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Business environment distance and innovation performance of EMNEs: The mediating effect of R&D internationalization

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ABSTRACT

Sustainable business environment plays an important role in creating conditions favorable to innovation. However, is this the case for all types of multinational enterprises (MNEs)? While recognizing the importance of sustainable business environment in innovation, we address this question by examining the impact of sustainable business environment distance on the innovation performance of emerging market multinational enterprises (EMNEs). A panel dataset of Chinese MNEs listed on the Shenzhen and Shanghai stock exchanges between 2005 and 2018 is employed. Our findings suggest that sustainable business environment distance positively affect the innovation performance of MNEs. R&D internationalization plays a mediating role in the relationship between business environment distance and innovation performance. Migrant networks can strengthen the positive impact of business environment distance on the parent company's R&D internationalization. Highly skilled migrants have a greater strengthening effect than do less skilled migrants on the relationship between business environment distance and R&D internationalization. Our study contributes to the literature by providing new insights into the relationship between business environment distance and outward foreign direct investment (OFDI).

Introduction

The relationship between sustainable environment and international innovation behavior of multinational enterprises (MNEs) has long been a center of academic attention in the international business (IB) literature. The current research believes that outward foreign direct investment (OFDI) can provide a high-quality platform for MNEs to learn advanced knowledge and experience, which can improve their sustainable innovation and development capabilities. For instance, Kogut & Chang (1991) analyze the industry-level data on Japan's direct investment in the United States from 1976 to 1987 and discover that OFDI positively affects the technological capabilities of the home country. Potterie & Lichtenberg (2001) analyze data on research and development (R&D) capital stocks in 13 developed countries and find that cross-company OFDI has a significant effect on the productivity of the source country of investment. It is not difficult to find that the previous literature on the international innovation performance of MNEs mainly focuses on developed countries. However, the research on the international innovation mechanism of emerging market multinational enterprises (EMNEs) has not attracted enough attention. In fact, compared with the characteristics of OFDI by developed country, the path of EMNEs to improve the technological innovation level of their home country companies through OFDI is unique. EMNEs engage in OFDI primarily to gain advanced technical experience and management models (Chen et al., 2013). They establish overseas subsidiaries to obtain high-quality technical resources and senior talent from host countries, which leads to positive reverse spillover effects. This also shows that the traditional international business theory focused on developed countries is not fully applicable to emerging markets (Piperopoulos et al., 2018). The phenomenon of EMNEs' international expansion and business behavior are not predicted by traditional views of international business in academia. Therefore, this study takes Chinese MNEs as the research sample, which provides a certain reference for explaining the sustainable innovation performance of EMNEs.

The business environment is regarded as an important factor affecting the sustainable development of MNEs in the field of international business. The OFDI of MNEs is related to the institution, economy, and culture of their host countries. At the macro-environmental

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level, the business environment is directly and closely linked to the life cycle of an enterprise and is a macroscopic representation of a country's institution, economy, and culture. The business environment covers the procedures and rules of a company from its establishment to its bankruptcy. High-quality business environments in host countries significantly and positively affect domestic economic growth (Djankov et al., 2006), the expansion of the scale of imports (Cui et al., 2022), and the attraction of high-quality FDI (Borojo & Yushi, 2020). Most studies focus on a single dimension of factors in a host country's macro environment that influence OFDI (e.g., institution, culture, or geography). Few scholars conduct systematic research on the effect of business environment distance on MNEs' innovation performance. Ahlquist & Prakash (2010) report that FDI inflows are positively correlated with lower contract costs for countries. Jayasuriya (2011) indicates that the sensitivity of FDI to the business environment of heterogeneous countries may differ by country. Corcoran & Gillanders (2015) employ the ease of doing business index developed by the World Bank to measure the cost of operating a company in a certain country. They determine that convenient business environments positively affect the attraction of FDI, but this is only significant for middle-income countries. Giannetti & Rubera (2020) indicate the impact of different internationalization strategies on innovation performance is different. Therefore, MNEs should propose optimization strategies according to the portfolio of different internationalization paths (Elia et al., 2020). However, the current literature mainly focuses on the single-level effects of institutions, culture, and geography on firms' OFDI. It is not sufficient to explain the reasons for the sustainable development of MNEs from a certain dimension of the business environment. EMNEs emerge from their home country's institutional context and operate in the host country's institutional context. Both business environments independently and conjointly shape the EMNEs' capabilities for and strategies of internationalization, and influence their corporate and subsidiary performance (Chidlow et al., 2021). From a theoretical perspective, while different streams of research have shed light on the impact of home or host country environmental factors on firm innovation, the existing literature only discusses the impact of the business environment on the sustainable development and innovation of MNEs from a single perspective of the home country or host country, the impact of the business environment difference between the two countries on the investment and financing decisions of MNEs is not yet clear. Although some scholars suggest that the difference in the business environment of the home country and the host country is an important factor when enterprises consider the location of OFDI (Qian et al., 2022). However, these studies only emphasize the macro-national level, and there are very few studies on the micro-firm level. Therefore, we focus on the impact mechanism of the business environment distance between the two countries on the innovation performance of MNEs. Business environment distance is defined as the difference in the institutional and economic conditions between a home and host country. This study performs a systematic analysis of the relationship between the business environment distance and innovation performance of Chinese MNEs.

