

# Review and Prospect of the Research on Overseas R&D Investment of MNEs and Subsidiary Performance

Ying Zhu<sup>1</sup> & QiQi Xu<sup>1</sup>

<sup>1</sup> Glorious Sun School of Business and Management, Donghua University, Shanghai, China

Correspondence: Ying Zhu, Glorious Sun School of Business and Management, Donghua University, Shanghai, China. E-mail: zhuying0906@foxmail.com

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## Abstract

In recent years, as globalized R&D activities have been launched on a large scale, more and more scholars have started to study overseas investment activities, but most of the research perspectives only focus on overseas investment entry methods, investment motives, and less on the study of reverse technology spillover of overseas R&D investment and the relationship with parent company innovation performance. Unlike overseas investment, overseas R&D investment is based on the knowledge base view, which considers knowledge as an important resource for enterprises, and tacit knowledge that is not easily understood and difficult to be expressed plays a key role in creating competitive advantage for enterprises. The dissemination of tacit knowledge is based on face-to-face interactions between individuals or organizations, and overseas R&D allows R&D activities to be geographically close to overseas markets and host country environments, thus enabling the transfer of home country knowledge and the acquisition of local knowledge. This study focuses on the motivation of overseas R&D investment, reverse technology spillover and relationship with parent company performance, and discusses future research directions.

**Keywords:** overseas R&D investment, R&D motivation, reverse technology spillover, subsidiary performance

## 1. Introduction

In an open economy era, multinational enterprises can participate in global production and distribution networks in different forms. Innovation is no longer limited to the country where the MNEs are located, but is integrated into the global knowledge network, and the limitations of innovation research under the previous closed framework gradually come to the fore. In a globalized and open economic environment, the innovation growth of multinational enterprises needs to rely on global innovation resources and integrate outward and inward internationalization. However, research results on the reverse spillover effect of internationalization have mainly focused on the national or regional level, with less research on the innovation growth mechanism of Chinese multinational enterprises gaining competitive advantages in the context of globalization, and no reverse spillover proposition has been placed in the discussion of fostering the internationalization performance of multinational enterprises, especially the lack of systematic research on the relationship between overseas R&D investment and parent company innovation performance integrating internal and external resources and institutional factors. The cultivation of multinational enterprises' internationalization performance, especially the lack of systematic research on the relationship between overseas R&D investment and parent company's innovation performance integrating internal and external resources and institutional factors.

With the development of global R&D activities, more and more scholars have started to study the overseas R&D investment activities of enterprises, but the research perspectives are mostly focused on the entry mode, investment motives, and location selection of overseas R&D investment. And there are few studies on the relationship between firms' overseas R&D activities and their parent companies' innovation performance, and even fewer studies on the influencing factors between the two. Therefore, this paper will take overseas R&D as the basic theoretical support to analyze the external knowledge creation and acquisition process of enterprises in overseas R&D, as well as the influence of some mediating influences on the innovation effect of parent companies. This study aims to review the literature on overseas R&D and the performance of overseas subsidiaries, with the aim of exploring future research hotspots and directions.

## 2. Studies on Overseas R&D Motivation

Why companies conduct overseas R&D is an issue that has received ample attention in the academic field. There is a wealth of academic research in the field of overseas R&D of developed country enterprises, and different scholars have come up with different research conclusions based on different research backgrounds.

Scholars have studied overseas R&D of MNEs earlier, and in the 1970s, Ronstadt's "Overseas R&D of U.S. MNEs" opened the research on overseas R&D. By the 1990s, research in this area had become a hot topic and had a wealth of research results. In the process of research on overseas R&D, many scholars have gradually formed two views, namely resource utilization and resource acquisition. The core idea of the resource utilization view is that multinational companies believe that it is more profitable to concentrate R&D activities in the home country, and the function of overseas R&D organizations is to use the parent company's R&D resources to help transfer knowledge locally. The resource acquisition view is that decentralized R&D is more likely to help the parent company acquire R&D resources, thus further enhancing the company's competitiveness (Cantwell & Narula, 2001; Fors & Zejan, 2012). Although the resource-using overseas R&D investment motive is consistent with the traditional theory of MNEs, it is unable to explain the increasing R&D investment behavior of developing countries to developed countries and regions.

