

The effect of institutional ties on knowledge acquisition in uncertain environments

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Abstract Institutional ties can contribute to a firm's performance in emerging economies because of the existence of ambiguous laws and unclear regulations. The main thrust of our argument is that a firm's choice of institutional ties needs to be congruent with the external environment and with industry characteristics. We test our proposed framework with survey data from 308 firms in China. The results indicate that, first, environmental uncertainty has a direct influence on institutional ties and knowledge acquisition, but second, a firm's industry position, although it likewise has an effect on knowledge acquisition, influences institutional ties in a U-shaped manner. Third, we find that institutional ties are positively related to knowledge acquisition.

Keywords Institutional ties · Environmental uncertainty · Industrial position · Knowledge acquisition · China

Institutional mechanisms, such as laws, formal contracts, regulations, and certifying organizations, are regarded as the soft-market infrastructure which influences a corporation's operation (Carney, 2005; Li, Sun, & Liu, 2006; Peng & Luo, 2000). Sometimes, however, reliable institutional mechanisms may be absent. In such situations, called institutional voids (Khanna & Palepu, 1997), firms must depend on

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informal or private solutions to avoid moral hazard and other problems, as suggested by researchers of institutional theory (Peng & Heath, 1996; Young, Peng, Ahlstrom, Bruton, & Jiang, 2008). Institutional ties, therefore, are often construed as a private solution to the absence of public contract laws (Peng & Luo, 2000). As Walder (1995) and Li, Zhou, and Shao (2009) note, in China, government officials to a large extent control the power to allocate resources and information as well as to grant and enforce contracts. Consequently, top managers' use of networking becomes a necessary complement to formal governmental support or institutional privileges (Luo, 2003; Xin & Pearce, 1996).

Social capital theory suggests that a firm's relationships make a major contribution to its performance (Leenders & Gabbay, 1999). By forging extensive institutional ties, firms can exploit complementary resources and competencies, obtain knowledge, technologies, and inputs (Li et al., 2009), and develop greater adaptability in an uncertain environment (Canina, Enz, & Harrison, 2005; Tallman, Jenkins, Henry, & Pinch, 2004). However, some questions remain unanswered. For instance, how do external factors affect a firm's decision to establish the institutional ties? More specifically, do firms in high uncertainty environments make more efforts to build and maintain institutional ties than firms in low uncertainty environments? Or in which industry position can a firm derive more benefit from their institutional ties?

We seek to answer these questions by investigating the micro-macro link, that is, the link between external factors and organizational characteristics (Peng, 2000; Tang & Xi, 2006; Wu & Leung, 2005). In doing so, this paper offers several contributions to the current understanding on the effect of institutional ties. First, prior studies have concluded that a firm's characteristics can influence the relationship between managerial ties and firm performance (e.g., Peng & Luo, 2000; Peng & Zhou, 2005), but few studies focus specifically on institutional ties themselves. Institutional ties, which are often associated not only with a firm's higher market share and higher profitability (Peng & Luo, 2000), but also with preferential access to market (Li et al., 2009), access to loans (Leuz & Oberholzer-Gee, 2006), and government bailouts during financial distress (Faccio, Masulis, & McConnell, 2006), are very important to a firm in an emerging economy. Thus, we propose that institutional ties are an important complement to a firm's internal resources, including knowledge (Uzzi, 1997).

Second, we investigate environmental uncertainty as an antecedent which may influence the closeness of institutional ties of a firm. While prior studies suggest that the greater the environmental uncertainty, the more likely firms will be to acquire information and knowledge in order to avoid potential risks from competitors and institutions (Autio, Sapienza, & Almeida, 2000; Kogut & Zander, 1992), our study argues that firms in such an environment will be more likely to rely on institutional ties (Pfeffer & Salancik, 1978; Powell, 1990). Possessing useful ties and contacts, a manager, as Burt (1997) argues, becomes an entrepreneur in the literal sense of the word: a person who adds value by brokering connections. In this way, our research contributes by investigating the effect of environmental uncertainty on the relationship between institutional ties and knowledge acquisition in China—a country lacking many market-supporting institutional mechanisms, such as transparent laws and regulations (Peng & Heath, 1996) and steady enforcement (Ahlstrom, Young, & Nair, 2002).

Third, our study attempts to extend previous studies by investigating U-shaped relationships between industry position and institutional ties, suggesting that firms with very strong (or very weak) industry positions are more likely to develop institutional ties than firms with a middling industry position, which refers that compared to competitors, a firm with the strongest market power or a firm with the weakest market power in an industry will be more likely to develop institutional ties than any another firm. Prior research has held that a firm's position in its industry can be seen as a predictor of a firm's power, opportunities, constraints, and behaviors (Oswald & Boulton, 1995; Smith, Ferrier, & Grimm, 2001). Previous studies find that firms with a higher industry position are typically able to earn higher rates of return and collect more information and knowledge through the advantages their position offers (Stephan, Mrumann, Boeker, & Goodstein, 2003). Firms within a lower industry position, on the other hand, need to establish close ties with other institutions in order to gain legitimacy and thereby mitigate their deficiencies in resources and capabilities (Aldrich & Fiol, 1994; Peng & Luo, 2000). Based on previous studies, we propose that firms with a very strong or very weak industry position are more likely to develop institutional ties than firms with a medium industry position (a U-shaped relationship between industry position and institutional ties).