Moreover, a large number of MNEs participate in global competition by establishing overseas R&D subsidiaries and developing R&D alliances with international partners. Such firms prioritize the internationalization of their R&D (Davis & Meyer, 2004). In developed countries, overseas R&D has become a mature strategic system, whereas EMNEs remain in the preliminary stage. The literature on R&D internationalization focuses on various issues, including geographic dispersion, developmental modes (Sanna-Randaccio & Veugelers, 2007), technology-driven motivation, overseas R&D (Luo & Tung, 2007), and outcomes (Chen et al., 2012). The evidence regarding the relationship between R&D internationalization and innovation performance is somewhat contradictory. Most scholars indicate that R&D internationalization and corporate innovation are positively linked because utilization of extant knowledge in MNEs and development of new knowledge in their host countries are conducive to enhancing corporate innovation performance. Arvanitis & Hollenstein (2011) conduct a study of 2817 MNEs in Switzerland and reveal that knowledge-oriented overseas R&D activity positively affects the innovation performance of parent companies through the reverse spillover of knowledge. By contrast, market-oriented and resource-oriented overseas R&D activity increases business productivity through economies of scale and learning effects. Other researchers indicate that foreign investment in R&D is accompanied by the liability of foreignness and a lack of legitimacy. This may cause companies to expend their limited resources while managing related affairs, thus impeding the R&D process and consequently leading to a decrease in innovation performance. Singh (2008) demonstrates that R&D institutions in various countries fail to facilitate innovation in enterprises because the cost of integrating knowledge is greater than the income generated by using knowledge and technology input from overseas R&D institutions. This contradiction may be partly attributable to studies failing to offer a complete definition of R&D internationalization or overly differentiating between certain characteristics. Furthermore, most existing literature ignore the differences between the home and host countries, for example, differences in institutional distance between the host and home countries. These differences affect the investment decisions of MNEs, which in turn affect the performance of overseas subsidiaries. Existing literature mainly captures the differences in institutional distance between the home and host countries (Qian et al., 2022). However, research has not yet employed the business environment index to analyze the impact of business environment distance on firm-level OFDI and present a moderating factor to explore the boundary of influence between them. Compared with other institution quality indicators, the business activities of overseas subsidiaries are often directly affected by their host countries' institutions, laws, and economies. Therefore, the business environment better reflects the regulations and difficulties encountered by firms involved in OFDI. In addition, the existing literature has not built a clear mathematical model to explain the impact mechanism of business environment distance on the innovation performance of MNEs. This also raises questions concerning the role of EMNEs' R&D internationalization capabilities in the relationship between business environment distance and corporate innovation performance, the answers to which can help to identify the mechanism by which the effects of technology spillover are transferred to overseas subsidiaries. China is a typical relational society (Hitt et al., 2002), migrants constitute a critical social network resource for building a channel of collaboration and exchange between China and overseas markets (Hernandez, 2014). The informal nature of the migrant network is a pivotal factor that influences cross-border exchange and cooperation (Chen et al., 2020). Therefore, we explore the moderating effect of migrant networks on the relationship between business environment distance and R&D internationalization. We divide migrant networks based on educational background and systematically analyze the effect of their characteristics on the innovation performance of MNEs. The objectives of this study are as follows: (a) to determine whether business environment distance affects the innovation performance of EMNEs, (b) to explore whether business environment distance increases the innovation performance of EMNEs by improving the parent company's R&D internationalization capabilities, and (c) to identify the moderating role of migrants' educational background.

This study enriches the literature on the theory of the OFDI of emerging economies and provides a valuable decision-making basis for enhancing the technological innovation capabilities of EMNEs. First, the literature mostly examines the performance of MNEs from a single perspective: the host country's business environment or the home country's business environment. Few studies consider the effect of business environment distance on the innovation efficiency

of MNEs. Based on the springboard theory, our research is more thorough and analyzes the impact of business environment distance on micro-enterprise innovation performance. The results show that business environment distance can enhance the reverse innovation spillover effect of MNEs, which fills the existing research gap. Second, the literature focuses on the direct impact of the external environment on the innovation performance of MNEs. Then the existing literature has not built a clear model to explain the impact mechanism of business environment distance on the innovation performance of MNEs. The mediating role of the parent company's R&D internationalization capabilities is commonly overlooked with respect to the reverse spillover effects of overseas subsidiaries' technological innovation. We subdivide the R&D internationalization of EMNEs into intensity and diversity to determine the effect of business environment distance on parent companies' innovation performance. Our study demonstrates that R&D internationalization is crucial for developing corporate internationalization strategies. This investigation adds to the research on the innovation performance of MNEs in the field of international business. Third, although the existing literature has investigated migrant networks as a factor affecting OFDI, there is little literature that discusses the role of migrant networks characteristics in the reverse spillover effects of innovation by overseas affiliates. Our research is more thorough and analyzes how to reduce the negative impact of business environment distance and proposes a possible method to alleviate the negative impact of business environment distance on micro-enterprise innovation performance: promotion and deepening of high-skilled migrant networks. This study provides a reference for future analysis of emerging markets.

The remainder of this paper is structured as follows: Section 2 summarizes the literature review and proposes hypotheses, Section 3 describes the measurement model and data, Section 4 presents the empirical results, and Section 5 is conclusions and practical implications.

Literature review and hypotheses

Business environment distance and EMNEs' innovation performance

The business environment comprises a series of business controls on companies from their establishment to their bankruptcy. These business controls consist of an evaluation of enterprises' institutional and economic environment (Jovanovic & Jovanovic, 2018) and are closely related to MNEs' production and operation. The business activities of overseas subsidiaries are often directly affected by their host countries' systems, laws, and economies. However, the rules, regulations, and business environments of each country are unique. Therefore, comprehensive consideration of business environment distance is crucial for increasing the survival rate of overseas subsidiaries. Since its introduction into the field of organization and management by DiMaggio & Powell (1983), scholars have used institutional theory to explain the investment behavior of MNEs. MNEs' OFDI varies by country but invariably involves institutional issues. Institutions are the general term for formal or informal social orders, rules, and quasi-rules that restrict organizational models. Institutional distance can either be formal or informal. Formal institutional distance refers to the differences in laws and regulations between home and host countries (North, 1990). Therefore, business environment distance is also a representation of formal institutional distance. We analyze the business environment distance and innovation performance of MNEs from the perspective of formal institutional distance.

The literature mainly examines the relationship between formal institutions and EMNEs' OFDI from a macro institutional perspective, and the findings are contradictory. Traditional institutional theory holds that MNEs inevitably encounter differences between their home and host countries' systems when investing overseas. When formal institutional distance is large, MNEs must expend more energy to earn local legitimacy. When MNEs invest in a advanced country with an established legal system and abundant technological resources, they may also encounter barriers to legality (Meyer et al., 2014). The pursuit of legitimacy often reduces the operational efficiency of MNEs, which threatens corporates' OFDI performance (Barreto & Baden-Fuller, 2006). However, some scholars indicate that formal institutional distance positively affects OFDI. Stahl & Tung (2015) assert that institutional arbitrage in which differences in institutional environment between home and host countries are exploited is a strong motivation for companies to engage in OFDI. Yi et al. (2021) indicate that formal institutional distance positively affects the innovation performance of MNEs. Besides, other scholars argue that formal institutional distance exerts a twofold effect on the innovation performance of overseas investment. On the one hand, greater formal institutional distance limits innovation performance of OFDI. On the other hand, greater formal institutional distance entails more opportunities for innovation, which can improve overseas innovation performance through mergers and acquisitions. However, the effect of formal institutional distance on OFDI is contested. Therefore, the mechanism by which formal institutions affect MNEs' innovation performance should be investigated from the perspective of business environment distance.

The springboard theory and institutional theory are appropriate to analyze the impact of business environment distance on the innovation performance of Chinese MNEs. China is experiencing a period of system transformation, and deficiencies in the market economy system remain. In addition, Chinese MNEs do not have operating advantages such as branding, technology, R&D, and organizational capabilities (Strange, 2018). According to the springboard theory, developed countries with advanced technology can be regarded as a springboard for acquiring management experience and R&D resources (Luo & Tung, 2007). Therefore, Chinese MNEs are motivated to use different business environment distances as a springboard to acquire strategic assets and advanced technological resources overseas. From the logical perspective of neoinstitutional theory, institutional contradictions are the internal driving force for organizational change. Different business environments provide learning platforms for MNEs to leverage overseas strategic assets and enhance their technological innovation capabilities. A high level of institutional depth is the only necessary condition for developed markets, both institutional depth and institutional efficiency could work (Pineiro-Chousa et al., 2019). Latecomer firms can apply both the business model of mature market environments and the advantages of emerging markets to improve their technological innovation capabilities. Business environment distance is the basis of technological innovation. Thus, the following hypothesis is proposed:

Hypothesis 1. Business environment distance positively affects EMNEs' innovation performance.

