Article:
Wu, J, Wang, C, Hong, J et al. (2 more authors) (2016) Internationalization and innovation performance of emerging market enterprises: The role of host-country institutional development. Journal of World Business, 51 (2). pp. 251-263. ISSN 1090-9516

https://doi.org/10.1016/j.jwb.2015.09.002

Internationalization and innovation performance of emerging market enterprises: The role of host-country institutional development

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Abstract

We examine how host-country institutional development influences innovation performance of internationalized emerging market enterprises (EMEs). Our panel-data analysis of Chinese EMEs shows that although host-country institutional development on average enhances innovation performance of the parent, such effects are more pronounced for EMEs with strong absorptive capacity and for those diversifying into a larger number of countries. Interestingly, EMEs with a higher level of state ownership gain more when entering countries with a lower level of institutional development. Our findings offer insights regarding how latecomer EMEs should configure their portfolio of subsidiaries in order to enhance innovation performance of their parent.

Keywords: Internationalization, Innovation performance, Institutional environment, Absorptive capacity, State ownership, Geographic diversification

1. Introduction

Emerging market enterprises (EMEs) are increasingly venturing into foreign countries (Buckley et al., 2007; Wang et al., 2012a; Wang et al., 2012b). Unlike firms from developed countries, EMEs operate in environments characterised by under-developed institutions that constrain the development of internal capabilities for innovation (Cuervo-Cazurra, 2008; Luo & Tung, 2007). Extant research suggests that firms originating from weak institutional settings expand overseas to seek more efficient institutions (Luo, Xue & Han, 2010; Yamakawa, Peng & Deeds., 2008) that may enable them to enhance their innovation performance and global competitiveness. Evolutionary theories of the multinational enterprise (MNE) suggest that knowledge and assets accessed and assimilated from foreign locations enrich the firm's knowledge bases which can lead to enhanced innovation performance (Birkinshaw & Hood, 1998; Kogut & Zander, 1993). Nevertheless, these studies have focused on the gains accrued at the subsidiary level and, therefore, as a result, we know very little about *whether* and *how* host-country institutional development affects the innovation performance of the parent of the internationalizing EME. This research gap is important because even though the patents for the parent company may come from innovations generated both at home and through knowledge acquisition from foreign subsidiaries, the role of the latter is often assumed away. From a strategic management point of view, accounting for the role of host-country institutional development may enable a more nuanced interpretation about where and how EMEs derive capabilities enabling them to innovate despite their weak internal R&D capabilities and unfavorable home-country institutional environment. Building on theories of institution and innovation, we examine how the level of host-country institutional development (via EME's portfolio of subsidiaries) influences innovation at home in addition to any unique home-based innovations and further examine how firm-specific idiosyncrasies (i.e. level of state ownership and absorptive capacity) and internationalization strategies (i.e. the geographic diversity of foreign locations and joint ventures vs wholly owned subsidiaries entry mode) affect this relationship. We propose that these contingencies may be particularly valuable in explaining which EMEs benefit from operating within well-developed foreign institutions. Our study, therefore, contributes to theories on internationalization and innovation in several

ways.

First, prior research suggests that well-developed host-country institutions can help EMEs nurture innovation by providing factor inputs and innovation intermediaries and by reducing transaction costs (e.g., Wang, Yi, Kafouros & Yan, 2015). On the other hand, many EMEs are not used to operate in such environments, and therefore, may be less able to exploit the associated benefits and may have to implement costly and disruptive organizational changes. So theory does not clearly predict when and how the level of institutional development in the host countries influences the innovation outcomes of the internationalizing EME. We, therefore, argue that not all internationalized EMEs benefit equally from well-developed institutions in the host country but instead this depends on the level of state ownership and more importantly on whether EMEs' ownership type matches the level of host-country institutional development.

Second, previous studies show that host-country institutions can be a source of competitive advantage for international ventures (Kim & Hoskisson, 2010), enabling firms to outperform competitors that remain at home. However, we argue that as firms differ in their abilities to internalize and benefit from host-country institutional advantages, only EMEs that possess stronger absorptive capacity can reap such institutional benefits and enhance their innovation performance. Our study thus differs from prior studies that examine whether absorptive capacity enables firms to benefit from external knowledge by testing the effects of absorptive capacity in assimilating the advantages host-countries' institutions offer to the innovation performance of internationalized EMEs.

Third, extant research provides mix findings about whether internationalised firms can benefit from geographical diversification of their subsidiaries (Hitt, Hoskisson & Kim, 1997). We explain that a greater geographic reach allow firms to get access to a larger set of different types of innovation-supporting institutions, and empirically demonstrate that the effects of institutional development of the host country on innovation performance are stronger for EMEs who choose a broad instead of a narrow set of countries when they venture abroad. We thus extend prior theorizing by proposing that the differential effects of internationalization on innovation performance can be explained

not only by the host-country level of institutional development , but also by differences in the geographic diversity of a firm's overseas subsidiaries.

Fourth, prior studies suggest that entry modes influence how foreign firms learn from foreign markets, innovate and transfer technology back home (e.g., Hoskisson, Wright, Filatotchev & Peng, 2013; Yamakawa et al. 2008). However, research rarely examines how entry mode choices shape the effects of host-countries' institutions on the innovation performance of the internationalizing firm. Our study fills this gap by proposing that having a portfolio of joint venture (JV) alliances or wholly owned subsidiaries (WOS) influences differently this effect. This conceptualization advances the premise that the ability to exploit host-country institutional advantages depends on internationalization entry decisions, thus bringing the literatures on institutions, entry mode choice and innovation under a more comprehensive framework.

China is a particularly suitable context for this study not only because many Chinese firms have improved their position in the global battle for technological leadership but also because the country has catapulted in the world's third place of outward FDI with an estimated US$101billion in 2013 (WIR, 2014) expanding into countries with heterogeneous institutional environments (Cui & Jiang, 2009). To test our hypotheses, we explore the internationalization of 599 Chinese manufacturing firms (with established portfolios of foreign subsidiaries in diverse geographical locations) through a longitudinal study of 4,067 firm-year observations for the period 2000-2010. Our findings demonstrate how host-country institutions positively influence the innovation performance of the parent and how firm-specific idiosyncrasies and internationalization strategies influence this relationship. The findings of the study also have implications for how managers of internationalizing EMEs can exploit institutional advantages of the host country and enhance innovation performance.

2. Theoretical Background and Hypotheses

Innovation depends on the company's capability to learn and integrate diverse knowledge and resources from multiple countries (Hitt et al., 1997; Yamakawa et al., 2008). International expansion, then, serves as a

'springboard' for developing organizational learning and acquiring innovative capabilities (Luo & Tung, 2007). Institutions on the other hand, commonly defined as "the rules of game" (North, 1990), influence firms' innovation structures and processes as well as the availability and cost of innovation inputs (Jackson & Deeg, 2008). A well-functioning and well-developed institutional environment may stimulate innovation by providing what firms cannot produce individually and by allowing firms to get access to various factors and innovation intermediaries, and build innovation-enhancing relationships (e.g., inter-firm alliances and research collaborations). Although globalization has accelerated in the past three decades, national innovation and institution systems differ in terms of, for example, government policies, regulations, education and research in universities, among others. These differences affect the quality and quantity of inputs and the demand for outputs of innovation and, therefore, the availability of technologies, know-how and intangible assets in a given location. Hence, because international differences in institutional development still persist (Hoskisson et al., 2013), the innovation-enhancing effects of internationalization may vary depending on the locations in which the firm's portfolio of subsidiaries operates.

In this study we expect that a host country's level of institutional development to affect the parent EME's innovation performance through its effects on the portfolio of the firm's subsidiaries. The following section, therefore, explains how subsidiaries enhance their learning and knowhow while operating abroad and how they transfer this back to the parent in order to develop innovations.