In order to examine the joint influence of environmental uncertainty, a firm's industry position, and institutional ties on knowledge acquisition, a questionnaire survey of 308 firms in China was conducted and the multiple regression models were used to verify the developed hypotheses. As a result, we find that environmental uncertainty can directly influence the closeness of institutional ties and knowledge acquisition, whereas close institutional ties for firms in either a very weak or a very strong industry position have a positive direct effect on knowledge acquisition. Finally, institutional ties are also found to be positively related to knowledge acquisition. The research site in China is helpful in providing a venue to study the value of institutional ties in emerging economies under differing conditions (Ahlstrom, 2010; Fang, 2010).

Literature review and hypothesis development

Institutional ties

Institutional theorists posit that a firm is more likely to survive if it obtains legitimacy, social support, and approbation from external constituents of its institutional environment (DiMaggio & Powell, 1983; Meyer & Rowan, 1977; Powell, 1988). When a firm develops ties with well-established societal institutions, it signals its adherence to institutional prescriptions of appropriate conduct and obtains a variety of rewards that are predicted to contribute to its likelihood of survival, including greater invulnerability to questioning (Meyer & Rowan, 1977), enhanced legitimacy and status (Oliver, 1990), greater stability and predictability (DiMaggio & Powell, 1983; Meyer & Rowan, 1977), and greater ease of access to resources (DiMaggio & Powell, 1983; Pfeffer & Salancik, 1978). Chinese managers, for instance, form networks and ties with government officials in order to obtain access to scarce resources and information and to reduce uncertainty (Podolny &

Page, 1998). In accordance with the institutional theory and with the concept of managerial ties, therefore, the term “institutional ties” in this study refers to linkages with various institutions such as government officials and agencies, banks and financial institutions, universities, and trade associations.

Environmental uncertainty

Environmental uncertainty as defined by Milliken (1987) is the perceived inability of an organization’s key manager or managers to accurately assess the external environment. Katz and Kahn (1978) assert that “any organized activity, in order to persist, must have some degree of predictability.” Environmental uncertainty may threaten this predictability. Accordingly, high levels of environmental uncertainty have typically been interpreted as threats to organizational efficiency. As a result, when an environment becomes more complex and turbulent, firms will use whatever means they have to deal with the increased uncertainty. That is why environmental uncertainty has been shown to increase all types of boundary-spanning activity (Aldrich & Herker, 1977; Miles, 1980). Among these activities, institutional ties are a practical means that firms use to reduce uncertainty in a turbulent environment (Peng & Luo, 2000; Yiu, Lau, & Bruton, 2007).

In some emerging economies, despite major economic liberalization and institutional transition (Peng, 2003; Su, Xie, & Li, 2009), there remains significant control by the central and local governments over firm activities (Cai, 1999). Firms have to seek government approval when they want to successfully operate in a market. In China, for instance, many managers find it necessary to maintain what has been called a “disproportionately greater contact” with government officials (Child, 1994) to achieve coercive legitimacy (DiMaggio & Powell, 1983). In addition to such government connections, links with trade associations and professional bodies can provide intelligence about different markets and access to those markets with less uncertainty (Yiu et al., 2007) as well as normative legitimacy (DiMaggio & Powell, 1983). Furthermore, the banking systems in most emerging economies are necessarily relation-based, and banks are willing to provide long-term loans if firms have a good relationship with them (Yiu et al., 2007). Hence links with financial institutions are another valuable tie by which firms in an uncertain environment can reduce financial uncertainty. Thus, we can derive the following hypothesis:

Hypothesis 1 Higher environmental uncertainty is positively related to stronger institutional ties.

Most studies agree that high levels of knowledge should be better exploited in an unstable environment (Autio et al., 2000; Kogut & Zander, 1992). Previous literature has highlighted the fact that firms in emerging economies are constrained by an institutional environment characterized as a lower environmental munificence (Makino, Lau, & Yeh, 2002). To lessen the resources and information constrained due to the high environmental uncertainty, firms need to require more resources, knowledge, and information in order to reduce the uncertainty (Granovetter, 1985; Uzzi, 1997). As a result, firms try to access all kinds of knowledge acquisition

channels, of which good relationships with government officials are among the most important and productive. Hence, we hypothesize:

Hypothesis 2 A firm with higher environmental uncertainty is likely to acquire more external knowledge than one with lower environmental uncertainty.

Industry position

A firm's industry position influences its power, opportunities, constraints, and behaviors (Oswald & Boulton, 1995; Smith et al., 2001). A firm in a stronger industry position *vis-à-vis* its actual and potential competitors can earn above-normal returns by using its power edge to integrate all kinds of resources. In most emerging economies, resources are not readily available because of the underdeveloped nature of institutional structures and market-based exchange systems such as the stock market. Under such circumstances, managers need to rely more on personal relationships with external entities, such as top managers of institutional organizations, government officials, and community leaders, so as to secure the resources and capabilities required to successfully operate (Acquaah, 2007). In such a case, an advantageous position is important because, to build and maintain a close relationship with external entities, a firm must possess adequate resources and capabilities (Gao, Xu, & Yang, 2008). As far as institutional ties are concerned, establishing such ties is time-consuming, costly, and often not rewarding in the short-term which only preponderant firms can afford (Narula & Dunning, 2000). Thus, only firms with a stronger industry position in their industries have abundant resources to form and maintain the personal relationship for a long-term objective (Acquaah, 2007).

