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Innovation outcomes of knowledge-seeking Chinese foreign direct investment

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Innovation Outcomes of Knowledge-Seeking Chinese FDI

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Structured Abstract:

Purpose This paper investigates how organizational learning, absorptive capacity, cultural integration, specialization of the acquired firm, and characteristics of transferred knowledge impact innovation performance subsequent to overseas acquisitions.

Design/methodology/approach Survey responses from 222 Chinese multinational enterprises engaged in overseas acquisitions.

Findings Differences between acquiring and acquired firms' capabilities, while having a positive direct influence, suppress the positive impact of organizational learning and absorptive capacity, suggesting that multinationals require some basic level of capabilities in order to appropriate value from overseas acquisitions.

Research implications This paper investigates the impact of knowledge-seeking overseas acquisition of Chinese multinationals on innovation performance as this appears to be the primary motive for making such acquisitions.

Practical implications Knowledge-seeking overseas acquisition should be based upon the absorptive capacity of the acquiring firm and complementarity between both firms. In knowledge-seeking overseas acquisitions, establishing an effective organizational learning mechanism is necessary for improving innovation performance.

Originality/value This paper reports on the behaviour and innovation performance of Chinese multinationals through analysis of primary data.

Keywords: China, cross-border acquisitions, foreign direct investment, reverse knowledge transfer, innovation, knowledge-based view.

Article Classification: Research paper

For internal production use only

Running Heads:

Innovation Outcomes of Knowledge-Seeking Chinese FDI

I. Introduction

Chinese multinational enterprises (MNEs) increasingly engage in cross-border mergers and acquisitions in order to build and strengthen their competitiveness. Recent examples include Lenovo's acquisition of IBM's PC business, Geely's acquisition of Volvo, and Sany's acquisition of the premiere brand in the global concrete machinery industry, German Putzmeister. Chinese MNEs typically pay a premium for these financially troubled MNEs as a means to acquiring their knowledge-based assets including technology, R&D capabilities, brands, and distribution networks (Child and Rodrigues, 2005; Knoerich, 2010; Li, 2007; Li, 2011a).

Unlike other forms of FDI such as efficiency, resource and market seeking, returns from knowledge-seeking acquisitions are slower to materialize as successful integration of value-creating assets is more difficult. Considering their relatively limited technological base, innovation capabilities, and relative lack of international experience, Chinese MNEs are less likely to enhance innovation performance from knowledge-seeking acquisitions in the short run. In this paper, we identify key factors influencing the innovation performance of Chinese MNEs, and the interactions among these factors during knowledge-seeking overseas acquisitions. Our study provides practical guidance for Chinese MNEs engaged in overseas acquisitions, and also examines the role that FDI can play in technological 'catch-up'. This

paper seeks to provide generalizable findings through a unique, large sample, empirical study.

II. Hypotheses and theoretical framework

Early theories of internationalization focused on the exploitation of firm and country-specific assets in foreign markets (Rugman, 2005). This type of FDI is typically motivated by a need for efficiency, in accordance with the transaction cost internalization theory of MNEs (Buckley and Casson, 1976; Hennart, 1982; Rugman, 1981). According to this view, overseas production and international trade are substitutes for one another. When contract costs are sufficiently low, MNEs will choose international trade instead of overseas production.

Conversely, for transactions involving intangible assets such as tacit knowledge within weak intellectual property regimes, MNEs will choose acquisition, which often results in internationalization (Hennart, 1982; Rugman, 1981).

The increasing importance of asset-seeking FDI has altered scholars' explanations of internationalization. Dunning (1994, 2006) suggested that among all factors affecting FDI, the motivation to seek region-bound assets is increasing the quickest. This form of FDI follows different motives from asset-exploiting FDI as it allows a MNE to acquire new resources and capabilities through internationalization in order to maximize value creation, rather than minimizing transaction costs. The trend of substituting asset-exploiting FDI for asset-seeking FDI has inspired an increasing research focus on the resource-based view (RBV: Barney, 1991; Wernerfelt, 1984) and knowledge-based view (KBV: Grant, 1996;

Kogut and Zander, 1992; Nonaka and Takeuchi, 1995) as an explanation for performance differences.

Innovation outcomes are improved when both parties have complementary knowledge and the acquiring firm is capable of integrating that knowledge, as evidenced by the merger between German MNE Coburg and BYJC (Fan and Wang, 2011). Chang (2011) likewise found that innovation performance of Chinese state-owned MNEs was positively related to the asset stock of acquired overseas MNEs and Gu and Reed (2011) found improvement in the short, medium, and long-term market performance of 157 overseas acquisitions made by Chinese MNEs during the period from 1994 to 2009. Nonetheless, lack of core competences still results in a high failure rate amongst overseas acquisitions by Chinese MNEs (Li, 2011b).

RBV (Barney, 1991; Wernerfelt, 1984) emphasizes that unique capabilities are the key source of sustainable competitive advantage. KBV (Grant, 1996; Kogut & Zander, 1992; Nonaka & Takeuchi, 1995) takes a similar stance, but considers knowledge, especially tacit knowledge, to be the most important strategic resource of multinationals. According to KBV, a firm's capabilities to acquire, integrate, store, share and apply knowledge are the key factors in establishing and sustaining competitive advantage (Grant, 1996). Kogut and Zander (1993) theorized that knowledge exists in the social relations among community members without fixed boundaries. Accordingly, greater capability to transfer knowledge across nations becomes a main source of competitive advantages and growth of MNEs over purely domestic

firms. The firm-specific assets of MNEs in their home country are no longer the essential condition for their global competitiveness as they can instead acquire overseas strategic assets.