Kogut and Zander (1992) also consider the resource-based view to conclude that firms undertake multinational R&D because they cannot obtain sustained resources from within the firm to sustain competitive advantage, and therefore in order to maintain this competitive advantage, firms must continuously draw knowledge from outside and exploit it. The "home-country-based development activities" proposed by Kuemmerle (1997) refer to the expansion of technological assets based on the technological advantages of the source company, with the main purpose of developing international markets by combining specific foreign local conditions. Dunning's (1996) international production trade-off theory states that multinational companies' outward technological investments are not triggered by internal dynamics, but rather by the pursuit of location advantages in the host country. Bas and Sierra (2004) found that the main factors driving MNEs' early overseas R&D are market and technology, and correspondingly adopt either market development or technology exploration R&D strategies. However, the R&D strategy will not remain unchanged, as the internationalization of MNEs' R&D continues, the technology gap between countries will become smaller and smaller, and MNEs will adjust their R&D strategies accordingly according to the changes of technological advantages in home and host countries. Hedge and Hicks (2008) argue that the fundamental determinant of MNEs' overseas R&D investment is the size of the overseas market, and emphasize the differences in the factors influencing overseas investment in different industries. Zadtwitz and Gassmann (2002) argue that most firms from developing countries lack two important resources relative to their developed counterparts: leading market position and technological innovation. This implies that the international R&D activities of most developed country firms are market-driven or technology-developing. Minin and Zhang (2010) argues that the motivation for overseas R&D is divided into market-driven and technology-initiated, as well as absorbing quality human resources from overseas and experiencing a shift from technology catch-up to overseas market development.

Based on the above scholars' studies, we find that the motives of overseas R&D of enterprises in developed countries are different from those of enterprises in emerging economies. The former's motives for overseas R&D are mainly technology application-oriented; while the latter's motives for overseas R&D are technology development-oriented and technology application-oriented, and are increasingly inclined to technology development-oriented.

## 3. Studies on Reverse Technology Spillover from Overseas R&D Investment

Dunning (1981) pointed out that the role of technician diffusion refers to the process that foreign enterprises first train their employees in technology and management, and then these employees work in local enterprises after completing their studies, thus transferring their cash technology and management experience to local enterprises. Zanfei (2000) divided the knowledge flow of MNEs into internal and external networks. Internal knowledge flow refers to the flow between R&D centers and various R&D institutions and between different functions, while external knowledge flow is the timely technology spillover and transfer induced by MNEs through R&D activities in host countries. Bruno and Pottelsberghe (2001) show that by conducting overseas R&D activities in developing countries to developed countries, the home country can gain advanced management experience and science and technology from the host country of investment, leading to technological progress in the home country. Pradhan and Singh (2009) used the Indian automobile industry as a research sample and find through empirical tests that there is a reverse technology spillover effect for overseas R&D activities in the automotive industry. Chen and Zulkifli (2012) used micro data of firms in emerging economies and the study proved that the

existence of reverse technology spillover effect of overseas R&D in developing countries and the positive effect of technological resources of host countries on reverse technology spillover effect of overseas R&D. On the other hand, Zhao, Liu, & Zhao (2010) used China as the research object and found that China was able to obtain positive reverse technology spillover through OFDI channel to enhance Based on data from 33 developing countries from 1980-2005. Herzer (2011) confirmed the existence of country differences in the reverse spillover effect of overseas R&D and finds that the reverse spillover effect of overseas R&D is negatively related to labor market regulation in the home country, while there is no significant association with human capital, financial development and trade openness in the home country. Chen, Jing, & Shapiro (2012) also concluded that there is a reverse technology spillover effect of overseas R&D to the home country. When studying the foreign direct investment in Bangladesh, the scholar hiau (2014) found that overseas R&D can not only promote the technological progress of the host country, but also help the home country investment enterprises expand the product range and improve the internal productivity. Riviezzo (2013) found that one of the most important reasons for developing countries to invest in developed countries is to enhance their innovation capacity by obtaining reverse knowledge spillovers from host countries. Seyoum, Wu, & Yang (2015) found that through overseas R & D investment in developing countries, multinational enterprises can access the advanced R & D resources of the host country, and then obtain positive technology spillover from the host country to the home country.