2.1 Knowledge flows from subsidiaries to the parent

MNEs from emerging markets tend to locate their subsidiaries in countries where institutional setups allow for increased opportunity for learning and technological knowledge-sourcing (Dunning, 1998; Kotabe, Dunlap-Hinkler, Parente & Mishra, 2007). Each of these subsidiaries may help them access a unique set of advantages and resources tied to particular countries (Hitt et al., 1997; Kafouros, Buckley & Clegg, 2012) and increase the likelihood of developing novel technological combinations (Jacobides, Knudsen & Augier, 2006). Furthermore, in well-developed host-country institutional environments,

foreign subsidiaries can access, recruit and/or collaborate with high-qualified and experienced local talent (i.e. scientists, designers and engineers) which can enhance the firm's innovation performance (Florida, 1997; Tung, 2007). In addition, because countries with well-endowed institutional settings are also characterized by dynamic and competitive local business environments they compel foreign subsidiaries to continuously upgrade their capabilities and keep up with the competition to ensure future survival and growth (Birkinshaw & Hood, 1998; Wan, 2005).

By internalizing local technological and institutional strengths of the area in which they are located, subsidiaries can develop their innovative capabilities and, thus, become contributors of valuable knowledge outflows to the parent, as well as to other subsidiaries within the internationalized firm's network (Michailova & Mustaffa, 2012). This 'reverse' technology transfer generates opportunities for the parent by finding useful applications of the geographically dispersed knowledge and capabilities their subsidiaries accumulate and create (Teece, 2014). The rationale is that subsidiaries act as 'listening posts' that capture the advanced knowledge from abroad and then augment home-based innovation by transferring it back to the parent (Hedge & Hicks, 2008). Indeed recent studies on patent and citations suggest that there is an increase in the flow of knowledge from the subsidiaries to the parent (Singh, 2004). Empirical studies also demonstrate how portfolios of firms' subsidiaries tap into global reservoirs of knowledge and intangible resources and enhance the entire MNEs' knowledge bases, capabilities and competitiveness (Kafouros et al, 2012; Lu & Beamish, 2004). For example, when Samsung needed to catch up and improve its technology in memory chips it located R&D subsidiaries in the Silicon Valley in the USA. Once the subsidiaries gained understanding and assimilated the advanced know-how they were able to transfer this capability back to the parent in Korea (Wright, Filatotchev, Hoskisson & Peng, 2005). Similarly, Chinese Haier relied on establishing home-base augmenting R&D subsidiaries in countries such as the USA, Germany and Japan to acquire foreign technology, exploit localized knowledge spillovers and develop its own innovative products aimed at both Chinese home and global customers (Liu & Li, 2002).

Building on the above, in the following paragraphs we demonstrate how well-developed host-country institutions positively influence the innovation performance of the parent of the

internationalized firm. We, further, develop four hypotheses that examine how firm-specific idiosyncrasies and internationalization strategies influence the foreign institutions – parent firm innovation performance relationship.

2.2. Host country institutional development and EMEs' innovation performance

Because well-developed institutions reduce uncertainty and lower transaction and search costs (Khanna & Palepu, 1997; North, 1990), we argue that expansion into foreign countries with stronger institutional development boosts the innovation performance of Chinese EMEs. Institutional development in a given country depends on various factors such as: (1) voice and accountability, (2) political stability and absence of violence, (3) government effectiveness, (4) regulatory quality, (5) rule of Law, and (6) control of corruption (World Bank, 2010). Voice and accountability reflect key dimensions of democracy of a country. Democratic institutions help to control for the use of power by government (De Haan & Siermann, 1995), ensuring that government policies including those for innovation are well aligned with the interest of innovators and the public. Democracies can protect property and facilitate human development (Kaufmann, Kraay & Zoido-Lobaton, 1999), which in turn encourages investment in innovation. Second, political stability affects economic growth by influencing investment in physical and human capital (Aisen & Veiga, 2013). A stable political environment reduces uncertainty (Schneider & Frey, 1985; Rodrik, 1989) and encourages innovators to take new innovative initiatives. Third, effective governments can provide high quality civil services, such as education, which facilitates knowledge diffusion and human development (Kaufmann et al., 1999). Fourth, a high quality regulatory framework reduces agency and transaction costs (Parker, 1999), help firms overcome information asymmetries, and protect intellectual property (World Bank, 2001), thereby promoting innovative activities. Fifth, rule of laws that are well-defined and transparent encourage investment, entrepreneurship and innovative activities. Laws on intellectual property rights (IPR) protection, for example, prohibit non-rights holders from using proprietary knowledge and thus limit opportunities for imitation (Maskus, 2000, p. 8). Hence, EMEs operating in host countries with well-developed IPR laws can reduce the probability of imitation

and protect their innovation output. Finally, corruption depresses investment in R&D because it increases uncertainty, transaction costs and the risk of expropriation (De Rosa, Gooroochurn & Görg, 2010).

Therefore, in host countries with stronger institutional development, EMEs can capitalize on institutional advantages to develop stronger technological capabilities (Makino, Lau & Yeh, 2002; Wu, 2013). Foreign subsidiaries in such markets have more opportunities to gain access to advanced technologies, broaden their innovation networks and benefit from innovation intermediaries which, in turn, enhances the innovation performance of the parent. In contrast, in host countries with lower levels of institutional development, foreign affiliates are likely to engage in costly market transactions and less efficient transformation, which hampers their ability to innovate productively and contribute to the innovation performance of the parent. Hence:

H1. The stronger the institutional development of the host countries in which an EME's portfolio of subsidiaries operates, the higher innovation performance of its parent.

2.3. Moderating role of state ownership

State ownership is an important institutional dimension in emerging markets (Hong, Wang & Kafouros, 2015) and can influence EMEs' internationalization in two ways. One the one hand, EMEs with a higher level of state ownership face strong governmental pressures that may force them to expand overseas (Wang et al., 2012b), even if this is not a strategically optimal decision. On the other hand, strong ties with government allow EMEs to enjoy privileged access to resources through non-market channels. This in turn facilitates international expansion (Hong et al., 2015; Wang et al., 2012b).

We argue that although a higher level of institutional development in the host country enhances innovation performance, this effect may be negatively moderated by the level of state ownership in the internationalizing EME. Prior research suggests that state-owned enterprises (SOEs) are more likely to enter countries with weak institutions and with rules similar to those in their home country (e.g., Buckley et al., 2007) because they are more comfortable with the way local markets and governments operate and, as a result, face lower liabilities of foreignness. In such environments, the 'perceived' institutional

barriers are lower and adaptation costs are reduced, enabling EMEs to innovate in a similar way they do at home (Cuervo-Cazurra, 2008).

In contrast, EMEs with a higher level of state ownership will face significant liability of foreignness when innovating in countries with more developed institutions because of institutional misalignment. Because they are used to opaque and less munificent home environments (Buckley et al., 2007; Wang et al., 2012b), these firms are less able to adapt to the environment in which institutions are more transparent, predictable and efficient and in which market forces dominate over government forces (Duanmu, 2012). Such environments discourage SOEs from using non-market mechanisms to build competitive advantages (Wang et al., 2012b) as they do at home. Although SOEs may shift management's attention to efficiency, profitability and innovation in such environments, institutional misalignment makes it difficult for them to take advantage of well-developed markets and to coordinate factors for innovative activities. We should also note however, that ownership ties with government may also reduce innovativeness because firms often have to accommodate social concerns and needs of the government (Ramamurti, 2000). Such ties can also lead to resource lock-in and a high degree of resource iteration, lowering therefore firms' ability to innovate.