Traditionally, knowledge-seeking FDI has manifested itself as the direct investment of MNEs of developed countries in other developed countries and regions, namely the US, Europe and Japan. With the rise of Asia, and the rapid expansion of knowledge-seeking FDI from South Korea and Taiwan, the traditional patterns have changed (Furman, Porter and Stern, 2002). Knowledge-seeking FDI of Chinese MNEs is also increasing, not only in developed countries and regions, but also in developing economies with advanced industrial clusters such as Bangalore in India. Chinese MNEs are now more frequently acquiring the knowledge of target MNEs through mergers and acquisitions [1]. Knowledge-seeking overseas acquisition provides a rapid mechanism for Chinese MNEs to acquire technical capacity, managerial expertise and other types of competitive resources. However, the relatively weak technological base and insufficient international experience of Chinese MNEs, combined with political reactions to their overseas acquisitions, can hamper the realization of the intended benefits. The key to successful knowledge-seeking overseas acquisitions by Chinese MNEs lies in discovering a path to acquiring the explicit and implicit knowledge of target MNEs and then transform that knowledge into innovation capabilities.

There is a lack of consensus in the literature on the best way to measure the innovation performance of MNEs (Kanji, 1996; Prajogo and Sohal, 2003; Tang, 1998). Some scholars

have adopted indicators such as the number of patents, published reports and newly-approved projects (Nieto and Rodríguez, 2011; Phene and Almeida, 2008; Yamin and Otto, 2004;). Others have, adopted subjective indicators such as comparison with competitors in the quality and function of new products (Hung *et al*, 2011; Prajogo, Power and Sohal, 2004). Still others have used proxies such as market share and brand reputation to measure innovation performance (Moser, 1984; Olson, Walker and Rueker, 1995). This paper followed Baker and Sinkula (1999), Prajogo *et al* (2004) and Hung *et al* (2011), by measuring innovation performance along three dimensions including product innovation, process innovation and organizational innovation. Innovation performance and all other measures were scored on a 7 point Likert-type scale.

Knowledge-seeking overseas acquisition and innovation performance

Chinese MNEs need to rapidly upgrade their innovation capabilities if they are to survive in the highly competitive global marketplace. These capabilities apply not only to product innovation, but also to processes, organizational structure (Rogers, 1995) and management practices (Birkinshaw, Hamel and Mol, 2008). According to Damanpour (1991), innovation includes the development and application of new ideas, new systems, new products or new technologies. In many industries, technology lifecycles are being continuously reduced, and the cost and complexity of technological development are increasing rapidly. Chinese MNEs must transform their approaches to knowledge acquisition in order to catch up to other firms. Among these approaches, knowledge-seeking overseas M&A is potentially a faster option than the slower, path dependent approach to achieving innovation competence.

Many scholars have found that knowledge-seeking activities of MNEs can improve innovation capabilities (e.g. Cantwell, 1994; Gupta and Govindarajan, 2000). Buckley and Carter (1996) suggest that MNEs innovate through “global synthesis”, i.e. integrating knowledge streams from different sources. Many studies have found that acquisition is an effective approach for acquiring the knowledge and capabilities of target MNEs (Ranft and Lord, 2002). Studies have shown that knowledge transfer during acquisitions is vital to value creation (Capron and Pistre, 2002). Successful knowledge transfer requires the participation of employees and effective integration of tasks, technologies, resources and personnel (Brown and Duguid, 1991; Anh, Baughn, Hang and Neupert, 2006). Other factors influencing knowledge transfer during acquisitions include knowledge type (Ranft and Lord, 2002), integration strategy (Birkinshaw, 1999), staff interaction (Empson, 2001), personnel exchanges (Bresman, Birkinshaw and Nobel, 1999), the role of expatriate managers (Hébert, Very and Beamish, 2005) and culture (Sarala and Vaara, 2010).

An important characteristic of knowledge-seeking overseas acquisition by Chinese MNEs is reverse knowledge transfer, which is motivated by the acquiring firm’s desire to improve upon weak innovation capabilities. This is different from the assertion that knowledge typically transfers from parent company to subsidiary company as described in most knowledge management research. In recent years, some scholars have turned their attention to reverse knowledge as an important source of innovation and a significant tool to forge a unique competitive advantage for MNEs, not available to purely domestic firms (Frost and

Zhou, 2005; Eden, 2009). Scholars assert that reverse knowledge transfer can help MNEs coordinate their global strategy and improve their capabilities in new product development, technologies and services (Ambos, Ambos and Schlegelmilch, 2006). During reverse knowledge transfer, the parent company transfers knowledge acquired from the subsidiary to other units within the organizational network. This not only improves the efficiency of knowledge exploitation, but also enhances the parent company's control over subsidiaries (Yamin and Forsgren, 2006; Rabbiosi, 2011). However, most of these studies focus on MNEs in developed rather than developing countries, while research on the global expansion of Asian firms is typically rooted in case studies (e.g. Li, 2007; Luo and Tung, 2007; Mathews, 2006).

Figure 1 depicts factors derived from current literature that we posit to influence innovation performance of Chinese MNEs during knowledge-seeking overseas acquisitions. The following sections build hypotheses on the nature of the relationships between these factors and innovation performance.

(INSERT FIGURE 1 ABOUT HERE)

Organizational learning

Organizational learning was measured using a scale adapted from Gupta and Govindarajan (1991) and Persson (2006). Learning is an important source of sustainable competitive advantage as one of the key determinants of organizational effectiveness (Nonaka, 1994).

Learning and knowledge creation require dialogue and interaction amongst employees (Easterby-Smith, Crossan and Nicolini, 2000). Organizational learning in MNEs promotes these activities which aids the transfer of proprietary knowledge, tacit knowledge and information between parent and subsidiary companies.