Mediating effect of R&D internationalization

R&D internationalization refers to the establishment of R&D centers or overseas subsidiaries with R&D functions by MNEs. MNEs use overseas subsidiaries to conduct R&D (Iwasa & Odagiri, 2004). The literature divides R&D internationalization into two dimensions: intensity and diversity. Intensity refers to the extent to which MNEs invest resources in overseas markets, whereas diversity refers to the scope of MNEs' distribution in overseas markets. The springboard theory asserts that EMNEs mainly establish overseas R&D centers to learn from developed countries' experience with advanced technology. Thus, when EMNEs establish R&D centers in developed countries with business environments different from those of their home countries, the business environment distance may facilitate the improvement of the company's R&D internationalization capabilities for

several reasons. First, a larger business environment distance indicates that the developed country possesses more advanced technology and development models. Latecomer firms have more opportunities to learn about new technology from high-quality companies and seek new partners (Hurtado-Torres et al., 2018). Business environment distance makes enterprises more motivated to increase human capital and R&D investment in developed countries to enhance their R&D internationalization capabilities. This enables companies to maximize the digestion and absorption of overseas subsidiaries' knowledge and technology. Moreover, because technological resources and advanced knowledge differ by country, emerging markets can obtain a range of advanced technological resources through OFDI in various countries. Therefore, MNEs should establish overseas R&D centers in several locations. Second, in developed countries, which typically have more favorable business environments than do emerging countries, the product renewal cycle is fast, product quality requirements are stringent, and consumer diversity is greater. Therefore, EMNEs must continuously improve their R&D internationalization capabilities and adapt to their host countries. Third, business environment distance allows companies to continuously adapt to different rules and regulations. Firms are thus more likely to develop an open, inclusive, and flexible organizational culture, which can increase their members' willingness to acquire knowledge from new global environments. In addition, overseas R&D centers in different regions can share their technical knowledge in a global R&D network to expand enterprises' knowledge base and enhance the R&D internationalization capabilities of parent companies. Accordingly, the following hypothesis is proposed:

Hypothesis 2. Business environment distance positively affects EMNEs' R&D internationalization.

The main motivation for EMNEs to establish overseas R&D centers is to learn about new technology and development models. The knowledge-based theory of the firm holds that tacit knowledge is key for enterprise development. Tacit knowledge is closely related to the business environment and is contextual and cultural. Therefore, MNEs must enhance their R&D internationalization capabilities to help overseas subsidiaries build learning platforms, access more high-quality resources, and utilize the host country's advanced technological resources as reserves of tacit knowledge (Kogut & Zander, 1993). EMNEs improve their innovation performance through R&D internationalization in three steps. First, R&D internationalization enables MNEs to obtain high-quality tacit knowledge from various host countries. Overseas subsidiaries absorb and integrate this tacit knowledge to accommodate their needs, thereby increasing the competitiveness of the parent company's international market. The higher the degree of R&D internationalization, the larger the number of MNEs with a richer reserve of tacit knowledge. Hence the innovation performance of the parent company will improve. Second, MNEs can expand the scope of resource acquisition by diversifying their R&D internationalization. The establishment of overseas subsidiaries in developed countries with different market advantages allows for parent companies to access scarce complementary resources. In addition, the establishment of overseas R&D centers in various countries facilitates the construction of a global R&D network (Hitt et al., 1997), which can reduce the cost of developing new technology. Third, EMNEs encounter legality issues in overseas markets. The liability of foreignness inhibits overseas subsidiaries' ability to obtain certain resources and prompts them to seek legal channels. This increases the adaptability of overseas subsidiaries to the complex environment of their host countries and allows for them to develop new technology that satisfies the needs of the market (Chen et al., 2012). Thus, the following hypothesis is proposed:

Hypothesis 3. R&D internationalization positively affects EMNEs' innovation performance.

Moderating effect of migrant networks

In social network theory, migrant networks are considered a relational asset that can be embedded in an ethnic network. The migrant population contributes to the flow of FDI. As a crucial aspect of population dynamics, migration can provide firms with unique channels of knowledge, thereby influencing their selection of locations and survival (Hernandez, 2014). As the scale of global population migration widens, scholars have increasingly examined the relationship between migrant networks and international investment. Herander & Saavedra (2005) survey the export value of 51 states in the United States and the results indicate that migrant networks increase a country's trade export volume and play a considerable role in areas with imperfect systems. Similarly, Kugler & Rapoport (2007) report that migrant networks promote FDI. Therefore, EMNEs' ability to utilize social networks is critical to their growth and success in the global market. Social network relationships help companies build trust with their host countries during the process of internationalization, which enhances their exploratory capabilities and market performance (Lew et al., 2013). Social network relationships also provide companies with unique advantages that accelerate international expansion. Furthermore, these relationships can increase the survival rate of overseas subsidiaries. Yi et al. (2022) indicate that migration networks effectively promote the survival of the overseas subsidiaries owned by EMNEs. Evidence has confirmed the positive effect of migrant networks in the field of international business. However, few studies have examined the heterogeneous characteristics of migrant networks. To fill this research gap, we use Chinese migrants as the study sample and group them based on educational background. We explore the moderating role of migrant networks comprising migrants with various educational backgrounds in the relationship between business environment distance and R&D internationalization.

Hypothesis 2 states that business environment distance positively affects R&D internationalization. As latecomers to the global market, MNEs in China do not have the advantages of branding or technology. In this context, parent companies are motivated to increase investment in human capital and R&D to leverage the springboard with regard to the technological gap between home and host countries and maximize the digestion and utilization of the knowledge and technology shared by overseas subsidiaries through R&D internationalization. Host countries can have a rich network of highly skilled migrants, and such countries offer greater potential as a technological springboard. Highly educated migrants provide MNEs with a basis for product innovation and technological development. The flow of cultural knowledge from migrant networks can increase the availability of advanced products and technology for EMNEs (Saxenian, 2002). Parent companies reinforce investment in R&D internationalization to maximize the digestion and absorption of overseas subsidiaries' technology and knowledge. In countries with networks of highly skilled migrants, the proportion of highly skilled migrants in the senior management team of overseas subsidiaries maybe increase. Executives with experience overseas are more adaptable to local culture and management models, which enhances the role of the business environment in promoting R&D internationalization. Moreover, networks of highly skilled migrants constitute high-quality social relationship capital. Such networks facilitate overseas subsidiaries' attainment of legitimacy in the host country. Regardless of the reserves and quality of knowledge in migrant networks, these networks are conducive to improving EMNEs' R&D internationalization. Therefore, the following hypotheses are proposed:

Hypothesis 4. Migrant networks strengthen the relationship between the business environment distance and R&D internationalization of EMNEs.