EMEs with lower levels of state ownership, including private firms, face different home institutional environment from SOEs. Because of their weak ties with government, they face unfair competition at home and are less able to access external resources through nonmarket channels (Nee, 1992) and therefore expand abroad to seek stronger institutions (Luo et al., 2010). Furthermore, because they are affected by discriminatory policies at home and are less competent in operating in burdensome institutional environments (Duanmu, 2012), non-state EMEs may benefit from entering foreign markets in which such discrimination is lower or absent. Hence, we propose:

> **H2:** An EME's level of state ownership negatively moderates the effect of host-country institutional development on innovation performance of its parent.

2.4. The moderating role of absorptive capacity

Although expansion into a host country with a more developed institutional environment allows EMEs to take advantage of high-quality institutions and acquire advanced technologies, they are not all equally able to exploit such institutional advantages and augment their innovation. According to the resource-based view (RBV), we argue that the extent to which a firm can take advantage of host-institutions is a function of its own absorptive capacity. EMEs with strong absorptive capacity are more sensitive to coercive pressures and changing norms (Wang et al., 2012b). Strong absorptive capacity may help EMEs respond well to institutional pressures by imitating local institutionalized practices increasing the legitimacy and likelihood of survival in the new environment. This in turn reduces uncertainty (Wang et al., 2012b) and helps EMEs exploit institutional advantages more effectively and improves their innovation performance.

Innovation and information intermediaries, for example, are key elements of an innovative environment because they reduce transaction costs and facilitate information dissemination and adoption (Mantel & Rosegger, 1987). Although host markets with strong institutions provide high-quality intermediary services, only EMEs with stronger capabilities are able to take advantage of such services (Khanna & Palepu, 2000). In contrast, firms with inadequate capabilities are less capable of responding to and exploiting such host-country institutional conditions (Makino et al., 2002), which hinders their ability to innovate. Similarly, universities (key components of a country's innovation system) in developed markets provide a pool of knowledge and specialized labor that constitutes a crucial element of intellectual human capital (Kafouros et al., 2014). Although collaboration with universities enables firms to lower search costs, acquire scientific talent and knowledge (Cohen, Nelson & Walsh, 2002), EMEs with weak absorptive capacity are not able to exploit such advantages and develop their innovation capabilities.

Furthermore, stronger absorptive capacity can bridge distant technological contexts (Rosenkopf & Almeida, 2003), helps firms recognize gaps in the technological landscape (Miller, Fern & Cardinal, 2007) and acquire complementary assets to develop new capabilities. Because knowledge is highly localized, only EMEs with higher absorptive capacity can improve their innovation performance by cognitively processing various sources of information, utilizing and integrating knowledge, and reducing transaction costs associated with external technology acquisition. Furthermore, EMEs with higher absorptive

capability are in a unique position to develop innovations from knowledge recombination by integrating home and foreign knowledge. Thus, we propose the following:

> **H3.** An EME's absorptive capacity positively moderates the effect of the host-country institutional development on innovation performance of its parent.

2.5. The moderating role of geographic diversity of foreign subsidiaries

Countries differ not only on their level of institutional development but importantly, also on the strength and availability of the types of innovation-supporting institutions (Edquist, 1997; Nelson, 1993). For example, India has a well-developed educational institutional infrastructure that provides high-qualified human talent at low-labor cost (Hedge & Hicks, 2008) but has less-developed regulatory institutions (Hoskisson et al., 2013), while USA has an abundance of well-developed capital markets (e.g., stock exchange, advanced banking system, venture capitals, etc.) that can provide access to funds for innovation projects (Wan, 2005) but the country is also facing a decreasing supply of high-qualified science and engineering graduates (Lewin, Massini & Peeters, 2009). Even the same type of institutions can differ between countries. For example, institutional differences in intellectual property protection system, such as the rule of 'first-to-invent' and 'first-to-file' in the USA and Japan respectively, have important consequences on the innovation behavior of firms in the two countries (van Waarden, 2001). This kind of cross country institutional differences influence not only the willingness and ability of internationalized firms' subsidiaries to innovate but importantly also the related outcomes and benefits that can be transferred back to the parent and positively influence innovation development. We, therefore, hypothesize that a broad or narrow internationalization affects differently the positive effects of institutional development on the parent's innovation performance.

First, through broad geographic diversification subsidiary units can access and learn from different and diverse innovation supporting institutions, enhance their capabilities and organization learning and improve their innovation performance (Bertrand & Capron, 2014). For example,

diversifying in many different host countries with well-developed educational institutions subsidiaries enhance their innovation performance by accessing large varieties of basic and exploratory researches in emerging technologies that are often unique and location-specific to individual countries (Phene & Almeida, 2008). This increases the diversity and variety of ideas that flow in the MNE and which are transferred back to the parent creating richer knowledge structures and fostering innovation back home (Barkema & Vermuelen, 1998). By contrast, firms internationalizing in only a handful of locations with well-developed institutions cannot benefit as much, as the narrower set of knowledge accessed abroad result in narrower or even familiar knowledge transferred to the parent, which limits its innovation potential.

Second, through interactions with various types of institutions, subsidiary firms can learn how to conform to or build a degree of independence from prevailing institutional norms and gain a "common understanding of what is appropriate and fundamentally meaningful behavior" (Oliver, 1991). In other words, embeddedness in multiple institutional contexts develops organizational learning and flexibility to deploy different strategic responses (i.e. resist or conform) to institutional pressures and expectations (Oliver, 1991). Such knowhow of 'how to deal with foreign institutions' is then shared with the parent which augments its existing competencies. This country-specific knowledge and subsidiary-specific experience improves the parent's understanding of foreign institutions, reduces transaction costs associated with technological collaboration with foreign partners and therefore enhances its innovation performance. By contrast, although firms can exploit host-country institutional advantages, those subsidiaries that operate on a narrow set of countries can only gain access to fewer and less diverse innovation supporting institutions. This can limit the positive benefits that host-country institutions have on internationalized firms' innovation performance. Therefore, even when two firms have located operations in countries with similar level of institutional development, their parents' innovation performance may differ because of the differences in the breath of geographic reach of their foreign subsidiaries. Hence, we propose the following:

H4. The higher the level of an EME's geographic diversity of its foreign subsidiaries, the greater the positive effect of the host-country institutional development on innovation performance of its parent.

2.6. The moderating role of entry mode

Firms' strategic responses and conformity to host-country institutional pressures and expectations is driven by their quest for legitimacy from important regulators, suppliers of critical resources, customers and broader audiences (Miller, Breton-Miller & Lester, 2013). Nevertheless, because businesses operate in competitive environments the speed and ease with which subsidiary firms manage to conform (or respond) to the institutional environment of the host country in relation to their competitors is critical for their innovation performance. Therefore, although subsidiary firms operating abroad are exposed to the same institutional advantages in a host-country, they are not able to benefit equally from such institutions. We argue that this depends on the entry mode (JV vs WOS) that an internationalized firm uses.

First, through their partner firms in a JV, EMEs can create bridges with their partners' other alliances, achieve institutional and social acceptance and overcome the liability of foreignness and un-connectedness (Vasudeva et al., 2013). JVs are also frequently more acceptable forms of foreign investment by host governments, which enables faster access to innovation supporting institutions compared to WOS (Pangarkar & Lim, 2003). Furthermore, the 'high-control' transactions involved in JVs (like interactions with the partner's suppliers, customers, contacts and its extended network) increase the breadth, depth and speed of learning and emdeddedness with the local business environment and institutions (Zahra, Ireland & Hitt, 2000). This stronger commitment and involvement develops deeper understanding and assimilation of the institutional advantages a host-country offers which, when combined with the increased (and also faster and easier) legitimacy and acceptance internationalized firms gain from JVs, enable subsidiary firms to improve their

innovation capabilities and subsequently transfer those back to the parent enhancing its innovation performance.

