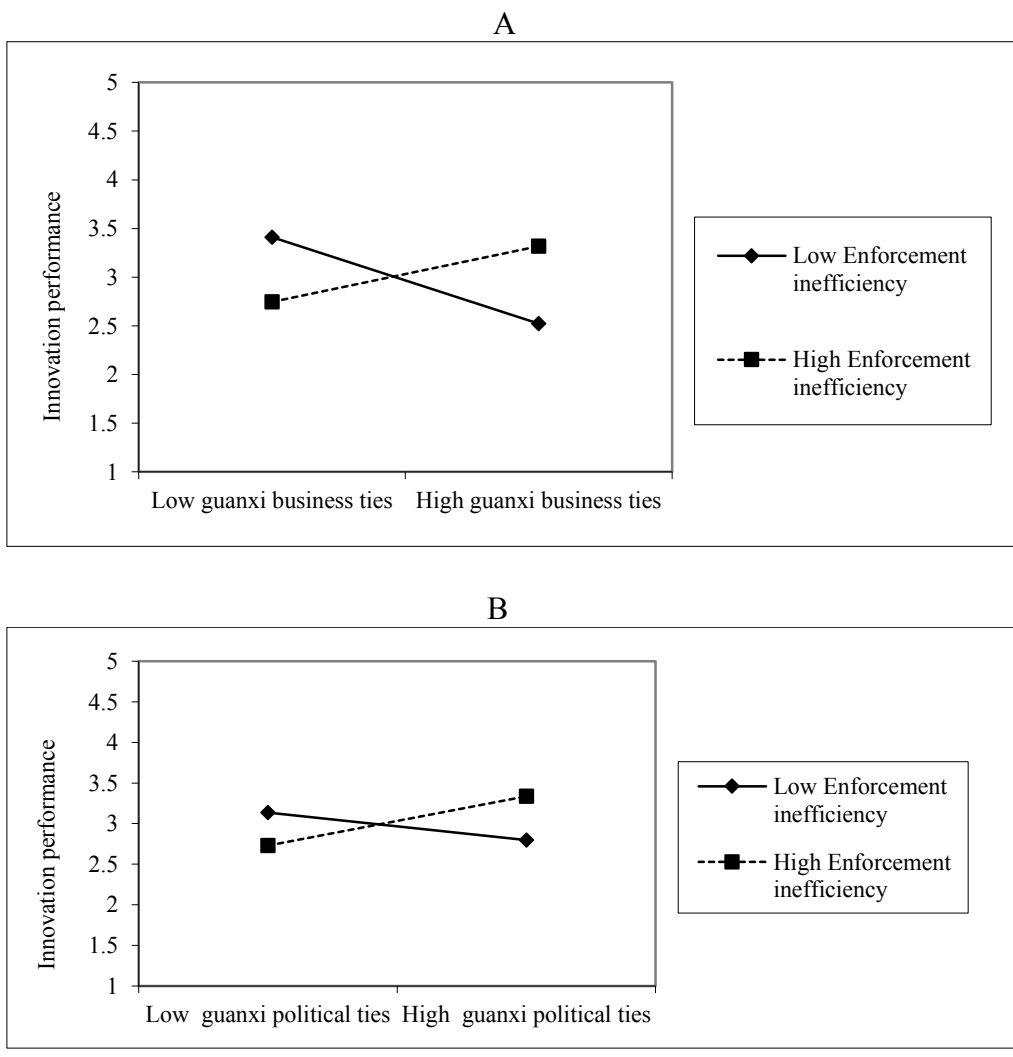
Fig. 2 2-way Moderating Effect of enforcement inefficiency