However, as Peng and Heath (1996), Peng and Luo (2000), Xin and Pearce (1996), and Yeung and Tung (1996) all suggest, in China, firms with weaker industry positions typically need to rapidly establish ties with other organizations in order to gain legitimacy, thus trying to compensate for their liability in resources and capabilities (Peng & Luo, 2000). As a result, firms with both strong and weak industry positions need closer institutional ties. Thus, we can hypothesize:

Hypothesis 3 A firm with either a very strong or a very weak industry position is more likely to establish close institutional ties than a firm with a middling industry position.

The firm's knowledge base includes its technological competencies as well as knowledge about customer needs and supplier capabilities (Teece, 1998). These competences are reflected in both individual skills and the collective knowledge of its network. A firm with a stronger position in its industry possesses superior resources and capabilities to create, transfer, assemble, integrate, and exploit the knowledge which is acquired from external channels (Cho & Yu, 2000). Furthermore, a firm with a stronger industry position has more power and a better reputation to effectively acquire external knowledge and it is more attractive to other organizations in terms of knowledge exchange. Moreover, a firm with a stronger

industry position has a stronger bargaining power over the government and institutions during the knowledge acquisition process. Thus it is possible to have more various options to acquire external knowledge at lower costs (Aurora & Gambardella, 1994).

Some researchers propose that a firm's industry position may become stronger with the increasing amount of a firm's acquired knowledge (Derfus, Maggitti, Grimm, & Smith, 2008). However, other research shows that a stronger industry position gives a selection advantage to firms, by definition, regardless of whether firms then use their position to expand their market competitiveness (Barnett, 1997). Thus, many analysts begin with the position and then consider the immediate consequences: whether it will be more or less efficient, powerful, and so forth (Gimeno, 2004). In their opinions, a firm's position is a pivotal determinant of a firm's knowledge acquisition especially from a short period of time (Uzzi & Gillespie, 2002). Furthermore, in emerging economies, a stronger industry position means a superior reputation and a higher bargaining power over institutional officials (Henisz & Macher, 2004), enabling firms to acquire valuable knowledge from institutional organizations. Therefore:

Hypothesis 4 A firm with a stronger industry position is likely to acquire more external knowledge than one with a weaker industry position.

Institutional ties and knowledge acquisition

Social capital theory maintains that competitive advantage derives not only from firm-level resources but also from difficult-to-imitate capabilities embedded in dyadic and network relationships (Dyer & Singh, 1998; Lane & Lubatkin, 1998). Although scholars believe that weak ties may provide certain efficiency or benefits in the knowledge acquisition process, especially when the meaning of information is not problematic (Granovetter, 1973) or when social capital are used for search activities (Hansen, 1999; Ren, Au, & Birtch, 2009), strong ties are crucial when knowledge is important, uncertain, or ambiguous. Prior evidence shows that when ties are strong, partners are more willing to exchange information and cooperate for mutual benefits (Krackhardt, 1992). Due to resource and information limitations of firms in emerging economies which make them prone to liabilities and instability (Amburgey, Kelly, & Barnett, 1993; Stinchcombe, 1965), institutional ties can help to explain how and why some firms are able to survive, thrive, and grow despite the lack of significant firm-specific resources.

Particularly in emerging economies, government officials still have considerable power and control. For instance, they control most financial institutions, the award of major contracts (which are exclusively determined by the government) and regulatory and licensing procedures. These officials can therefore provide firms easy access to financial resources, provide opportunities by granting government projects and contracts, provide certification and approval to products as meeting government standards, and provide information about new and impending regulations before the information is officially announced, making it possible for a firm to take advantage of such knowledge (Yiu et al., 2007). Thus, top managers developing close

relationships with institutional organizations can secure access to resources, information, and knowledge that create a buffer against the higher level of business environmental uncertainty (Acquaah, 2007). Thus, the following hypothesis can be drawn:

Hypothesis 5 A firm with stronger institutional ties is likely to acquire more knowledge than one with weaker institutional ties.

Figure 1 summarizes the entire framework of our study.

Methodology

Sample

Our investigation mainly focused on firms operating in China in the manufacturing sector. The description of the firms is shown in Table 1.

Pilot test

First, we developed our questionnaire based on a review of the literature. We translated the English questionnaire into Chinese and back-translated it independently into English to confirm consistency and accuracy (Brislin, Lonner, & Thorndike, 1973). Then we conducted our pilot test with four firms located in Xi'an, Shannxi province.