Hypothesis 5. Networks of highly skilled migrants have a greater moderating effect on the relationship between the business environment distance and R&D internationalization of EMNEs.

We combine the springboard theory, institutional theory, and the knowledge-based theory of firms to construct a theoretical model of the relationship between the business environment distance and innovation performance of EMNEs. We also discuss the moderating role of the heterogeneous characteristics of migrant networks in this relationship. Fig. 1 displays the analytical framework.

Measurement models and data

Sample selection and data collection

Our study is set in the context of emerging economies. Developed and emerging economies vary greatly in terms of business environment, which can influence firms' strategy selection when investing in foreign markets. As latecomers to the global market, EMNEs are subject to special constraints because of resource limitations. Therefore, firm heterogeneity (e.g., in international experience) and country heterogeneity (e.g., in migrant networks) may play crucial roles in the internationalization of firms, especially in emerging economies.

We investigate China for several reasons. First, according to the *World Investment Report 2018* issued by the United Nations Conference on Trade and Development, China is the largest source of OFDI among emerging economies, making it an ideal setting in terms of market size and growth rate (Luo et al., 2010). Second, similar to other emerging economies, China's economy has not yet fully established a standard corporate governance framework, making it an ideal setting to investigate the impact of business environment distance and R&D internationalization on OFDI. The Chinese government started to implement a managed floating exchange rate system in 2005, which increased the exchange rate of the RMB. The increase in the RMB exchange rate has driven the scale of OFDI in Chinese enterprises, and the flow value of China's OFDI has continued to increase since 2005. In addition, the COVID-19 virus began to spread globally in 2019, which caused a shock to the global financial market. To reduce the selection bias of the sample, we select the sample period from 2005 to 2018.

Given the availability and objectivity of data on the internationalization of enterprises, we select data on the OFDI (2005–2018) of Chinese companies on the Shenzhen and Shanghai stock exchanges in developed OECD countries. The sample is determined as follows: (1) Special Treatment firms are excluded, (2) Firms that do not disclose their data or only partially disclose their data are excluded, (3) Firms in the finance industry are excluded, and (4) Firms in tax haven host countries, such as Bermuda, the British Virgin Islands, and the Marshall Islands are excluded.

The research sample comprises a panel of data on 1143 listed companies, 2538 foreign subsidiaries, and 32 host countries. A total of 4244 observations are obtained. The data are sourced from the China Securities Regulatory Commission (CSRC) and the China Stock Market and Accounting Research Database. We winsorize the data of the continuous variables at the 1st and 99th percentiles to prevent extreme values from affecting the results.

Variable design and definitions

Dependent variable

In this context, innovation performance refers to that of MNEs engaging in OFDI. The literature focuses on the impact of OFDI on the innovation performance of the home country at the macro-level. However, this study mainly investigates the impact of OFDI on the parent company's innovation performance on the micro-level. The Chinese MNEs' innovation performance is evaluated in terms of their total number of valid inventions, utility models, and design patents each year (Wu & Park, 2019).

Independent variable

The Doing Business reports published by the World Bank from 2005 to 2018 record changes in laws and regulations imposed on 12 business activities in 190 economies around the world. The scores and rankings correspond to the ease of doing business in each economy across 10 areas, namely starting a business, applying for construction permits, obtaining electricity, registering property, obtaining credit, protecting minority investors, paying taxes, trading across borders, enforcing contracts, and resolving insolvency. Regarding the method of Habib & Zurawicki (2002), the difference between the host and home countries' business environment convenience score is used as the business environment distance. The business environment distance between China and each host country is calculated on the basis of the Kogut–Singh distance index formula (Kogut & Singh, 1988), which is as follows:

$$dbdistance_j = \sum_{m=1}^{7} \left[(CD_{mj} - D_m)^2 / S_m \right] / 10$$

where $dbdistance_j$ represents the business environment distance between host country J and China, CD_{mj} is the value of the M dimension of the host country's business environment distance, D_m

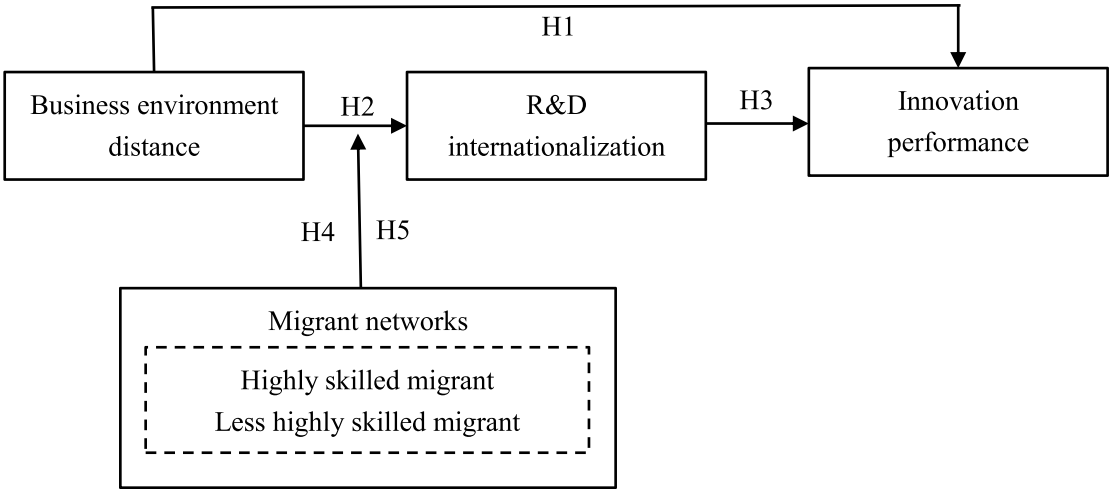

Fig. 1. Research framework.

represents the value of the *M* dimension of China's business environment distance, and S_m represents the variance in the *M* dimension across business environments.

Mediator variable

According to the annual reports of the company, the sample is manually sorted with regard to the establishment of overseas R&D subsidiaries or R&D institutions. We divide R&D internationalization into two dimensions: intensity and diversity. With reference to Hsu et al. (2015), diversity is measured by the number of host countries in which an enterprise's overseas R&D subsidiaries are located on an annual scale. Intensity is measured by the number of R&D projects a firm invests in each year.

Moderator variable

Referring to Gao (2003), we use the proportion of the host country's migrant population to the host country's population to measure migrant networks, the moderator variable. The Database on Immigrants in OECD and non-OECD Countries (DIOC-E) contains information on 100 migration destinations and more than 200 migration source countries around the world. Migration-related information, including educational attainment, is available in this database. We divide the Chinese migrant networks into two groups to examine the heterogeneity in the migrants' educational backgrounds. The migrants are classified as highly skilled or less highly skilled depending on whether they had a university education.