To promote reverse knowledge transfer and improve innovation performance, Chinese MNEs need to establish effective organizational learning mechanisms. These mechanisms typically include personnel exchanges, training, visits, seminars, task forces and electronic communication. Research has shown that organizational learning can enhance the probability that innovations from different departments will be diffused throughout the MNE (Bartlett and Ghoshal, 1989). Empirical research has demonstrated that the creation of new knowledge is associated with higher financial performance (Bontis, Crossan and Hulland, 2002; Tippins and Sohi, 2003), and organizational learning can enhance the knowledge capability of MNEs and improve their innovation performance (Hung, Yang, Wu and Kuo, 2011).

H1. During knowledge-seeking overseas acquisitions by Chinese MNEs, organizational learning between acquiring and acquired firms has a positive impact on innovation performance.

Absorptive capacity

Absorptive capacity was assessed using a scale adapted from Zahra and George (2002).

Innovation research places great importance on absorptive capacity (e.g. Lane and Lubatkin,

1998; Minbaeva, Pedersen, Björkman, Fey and Park, 2003), which is defined as “the ability to assess the value of new external information, internalize it, and apply it to new or existing business purposes” (Cohen and Levinthal, 1990, p. 128). Especially in the context of overseas acquisitions, absorptive capacity depends primarily on the competence and motivation of employees (Minbaeva *et al*, 2003). Zahra and George (2002) proposed that absorptive capacity is a dynamic capability consisting of four interrelated factors: acquisition, assimilation, transformation and utilization. According to research, absorptive capacity is crucial to improving innovation performance (Pérez-Nordtvedt, Babakus and Kedia, 2010).

H2. During knowledge-seeking overseas acquisitions by Chinese MNEs, the stronger absorptive capacity of the acquiring firm, the higher the innovation performance of the MNE.

Cultural integration

Cultural integration was assessed using a scale adapted from Sarala and Vaara (2010). Since Chinese firms have historically relied on their advantage in low-cost labor in the course of economic reform and trade liberalization, their management practices diverge from those of firms in developed countries. This difference adds more complexity to cultural integration and increases pressures for adaptation, magnifies resistance to change, and undermines organizational learning and knowledge transfer (Kamoche, 1997; Kang, Morris and Snell, 2007). Others, however, have found that cultural difference can actually promote learning due to complementarity and enhance value creation (Björkman, Stahl and Vaara, 2007; Larsson and Finkelstein, 1999). This is because cultural integration enhances the

interdependence between acquiring and acquired firms, promotes communication between both parties, and facilitates the transfer of tacit and explicit knowledge (Haspeslagh and Jemison, 1991; Vaara, Tienari and Björkman, 2003).

H3. During knowledge-seeking overseas acquisitions by Chinese MNEs, the development of common culture between acquiring and acquired firms has a positive impact on innovation performance.

Role of acquired firm

Role of the acquired firm was assessed using a scale adapted from Gupta and Govindarajan (1991) and Frost *et al* (2002). Several scholars have found that highly specialized subsidiaries referred to as ‘centers of excellence’ play an important role in MNE innovation (Birkinshaw and Hood, 1998; Frost, 2001; Frost, Birkinshaw and Ensign, 2002; Gupta and Govindarajan, 1991; Phene and Almeida, 2008). Chinese MNEs that have a weak technological base depend on the knowledge of acquired firms in order to improve their innovation capabilities. But instead of pooling the knowledge resources, Chinese firms may treat their acquisitions as strategic knowledge and innovation centers.

H4. During knowledge-seeking overseas acquisitions of Chinese MNEs, giving the acquired firm a specialized role in the global innovation network has a positive impact on innovation performance.

Characteristics of transferred knowledge

Knowledge characteristics were assessed using a scale adapted from Zander (1991) and Zander and Kogut (1995). Tacit knowledge is abstract and only passed on through the active participation of “teachers”. Explicit knowledge is highly codified and transferred through official and systematic language (Nonaka and Takeuchi, 1995; Polanyi, 1966). Figuratively speaking, explicit knowledge is a building block, while tacit knowledge is the “glue” and integrating mechanism (Nelson and Winter, 1982). Explicit knowledge is often embedded in standardized programs, while tacit knowledge is often embedded in non-standardized, context-specific processes (Martin and Salomon, 2003). Tacit knowledge is potentially more valuable because it is harder to imitate, whereas explicit knowledge is easier to obtain and more rapidly exploited (Polanyi, 1966). In MNEs, the transfer of explicit knowledge promotes reutilization of knowledge to solve common problems, and to provide standardized products and services (Hansen, Nohria and Takeuchi, 1999). Due to the inimitability of tacit knowledge, transfer requires adequate interpersonal communication, but it is a key source of competitive advantage (Teece, 1998; Nonaka and Takeuchi, 1995; Teigland and Wasko, 2009).

H5. During knowledge-seeking overseas acquisitions by Chinese MNEs, the more tacit knowledge transferred, the greater the innovation performance.

Capability difference between acquiring and acquired firms

Capability difference between acquiring and acquired firms was assessed using a scale adapted from Larsson and Finkelstein (1999) and Björkman *et al* (2007). Relying on the domestic market and low labor costs, Chinese firms have developed strong manufacturing and marketing capabilities. For competition in global markets, however, they lack the necessary innovation capabilities. Acquired firms or business units in developed countries typically have stronger technical and R&D capabilities, as well as distribution channels and brand recognition in developed markets. However, the advantages of these firms are eroded by higher costs. The benefits derived by combining the strengths of Chinese and developed market firms provide strong motivations for two geographically distant MNEs to overcome the challenges of integration.

If the resources or capabilities of the acquiring firm can enhance the resource allocation or capabilities of the acquired enterprise, the merger may present more opportunities for collaboration and knowledge sharing (Larsson and Finkelstein, 1999). However, this complementarity depends on the difference in the capabilities between acquiring and acquired firms. If this difference is too great, it may negatively impact the effect of organizational learning and absorptive capacity on innovation performance.