There were two purposes for the pilot test in this study. First, it improved our questionnaire by making it more comprehensive and accurate in presenting the questions to the sample firms. Second, it overcame any shortcomings of the questionnaire survey, which otherwise could not provide an in-depth understanding

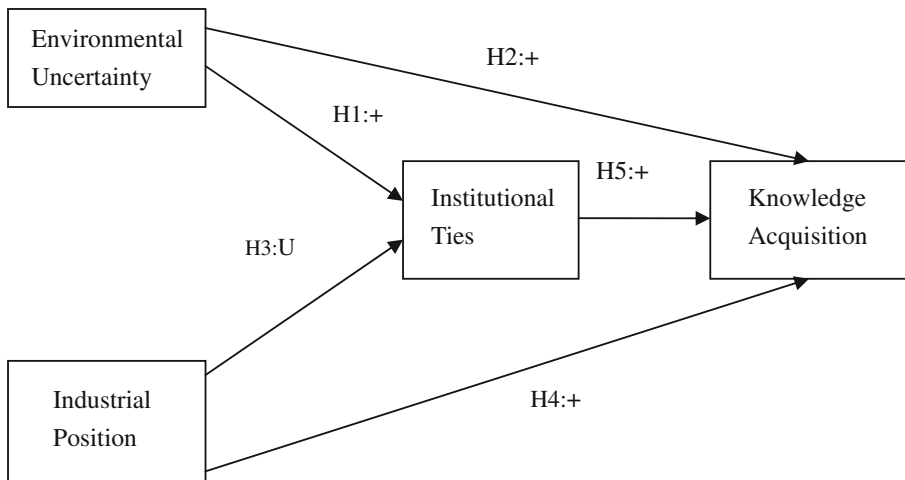


Figure 1 Conceptual model

Table 1 Sample description.

Firm type	Number
State-owned enterprise	92
Private enterprise	71
Sino-foreign joint venture	32
Wholly foreign-owned enterprise	25
State holding enterprise ^a	48
Private holding enterprise	31
Others	9
Total	308

^a State-owned enterprise represents the firm with 100% of its holdings belonging to the state while state holding enterprise refers to the firm with more than 50% of its holdings belonging to the state. The rules are also implied to private enterprise and private holding enterprise.

regarding firms' perspectives. Each pilot test was conducted by using PhD students as interviewers. The interviewer had a four-hour conversation with the president (or vice president) and top managers of the firm. Based on the results of the pilot test, our questionnaire was revised as the final questionnaire.

Survey

The survey was carried out during the period between July 2007 and January 2008 by professors and graduate students of a leading university in Northwest China. During the survey, we sent the questionnaire to interviewee companies by snail mail. The questionnaire was answered by the top managers of the sample firms. The interviewers recorded the answers to the questions and took notes on questions which were not answered completely. Out of 650 questionnaires, 308 completed questionnaires were collected by January 2008. The total respondent rate was 47.38%, which was acceptable since this rate was much higher than the required 20% (Gaedeke & Tootelian, 1976).

Variables

Seven-point Likert scale questions were designed for measuring the dependent variable of knowledge acquisition from the institutional organizations (e.g., Doz & Hamel, 1997; Grant, 1996). As shown in Table 2, the questions asked respondents to evaluate to what extent they had learned from external organizations regarding (a) new technological expertise, (b) new marketing expertise, and (c) new and important information (where 1 = little; 7 = to a great extent; Cronbach's alpha = 0.79).

Environmental uncertainty Environmental uncertainty factors are based on the survey items used by Grinyer and McKiernan (1990) and Li, Li, Liu, & Wang (2005). Six external environment indicators are used (see Table 2). These items

Table 2 Reliability and validity.

Construct/indicator	Cronbach alpha	Standardized loadings	Variance extracted
Knowledge acquisition	0.788		0.70
1. Your firm has acquired new and important information.		.850	
2. Your firm has acquired technology expert.		.855	
3. Your firm has acquired market development skill.		.809	
Environmental uncertainty	0.762		0.46
1. We regularly review the core capabilities of our current and potential competitors.		.682	
2. Senior executives pay little attention to competitors' strategies.		.628	
3. Exchange views on the information about competitors between managers and employees.		.694	
4. It is important for our business to develop strategies that are competitor-oriented in the long run.		.706	
5. Share information about competitors within the company.		.677	
6. Discuss competitor's strategy and competitive advantage at the management level.		.667	
Institutional ties	0.854		0.77
1. To which extent top managers at your firm have utilized personal ties during the past three years with political leaders in various levels of the government.		.884	
2. To which extent top managers at your firm have utilized personal ties, networks, and connections during the past three years with officials in industrial bureaus.		.903	
3. To which extent top managers at your firm have utilized personal ties during the past three years with officials in regulatory and supporting organizations such as tax bureaus, state banks, commercial administration bureaus, and the like.		.852	
Industrial position	1		
"How do you rank your firm in your industry" (5 = top 15%; 4 = top 15–30%; 3 = middle; 2 = bottom 15–30%; 1 = bottom 15%)			

assess the uncertainty of an environment on a seven-point Likert scale, and the Cronbach's alpha was 0.76.

Industry position We measure industry position by using the question "How do you rank your firm in your industry?" (5 = top 15%; 4 = top 15–30%; 3 = middling; 2 = bottom 15–30%; 1 = bottom 15%) (Hooley & Greenley, 2005).

Institutional ties Our measure of institutional ties is based on Peng and Luo's (2000) measures of managerial ties. The following questions appeared in the questionnaire to collect the appropriate data: "I (top manager) have established close relationships with political leaders in various levels of the government; officials in industrial bureaus; officials in regulatory and supporting organizations such as tax bureaus, state banks, commercial administration bureaus, and so on." Based on a seven-point

Likert scale, the respondent was asked to select from “disagree very strongly” to “agree very strongly.”