Control variables

The control variables are as follows:

Corporate age (Age): Balasubramanian & Lee (2008) report that younger companies are more flexible and dedicated to innovative activities than are older companies. We measure the age of the enterprise by subtracting the observation year from the year of establishment and taking the logarithm of the result.

Company ownership (State): Wu & Park (2019) note that equity properties may influence firms' innovation activities. We classify MNEs as state-owned enterprises and non-state-owned enterprises (i.e., private enterprises and foreign-funded enterprises). We employ dummy variables by assigning state-owned and non-state-owned enterprises values of 1 and 0, respectively (Ramasamy et al., 2012).

Per capita management cost (Percost): Observes that a company's management cost affects organizational change, which in turn affects its innovation activities. We measure the per capita management cost by determining the ratio of the annual management cost to the number of employees and taking the logarithm of the result.

Corporate financing capacity (Finance): Ozkan (2002) suggests that corporate R&D activities are constrained by financial pressure. We measure this variable by obtaining the ratio of total tangible assets to the total assets held.

Operational capability (Operation): The operational efficiency of an organization affects the flow of knowledge. We use the ratio of operating income to the ending balance of total assets to measure this variable.

Profitability (Profit): According to Jensen (1982), the higher the profit of a company, the more active the company may be in innovation. Profitability is measured using the ratio of net profit to operating income.

Ownership concentration (Concent): According to Li et al. (2010), the efficiency of enterprises' use of key resources for innovation is affected by ownership concentration. We use the Herfindahl index of the top five shareholders to measure this variable.

The economic development scale of the host country (Economic): This variable affects the speed of technology diffusion between countries and the process of technology transfer from overseas subsidiaries to the parent company. We use the logarithm of the host country's GDP to measure this variable.

The economic stability of the host country (Stability): A stable environment can help stimulate innovation potential. If a host country is economically stable, this indicates a more convenient information exchange and knowledge transfer mechanisms between overseas subsidiaries and parent companies. This variable is measured through the inflation rate based on the consumer price index.

The degree of trade openness of the host country (Open): According to the literature—for example, Long et al. (2011)—the degree of trade freedom of the host country reflects the transaction costs borne by foreign enterprises in that country. These costs affect the innovation input of the enterprise. This ratio is measured using the ratio of total imports and exports to the GDP.

Table 1 lists the variables and data sources.

Empirical analysis

Measurement method

We analyze the data by first using the panel model. POLS, FE, and RE constitute the three main methods of estimation in the panel model. Next, we test and compare the three models and select the fixed effects model for analysis.

Table 1
Variables and data sources.

Type of variable	Variable	Label	Source
Dependent Variable	Innovation performance	Innovation	CSMAR database
Independent Variable	Business environment distance	Dbdistance	World Bank Database
Mediator variable	R&D internationalization intensity R&D internationalization diversity	R&D internationalization	Annual reports of enterprises listed on the Shanghai and Shenzhen Stock Exchanges
Moderator Variable	Migrant networks	Migrant	United Nations Population Division
Control Variables	Corporate age	Age	CSMAR database
	Company ownership	State	CSMAR database
	Per capita management cost	Percost	CSMAR database
	Corporate financing capacity	Finance	CSMAR database
	The operational capability of an organization	Operation	CSMAR database
	Profitability	Profit	CSMAR database
	Ownership concentration	Concent	CSMAR database
	The economic development scale of the host country	Economic	World Bank Database
	The economic stability of the host country	Stability	World Bank Database
	The degree of trade openness of the host country	Open	World Bank Database

Measurement model

The three following models are used to examine the effect of business environment distance on innovation performance and the mediating effect of R&D internationalization:

Model 1:

$$Innovation_{it} = \alpha_0 + \beta_1 Dbdistance_{it} + \varphi(\xi) + \theta_i + \mu_t + \varepsilon_{it}$$

Model 2:

$$R\&D\ Internationalization_{it} = \alpha_0 + \gamma_1 Dbdistance_{it} + \varphi(\xi) + \theta_i + \mu_t + \varepsilon_{it}$$

Model 3:

$$Innovation_{it} = \alpha_0 + \beta_1 Dbdistance_{it} + \beta_2 R\&D\ Internationalization_{it} + \varphi(\xi) + \theta_i + \mu_t + \varepsilon_{it}$$

where i denotes the ith MNE, t denotes the year, α_0 is a constant, β and γ denote the coefficient of an explanatory variable, θ_i denotes the industry fixed effects, μ_t denotes the year fixed effects, ε_{it} is a stochastic disturbance term, and $\varphi(\xi)$ denotes the function of all control variables. The model testing procedures are as follows.

The dependent variable of model 1 is innovation performance. We test the β_1 of the business environment distance coefficient in model 1 to determine the total effect of business environment distance on innovation performance. If coefficient β_1 is significant, we proceed to the next step.

The dependent variable of model 2 is R&D internationalization. We test the γ_1 of the business environment distance coefficient in model 2 to determine the impact of business environment distance on R&D internationalization.

The dependent variable of model 3 is innovation performance. We test the β_1 of the business environment distance coefficient and the β_2 of the R&D internationalization coefficient in model 3. If coefficients γ_1 and β_2 are significant, the mediating effect is significant.

We use model 4 to test the moderating effect of migrant networks on the relationship between business environment distance and R&D internationalization:

Model 4:

$$R\&D\ inernationalization_{it} = \alpha_0 + \gamma_1 Dbdistance_{it} + \beta_3 Migrant_{it} + \beta_4 Dbdistance_{it} * Migrant_{it} + \varphi(\xi) + \theta_i + \mu_t + \varepsilon_{it}$$

where i denotes the ith MNE, t denotes the year, α_0 is a constant, γ_1 denotes the coefficient of an explanatory variable, β_3 denotes the coefficient of migrant networks, β_4 denotes the interaction coefficient of business environment distance and migrant networks, θ_i denotes the industry fixed effects, μ_t denotes the year fixed effects, ε_{it} is a stochastic disturbance term, and $\varphi(\xi)$ denotes the function of all control variables.

Empirical results

Descriptive statistics

Table 2 displays the descriptive statistics of all variables. These statistics are based on the annual data of 1143 firms for 14 years (2005–2018), making a total of 4244 observations. The minimum value of innovation is 0, and the maximum value is 6.898. This suggests differences in the scale of enterprises and industries cause the degree of technological innovation to differ across parent companies. The mean, minimum, and maximum values of business environment distance are 1.991, 0.792, and 3.723, respectively. China constantly improves the business environment; however, a gap remains between China and developed countries at this stage. Regarding R&D internationalization, the statistical difference between intensity and diversity is small. The empirical results for the two dimensions of intensity and diversity play a role in the robustness test to a certain extent. Furthermore, the mean value of migrant networks is 0.013, which may indicate that the differentiated migrant network environment provides a data basis.

Table 2
Descriptive statistics.