Second, well-developed institutional environments entail head-to-head competition and self-sufficiency between rival firms (Vasudeva et al., 2013). In other words a relative abundance of innovation supporting institutions tends to encourage firms to pursue more individualistic innovation strategies that aim to lead and dominate their competitors. Further, highly competitive environments force firms to accelerate learning, acquisition of knowledge and improve innovation performance to survive and beat competitors. JVs enable subsidiaries to acquire knowledge, that is lacking, time consuming and difficult to develop on their own, from its partner and the partner's other alliances (Inkpen, 2000). For example, acquisition of knowledge regarding how to collaborate with local research institutes, suppliers and innovation supporting intermediaries fosters subsidiaries' experiential learning and enables them to capitalize better and faster on the well-developed institutions, and survive the intense competition. In turn, both the immediate advantages from such learning (i.e. innovations developed by the subsidiary) and the accumulated knowhow on how to innovate, survive and grow in highly competitive and individualistic environments can be channeled to the parent's knowledge bases enhancing its innovation performance. By contrast, WOS act more in line with Schumpeter's 'lone entrepreneur' model (1942) and, therefore, incur higher transaction costs and time-compression diseconomies (e.g. extensive trial and error in forming alliances, finding suppliers and building networks with local agents) and liabilities of foreignness in attempting to learn and benefit from the host-country's institutional advantages. Hence, as WOS replicate more individualistic strategies they will be slower and less capable of assimilating the foreign countries' institutional benefits and develop innovation capabilities. We propose:

> **H5.** The positive effect of the host-country institutional development on its innovation performance of the parent firm will be stronger when the foreign subsidiary is a joint venture than when it is a wholly owned subsidiary.

The theoretical framework is summarized in Figure 1.

(Insert Figure 1 about here)

3. Data and methods

3.1. Data and sampling

We tested our hypotheses using a panel dataset of internationalized Chinese firms. The data were collected from three sources. First, we obtained financial and ownership information of internationalized Chinese firms from China Stock Market & Accounting Research (CSMAR) databases. This is developed by GA information Technology, a leading financial database provider in China. Second, we obtained patent data from China's State Intellectual Property Office, which provides information such as patent application, patent granted and patent assignee. Third, we collected the information about EMEs' overseas subsidiaries from their annual reports. We limited the scope of the study to manufacturing industries for two reasons. Chinese manufacturing firms were active in venturing overseas during the study period, and the manufacturing firms are more likely to apply for patents for their innovative outputs. This allows us to accurately measure innovation performance. We cross-checked the data from the annual reports of the sample companies to accurately identify the number of overseas subsidiaries, the location of each overseas subsidiary and the year of establishing the subsidiary. We then matched this information with the corporate-level financial and patent data. The final sample comprises of 599 internationalized Chinese EMEs across 18 three-digit manufacturing industries that have established 2,430 subsidiaries across 82 countries during the period of 2000 and 2010.

3.2. Measures

3.2.1. Dependent variable

We measured the dependent variable, *parent innovation performance*, using the number of patents granted to the parent firm each year during the sample period. These innovations occurred within China where the parent firm operates and as a result the respective patents are also granted to the parent firm in the same country. These patents may come from innovations generated both at home and through

knowledge acquisition from subsidiaries. Our measure captures the "flow" rather than stock of patents and excludes the patents originated prior to the internationalization activities of the firm. Patents measure something "above and beyond R&D inputs, a creation of an underlying knowledge stock" (Hall, Griliches & Hausman, 1986) and provide an observable indicator of a firm's technological capabilities (Adegbesan & Higgins, 2010). Patent data can accurately capture the intellectual property of a firm and therefore have been widely used to measure innovation performance (e.g., Hall, Jaffe & Trajtenberg, 2001; Adegbesan & Higgins, 2010; Salomon & Jin, 2010).

3.2.2. Independent and moderating variables

Our key independent variable is *host-country institutional development* of the foreign country in which an EME is active. This variable is constructed as a composite measure of six institutional aspects from World Governance Indicators: voice and accountability, political stability and absence of violence, government effectiveness, regulatory quality, rule of law and control of corruption. The World Bank database provides information on these indicators for 210 countries for the period of 2000 to 2010. This index is often used in studies that examine cross-country differences in institutional environments (e.g., Kaufmann, Kray & Mastruzzi, 2003). Because each of the six indicators includes multiple sub-items, the composite measure takes into account many aspects of the institutional development of a country, including not only governance systems but also educational, religious, governmental and legal systems. For example, government effectiveness reflects the "quality of primary education" (which is subtracted from World Economic Forum Global Competitiveness Report) and the "satisfaction with education system" (from Gallup World Poll).

These six indicators are highly correlated (Cronbach alpha > 0.95), indicating a high degree of reliability of our composite measure. We submitted these six indicators to factor analysis to arrive at a single factor. A higher value of the measure represents a higher level of host-country institutional development. Table 1 shows the values of institutional development of the 82 host countries in which the sampled Chinese firms established operations during the period of 2000-2010.

[Insert Table 1 about here]

To operationalize the two moderating variables, *state ownership* and *absorptive capacity*, we obtained information from the CSMAR database. This database reports detailed information on the ownership structure of the sampled Chinese firms. *State ownership* is defined as the share of state-owned paid-in capital over the total paid-in capital of the firm. Various measures have been used to capture a firm's absorptive capacity (Zahra & George, 2002). Because it is strongly related to the total R&D expenditures of a firm, an established measure of absorptive capacity is the firm's own R&D spending (Cohen & Levinthal, 1990; Lane & Lubatkin, 1998). We thus measure *absorptive capacity* by dividing each firm's R&D expenditures by its total sales.

To operationalize *geographic diversity* of a firm's international expansion, we obtained the geographic distance of host countries from Berry, Guillen & Zhou (2010) and computed the Herfindahl index of overseas subsidiaries across markets and used it to proxy *geographic diversity*. We operationalized *JV* by generating a variable, which takes the value of one if the entry mode of an overseas subsidiary is *joint venture*, and takes the value of zero, if its entry mode is *wholly owned subsidiary*. The distinction between joint venture and wholly owned is determined by the percentage of equity of an overseas subsidiary owned by the parent firms. Following prior studies (Anderson & Gatignon, 1986; Hennart, 1991; Padmanabhan & Cho, 1996), we classified an overseas subsidiary as *JV* if the parent firm owned more than 95 percent of the share and as *WOS* otherwise.

3.2.3. *Control variables*

First, we controlled for *firm size*, which was measured by a firm's total assets. We applied a natural logarithm transformation to this variable to normalize it. Second, we included *firm age*, measured by the number of years elapsed since the establishment of the firm.

Third, because marketing capability can enhance the performance benefits of internationalization by enabling firms to market new products in the foreign markets and boost bargaining power with suppliers and distributors (Kotabe *et al*., 2002), we include *marketing capabilities* which is defined by the ratio of marketing expenses divided by sales revenue. Fourth, because it takes some time for the institutional quality effect to be materialized, we included a variable, the *no. of years of foreign presence*, which is

measured as the number of the years in which the firm has been active in the host country. Fifth, to control for the potential effects of the concentration of the size of the investment across the host countries a Chinese EME entered, we included *distribution of investment size* by computing a Herfindahl indicator based on the distribution of investment size across countries.

Sixth, because the level of institutional development varies across subnational regions within the home country, we followed Wang et al. (2012) and included *Region-specific home institutional development* to control for this effect. This operationalization adopted the marketization index developed by Fan, Wang and Zhu (2006) for 2005. This comprehensive composite index evaluates the levels of economic freedom in five key areas including the role of market relative to government, the development of the private sector, the development of commodity and factor markets, and the development of free market institutions. A higher value of the marketization index indicates a higher level of market-based system in a region. Finally, since the sampled firms were from multiple industries, we controlled for industry effect by generating multiple *industry (three digit) dummy variables* and including them in the regression analyses.