Studies of the impact of organizational capabilities on post-acquisition performance are mixed. Hill and Hellriegel (1994) found no performance implications of capability complementarity between alliance partners while Sarkar *et al* (2001) showed that although compatibility of operations can translate to better project management and implementation

processes, it has a negative impact on strategic performance. Saxton (1997) found that the similarity in strategies (manufacturing, raw materials, technology, marketing and customers) is positively correlated to performance, while similarity in organizational processes (personnel relationships, culture, structure, accounting and information systems) had insignificant or even negative impacts on performance. During knowledge-seeking overseas acquisitions by Chinese MNEs, large capability differences between acquiring and acquired firms may thus negatively impact innovation performance.

H6a-e. Capability difference between acquiring and acquired firms moderates the impact of a) organizational learning, b) absorptive capacity, c) cultural integration, d) innovative performance and e) knowledge characteristics on innovation performance. The greater the capability difference, the lesser the positive effect of organizational learning on innovation performance.

Control variables

Due to the path dependent nature of innovation performance (Cohen and Levinthal, 1990; Phene and Almeida, 2008), we included three control variables in our analysis. The first was the size of the acquiring firm. Many argue that firm size has a positive impact on its R&D capabilities, given their resource intensity (Cohen and Levin, 1989). Research shows that large MNEs have more resources, and can more easily obtain additional resources, which in turn has a positive impact on innovation performance (Gooding and Wagner, 1985). Others

have argued that large-sized companies often lack incentives for scientific research, relying instead on existing technologies, which can lead to lower levels of innovation (Phene and Almeida, 2008). Small high-tech companies, it has been argued, are more efficient, and their R&D investments tend to result in more patents (Austin, 1993; Grilliches, 1990). We measure the size of the acquiring firm by the natural logarithm of number of employees, to correct for skew.

The second control variable we included is time elapsed post-acquisition. Over time, merged organizations tend to become more integrated (Buono and Bowditch, 1989; Haspeslagh and Jemison, 1991). Empirical research has confirmed that the time elapsed after an acquisition can affect the success of the acquisition (Very, Lubatkin, Calori and Veiga, 1997). Bresman *et al* (1999), in particular, showed that the time elapsed after acquisition has a positive impact on knowledge transfer. In our study, we defined the time between the acquisition and when the respondent completed our questionnaire, in years.

The third control was cultural distance between China and the country of the acquired firm. National culture influences perceptions of right and wrong (Olie, 1994) and reflects national identity, which can impact trust and cooperation (Olie, 1994; Vaara, 2003; Weber, Shenkar and Raveh, 1996). Sometimes differences can lead to politicization of post-acquisition integration along ethnic lines (Olie, 1994; Vaara, 2003). Conversely, if cross-border acquisition happens in the context of greater cultural distance, the two firms often possess

different knowledge stocks which in turn increases potential complementary (Barney, 1991; Morosini, Shane and Singh, 1998; Björkman *et al*, 2007).

Many scholars have proposed a variety of approaches to measure cultural distance between countries (Hofstede, 1980, 1991; Inglehart, Basáñez, Díez-Medrano, Halman and Luijkz, 2004; Schwartz, 2004; Trompenaars and Hampden-Turner, 1998). We adopted the Hofstede's cultural dimension scores (power distance, individualism, masculinity, uncertainty avoidance), and used Kogut and Singh's (1988) measure which integrates the four cultural dimension scores into a single distance score.

III. Sample and methodology

All data in this paper were collected through survey except for cultural distance which was calculated from Hofstede's cultural dimension scores. We identified 493 Chinese MNEs that had acquired MNEs or business units from the List of Chinese Enterprises with Foreign Investment publicized by China's Ministry of Commerce (<http://hzs.mofcom.gov.cn/>). Prior to sending questionnaires to these MNEs, we conducted interviews and tested our instruments on researchers and MNE managers, and revised the questionnaires according to their feedback. We then contacted these MNEs by telephone or email, and sent them a Project Approval Notice issued by the National Social Science Foundation and Humanity and Social Science Fund of the Ministry of Education of the People's Republic of China. We received 222 valid questionnaires for an overall response rate of 45%. The industry and geographical distribution of the survey sample are shown in Table 1 and Table 2.

(INSERT TABLES 1 AND 2 ABOUT HERE)

In order to test the for non-response bias, we randomly selected samples from our original list of 493 and conducted a series of t-tests for differences in revenue and number of employees between our sample and the non-respondents. We also followed Armstrong and Overton (1977) in testing for non-response bias by conducting t-tests of all predictor variables using subsamples of early and later respondents. No significant differences were found. The reliability coefficient of the survey sample was 0.99 (for revenue) and 0.96 (for number of employees). Pearson correlation coefficients for the sales revenue of the two samples was 0.99 ($p < 0.01$), and Pearson correlation coefficient for number of employees was 0.92 ($p < 0.01$). These tests suggest that our survey sample is adequately representative and reliable. Finally, we used Harman's one-factor method to test for common method bias, given that most of our data was from the same survey. According to Podsakoff and Organ (1986), if common method bias is impacting the results, then factor analysis will reveal a single dominant factor which explains substantial variance. The variance explained by the first factor derived from our data was 45.5%, the second factor 10.2% and the third factor 9.4%. We thus did not find a dominant factor that explains the majority of variance and hence no conclusive evidence of common method bias.

Reliability and validity

We analyzed our model using PASW 18.0 (upgraded version of SPSS) to test the reliability and validity of our survey data. Table 3 shows that Cronbach's α coefficients of all the

variables are above 0.81, which indicates adequate internal consistency of scales. We adopted principal component analysis (PCA) to test the validity of our measurement scales. The results of our analysis are shown in Table 3. We first examined the Kaiser-Meyer-Olkin (KMO) statistic and significance of Bartlett's test of sphericity. It is generally accepted that if KMO is lower than 0.5, the sample is unsuitable for factor analysis. As shown in Table 3, KMO of all variables are larger than 0.70, and Bartlett's Test of Sphericity is significant at $p < 0.001$. Hence we deemed our data were suitable for factor analysis.