Control variables

Because previous studies have suggested that both organizational and environmental factors may affect institutional tie development, we controlled for these effects in our analyses.

Industry type Since competition and environmental uncertainty vary by industry sector (Lane & Lubatkin, 1998), we included dummy variables to control for industry effects. A firm’s industry, originally determined by the primary SIC code from the source of the database, was confirmed by using the business description obtained in the survey.

In our study, industry classification was measured by the two-digit primary SIC code. The data were available for 170 out of 308 sample firms. A majority of the sample firms were in fabricated metal products (SIC 34, 14.61%), followed by business services (SIC 73, 11.69%), electronic and other electrical equipment and components (SIC 36, 8.77%), petroleum refining and related industries (SIC 29, 7.79%), chemicals and allied products (SIC 28, 6.17%), and electric, gas, and sanitary services (SIC 49, 6.17%). Firms in other industries made up the remaining 44.81%.

Firm age The age of a firm may have an influence on its ability to acquire knowledge from the institutional relationship (Lane & Lubatkin, 1998). Older firms may have an experience advantage, or, alternatively, younger firms may have a higher capacity to take in new knowledge (Autio et al., 2000). Therefore, we included firm age as a control variable. Firm age was measured as the number of years since the formation or incorporation of the firm (Acquaah, 2007).

Firm size The size of the firm may influence knowledge acquisition (Autio et al., 2000). Larger firms may have more resources to devote to the institutional relationship. In this study, we used the logarithms of employees in each corporation as the indicator of firm size.

Competitive intensity The degree of competitive intensity in different industries may affect the level of firms’ dependence on institutional ties. A firm in a very competitive environment tends to build institutional ties in order to advance in its industry (Park & Luo, 2001; Peng & Luo, 2000). To assess the extent of competition in different areas, we used the item “Competition is intense in our local business environment” (1 = “strongly disagree,” 5 = “strongly agree”) (Aghion, Griffith, & Howitt, 2006).

Performance A firm’s prior financial performance determines its financial power, which is critical in building institutional ties and in knowledge acquisition. Financial performance was measured by the ROA, or return on assets (net incomes divided by total assets), in 2007 (Shiue, Chung, & Yen, 2005).

Results

First, the reliability and validity were examined in our research. As shown in Table 2, all variables displayed satisfactory levels of reliability, since the values of Cronbach Alpha range from 0.76 to 0.85, which is acceptable (Nunnally & Bernstein, 1994).

We estimate CFA model using AMOS 4.0. The results suggest that the model performs reasonably well ($\chi^2 = 86.0$, $\chi^2/df = 1.686$, goodness-of-fit index [GFI] = 0.955, comparative fit index [CFI] = 0.967, and root mean square error of approximation [RMSEA] = 0.05). Therefore, the constructs have reached acceptable levels of reliability.

We collected most of our data using a single survey and a single informant per corporation. To address the potential concerns of common method bias and single informant bias, we used several procedural and statistical remedies. Specifically, we undertook the procedural remedies of reducing item ambiguity, separating scale items for measuring the environmental uncertainty, institutional ties, and knowledge acquisition, and obtaining data from different sources of several control variables. Our statistical remedies included logarithms of survey data and Harman's (1967) one-factor test. The factor analysis showed that the measures loaded cleanly on separate factors; all factor loadings were above 0.48, which is a common threshold for acceptance. The above analyses indicate that neither a single factor nor a general factor accounts for the majority of the covariance in the measures.

However, as Podsakoff, MacKenzie, Lee, and Podsakoff (2003) indicated, Harman's one factor has several potential problems. For example, "the likelihood of obtaining more than one factor increases as the number of variables examined increases, thus making the procedure less conservative as the number of variables increases" (Podsakoff et al., 2003: 890). Thus, we also used confirmatory factor analysis of several competing models to diagnose the prevalence of common method variance as Podsakoff and his colleagues (2003) suggested. This approach allowed us to explore the potential increase in model fit obtained by the common methods factor, as well as the variance extracted by this factor. We specified the model in such a way that the common methods factor is not correlated with the four hypothesized factors (environmental uncertainty, industry position, institutional ties, and knowledge acquisition). The fit of this model was slightly better than that of the hypothesized four factor model ($\chi^2 = 67.8$, $\chi^2/df = 1.738$, goodness-of-fit index [GFI] = 0.965, comparative fit index [CFI] = 0.975, and root mean square error of approximation [RMSEA] = 0.049; $\Delta\chi^2 = 18.2$, $df = 12$, $p > .05$). The variance extracted by the common method factor, though, was only 0.16, falling below the 0.50 cut-off suggesting that the presence of a latent factor represents the manifest indicator (Hair, Anderson, Tatham, & Black, 1998). Furthermore, it is possible that the relationship between the indicator and the common method factor is a function of both common method problems and the effects of an unmeasured variable related to all four constructs (environmental uncertainty, industry position, institutional ties, and knowledge acquisition). Therefore, although common method variance might be an issue in this research, our tests show that it does not appear to be a serious problem inhibiting the adequate testing of our hypotheses.