Fig. 3 2-way Moderating Effect of survival pressure

A

Innovation performance

5
4.5
4
3.5
3
2.5
2
1.5
1

Low guanxi business ties   High guanxi business ties

- ◇ - (1) High Enforcement inefficiency , High Survival pressure

- ◆ - (2) High Enforcement inefficiency , Low Survival pressure

—□— (3) Low Enforcement inefficiency , High Survival pressure

---■--- (4) Low Enforcement inefficiency , Low Survival pressure

B

Innovation performance

5
4.5
4
3.5
3
2.5
2
1.5
1

Low transactional political ties   High transactional political ties

- ◇ - (1) High Enforcement inefficiency, High Survival pressure

- ◆ - (2) High Enforcement inefficiency, Low Survival pressure

—□— (3) Low Enforcement inefficiency, High Survival pressure

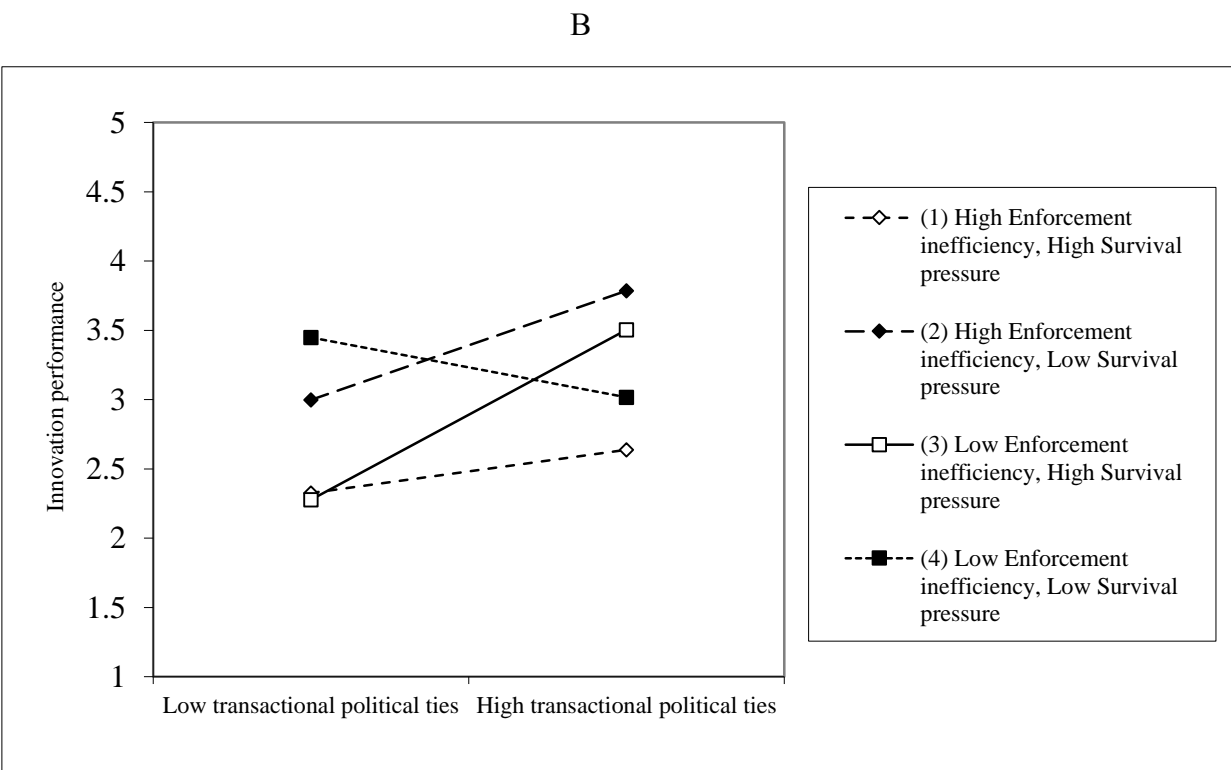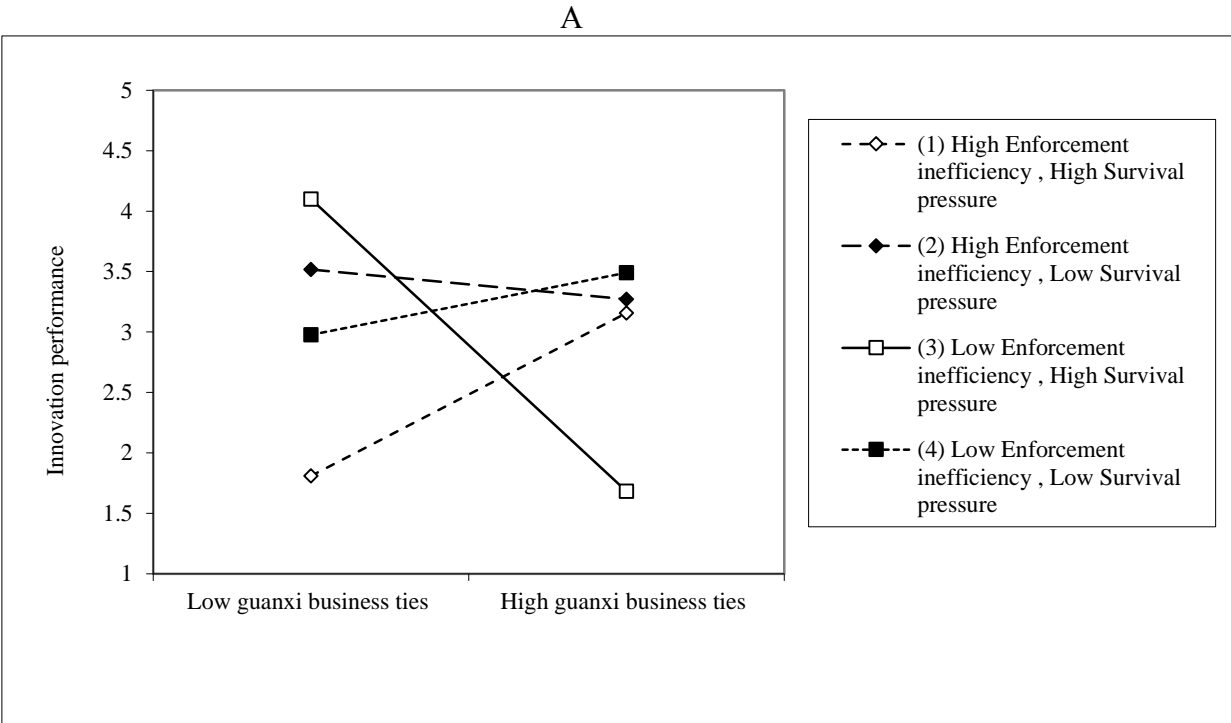---■--- (4) Low Enforcement inefficiency, Low Survival pressure

Fig. 4 3-way Moderating Effect

45

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