Table 2 reports descriptive statistics for the variables used in the analysis. The variance inflation factor values ranged from 1.23 to 4.68, well below the cutoff threshold of 10 (Hair, Anderson, Tatham & Black, 1998). Thus, multicollinearity appears not to be a major concern. Nevertheless, we mean-centered variables in the interaction terms to avoid problems of multicollinearity and increase interpretability of interactions (Aiken & West, 1991). We also lagged all the explanatory variables for one year, taking into consideration the time needed for the effects of host-country institutions to materialize and influence innovation of the parent firm. The adoption of a lag structure may also help control for potential endogeneity.

[Insert Table 2 about here]

3.3. Statistical modeling

Because our dependent variable is measured by the number of patents granted to a firm, a linear

regression model is not appropriate and will lead to biased and inconsistent coefficient estimates. Therefore, we adopt the categorical data regression model to perform the analysis (Agresti, 2002). With the categorical data regression model, one key concern is that the variance may exceed the mean, as Table 2 shows. Poison regression is often employed to deal with the problems associated with the use of count data for dependent variables, but its limitation lies in the assumption that the variance of the dependent variable must equal the mean. To overcome this limitation, we adopt the negative binomial count regression model. The negative binomial model allows the mean of the dependent variable to vary. The conditional expectation of the count dependent variable is specified as

$$E(Y^t|X, e) = \exp(X\beta + e) = \delta u \qquad (1)$$

where X is a set of explanatory variables, β is the coefficient, e is the random error, and δ and u are two random variables. δ is assumed to be subject to one parameter Gamma distribution. The probability density function of δ with one parameter k can be specified as follows:

$$g(\delta) = \frac{k^k}{\Gamma(k)}\delta^{k-1}\exp(-\delta k) \qquad (2)$$

After integrating δ out of the probability density function specified in Eq.(2), we obtain the following marginal negative binominal distribution:

$$\text{Prob}\,(Y^t; k, u) = \frac{\Gamma(Y^t+k)}{\Gamma(k)\Gamma(Y^t+1)}\left(\frac{k}{u+k}\right)^k\left(1-\frac{k}{u+k}\right)^{Y^t} \qquad (3)$$

where the negative binomial distribution has a mean of $E(Y^t) = u$ and a variance of $VAR(Y^t) = u + \frac{u^2}{k}$. With Eq.(3) being specified, the maximum likelihood method can be used to estimate the model.

4. Results

4.1. Main results

Table 3 provides the estimation results. The log-likelihood ratio indicates strong explanatory power of all models. The changes in this ratio across models indicate significant increases in explanatory power in those restricted models (Models 4 - 8) compared with Models 1 and 2.

[Insert Table 3 about here]

Model 1 serves as the baseline model because it includes control variables only. The variable for host-country institutional development is added to Model 2. The coefficient of this variable is positive and statistically significant, and it remains so in Models 3 - 8. This indicates that EMEs' international venturing into host countries with a higher level of institutional development has a positive effect on the innovation performance of the parent firm. Thus, H1 is supported.

Model 3 adds four moderating variables, *state ownership, absorptive capacity*, *geographic diversity* and *entry mode*, and models 4-8 include their interactions with host-country institutional development, respectively. The coefficient of the interaction term in Model 4 is negative and significant, indicating that state ownership weakens the relationship between the level of host-country institutional development and parent innovation performance of the investing firm. H2 is thus corroborated. Similarly, the interaction term in Model 5 is positive and significant, indicating that stronger absorptive capacity strengthens the focal relationship. This result supports H3. H4 is also supported as the coefficient of the interaction term in Model 6 is also positive and significant. Our results, however, do not provide support for H5 as the coefficient of the interaction term in Model 7 is statistically insignificant. As a robustness check, Model 8 is a full model which includes all independent variables and interaction terms. As can be seen, the key results concerning the host-country institutional development variable and the four interaction terms remain qualitatively unchanged. To better explain the moderating effects of state ownership and absorptive capacity, these relationships are presented in Figures 2a and 2b.

[Insert Figures 2a& 2b about here]

4.2. Further analyses

Firms with higher innovation performance may selectively enter countries with a higher level of institutional development, causing concerns of endogeneity which threatens our empirical strategy. We

control for the possible estimation biases in several ways. We alleviated this potential source of bias by including several variables that account for firm characteristics. We also used lagged independent variables to reduce the potential endogeneity bias, if any. For example, when host-country institutional development is lagged by one year, it is less likely that the parent innovation performance at year *t* affects the institutional development in year *t*-1.

Further, we followed Wang et al's (2012b) two-stage least square method to deal with the issue of endogeneity. The test procedure involves three steps. Since it is difficult to carry out negative binomial regression model using instrumental variables, the first step is to apply logarithm transformation to the dependent variable, the number of patents granted. Then we run the fixed effect model using the specification of Model 2 in Table 3. The results from the fixed-effect model are very similar to those from the negative binomial regression. The second stage involves choosing a valid instrument for the host-country institutional development variable. A valid instrument should be highly correlated with the explanatory variable but not with the error term. We followed Gujarati and Porter (2009) and used lagged (for two years) institutional development as the instrument. We then conducted an exclusion restriction test in which we regressed the residuals of the second stage estimation on the instrumental variable. The test has the p-value of 0.405 indicating that the instrumental variable is not significant and is indeed perpendicular to the error term. Then the third step is to carry out the Hausman (1978) test to compare with the 2SLS (with the instrument variable of host-country institutional development) and the fixed effects model. The null hypothesis is that the fixed effects and 2SLS are not systematically different. The Hausman statistics has a value of 11.99 with the p-value of 0.101, which is not significant at 5%. This suggests that the host-country institutional development variable is not endogenous and our estimated results are not biased.

To further check the robustness of the results, we replaced the *host-country institutional development* variable with host-country *national innovation systems*. National innovation systems refer to configurations of institutions that foster the development of technology and innovation (Nelson & Rosenberg, 1993). Our operationalization of this variable adopts the scores reported in the Global

Innovation Index (GII) from 'The Global Innovation Index 2014: The Human Factor in Innovation' which is the result of a collaboration between Cornell University, INSEAD, and the World Intellectual Property Organization (WIPO)[1]. The GII score is the composite measured by seven pillars and each pillar is divided into three sub-pillars. The main seven pillars include institutions, human capital and research, infrastructure, market sophistication, business sophistication, knowledge and technology outputs and creative outputs. A higher value of the index indicates a higher level of national innovation system. As shown in Table 3A, the results using the national innovation systems are qualitatively similar to those reported above. These results provide further support for our hypotheses.

[Insert Table 3A about here]

5. Discussion and conclusions

This study developed an integrative framework that theoretically articulated and empirically tested the effects of a host country's institutional development on the innovation performance of internationalizing EMEs parent back home and explored how these effects are contingent on firm-specific idiosyncrasies (i.e. level of state ownership and absorptive capacity) and internationalized strategies (i.e. geographic diversification and foreign entry mode). Our analysis shows that the internationalization configuration of foreign subsidiaries systematically affects innovations of the parent in addition to any unique home-based innovations. Specifically, the study shows that on average innovation performance of the parent is greater for firms expanding into host countries with stronger than weaker institutional development. Furthermore, we find that the role of a host country's institutional development in promoting innovation is greater for EMEs with stronger absorptive capacity. We further demonstrate that parents' innovation performance is enhanced when EMEs' portfolio of subsidiary units is located in geographical diverse and institutionally well-developed countries. However, we also find that a lower level of institutional development in the host country may actually enhance innovation performance when

[1] https://www.globalinnovationindex.org/content.aspx?page=data-analysis

the level of state ownership in the internationalizing EME is high. In addition, contrary to our predictions we found no support that parent firm innovation performance benefits more via JV to well-developed institutional countries as opposed to WOS entry mode. Our analysis contributes to the growing body of research on EMEs' internationalization strategies and innovation performance in several ways.