Table 3 shows the mean values, standard deviations, and correlations for all the variables. The positive and statistically significant correlation between institutional

Table 3 Means, standard deviations, and correlations.

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Chemicals and allied products	0.06	0.24													
2. Petroleum refining and related industries	0.08	0.27	-0.08												
3. Fabricated metal products	0.15	0.35	-0.11	-0.12*											
4. Electronic and other electrical equipment and components	0.09	0.28	-0.08	-0.09	-0.13*										
5. Electric, gas, and sanitary services	0.06	0.24	-0.07	-0.08	-0.11	-0.08									
6. Business services	0.12	0.32	-0.09	-0.11	-0.15**	-0.11*	-0.09								
7. Firm age	2.63	0.90	0.12*	0.04	-0.00	-0.04	0.12*	-0.16**							
8. Industry competition	5.49	1.52	0.08	-0.03	0.05	0.10	-0.12*	0.03	0.05						
9. Firm size	6.50	2.07	-0.04	0.06	0.02	0.13*	0.07	-0.23**	0.43**	0.09					
10. ROA	2.89	2.58	-0.09	-0.04	0.02	0.09	-0.06	0.12*	-0.05	-0.01	0.07				
11. Environmental uncertainty	4.67	0.96	0.06	-0.03	0.01	0.05	-0.13*	0.05	-0.03	0.27**	0.11	0.09			
12. Industrial position	3.97	1.14	-0.08	-0.06	0.04	0.09	-0.05	0.05	0.19**	0.11	0.25**	0.16**	0.12*		
13. Institutional ties	4.98	1.33	0.03	0.03	-0.12*	-0.16**	0.06	-0.04	0.12*	-0.01	0.18**	-0.05	0.09	0.14*	
14. Knowledge acquisition	4.69	1.01	-0.08	0.12*	-0.14*	0.03	0.01	-0.05	0.03	0.09	0.14*	-0.04	0.28**	0.08	0.25**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

ties and a firm's knowledge acquisition suggests that institutional ties help to increase a firm's knowledge acquisition.

Table 4 shows the results of regression models estimating the effects of environmental uncertainty, a firm's industry position, and institutional ties on the firm's knowledge acquisition. Hypothesis 1 suggested that firms facing higher environmental uncertainty are likely to develop institutional ties. As shown in Model 2, the coefficient for environmental uncertainty and institutional ties is positive and somewhat significant ($p < 0.10$). Hence Hypothesis 1 is supported. Hypothesis 2 held that firms that have higher environmental uncertainty are likely to acquire more knowledge. As shown in Model 3, the coefficient for environmental uncertainty and knowledge acquisition is also significantly positive ($p < 0.001$), indicating that environmental uncertainty does significantly affect knowledge acquisition, offering support for Hypothesis 2.

Hypothesis 3 advised that firms with a stronger industrial position have a U-shaped relationship with institutional ties. As shown in Model 4, the quadric coefficient for industry position and institutional ties is positive and significant ($p < 0.01$), indicating that firms with a very strong or very weak industry position will establish close institutional ties compared with the firms with a moderate industry position. Hence, Hypothesis 3 is supported.

Hypothesis 4 stated that firms with a stronger industry position are likely to acquire more knowledge. As shown in Model 5, the coefficient between industry position and institutional ties is also significant ($p < 0.05$), indicating that industry position significantly contributes to knowledge acquisition. Therefore, Hypothesis 4 is supported.

Hypothesis 5 predicted a positive effect of institutional ties on knowledge acquisition. As we can see in Model 6, the coefficient for institutional ties is also significantly positive ($p < 0.001$), indicating that a firm with closer institutional ties is likely to acquire more knowledge. Hypothesis 5 is therefore supported.

Discussion

This study extends Peng and Luo's (2000) research by specifically investigating the impact of institutional ties developed from top managers' personal relationships with political leaders, government officials, and officials in supporting organizations on knowledge acquisition. In fact, our study opened an insightful discussion of the role of institutional ties on knowledge acquisition instead of a general examination of the effect of personal ties on firm performance as Peng and Luo (2000) did. More importantly, although Peng and Luo (2000) mentioned that environmental uncertainty and firms' characteristics may influence firms' use of personal ties, our study empirically proved the extent to which the environmental uncertainty and a firm's industry position can influence institutional ties and knowledge acquisition.

Our results indicated that environmental uncertainty leads to institutional ties, thus supporting previous studies, from a specific perspective, which show that the greater the environmental uncertainty, the more likely that firms will rely on managerial ties (Peng & Luo, 2000; Pfeffer & Salancik, 1978; Powell, 1990). The advantage of closer institutional ties, when facing environmental uncertainty and

Table 4 Results of hierarchical regression models.