Variables	Obs	Mean	SD	Min	Max
Innovation	4244	2.312	1.844	0.000	6.898
Dbdistance	4244	1.991	0.631	0.792	3.723
R&D internationalization intensity	4244	0.255	0.451	0.000	2.639
R&D internationalization diversity	4244	0.235	0.403	0.000	2.485
Migrant	4244	0.013	0.011	0.000	0.056
Age	4244	2.666	0.444	0.000	3.932
State	4244	0.311	0.463	0.000	1.000
Percost	4244	11.290	0.728	9.548	13.354
Finance	4244	0.916	0.096	0.510	1.000
Operation	4244	0.648	0.404	0.106	2.384
Profit	4244	0.067	0.162	−0.941	0.433
Concent	4244	0.163	0.119	0.013	0.562
Economic	4244	1.349	1.445	−8.513	23.986
Stability	4244	1.597	0.961	−0.500	3.856
Open	4244	0.431	0.307	0.184	1.567

Mediating effect of R&D internationalization

Table 3 presents the results of the panel data analysis of our regression model. To verify hypothesis 1, we add the variable of business environment distance (Dbdistance) to our regression model to test its effect on firm innovation performance. Regarding the model 1 results, the coefficient of the linear term of Dbdistance of 0.125 is significant at the 1% level. This demonstrates that the greater the business environment distance, the better the MNEs' innovation performance. This indicates that a differentiated business environment provides Chinese MNEs with the opportunity to leverage overseas strategic assets to achieve substantial development in innovation capabilities. The comprehensive business environment of the host country provides the soil necessary for the growth of technological innovation. This result shows that business environment distance can not only promote OFDI at the national level, but also help to improve the innovation performance of MNEs (Qian et al., 2022). Thus, hypothesis 1 is validated. The business environment distance coefficient in model 2 of 0.132 is significant at the 1% level, supporting the premise that a differentiated business environment can facilitate R&D internationalization. Thus, hypothesis 2 is validated. The R&D internationalization coefficient in Model 3 is −0.025, which is not significant. According to simulation studies, however, in some cases, the product of the coefficients may be significant but not subjected to stepwise regression testing. This demonstrates that the power of the stepwise regression test on the mediation effect is not as considerable as that of the coefficient product test (Mackinnon et al., 2002). When the mediating effect cannot be tested by stepwise regression, the Sobel method is generally employed instead Sobel (1982). The coefficient of R&D internationalization intensity of 0.624 is significant at the 1% level; the higher the R&D internationalization intensity, the better the company's innovation performance. Overseas subsidiaries will have more access to imitating high-quality products and have the opportunity to collaborate with more technologically advanced partners (Hurtado-Torres et al., 2018). Thus, hypothesis 3 is supported. Regarding the Sobel test results, the indirect effect is 0.111, the direct effect is 0.345, and the total effect is 0.456. Therefore, the mediating effect accounts for 0.111/0.456×100% = 24.34% of the total effect. Panel B of Table 3 indicates

Table 3
Regression results.

Panel A: Mediating effect of R&D internationalization intensity				
Variable	Model 1	Model 2	Model 3	Sobel Test
Dbdistance	0.125***	0.132***	0.129***	0.345***
	(2.95)	(9.21)	(2.99)	(6.86)
R&D intensity			−0.025	0.624***
			(−0.47)	(10.16)
Age	0.474***	0.061	0.476***	−0.227***
	(2.71)	(1.03)	(2.72)	(−2.91)
State	−0.042	−0.056	−0.043	0.066
	(−0.31)	(−1.24)	(−0.32)	(0.99)
Percost	−0.149***	0.024*	−0.148***	−0.244***
	(−3.51)	(1.68)	(−3.50)	(−6.01)
Finance	0.393	−0.140	0.389	1.939***
	(1.48)	(−1.57)	(1.46)	(6.38)
Operation	0.211***	−0.059**	0.209**	0.402***
	(2.59)	(−2.18)	(2.57)	(5.50)
Profit	0.457***	−0.015	0.457***	0.664***
	(4.53)	(−0.44)	(4.52)	(3.92)
Concent	−0.587	0.330**	−0.579	0.705***
	(−1.51)	(2.53)	(−1.49)	(2.82)
Economic	−0.018	−0.005	−0.019	−0.031
	(−1.36)	(−1.10)	(−1.37)	(−1.22)
Stability	−0.035	−0.011	−0.035	−0.030
	(−1.46)	(−1.33)	(−1.47)	(−0.70)
Open	−0.053	0.078***	−0.051	0.434***
	(−0.79)	(3.42)	(−0.76)	(4.77)
Constant	2.276***	−0.341	2.267***	1.350**
	(2.93)	(−1.30)	(2.92)	(2.10)
Year	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
R-square	0.055	0.052	0.055	0.091
Indirect effect				0.111
Direct effect				0.345
Total effect				0.456
Observations	4244	4244	4244	4244
Panel B: Mediating effect of R&D internationalization diversity				
Variable	**Model 1**	**Model 2**	**Model 3**	**Sobel Test**
Dbdistance	0.125***	0.120***	0.123***	0.334***
	(2.95)	(9.25)	(2.86)	(6.66)
R&D diversity			0.017	0.779***
			(0.29)	(11.33)
Age	0.474***	0.044	0.473***	−0.223***
	(2.71)	(0.83)	(2.71)	(−2.86)
State	−0.042	−0.078*	−0.041	0.063
	(−0.31)	(−1.92)	(−0.30)	(0.95)
Percost	−0.149***	0.013	−0.149***	−0.243***
	(−3.51)	(1.05)	(−3.52)	(−6.01)
Finance	0.393	−0.066	0.394	1.919***
	(1.48)	(−0.82)	(1.48)	(6.34)
Operation	0.211***	−0.059**	0.212***	0.396***
	(2.59)	(−2.39)	(2.60)	(5.44)
Profit	0.457***	0.001	0.457***	0.649***
	(4.53)	(0.02)	(4.53)	(3.84)
Concent	−0.587	0.381***	−0.594	0.728***
	(−1.51)	(3.23)	(−1.53)	(2.92)
Economic	−0.018	−0.005	−0.018	−0.029
	(−1.36)	(−1.31)	(−1.35)	(−1.14)
Stability	−0.035	−0.015**	−0.035	−0.021
	(−1.46)	(−2.09)	(−1.45)	(−0.49)
Open	−0.053	0.061***	−0.054	0.434***
	(−0.79)	(2.99)	(−0.80)	(4.78)
Constant	2.276***	−0.221	2.279***	1.313**
	(2.93)	(−0.94)	(2.93)	(2.05)
Year	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
R-square	0.055	0.056	0.055	0.096
Indirect effect				0.122
Direct effect				0.334
Total effect				0.456
Observations	4244	4244	4244	4244

Notes: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$; T value are in parentheses.

that the mediation effect is 0.122, the direct effect is 0.334, and the total effect is 0.456. The mediating effect accounts for 0.122/0.456×100% = 26.75% of the total effect. This is consistent with the result of 24.34% presented in Panel A. Overall, the results indicate that R&D internationalization plays an mediating role in the relationship between business environment distance and innovation performance.