5.1. Theoretical implications

First, we demonstrate that the effects of host-country institutional development may spread beyond national boundaries to boost innovation performance of the parent internationalizing EME. The results suggest that well-developed institutions compensate for disadvantages of liability of foreignness (Hymer, 1976) and in fact enable foreign firms to get access to knowledge and resources which enhance their innovation performance back home. Adding to the emerging institution-based explanations of the rise of EMEs as innovators (e.g., Wang et al., 2015) that largely focus on the role of home-country institutions, we posit that the institutional and knowledge gap between the host market and the home market becomes conducive to reverse learning and knowledge opportunities for internationalized EMEs (Bertrand & Capron, 2014). Combined with the finding that a strategy of international expansion in geographical diverse and institutionally well-developed countries increases a firm's innovation performance our results, therefore, support the comparative institutional perspective that firms venture overseas in order to arbitrage institutional differences between home- and host- countries and enhance their performance (e.g., Luo et al. 2010). Our results open up avenues for future research to explore in more detail how (e.g., identify which mechanisms enable reverse knowledge transfers and what is the optimum level of geographic diversification before costs outweigh the benefits) the level of institutional development of a host-country affects internationalized firms' innovation performance back home. Such understanding can offer a new explanation for the sources of competitive advantages enabling EMEs to innovate and compete with their advanced rivals on a home and global scale (Kafouros, Wang, Piperopoulos & Zhang, 2014).

Second, our research shows that though EMEs may perceive a greater investment risk in

institutionally less-developed countries, those with a higher level of state ownership can actually boost innovation performance because of its similarity to their home environments. On surface, this finding seems to contradict the view that 'institutional voids' hamper innovation performance by increasing transaction costs and making transformation less efficient for foreign subsidiaries (Khanna & Palepu, 2000). Our finding is actually intriguing because it suggests that well-developed institutions are not always beneficial for EMEs' innovation success and that not all EMEs should enter institutionally well-developed host countries. Our study thus, offers 'partial' support to the view that some location-bound advantages in a host country are specific to a particular group of firms only (Dunning, 1998).

Third, we show that although institutional development in the host country has a significant and independent effect on innovation performance, well-developed institutions alone might not be enough for enhancing innovation. Rather, firms need to develop strong absorptive capacity that enables them to "address a myriad of complex cultural issues, different political environments, and regulatory requirements" (Zahra & Hayton, 2008). This finding supports the view that firms are not equally able to exploit favourable institutional environment and diverse knowledge sources (e.g., Zahra & Hayton, 2008). While prior perspectives suggest that the RBV and institution-based view are competing rather than complementary and have limited researchers' ability to explain variations in innovation performance, this study is one of the first to examine how institutional factors and firm capabilities (i.e. RBV) jointly affect a firm's innovation performance, an approach that, according to Meyer & Peng (2005) and Yamakawa et al. (2008), is necessary and highly promising.

Finally, although theory on global alliances predicts that learning from the partner (especially when certain knowledge is tacit) and gaining legitimacy and access to their social networks in the new environment is the preferred strategy for firms looking to upgrade their capabilities (Kurokawa, Iwata & Roberts, 2007; Vasudeva et al., 2013), we find that JVs will not reinforce further the positive effects of host-country's institutional development on the parent's innovation performance. A possible explanation has to do with the fact that the extant literature does not provide a clear distinction regarding which entry

mode is best for venturing abroad (e.g. Cui & Jiang, 2009; Meyer, Estrin, Bhaumik & Peng, 2009) and in fact suggests that both WOS and JVs are used equally successful by EMEs in their quest for accessing and assimilating resources and advanced capabilities from abroad (Guillen & Garcia-Canal, 2009).

5.2. Managerial implications

Our findings also offer valuable guidelines for globally focused managers from emerging economies who aim to enhance innovation performance through internationalization. First, although strong institutions may facilitate innovation performance, EME managers should realize that they do not always need to seek strong institutions when expanding overseas but instead, they should look for countries with a similar level of institutional development to their home countries if their firms have a higher level of state ownership. Second, our study suggests that EMEs should develop absorptive capacity which will enable them to take advantage of the institutional development in the host country. Further, EME managers should also be aware that diversifying into geographically dispersed locations with well-developed institutions is more beneficial than locating their company's portfolio of subsidiaries in only a few countries.

We, therefore, suggest that innovation business models resting on the combination of location and diversification choice strategy and development of internal absorptive capacity is the most fruitful mechanism for increasing innovation through internationalization. Thus, before venturing abroad, EME managers should consider whether institutions in a particular host country are conducive to their innovative activities, how they can improve their absorptive capacity to exploit the institutional advantages in the chosen host country and finally select a broad (instead of a narrow) set of geographically diverse countries to target their outward investments.

5.3. Limitations and further research

This research has several limitations. First, our empirical data rely on one country (i.e. China), and thus our findings may not be equally generalizable to other emerging countries because of the peculiarity of

organizational structure, government actions, and/or the institutional setting associated with China. Therefore, a useful avenue for research would be to explore whether our hypothesized relationships hold true for internationalizing EMEs from other emerging economies. Second, our measurement of innovation performance relied on patents; however, not all innovations are patentable, and a patent-based measure does not incorporate market acceptance of related products (Liu & Buck, 2007). Because institutional environments may influence various forms of innovation (e.g., new product introduction and process innovation) in different ways, different findings may emerge when innovation performance is operationalized by new product introduction or measures not directly related to patents. Third, this study attached great importance to absorptive capacity, which is essentially proxied by technological capabilities. Researchers may explore the relationship between the host-country institutional environment and innovation performance by examining how other types of capabilities (e.g., operational capabilities and management quality) moderate the focal relationship. Finally, we considered two types of foreign entry mode, namely JV and WOS. Future research should also explore acquisitions as an FDI strategy, particularly as many EMEs seem to favor this type of entry mode.

Despite some limitations, our study contributes to institutional and innovation theories about the *effects* of host-country institutional development on parent EMEs' innovation performance. The findings suggest that EMEs' parents overcome their internal constraints and obstacles related to under-developed home-country institutions by investing in foreign countries and tapping into their institutional settings to enhance their organizational learning, acquire diverse ideas and mental models, enrich their knowledge bases and upgrade their capabilities. Through a process of reverse knowledge transfer from the subsidiaries to the parent, EMEs enhance their innovation performance back home and thus are able to counter-attack major global rivals operating in their home-markets and abroad (Luo & Tung, 2007). We, thus, concur with recent arguments that internationalized EMEs initially go abroad to obtain technologies and resources primarily for exploitation in their home countries and once they secure greater ownership advantages and a stronger foothold in their own countries, (re)enter the global competitive markets (Ramamurti, 2012).

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Table 1
List of host countries and the index of institutional development.