Finally, Table 3 shows that all the factor loadings of 36 indicators for 10 variables are above 0.68, which suggests adequate convergent validity. Table 3 also shows that the cumulative variance explained by all indicators is higher than 72%, which satisfies the standard that common indicators should explain at least 30% variance of variables.

(INSERT TABLE 3 ABOUT HERE)

IV. Results

We used OLS regression analysis to test our hypotheses. Table 4 shows the descriptive statistics and correlation coefficient matrix of the variables. The correlation coefficients of all the independent variables, moderator variable and control variables are lower than 0.60. As the interaction effect was involved, we processed the variables using mean centering (Cooper & Nakanishi, 1983). Additionally, we found that the highest VIF was 2.634, lower than the reference value of 10. These results provide no evidence that multicollinearity threatens the validity of our findings.

Table 5 shows the result of regression analysis. Model 1 tested the effects of the control variables, model 2 tested hypotheses 1 - 5, model 3 through 7 tested hypothesis 6a - e, and Model 8 is the full model. As shown in Table 5, except for the lower values of R^2 and adjusted R^2 in Model 1 (control variable effects test), R^2 and adjusted R^2 in models 2 through 8 are within the range of 0.76 - 0.81, all the values of F in Models 1-8 are significant ($p < 0.01$), which indicates adequate explanatory power.

Model 2 shows that, organizational learning has a very significant positive impact on innovation performance and remains significant after adding the interaction effects (see Model 3-8). This is consistent with the findings of Easterby-Smith *et al* (2000), Bartlett and Ghoshal (1989) and Hung *et al* (2011). The difference in our findings is that prior research studied MNEs in developed countries, while focus on those from emerging countries with latecomer technology characteristics. This suggests that, during knowledge-seeking overseas acquisitions of Chinese MNEs in developed countries, organizational learning based on personnel interaction is one of the key factors involved in improving innovation performance. As shown in Model 2, absorptive capacity also has a significant positive relationship with innovation performance and remains significant after adding the interactions. This result is consistent with Cohen and Levinthal (1990) and Pérez-Nordtvedt *et al* (2010). However, it is worth noting that the findings of this paper are particularly important implication for Chinese MNEs. Because most Chinese MNEs involved in cross-border acquisitions have a limited

technological base, and therefore insufficient absorptive capacity, the results of this study suggest that the level of innovation performance is likely to be lower than sought.

Cultural integration is also positively related to innovation performance. During knowledge-seeking overseas acquisitions of Chinese MNEs, the development of common culture between acquiring and target firms has a positive impact on the innovation performance of MNEs. This result is consistent with Larsson and Finkelstein (1999) and Björkman *et al* (2007). However, for Chinese MNEs with less developed management practices, cultural integration is often a major challenge, which can directly impact the success of the acquisition process.

Hypothesis 4, predicting that the level of specialization of an acquired firm has a positive impact on innovation performance, was also supported. During knowledge-seeking overseas acquisitions of Chinese MNEs, providing the acquired firm a unique position in the MNE innovation network has a positive impact on innovation performance. This result is consistent with the findings of Birkinshaw and Hood (1998) and Frost *et al* (2002). Gupta and Govindarajan (1991) classified subsidiary roles within the MNE into four types: global innovator, integrated player, implementer and local innovator. For knowledge-seeking overseas acquisitions by Chinese MNEs, firms that can be defined as global innovators or centers of excellence are most closely associated with improved innovation performance.

The characteristics of transferred knowledge are positively associated with innovation performance, as well. During knowledge-seeking overseas acquisitions by Chinese MNEs, the more tacit knowledge that is transferred, the better is the overall innovation performance of the MNE. This result is consistent with Nonaka and Takeuchi (1995) and Teigland and Wasko (2009). Since Chinese MNEs acquire technologies mainly through industrial transfer from developed countries, and most of these technologies are mature and/or standardized, the ability to improve in their innovation capabilities has been hindered. Cross-border acquisition aids Chinese MNEs in acquiring tacit knowledge, breakthrough technological dependence, and ultimately improved innovation capability.

Model 3 tests the moderating effect of capability differences between acquiring and acquired firms on innovation performance. The results show that capability difference reduces the positive impact of organizational learning on innovation performance. Model 4 shows that capability difference between acquiring and acquired firms reduces the impact of absorptive capacity on innovation performance; while model 5 shows that the moderating effect of capability difference between acquiring and acquired firms on the relationship between cultural integration and innovation performance is not significant.

No moderating effect of capability difference on the relationship between role of acquired firm and innovation performance was found. However, model 7 demonstrates as predicted that capability difference between acquiring and acquired firms negatively impacts the relationship between characteristics of transferred knowledge and innovation performance.

The greater the capability difference, the poorer the effect of transferred tacit knowledge on innovation performance.

Finally, model 8 included all the variables. When all the control, independent and moderator variables are incorporated into the model, the scale of acquiring firms and post-acquisition time elapsed have significant effects. Among independent variables, organizational learning and absorptive capacity still have significant effects. Meanwhile, organizational learning and absorptive capacity have significant interaction effects with capability differences between acquiring and acquired firms respectively. Other independent variables or interaction effects have lower significance. This result reveals the particularly important influence of organizational learning and absorptive capacity on innovation performance as well as the interaction effects of capability difference between acquiring and acquired firms on this influence.