Moderating effect of migrant networks

Table 4 presents the analysis results of the moderating effect of the migrant networks. Regarding the model 4 results, 0.062, the coefficient of the interaction term (Migrant×Dbdistance) formed by multiplying the business environment distance by migrant networks, is significant at the 0.01 level. This result suggests that migrant networks strengthen the relationship between business environment distance and the R&D internationalization of EMNEs. Thus, hypothesis 4 is supported. We also examine the differences in the moderating effects of educational background. Regarding the model 5 results, 0.203, the interaction term formed by multiplying the business environment distance by the networks of highly skilled migrants (Skillmigrant×Dbdistance), is significant at the 1% level. As for the model 6 results, 0.056, the interaction term formed by multiplying the business environment distance by the networks of less highly skilled migrants (Nonskillmigrant×Dbdistance), is significant at the 1% level. Overall, the results indicate that networks of highly skilled migrants exert a greater strengthening effect on the relationship between business environment distance and R&D internationalization. Thus, hypothesis 5 is supported. Our conclusions complement the study by Yi et al. (2022), which shows that high-skilled migrant networks can enhance the springboard effect of EMNEs.

Robustness test

Following the methods of Chen et al. (2012) and Bellemare et al. (2017), we use the corporate income tax rate of the host country in 2000 (taxrate2000) and the lagged term of business environment distance as the instrumental variables of business environment distance to perform a two-stage least squares regression. The taxation indicator is one of the 10 dimensions of the business environment. Thus, the corporate income tax rate in 2000 also reflects the business environment in 2000. The early business environment of the host country must be related to the current business environment. This is consistent with the principle of relevance for selecting instrumental variables. We also conduct a correlation test on the business environment distance between the current period and the lagged item. The results demonstrate that the correlation principle for instrumental variable selection is suitable. The instrumental variables must not be related to the disturbance terms of the explained variables. After 2000, Chinese enterprises entered an accelerated phase of overseas investment. The corporate income tax rate of the host country in 2000 does not affect the innovation performance of MNEs at this stage. The disturbance term of the business environment distance from the current period is unlikely to affect the observation value of the previous period. Therefore, these two variables satisfy the requirements of the exogenous principle. In summary, the host country's corporate income tax rate in 2000 and the lagged term of the business environment are ideal instrumental variables. Table 5 shows the regression results of the robustness test. The coefficient of T1dbdistance is 0.865, and it is significant at the 1% level, which indicates that the instrumental variable is correlated with Dbdistance. The coefficient of Dbdistance in the second column of Table 5 is 0.222, which is significant at the 1% level. The above results verify the robustness of the research conclusions.

Conclusions and practical implications

The examination of the challenges associated with the business environment distance and management of R&D internationalization

Table 4
Regression results.

Panel A: Dependent variable is R&D internationalization intensity Variable	Model 2	Model 4	Model 5	Model 6
Dbdistance	0.132***	0.093***	0.107***	0.092***
	(9.21)	(5.90)	(6.98)	(5.83)
Migrant		−0.130***		
		(−2.99)		
Migrant*Dbdistance		0.062***		
		(4.74)		
Skillmigrant			−0.468***	
			(−4.97)	
Skillmigrant*Dbdistance			0.203***	
			(4.67)	
Nonskillmigrant				−0.083
				(−1.16)
Nonskillmigrant*Dbdistance				0.056***
				(2.72)
Age	0.061	0.060	0.054	0.061
	(1.03)	(1.03)	(0.92)	(1.04)
State	−0.056	−0.064	−0.055	−0.066
	(−1.24)	(−1.42)	(−1.22)	(−1.47)
Percost	0.024*	0.025*	0.023	0.026*
	(1.68)	(1.75)	(1.63)	(1.80)
Finance	−0.140	−0.098	−0.119	−0.096
	(−1.57)	(−1.09)	(−1.33)	(−1.08)
Operation	−0.059**	−0.066**	−0.058**	−0.069**
	(−2.18)	(−2.42)	(−2.11)	(−2.54)
Profit	−0.015	−0.010	−0.013	−0.011
	(−0.44)	(−0.31)	(−0.39)	(−0.33)
Concent	(−1.57)	(−1.09)	(−1.33)	(−1.08)
	−0.059**	−0.066**	−0.058**	−0.069**
Economic	(−2.18)	(−2.42)	(−2.11)	(−2.54)
	(−2.18)	(−2.42)	(−2.11)	(−2.54)
Stability	−0.015	−0.010	−0.013	−0.011
	(−0.44)	(−0.31)	(−0.39)	(−0.33)
Open	0.330**	0.316**	0.318**	0.317**
	(2.53)	(2.43)	(2.44)	(2.44)
Constant	−0.341	−0.276	−0.233	−0.315
	(−1.30)	(−1.06)	(−0.89)	(−1.21)
Year	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
R-square	0.052	0.063	0.060	0.063
Observations	4244	4244	4244	4244
Panel B: Dependent variable is R&D internationalization diversity				
Variable	**Model 2**	**Model 4**	**Model 5**	**Model 6**
Dbdistance	0.132***	0.084***	0.095***	0.083***
	(9.21)	(5.88)	(6.89)	(5.81)
Migrant		−0.099**		
		(−2.51)		
Migrant*Dbdistance		0.052***		
		(4.39)		
Skillmigrant			−0.420***	
			(−4.94)	
Skillmigrant*Dbdistance			0.196***	
			(5.00)	
Nonskillmigrant				−0.041
				(−0.63)
Nonskillmigrant*Dbdistance				0.042**
				(2.25)
Age	0.061	0.043	0.037	0.043
	(1.03)	(0.82)	(0.70)	(0.81)
State	−0.056	−0.086**	−0.077*	−0.088**
	(−1.24)	(−2.11)	(−1.89)	(−2.15)
Percost	0.024*	0.015	0.013	0.015
	(1.68)	(1.13)	(1.01)	(1.18)
Finance	−0.140	−0.027	−0.046	−0.026
	(−1.57)	(−0.34)	(−0.57)	(−0.33)
Operation	−0.059**	−0.066***	−0.059**	−0.069***
	(−2.18)	(−2.68)	(−2.38)	(−2.78)
Profit	−0.015	0.004	0.002	0.003
	(−0.44)	(0.14)	(0.07)	(0.11)
Concent	(−1.57)	0.369***	0.372***	0.370***
	−0.059**	(3.15)	(3.16)	(3.15)
Economic	(−2.18)	−0.005	−0.004	−0.005
	(−2.18)	(−1.29)	(−0.98)	(−1.31)
Stability	−0.015	−0.015**	−0.015**	−0.015**
Open	0.330**	0.053**	0.053**	0.055***
	(2.53)	(2.55)	(2.55)	(2.69)
Constant	−0.341	−0.173	−0.128	−0.206
	(−1.30)	(−0.73)	(−0.54)	(−0.87)
Year	Yes	Yes	Yes	Yes
Firm	Yes	Yes	Yes	Yes
R-square	0.052	0.066	0.064	0.066
Observations	4244	4244	4244	4244