Country	Institutional development index	Country	Institutional development index	Country	Institutional development index
New Zealand	1.97	Poland	0.75	Indonesia	-0.40
Norway	1.96	Seychelles	0.70	Cote d'Ivoire	-0.40
Denmark	1.94	Korea, Rep.	0.65	Vietnam	-0.44
Finland	1.91	Malaysia	0.62	Gabon	-0.46
Switzerland	1.90	Mauritius	0.62	Papua New Guinea	-0.47
Netherlands	1.90	Uruguay	0.61	Ecuador	-0.53
Luxembourg	1.87	Samoa	0.60	Kyrgyz Republic	-0.56
Sweden	1.87	United Arab Emirates	0.54	Colombia	-0.56
Austria	1.84	Lithuania	0.47	Zimbabwe	-0.58
United Kingdom	1.81	South Africa	0.43	Mali	-0.61
Canada	1.80	Slovak Republic	0.43	Uganda	-0.62
Germany	1.71	Thailand	0.35	Russian	-0.70
Singapore	1.70	Macau, China	0.33	Pakistan	-0.71
Australia	1.68	Argentina	0.18	Zambia	-0.73
United States	1.58	Jordan	0.13	Kenya	-0.74
Cayman Islands	1.55	Morocco	0.09	Ukraine	-0.75
Belgium	1.49	India	-0.02	Bangladesh	-0.81
Spain	1.37	Philippines	-0.02	Lao PDR	-0.82
France	1.37	Mongolia	-0.08	Iran,	-0.82
Portugal	1.34	Sri Lanka	-0.09	Cambodia	-0.90
Bermuda	1.27	Brazil	-0.11	Kazakhstan	-1.00
Japan	1.14	Egypt, Arab Rep.	-0.11	Ethiopia	-1.12
Hong Kong, China	1.11	Turkey	-0.12	Nigeria	-1.16
Italy	0.90	Saudi Arabia	-0.18	Uzbekistan	-1.23
Hungary	0.87	Bolivia	-0.24	Myanmar	-1.51
Antigua & Barbuda	0.85	Ghana	-0.26	Tajikistan	-1.62
Czech Republic	0.85	Mexico	-0.32		
Taiwan, China	0.82	Bulgaria	-0.34		

Table 2 Means, standard deviations, and correlations

		Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	Parent innovation performance	10.321	49.685	1											
(2)	Firm age	11.281	4.791	0.003	1										
(3)	Firm size	7.973	1.153	0.218	0.155	1									
(4)	Marketing capability	0.069	0.079	-0.025	-0.025	-0.069	1								
(5)	Distribution of investment size	0.404	0.456	0.03	0.139	0.101	0.062	1							
(6)	Region-specific home institutional development	2.056	2.711	0.197	-0.207	-0.017	0.01	-0.101	1						
(7)	No. of years of foreign presence	2.328	1.006	0.077	0.387	0.362	-0.037	0.225	-0.062	1					
(8)	Host-country Institutional development	0.067	0.549	0.061	-0.046	-0.013	0.008	0.16	0.018	-0.077	1				
(9)	State ownership	0.148	0.223	0.153	0.021	0.227	-0.085	-0.113	0.147	0.038	0.042	1			
(10)	Absorptive capacity	0.002	0.02	0.245	-0.003	-0.059	0.06	0.021	-0.045	0.012	0.025	0.014	1		
(11)	Geographic diversity	2.761	4.388	0.09	0.009	0.203	-0.01	0.059	0.044	0.538	-0.098	-0.028	0.014	1	
(12)	Entry mode	0.067	0.249	-0.011	0.086	0.068	0.023	0.226	-0.022	0.09	-0.09	0.016	0.086	0.001	1

Correlations with an absolute value greater than .03 are significant at $p < .05$.

Table 3 Negative binomial regression analyses of parent innovation performance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	-5.628***	-5.568***	-15.334	-15.551	-16.295	-15.597	-15.265	-16.775
	(-4.352)	(-4.311)	(-0.132)	(-0.158)	(-0.095)	(-0.112)	(-0.120)	(-0.073)
Firm age	0.010	0.011	0.025*	0.036**	0.025*	0.018	0.017	0.016
	(0.841)	(0.973)	(2.183)	(3.191)	(2.170)	(1.549)	(1.502)	(1.405)
Firm size	0.462***	0.455***	0.266***	0.342***	0.278***	0.262***	0.227***	0.266***
	(10.706)	(10.467)	(5.643)	(7.150)	(5.980)	(5.539)	(4.825)	(5.527)
Marketing capability	-0.906	-0.882	-1.089+	-1.009+	-0.981+	-1.200*	-1.176*	-1.061+
	(-1.451)	(-1.406)	(-1.822)	(-1.725)	(-1.648)	(-2.019)	(-1.966)	(-1.785)
Distribution of investment size	-0.437***	-0.495***	-0.439***	-0.500***	-0.458***	-0.421***	-0.447***	-0.504***
	(-4.521)	(-5.063)	(-4.383)	(-5.006)	(-4.594)	(-4.182)	(-4.440)	(-4.862)
Region-specific home institutional development	0.323***	0.319***	0.321***	0.330***	0.326***	0.321***	0.314***	0.321***
	(15.514)	(15.448)	(15.744)	(16.380)	(16.190)	(15.742)	(15.472)	(16.015)
No. of years of foreign presence	0.259***	0.252***	0.128+	0.061	0.141*	0.155*	0.177**	0.205**
	(5.652)	(5.480)	(1.947)	(0.928)	(2.156)	(2.340)	(2.697)	(3.065)
Host-country institutional development		0.234**	0.132	0.209*	0.325***	0.200*	0.154+	0.474***
		(2.935)	(1.628)	(2.461)	(3.564)	(2.434)	(1.857)	(4.779)
State ownership			1.102***	0.935***	1.006***	1.115***	1.096***	0.875***
			(5.303)	(4.592)	(4.857)	(5.372)	(5.245)	(4.208)
Absorptive capacity			3.949+	3.025	5.702	3.796+	3.754+	3.716
			(1.798)	(1.595)	(1.159)	(1.742)	(1.779)	(0.779)
Geographic diversity			0.046**	0.057**	0.040**	0.012	0.038*	-0.010
			(2.745)	(3.259)	(2.597)	(0.632)	(2.383)	(-0.459)
Entry mode			-0.529**	-0.565**	-0.582**	-0.533**	-0.537**	-0.622**
			(-2.791)	(-3.025)	(-3.071)	(-2.819)	(-2.814)	(-3.254)
Host-country institutional development * State ownership				-1.998***				-1.859***
				(-3.806)				(-3.511)
Host country institutional development * Absorptive capacity					79.989***			69.405***
					(4.529)			(3.900)
Host-country institutional development * Geographic diversity						0.050***		0.061***
						(3.477)		(3.308)
Host-country institutional development * Entry mode							0.132	0.138
							(0.494)	(0.468)
Industrial dummies	Included	Included	Included	Included	Included	Included	Included	Included
Log-Likelihood	-8495.61	-8491.75	-8482.22	-8469.46	-8468.99	-8478.55	-8487.23	-8462.29
AIC	17019.22	17013.50	17000.45	16976.91	16975.98	16995.10	17012.46	16968.59
Degree of freedom	12	13	16	17	17	17	17	20
Significance of model test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: The values reported are regression coefficients, with t-values given in parentheses; * indicates significance at the $p \leq 0.05$ (** $p \leq 0.01$; *** $p \leq 0.001$) level of confidence (two-tailed tests).