Model	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
	Knowledge acquisition		Institutional ties		Knowledge acquisition		Institutional ties		Knowledge acquisition		Knowledge acquisition	
Dependent Variable	β	<i>t</i> -value	β	<i>t</i> -value	β	<i>t</i> -value	β	<i>t</i> -value	β	<i>t</i> -value	β	<i>t</i> -value
Chemicals and allied products	-0.12	4.14*	-0.02	0.15	-0.14	6.11**	0.05	0.81	-0.11	3.74*	-0.07	1.56
Petroleum refining and related industries	0.05	0.80	-0.02	0.06	0.06	0.96	-0.03	0.21	0.06	1.08	0.09	2.67+
Fabricated metal products	-0.16	7.31**	-0.16	6.91**	-0.14	5.78**	-0.09	2.17	-0.16	7.06**	-0.10	2.77+
Electronic and other electrical equipment and components	-0.02	0.13	-0.18	8.78***	-0.03	0.25	-0.21	12.42***	-0.02	0.14	0.04	0.40
Electric, gas, and sanitary services	-0.02	0.16	0.01	0.03	0.03	0.18	0.03	0.21	-0.02	0.08	-0.01	0.03
Business services	-0.03	0.24	-0.05	0.75	-0.04	0.54	-0.02	0.09	-0.03	0.22	-0.02	0.09
Firm age	-0.06	0.75	0.10	2.43+	-0.03	0.18	-0.01	0.04	-0.07	1.04	-0.07	1.29
Industry competition	0.10	2.96+	-0.11	3.21**	0.02	0.18	-0.10	3.16+	0.10	3.13*	0.13	5.61**
Firm size	0.16	6.26**	0.15	5.85**	0.13	4.55*	0.18	8.55***	0.15	5.41**	0.10	2.38+
ROA	-0.14	5.87**	-0.08	1.88	-0.16	8.39***	-0.04	0.40	-0.13	4.84**	-0.05	0.88
Environmental uncertainty			0.12	4.14**	0.30	27.66***						
Position					0.15	6.03*	0.11	3.51*				
Position ²					0.18	10.17***						
Institutional ties	0.10		0.11		0.17		0.14		0.11		0.30	28.75***
R ²	1.61		1.39+		2.34***		1.96**		1.62*		2.61***	

Standard errors are in parentheses; + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed test).

change, is that firms have already allocated resources to maintain relationships with governmental officials in order to get support from the government and other institutional organizations (Ahuja, 2000). Meanwhile, our results contribute to the current research by showing that environmental uncertainty is a motivation for a firm's knowledge acquisition. A firm in an uncertain environment is apt to form a communication channel for knowledge acquisition and as a mechanism for collecting information to monitor and coordinate external uncertainty.

In our study, we also found that industry position is an influential factor for institutional ties. This finding suggested that firms with a very strong or very weak position are more interested in building and maintaining institutional ties than firms with medium industry position. Firms with a stronger industry position have abundant financial capital to afford the expenditure of establishing and maintaining institutional ties, whereas firms with a weaker position may be more flexible, capable, and eager in constructing and improving institutional ties to complement their limited resources (Peng & Luo, 2000). Furthermore, our empirical results suggested that a firm with strong industry position is inclined to acquire more knowledge. This result could be also explained as the learning base of a firm is synonymous with the acquisition of new technologies because of its absorptive capacity, industry position, and negotiation power (Chandler, 2001).

Our results also indicated that the social capital developed from institutional ties by managers has significant and positive effects on knowledge acquisition, a finding which was consistent with those of Peng and Luo (2000) and other prior studies (e.g., Park & Luo, 2001; Pennings, Lee, & van Witteloostuijn, 1998; Yli-Renko, Autio, & Sapienza, 2001). Firms can augment their knowledge base via institutional ties, which pools knowledge and resources as well as gathers and screens relevant information (Ahuja, 2000). Maintaining a presence in institutional ties further enhances a firm's knowledge acquisition by repeated experience.

To further discuss the impact of three types of institutional ties (with political leaders, officials in industrial bureaus, and officials in regulatory and supporting organizations), we ran the model using the three kinds of institutional ties separately. The results showed that there was no significantly inconsistent result between the model using three institutional ties and the model using one factor model (please see Table 5). While environmental uncertainty did not have significant impacts on institutional ties with political leaders and officials in industrial bureaus, there was a significantly positive relationship between environmental uncertainty and institutional ties with officials in regulatory and supporting organizations. Meanwhile, there existed significant U-shaped relationships between industry position and political ties as well as industrial bureaus ties. Furthermore, we found the positive relationships between three types of institutional ties and knowledge acquisition.

Conclusion

Prior studies of knowledge acquisition have shown that a firm explores critical choices concerning its scope and boundaries. Particularly, prior studies have concluded that a firm's characteristics can influence the relationship between managerial ties and firm performance (such as Peng & Luo, 2000; Peng & Zhou,

Table 5 Results of regression models with three kinds of institutional ties.