V. Discussion and conclusion

Chinese MNEs are increasingly carrying out technology-oriented overseas acquisitions at an unprecedented rate. This technology-pursuing strategy is likely to reduce the technological and innovation capability gap between Chinese MNEs and those of developed countries. This paper analyzed knowledge-seeking overseas acquisition behaviors of Chinese MNEs using a KBV lens to develop and test a framework of the influential factors on innovation performance during overseas acquisition. Our results show that during knowledge-seeking overseas acquisition of Chinese MNEs, organizational learning, absorptive capacity, cultural integration, role of acquired firm and characteristics of transferred knowledge have positive

impacts on innovation performance. Furthermore, we found that the capability difference between acquiring and acquired firms negatively impacts the effects of organizational learning, absorptive capacity and transferred knowledge's characteristics on innovation performance.

Theoretical contribution

Although the relationship between cross-border acquisition and company performance has drawn great attention from scholars, most of the existing literature has focused on the wealth effect of cross-border acquisition. The primary research method used has been event study (e.g. Delios and Beamish, 1999; Denis, Denis and Yost, 2002; Gu and Reed, 2011). This paper contributes to this growing research stream by exploring the impact of cross-border acquisition on innovation performance using a large sample, empirical study. We focused on the impact of knowledge-seeking overseas acquisition of Chinese MNEs on innovation performance as this appears to provide a primary motive for making these acquisitions. Hence, this unique research perspective has contributed to and extended current research.

This study helps clarify the factors influencing innovation performance and their functional mechanisms during knowledge-seeking overseas acquisition of Chinese MNEs. Prior event studies focused on calculating abnormal returns achieved through overseas acquisition, and treated the process yielding this return as a black box. Although some case studies have attempted to explore the influencing mechanism of cross-border acquisition on innovation capabilities, they have not provided generalizable findings. The findings of this paper have

thus expanded our understanding about factors influencing innovation performance during knowledge-seeking overseas acquisitions, and revealed the key factors and internal relations during this complex process.

The third contribution of this paper is revealing approaches in pursuing technology by latecomer firms. The traditional MNE theories, such as eclectic paradigm (Dunning, 1977, 1988) and internationalization process model (Johanson and Vahlne, 1977), generally consider the international expansion to be a process of exploiting existing advantages. However, these theories cannot explain how MNEs that lack certain advantages acquire them through global expansion. Although Mathews (2006) and Luo and Tung (2007) have proposed the models to account for these behaviors, they have yet to be validated. This paper not only confirms the feasibility of latecomer firms obtaining strategic assets and improved innovation capabilities through global expansion, but also illuminates a basic approach towards achieving this goal.

Managerial implications

The findings of this paper provide practical guidance for managers of MNEs, especially Chinese MNEs that are vigorously carrying out cross-border acquisitions to acquire innovation capabilities. First, knowledge-seeking overseas acquisition should be based upon the absorptive capacity of the acquiring firm and complementarity between both firms. Cross-border acquisition can serve as a strategic lever for Chinese MNEs to obtain knowledge and

improve innovation capabilities, because it often takes a prohibitively long time for them to accumulate this knowledge on their own.

In the recent decade, firms from many developed countries have suffered from financial and debt crises. These crises provided great opportunities for knowledge-seeking overseas acquisition by Chinese MNEs. However, most have become reliant on transfer of low-technology industries from western countries and exploiting low labor costs as a primary source of competitive advantage. As a result, they are still hindered by weak technological bases and innovation capabilities. This can negatively impact the obtainment of desired outcomes from knowledge-seeking overseas acquisition. For example, Holley Group acquired the CDMA mobile communication business of Philips in September, 2001. This provided them an opportunity to acquire technological capabilities, but their weak mobile communication technology greatly impeded their goals. Thus, knowledge-seeking overseas acquisition is more successful when based on the enterprise's own capabilities, and the complementary between the two parties' strategic assets.

Second, during knowledge-seeking overseas acquisitions, establishing effective organizational learning mechanisms is necessary for improving innovation performance. Acquisitions do not automatically result in knowledge transfer or upgrading of innovation performance. It is imperative to establish mechanisms that promote knowledge transfer and innovation performance, prior to engaging in cross-border acquisitions. Knowledge-seeking overseas acquisitions by Chinese MNEs are different from those of corporations in developed

countries. Since the headquarters of MNEs in more developed countries typically possess stronger innovation capabilities, knowledge transfer between different units of corporation is two-way and mutually beneficial. One-way flow of knowledge and a disadvantaged position of the acquiring firm in terms of technological capability can lead to failure of the acquisition. Under these conditions, if an effective dialogue and personnel interaction mechanism cannot be established between acquiring and acquired firms, organizational learning will not be possible, nor does this result in an improvement in innovation performance.

Third, developing a common culture between acquiring and acquired firms hastens the improvement of innovation performance. Cultural clash often happens during cross-border acquisitions by Chinese MNEs, which is mainly attributable to their latecomer status.

Knowledge-seeking overseas acquisition by Chinese MNEs often targets technology-leaders of developed countries. Chinese MNEs leverage industry globalization and gain competitiveness through strong cost advantage, but still possess weak innovation capabilities and less developed management practices. When these two types of MNEs come together, cultural clash seems inevitable. To mitigate against this clash, firms should establish a corporate culture based on mutual respect and seeking common ground. This helps reduce direct cultural conflict, and also promotes resource complementary and mutual learning. Importantly, it protects the innovative ‘genes’ in the culture of acquired firms and provides support to the strategic transformation of acquiring firms.

Fourth giving the acquired firm a unique role in global innovation is beneficial. Knowledge-seeking overseas acquisition is not intent on short-term gains, but undertaken for its potential long-term benefits. Buying only a few patents is not likely to result in a sustained pattern of innovation. Considering the weak innovation capabilities of many Chinese MNEs, the acquired firm should be given an independent position if possible, so it can become more embedded in the local environment, obtain a variety of innovation resources and sustain its capabilities. Resources should be transferred to acquired firms with strong R&D capabilities, with an aim to build them into the global R&D strategic base of the MNE.