Notes: *$p < 0.1$; **$p < 0.05$; ***$p < 0.01$; T value are in parentheses.

of MNEs constitutes a critical area of the literature on headquarters −subsidiary relationships (Kostova et al., 2016). This study represents one of the first investigations of the business environment distance between emerging and developed economies, specifically the overseas subsidiaries of Chinese MNEs. By combining institutional theory and the springboard theory, this study uses Chinese MNEs as an example to investigate the mechanism by which business environment distance influences the innovation performance of EMNEs. We also discuss the moderating role of migrants' educational background in the relationship between business environment distance and R&D internationalization, which has certain policy implications for improving EMNEs' innovation performance. Innovation performance significantly improves when enterprises invest in developed countries with business environments superior to those of their home country. Diverse business environments provide potential opportunities for companies to considerably improve their innovation capabilities. Therefore, enterprises can leverage the differences in the business environment to increase their innovation efficiency. Business environment distance improves the company's R&D internationalization capabilities, facilitating the absorption and integration of new technology and knowledge. In addition, migrant networks enhance the business environment distance, which promotes the parent company's R&D internationalization capabilities. Compared with less highly skilled migrants, highly skilled migrants exert a greater strengthening effect on the relationship between business environment distance and R&D internationalization. Host countries' expansive network of highly skilled migrants enhances the parent company's ability to discover the advantages and opportunities of the business environment. Therefore, the parent company has more motivation to increase international R&D investment to absorb new foreign technology. Our findings support the premise that R&D internationalization has both advantages and disadvantages that determine innovation performance (Chen et al., 2012). For EMNEs, domestic institutions cannot provide efficient or sufficient support for innovation (Peng, 2003). Therefore, establishing overseas R&D subsidiaries in countries with a favorable business environment is a solution for companies in emerging economies seeking to enhance their innovation capabilities (Peng et al., 2008).

This study makes four main contributions to the literature on international business. First, present studies mostly focus on OFDI decision-making (Li & Zhang, 2014), location selection (Luo & Rui, 2009), and entry modes. However, we emphasize the reverse technological innovation effect of OFDI on the parent company and identify factors influencing OFDI. Second, studies indicate that acquiring technology-based strategic assets through the establishment of overseas subsidiaries motivates Chinese MNEs to engage in OFDI. However, few studies address the transmission mechanism and influencing factors of the technological reverse spillover effect of overseas subsidiaries. We use the mediating perspective of R&D internationalization to discuss the internal mechanism by which the innovation performance of Chinese MNEs is influenced. The study results may be

Table 5
Robustness results.

Variable	IV-Ⅰ	IV-Ⅱ
Dbdistance		0.222***
		(2.94)
T1dbdistance	0.865***	
	(96.30)	
Age	−0.007	0.461***
	(−0.48)	(2.63)
State	−0.022*	−0.041
	(−1.74)	(−0.30)
Percost	0.010	−0.152***
	(1.37)	(−3.56)
Finance	−0.231***	0.507*
	(−4.31)	(1.86)
Operation	0.006	0.217***
	(0.42)	(2.67)
Profit	0.027	0.456***
	(0.96)	(4.51)
Concent	0.099**	−0.597
	(2.07)	(−1.54)
Economic	0.002	−0.019
	(0.43)	(−1.38)
Stability	−0.011	−0.032
	(−1.53)	(−1.31)
Open	0.098***	−0.072
	(6.06)	(−1.05)
Constant	−0.308***	2.174***
	(−2.67)	(2.78)
Year	Yes	Yes
Firm	Yes	Yes
R-square	0.558	0.050
Observations	4244	4244

Notes: $^{*}p < 0.1$; $^{**}p < 0.05$; $^{***}p < 0.01$; T value are in parentheses.

related to the potential of cooperation to reinforce a firm's capabilities in identifying, sharing, distributing, and coordinating international knowledge flows (Tortoriello et al., 2011). Third, the growing influence of the business environment on international investment is an integral external support for MNEs' strategic selection and performance improvement that cannot be overlooked (Ward et al., 1995). Existing studies examine the performance of MNEs from a single-country perspective: the host country's business environment or the home country's business environment. Although some scholars consider the critical influence of institutional distance and cultural distance on the innovation performance of MNEs, these factors indirectly affect the development of enterprises. However, business environment distance not only comprehensively reflects the factors of institutional, economic, and cultural distance but is also directly related to the life cycle of an enterprise. Therefore, the business environment directly affects corporate innovation performance. This study supplements the literature on the relationship between business environment distance and MNEs' innovation performance. Fourth, the heterogeneous characteristics of migrants are ignored in present literature (Li et al., 2019). We discuss the moderating role of migrant networks and their educational background in the relationship between business environment distance and R&D internationalization. We classify migrants as highly skilled and less highly skilled and analyze the influence of migrant networks on EMNEs' OFDI in the literature on emerging market countries. Thus, our findings provide theoretical and practical value.

This research entails crucial practical implications for EMNEs and policymakers in emerging markets. Enterprises' potential opportunities to absorb new technological resources increase when the business environment of the host country is more favorable than that of the home country. Therefore, EMNEs should consider the overseas investment environment and leverage different business environments to increase their innovative potential. Latecomer Chinese MNEs should construct overseas R&D networks and encourage R&D personnel to communicate through overseas R&D networks. The government of emerging economies should provide enterprises with financial support and tax incentives. Overseas migrant networks constitute an essential bridge for communication and cooperation between the home and host countries. MNEs should enhance their ability to obtain high-quality external resources by leveraging high-quality resources within networks of highly skilled migrants. Therefore, countries with emerging markets should build investment relationship networks with host countries through overseas migrant networks to increase the efficiency of knowledge and technology flows. Emerging economies have made great achievements, but high-skilled human resources remain one of the key issues for EMNEs. Therefore, practitioners and investors should pay attention to how to recruit management talents with rich professional knowledge and practical experience. Overseas background is a specific manifestation of human capital. Overseas study and work experience in developed countries can enable senior executives to accumulate excellent management experience, broad international vision and international social network. Then, executive teams should make full use of migrants living overseas to reduce the risks in the process of R&D internationalization. More importantly, investors should follow the cost-benefit principle to fully assess the risks and opportunities brought about by the business environment distance to avoid falling into the dilemma of investment failure.

Our study has several limitations. First, because we focus on the technological innovation of Chinese enterprises, the sample data are on the investments of enterprises in developed countries that have superior business environments to that of China. In the future, future research can compare the differences in the impact of business environment distance between developed and developing countries on the innovation capability of the parent company. Second, we consider the comprehensive indicators of business environment distance but do not classify the indicators of subdimensions of the business environment. The heterogeneity of various indicators can be further analyzed in subsequent investigations. Third, we select the sample data of Chinese listed companies from 2005 to 2018, future studies can further update the data and discuss the impact of the COVID-19 virus on EMNEs.

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