Dependent Variable	Institutional ties 1 ^a		Institutional ties 2 ^b		Institutional ties 3 ^c		Institutional ties 1		Institutional ties 2	
	β	t-value	β	t-value	β	t-value	β	t-value	β	t-value
Chemicals and allied products	0.01	0.06	-0.01	0.03	-0.05	0.89	0.03	0.28	-0.01	0.02
Petroleum refining and related industries	0.01	0.03	-0.01	0.02	-0.03	0.26	-0.00	0.00	-0.02	0.11
Fabricated metal products	-0.12	3.91*	-0.11	3.51*	-0.18	9.30***	-0.06	0.96	-0.12	3.80*
Electronic and other electrical equipment and components	-0.09	2.31	-0.23	15.09***	-0.22	15.30***	-0.14	5.24	-0.23	14.86***
Electric, gas, and sanitary services	0.05	0.72	0.04	0.55	0.03	0.19	0.04	0.54**	0.01	0.04
Business services	-0.02	0.10	-0.04	0.41	-0.04	0.53	-0.01	0.02	-0.05	0.73
Firm age	-0.06	1.00	0.10	2.47+	0.10	2.82*	-0.04	0.42	0.08	1.92
Industry competition	-0.05	0.63	0.07	1.48	-0.06	0.96	-0.08	1.81	0.08	1.90
Firm size	0.22	9.55***	0.10	2.25	0.11	3.41*	0.18	7.76***	0.11	2.53+
ROA	-0.03	0.15	0.10	2.47	0.20	11.51***	-0.08	1.86	0.09	1.99
Environmental uncertainty	-0.02	0.06	0.07	1.34	0.15	7.09***				2.37+
Position							0.17	7.38***	0.09	0.69
Position ²							0.21	12.39***	-0.05	
R ²	0.06		0.12		0.16		0.11		0.12	
F	0.93		1.86*		2.24***		1.53+		1.74*	

Dependent Variable	Institutional ties 3		Knowledge acquisition		Knowledge acquisition		Knowledge acquisition	
	β	t-value	β	t-value	β	t-value	β	t-value
Chemicals and allied products	-0.05	0.66	-0.07	1.54	-0.07	1.63	-0.06	1.12
Petroleum refining and related industries	-0.02	0.12	0.09	2.68+	0.10	2.95+	0.09	2.68+
Fabricated metal products	-0.18	9.44***	-0.11	3.44*	-0.10	2.93+	-0.10	2.82+
Electronic and other electrical equipment and components	-0.23	16.32***	-0.00	0.00	0.04	0.56	0.04	0.50
Electric, gas, and sanitary services	0.02	0.14	0.01	0.01	-0.01	0.04	-0.02	0.18
Business services	-0.04	0.45	-0.05	0.75	-0.03	0.19	-0.03	0.22
Firm age	0.08	1.95	-0.06	0.79	-0.08	1.42	-0.09	1.76
Industry competition	0.08	1.82	0.14	6.53**	0.13	5.25**	0.13	5.57**
Firm size	0.10	2.72	0.16	5.37**	0.16	5.32**	0.17	6.02***
ROA	0.18	9.03***	-0.10	2.59+	-0.11	3.38*	-0.13	4.08*
Ties with political leaders			0.27	24.39***				
Ties with officials in industrial bureaus	0.09	2.25			0.29	25.86***		
Ties with officials in regulatory and supporting organizations	0.11	3.41*					0.27	21.22***
R ²	0.16		0.16		0.16		0.15	
F	2.28***		2.76***		2.52***		2.25	

Standard errors are in parentheses; + $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$ (two-tailed test).

^a Institutional ties with political leaders.

^b Institutional ties with officials in industrial bureaus.

^c Institutional ties with officials in regulatory and supporting organizations.

2005, etc.). However, few studies focus specifically on institutional ties. The main thrust of our framework is that the choice of institutional relationship needs to be congruent with external characteristics. Furthermore, to investigate the micro-macro link (Peng, 2000; Tang & Xi, 2006; Wu & Leung, 2005) between institutional ties and governmental and industrial environment, we empirically tested how environmental uncertainty and a firm's industry position influence a firm's knowledge acquisition. By examining 308 firms in China, we found that environmental uncertainty can directly influence the closeness of institutional ties and knowledge acquisition. While a firm in a very strong or a very weak industry position needs close institutional ties, a firm's industry position also has a positively direct effect on knowledge acquisition. Finally, institutional ties were also found to be positively related to knowledge acquisition.

Some limitations of our study should be noted for future research. Our focused sample helped us to control for industry- and country-specific variances that might have otherwise masked significant effects, but future studies are encouraged in other industry and country settings, since they may shed light on the generalizability of the theoretical grounding. Second, even though we have rooted our arguments in existing theories and previous empirical findings, future studies might include longitudinal research which could help to sort out whether reverse or reciprocal relationships exist. Finally, although secondary and objective data do have the advantage of verifiability and replicability, and consequently the potential for creating freedom from bias, those types of data are often inadequate proxies for the constructs (Krishnan, Martin, & Noorderhaven, 2006). In this study, we employed the self-reported measures both because of their potential for concept-specific accuracy and because of the unavailability of other measures across an entire sample. Future research should replicate our model and test it with objective data, which can further enhance the generalizability of our findings regarding the importance of institutional ties on knowledge acquisition.

This study makes a contribution to our understanding of the roles of institutional ties and knowledge acquisition for Chinese firms with consideration of environmental uncertainty and industry position. The above analyses show that institutional ties developed from the social networking relationships and ties with political leaders, officials in industrial bureaus, and officials in regulatory and supporting organizations are significant predictors of knowledge acquisition. Particularly, these institutional ties not only help firms to gain legitimacy but also to acquire knowledge. More importantly, managers in China should also take the external characteristics (such as environmental uncertainty and a firm's industry position) into consideration when they use institutional ties as a source of knowledge acquisition. By showing the relationships among internal and external determinants, institutional ties, and knowledge acquisition, we contribute empirically and theoretically to the development of this vital stream of research.

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