Limitations and directions for future research

Like all studies, these results should be considered within the context of their limitations.

First, subjective indicators to measure innovation performance were used. There is still some controversy amongst scholars over the best measurement approach for innovation performance (Kanji, 1996; Prajogo and Sohal, 2003; Tang, 1998). Most scholars acknowledge that a single objective indicator (e.g. number of patents) cannot measure innovation performance at different levels, e.g. product innovation, process innovation and organizational innovation (Baker and Sinkula, 1999; Hung *et al*, 2011; Prajogo *et al*, 2004). But the validity of subjective measurement may also be influenced by biases in the opinions and attitudes of respondents, and the results may deviate from objective measures. Future studies could include objective indicators for measuring innovation performance in order to solidify our findings.

In addition, this paper uses cross-sectional data to study the impact of organizational learning, absorptive capacity, cultural integration, role of acquired firm, characteristics of transferred knowledge and capability difference between acquiring and acquired firms on innovation performance. Although this method can measure the effect and influence of various factors on perceived innovation performance, it still cannot fully explain the causal relationship. Future studies can use time series data to better support finding on the dynamics of the causal relationships in order to verify or expand upon the research results of this paper.

Notes

[1] According to the Retrospect and Prospect of Mergers and Acquisitions of Chinese Multinationals in 2011 published by Price Waterhouse Coopers, overseas acquisitions of Chinese MNEs in 2011 has broken the record of 42.9 billion USD, and nearly half of these acquisitions were in North America and Europe. Although acquisitions in resource and energy industries still dominate transaction volumes from 44% in 2010 to 42% in 2011, overseas acquisitions in the field of consumer and industrial goods has increased from 22% to 35%. North America has seen the largest number of overseas acquisitions by Chinese MNEs, increasing from 52 acquisitions in 2010 to 57 in 2011. Overseas acquisition by Chinese MNEs in Europe has increased dramatically from 25 cases to 44 cases.

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Table 1 Industrial distribution of samples of acquired firms or business units

Major industries	Number of acquired firms or business units	Percentage (%)
Agriculture, forestry, animal husbandry and fishery	1	0.45
Mining industry	37	16.67
Manufacturing	137	61.71
Electricity, heat, gas and water production and supply	8	3.60
Transportation, storage and postal industry	5	2.25
Transmission of information, software and IT services industry	31	13.97
Wholesale and retailing	2	0.90
Accommodation and catering industry	1	0.45
Total	222	100

Table 2 Geographical distribution of samples of acquired firms or business units

Geographical region	Number of acquired firms or business units	Percentage (%)
Asia	33	14.86
Europe	91	40.99
North America	69	31.09
South America	1	0.45
Australia and New Zealand	28	12.61
Total	222	100

Table 3 Reliability and validity analysis

Variable	Indicator	Factor loading	Accumulated variance explained	KMO	Bartlett's Test of Sphericity (p)	Cronbach's α
Innovation performance	1	0.98	98.47%	0.769	0.000	0.99
	2	0.98				
	3	0.99				
Product innovation	1	0.92	91.93%	0.868	0.000	0.97
	2	0.92				
	3	0.91				
Process innovation	4	0.92	90.31%	0.870	0.000	0.96
	1	0.94				
	2	0.88				
Organizational innovation	3	0.87	91.56%	0.869	0.000	0.97
	4	0.92				
	1	0.95				
Organizational learning	2	0.88	87.38%	0.854	0.000	0.95
	3	0.92				
	4	0.91				
Absorptive capacity	1	0.93	80.29%	0.816	0.000	0.92
	2	0.85				
	3	0.88				
Cultural integration	4	0.83	81.53%	0.743	0.000	0.88
	1	0.90				
	2	0.81				
Role of acquired firm	3	0.82	84.74%	0.757	0.000	0.91
	1	0.84				
	2	0.85				
Knowledge characteristics	3	0.86	72.64%	0.711	0.000	0.81
	1	0.76				
	2	0.70				
Capability difference	3	0.72	89.95%	0.832	0.000	0.96
	1	0.91				
	2	0.89				
	4	0.90				

Table 4 Descriptive statistics and correlation coefficient

Variables	mean	s.d.	1	2	3	4	5	6	7	8	9	10	11	12
Dependent variable														
1. Innovation performance	5.45	1.65	1											
2. Organizational learning	5.42	1.55	0.79**	1										
3. Absorptive capacity	4.42	1.63	0.64**	0.45**	1									
4. Cultural integration	3.35	1.26	0.41**	0.34**	0.25**	1								
5. Role of acquired firm	5.32	1.25	0.43**	0.35**	0.28**	0.26**	1							
6. Characteristics of transferred knowledge	3.93	1.00	0.46**	0.38**	0.49**	0.22**	0.12	1						
7. Capability difference between firms	4.67	1.81	0.67**	0.57**	0.55**	0.29**	0.37**	0.40**	1					
8. R&D intensity	4.48	2.69	0.36**	0.35**	0.26**	0.23**	0.21**	0.18**	0.36**	1				
9. Industry type	0.70	0.46	0.39**	0.37**	0.29**	0.17**	0.26**	0.19**	0.37**	0.05	1			
10. Scale of acquiring firm	5.02	2.35	-0.23**	-0.20**	-0.06	-0.13*	-0.28**	-0.06	-0.22**	-0.36**	-0.26**	1		
11. Time elapsed after acquisition	3.43	2.54	0.24**	0.26**	0.06	0.11	0.03	-0.01	0.04	0.09	0.17*	-0.04	1	
12. Cultural distance between countries	5.78	1.50	-0.07	-0.11	-0.07	-0.06	-0.05	0.02	0.06	0.01	-0.001	-0.02	-0.16*	1

N=222. **Correlation is significant at the 0.01 level (two-tailed); *Correlation is significant at the 0.05 level (two-tailed).