Table 3A Robustness analyses of parent innovation performance

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	-6.653***	-6.609***	-19.319	-19.604	-7.090***	-19.404	-20.282	-17.814
	(-5.169)	(-5.135)	(-0.023)	(-0.022)	(-4.551)	(-0.023)	(-0.017)	(-0.054)
Firm age	-0.003	-0.002	0.013	0.015	-0.004	0.019+	0.015	0.032**
	(-0.276)	(-0.202)	(1.158)	(1.328)	(-0.331)	(1.696)	(1.327)	(2.845)
Firm size	0.529***	0.531***	0.209***	0.220***	0.728***	0.226***	0.224***	0.217***
	(11.676)	(11.695)	(4.193)	(4.412)	(14.738)	(4.553)	(4.488)	(4.341)
Marketing capability	0.947	0.921	0.121	0.180	1.430*	0.258	0.301	0.746
	(1.463)	(1.425)	(0.198)	(0.298)	(2.251)	(0.423)	(0.490)	(1.202)
Distribution of investment size	-0.078	-0.338	0.044	0.002	-0.434	0.010	0.134	-0.085
	(-0.784)	(-1.235)	(0.158)	(0.006)	(-1.575)	(0.034)	(0.473)	(-0.298)
Region-specific home institutional development	0.273***	0.273***	0.273***	0.276***	0.268***	0.284***	0.279***	0.282***
	(13.293)	(13.308)	(13.090)	(13.404)	(13.078)	(13.581)	(13.317)	(13.716)
No. of years of foreign presence	0.448***	0.426***	0.278**	0.274**	0.311***	0.250**	0.314***	0.253**
	(8.342)	(7.396)	(3.257)	(3.222)	(3.755)	(2.884)	(3.667)	(2.923)
Host-country institutional development		0.005	-0.001	-0.001	0.009+	-0.000	-0.003	0.004
		(1.015)	(-0.210)	(-0.131)	(1.800)	(-0.075)	(-0.503)	(0.844)
State ownership			1.210***	1.228***	0.977***	1.257***	1.251***	1.322***
			(5.941)	(6.086)	(4.917)	(6.205)	(6.146)	(6.489)
Absorptive capacity			3.272	2.895	-0.551	2.930	2.992	-2.257
			(1.463)	(1.365)	(-0.126)	(1.350)	(1.362)	(-0.520)
Geographic diversity			0.068***	0.070***	0.027*	0.072***	0.067***	0.079***
			(4.660)	(4.777)	(2.276)	(4.547)	(4.580)	(5.053)
Entry mode			-0.129	-0.181	-0.170	-0.139	-0.180	-0.235
			(-0.699)	(-0.988)	(-0.931)	(-0.751)	(-0.973)	(-1.286)
Host-country Institutional development * State ownership				-0.020**				-0.021**
				(-2.698)				(-2.816)
Host-country institutional development * Absorptive capacity					1.060***			1.181***
					(5.414)			(6.137)
Host-country institutional development * Geographic diversity						0.003		0.003
						(0.338)		(0.369)
Host-country institutional development * Entry mode							0.023	0.019
							(1.556)	(1.391)
Industrial dummies	Included	Included	Included	Included	Included	Included	Included	Included
Log-Likelihood	-8463.06	-8462.55	-8467.12	-8462.01	-8434.02	-8463.92	-8465.78	-8432.18
AIC	16954.12	16955.10	16970.25	16962.03	16906.04	16965.83	16969.57	16908.36
Degree of freedom	12	13	16	17	17	17	17	20
Significance of model test	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes: The values reported are regression coefficients, with t-values given in parentheses; * indicates significance at the $p \leq 0.05$ (** $p \leq 0.01$; *** $p \leq 0.001$) level of confidence (two-tailed tests).

Fig 1. Research model

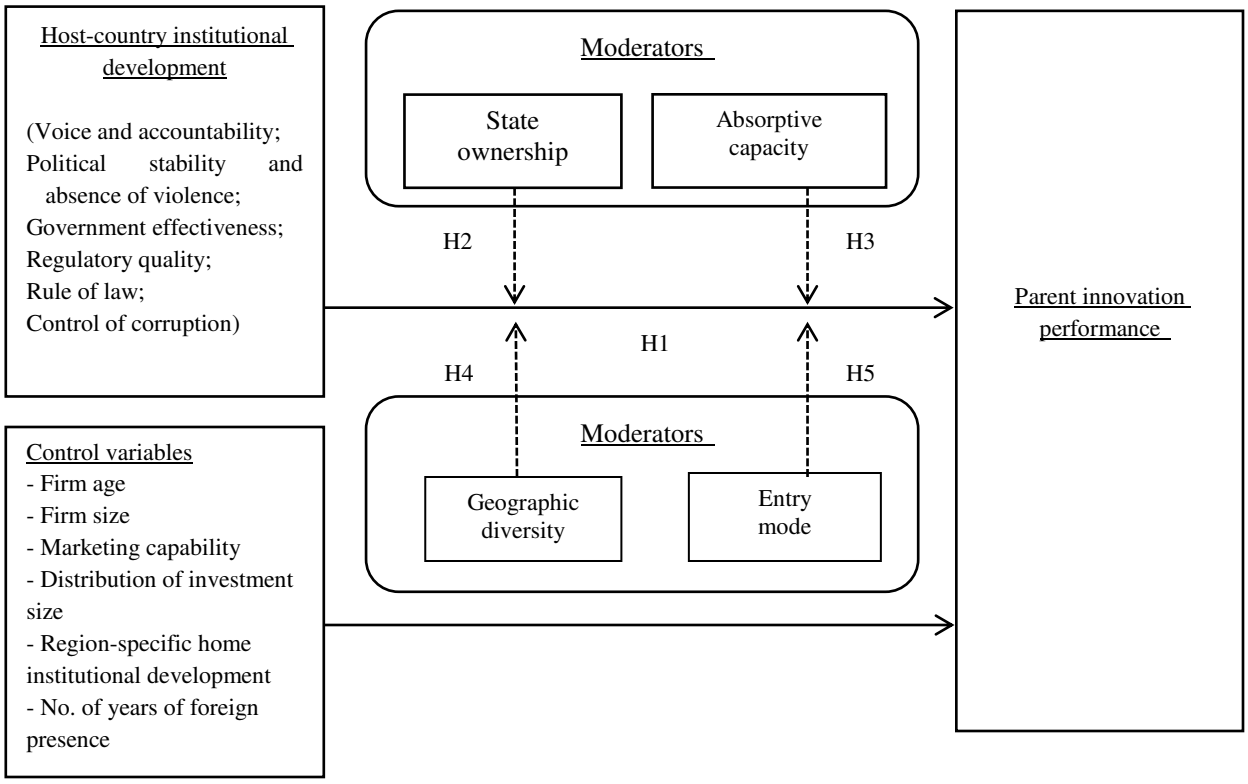

Fig. 2a. Host-country institutional development, state ownership, and parent innovation performance

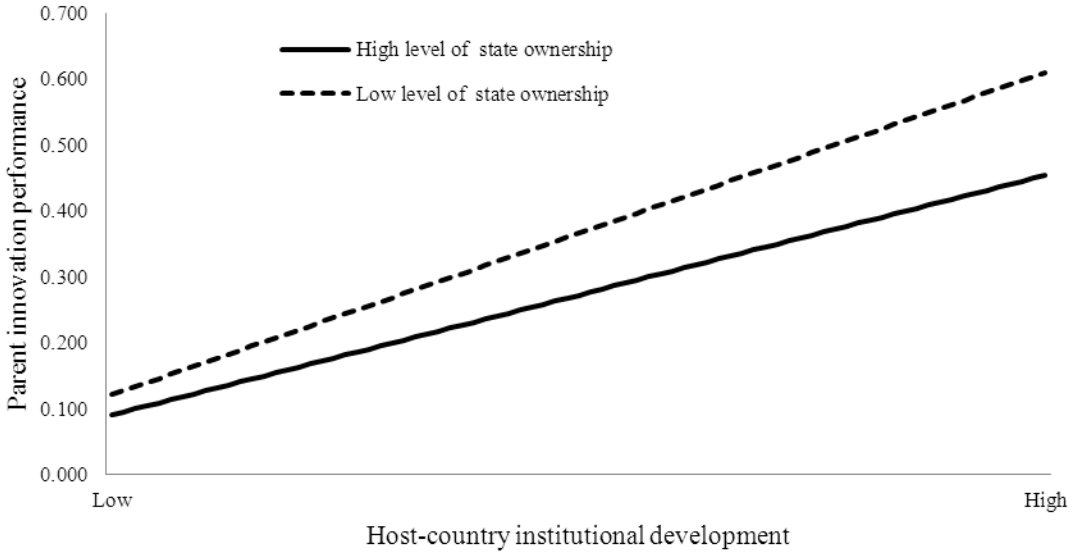

Fig. 2b. Host-country institutional development, absorptive capacity, and parent innovation performance