#### **4. Studies on the Relationship between Overseas R&D Investment and Parent Company Innovation Performance**

There is no unanimous conclusion on whether overseas R&D can contribute to a firm's innovation performance or not. There are roughly three views as follows: linear positive correlation, linear negative correlation, and curvilinear correlation. Some scholars believe that overseas R&D can significantly improve firms' innovation performance by absorbing, utilizing and integrating heterogeneous resources; therefore, the relationship between overseas R&D and firms' innovation performance is a linear positive correlation.

For example, Iwasa and Odagiri (2004), Loof (2009), Arvanitis and Hollenstein (2011) pointed out that overseas R&D has a significant positive impact on the innovation performance of the parent company. Arvanitis and Hollenstein (2011) studied 2817 Swiss multinational companies, and confirmed that different types of overseas R&D activities (knowledge seeking or market seeking) have positive effects on innovation performance in different ways. Zhong, Huang, & Liu(2014) take 400 high-tech enterprises in China as the research object, and divided the enterprise innovation into two dimensions: incremental innovation and disruptive innovation. Empirical research shows that overseas R&D of enterprises in emerging economies has a positive impact on both incremental innovation and disruptive innovation. However, some scholars' empirical research conclusions are just the opposite. They believe that with the deepening of overseas R&D, a series of costs such as coordination and communication will offset or even exceed the innovation performance brought by heterogeneous resource integration. Therefore, the relationship between overseas R&D and enterprise innovation performance is a linear negative correlation. Argyres and Silverman (2004), Faccio (2006) found that overseas R&D activities have a negative effect on innovation performance. Singh (2008) studied 1127 enterprises, and confirmed that the geographical dispersion of R&D activities has a negative impact on the innovation performance of enterprises. Stan and Peng (2010) also found that there is an inverted U-shaped relationship between overseas R&D and enterprise innovation performance. Before the critical value of overseas R&D diversity reaches 0.38, although the marginal effect of overseas R&D decreases, it has a positive effect on innovation performance. After 0.38, because the increasing cost exceeds the benefits of overseas R&D, the two gradually show a negative correlation. Chen, Jing, and Shapiro (2012) based on the organizational learning theory, took 210 Taiwan IT enterprises as the research object, and the results showed that the relationship between overseas R&D and innovation performance of enterprises was a S-shaped curve. Hsu, Lien, and Chen (2015) took 202 high-tech enterprises in Taiwan as the research object, and verified that the relationship between overseas R&D intensity and diversity and innovation performance of enterprises was a U-shaped curve. Argyres and Silverman (2004) believe that there was a negative correlation between overseas R&D and innovation performance of the parent company. Branstetter (2001) compared the impact of domestic and foreign R&D activities on innovation performance of American high-tech manufacturing enterprises. The results showed that the knowledge spillover effect of domestic R&D was significant, but the knowledge spillover effect of transnational R&D was negative. Chen, Jing, & Shapiro (2012) believe that the transfer of knowledge from developed countries to the home country of enterprises in emerging countries will encourage the headquarters of enterprises to increase R&D investment in the home country, so as to enhance the technology absorption capacity of enterprises, as well as the ability of enterprises to integrate external acquired knowledge and existing knowledge for re innovation.

## 5. Conclusion

In general, research on overseas R&D and parent company innovation performance is still in its infancy, with research data and case studies as the main focus, and standardized quantitative empirical analysis is still rare. In addition, the impact of overseas R&D investment on innovation performance may be moderated by numerous potential factors, such as the firm's own factors of technology absorption ability, knowledge integration ability, and internationalization experience, the location choice, entry method, ownership structure, organizational form, and communication and coordination with the parent company of the overseas R&D organization, and the location factors of the host country such as technological strength, research system, and talent advantage. may all have a positive or negative moderating effect on this relationship, and it is the research findings on these issues that will really have a reference value for future business practices. This paper also has some limitations, innovation performance as the core issue of overseas R&D, there are many internal mechanisms need to be explored, such as whether the enterprise production efficiency, absorptive capacity and so on will affect the innovation performance of overseas R &D, these problems will have important reference value for specific business activities. On the other hand, whether the enterprises' overseas R&D facilities will have an impact on the host country's technological innovation, industrial development and market competition pattern is worthy of further discussion.

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