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Table 5 Regression analysis

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
R&D intensity	0.198*** (0.04)	-0.001 (0.02)	0.015 (0.02)	0.005 (0.02)	0.001 (0.02)	0.004 (0.02)	-0.008 (0.02)	0.011 (0.02)
Industry type	1.242*** (0.22)	0.047 (0.14)	0.048 (0.13)	0.003 (0.13)	0.033 (0.14)	0.061 (0.14)	-0.036 (0.13)	0.02 (0.13)
Size of acquiring firm	-0.011 (0.05)	-0.025 (0.03)	-0.029 (0.03)	-0.039 (0.03)	-0.023 (0.03)	-0.019 (0.03)	-0.026 (0.03)	-0.035 (0.03)
Time elapsed after acquisition	0.096** (0.04)	0.057** (0.02)	0.059*** (0.02)	0.041* (0.02)	0.058** (0.02)	0.054** (0.02)	0.048** (0.02)	0.048** (0.02)
Cultural distance	-0.052 (0.06)	0.012 (0.04)	0.025 (0.04)	0.014 (0.04)	0.018 (0.04)	0.013 (0.04)	0.014 (0.04)	0.023 (0.04)
Organizational learning		0.487*** (0.05)	0.427*** (0.05)	0.408*** (0.05)	0.482*** (0.05)	0.488*** (0.05)	0.451*** (0.05)	0.395*** (0.05)
Absorptive capacity		0.252*** (0.04)	0.187*** (0.04)	0.255*** (0.04)	0.245*** (0.04)	0.252*** (0.04)	0.232*** (0.04)	0.204*** (0.05)
Cultural integration		0.107** (0.05)	0.086* (0.04)	0.084* (0.05)	0.115** (0.05)	0.099** (0.05)	0.135*** (0.05)	0.088* (0.05)
Role of acquired firm		0.119** (0.05)	0.109** (0.05)	0.123*** (0.05)	0.108** (0.05)	0.083 (0.06)	0.14*** (0.05)	0.12** (0.05)
Knowledge characteristics		0.11* (0.07)	0.104* (0.06)	0.097 (0.06)	0.126* (0.07)	0.112* (0.07)	0.124** (0.06)	0.103* (0.06)
Capability diff.		0.161*** (0.04)	0.116*** (0.04)	0.113*** (0.04)	0.147*** (0.05)	0.155*** (0.04)	0.138*** (0.04)	0.099** (0.04)
Organizational learning X Capability diff.			-0.112*** (0.02)					-0.076*** (0.02)
Absorptive capacity X Capability diff.				-0.104*** (0.02)				-0.055** (0.03)
Cultural integration X Capability diff.					-0.032 (0.03)			-0.001 (0.03)
Role of acquired firm X Capability diff.						-0.029 (0.02)		0.001 (0.02)
Knowledge characteristics X Capability diff.							-0.132*** (0.03)	-0.033 (0.04)
R ²	0.292	0.772	0.804	0.799	0.774	0.774	0.791	0.813
Adjusted R ²	0.276	0.760	0.793	0.788	0.761	0.761	0.779	0.798
F value	17.858***	64.795***	71.447***	69.393***	59.646***	59.665***	65.806***	55.623***
df	5	11	12	12	12	12	12	16

Notes: N=222. Two-tailed tests; *p<0.10; **p<0.05; *** p<0.01 (standard error in parenthesis).



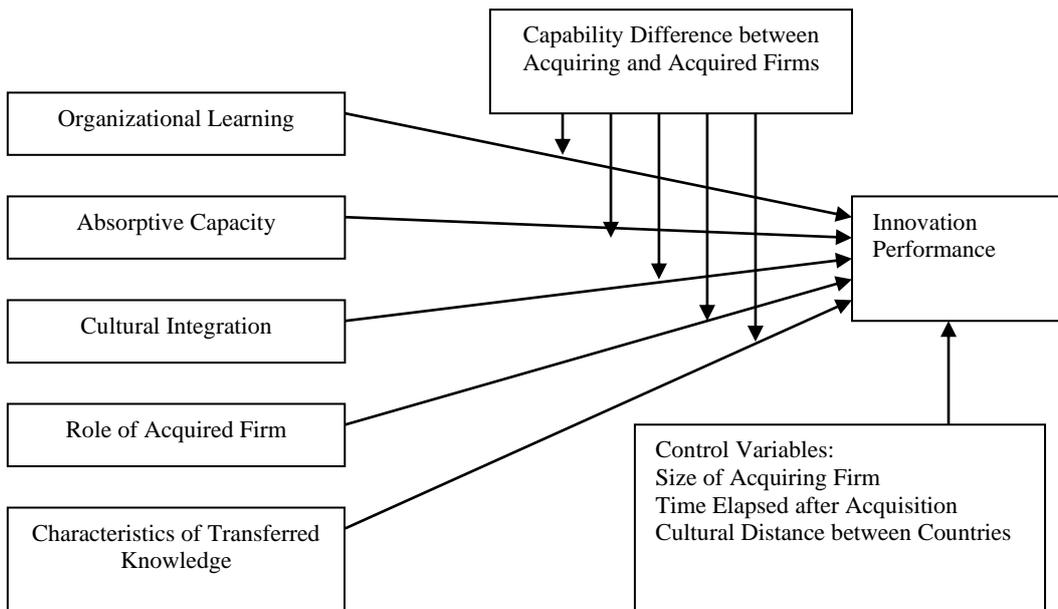


Figure 1 Factors affecting the innovation performance of Chinese multinationals during knowledge-seeking overseas acquisitions.