



R&D internationalization and innovation performance

Chia-Wen Hsu^{a,*}, Yung-Chih Lien^{b,1}, Homin Chen^{b,2}

^a Department of Business Administration, National Chung Cheng University, No. 168, University Road, Minhsiung Township, Chia-Yi, Taiwan

^b Department of International Business, National Taiwan University, No. 85, Sec. 4, Roosevelt Road, Taipei 106, Taiwan

ARTICLE INFO

Article history:

Received 28 May 2013

Received in revised form 27 April 2014

Accepted 9 July 2014

Available online 28 July 2014

Keywords:

Innovation performance

International experience

R&D internationalization

ABSTRACT

This paper investigates the effect of R&D internationalization on firm innovation performance. Using a longitudinal dataset of Taiwanese high-tech firms, we test the effects of R&D internationalization in terms of intensity and diversity. Results reveal a curvilinear U-shaped relationship, suggesting the benefits of R&D internationalization eventually outweigh the costs after critical levels of intensity and diversity. Additionally, we find that a firm's experience in foreign expansion may have a positive moderating impact on the relationship between R&D internationalization and innovation performance, which suggests that the effect is contingent on the firm's capability in dealing with the complexities and uncertainties inherent in international business.

© 2014 Elsevier Ltd. All rights reserved.

1. Introduction

Intense global competition has necessitated that contemporary businesses search for knowledge and capabilities beyond their home markets. As such firms have emphasized the internationalization of their research and development (R&D) activities (Criscuolo, 2009; Davis & Meyer, 2004; Dunning & Lundan, 2009). In particular, the multinational corporations (MNCs) of most advanced economies have accelerated their investments in overseas R&D as a response to increasing technological sophistication in contemporary product markets (Penner-Hahn & Shaver, 2005; Serapio & Dalton, 1999). Indeed, due to technological complexity and variety, MNCs have strong motivations to strengthen their technological capabilities so as to upgrade the efficiencies of their existing products and to facilitate new product development (Grandstrand, Patel, & Pavitt, 1997; Pavitt, Robson, & Townsend, 1989). Through R&D internationalization, MNCs can foster technological capabilities through dispersed geographical access to knowledge as well as by diversification and complementary augmentation of its technologies (Cantwell & Piscitello, 2000), which help the firm's competitiveness in global markets (Bartlett & Ghoshal, 1989).

The extant literature on R&D internationalization has focused on a wide-range of issues including firm motivations to transfer its

R&D activities abroad (e.g., Gassmann & Han, 2004; Zander, 1999), ability to implement R&D activities overseas (e.g., Cantwell & Mudambi, 2000), geographic dispersion and development modes of R&D internationalization (e.g., Asakawa, 2001; Fisch, 2003; Gassmann & von Zedtwitz, 1999; Sanna-Radaccio & Veugelers, 2007), and the outcomes of R&D internationalization (e.g., Chen, Huang, & Lin, 2012; Grevesen & Damanpour, 2007; Lahiri, 2010; Penner-Hahn & Shaver, 2005). Regarding the outcomes of R&D internationalization, findings have been somewhat contradictory. Several studies have found evidence that R&D internationalization facilitates corporate innovation and encourages the diffusion of innovations between the parent company and its foreign subsidiaries (Cantwell, 1989; Cantwell & Mudambi, 2005; Cantwell & Zhang, 2006). Another study found that R&D internationalization significantly promotes a firm's innovation performance and the effect can be critical to sustaining a firm's competitive advantage in international markets (Kafourous, Buckley, Sharp, & Wang, 2008). Conversely, other studies have indicated that the liability of foreignness causes MNCs with R&D activities abroad to be less successful compared to firms with R&D in their home countries (Schmidt & Sofka, 2006; Sofka, 2006). Additionally, geographic dispersion of R&D activities appears to be negatively associated with value of innovation (Singh, 2008). Although previous examinations have found evidence supporting a relationship between R&D internationalization and firm's innovation performance, the direction of this relationship, and its strength in various contingencies remain ambiguous (Lahiri, 2010; Singh, 2008). This ambiguity may be partly attributable to previous studies' incompletely defining or discriminating between the different characteristics of R&D internationalization.

* Corresponding author. Tel.: +886 5 2720411x34306; fax: +886 2 23641843.

E-mail addresses: cwhsu@ccu.edu.tw (C.-W. Hsu), lienyc@ntu.edu.tw (Y.-C. Lien), hominchen@ntu.edu.tw (H. Chen).

¹ Tel.: +886 2 33669734.

² Tel.: +886 2 33664969; fax: +886 2 23641843.

This study attempts to address the ambiguity in the previous findings. We introduce a consolidated theoretical framework that explains how R&D internationalization affects a firm's innovation performance. Our experimental approach utilizes two important measures of R&D internationalization: the *intensity of R&D internationalization* (a firm's R&D expansion related to its foreign expansion), and the *diversity of R&D internationalization* (the firm's geographic distribution of R&D activities). Additionally, our study verifies the contingency perspective on the effect of R&D internationalization, in which we test the moderating effect of firm's international experience on the relationship between R&D internationalization and innovation performance. We use a panel dataset on R&D internationalization for 202 Taiwanese firms spanning 11 years (2000–2010) to test this framework. Our findings suggest that a firm's experience in foreign expansion may significantly influence R&D internationalization, which affects innovation performance. The analysis based on this contingency perspective ascertains how international-related attributes of the firm are associated with R&D internationalization.

This paper contributes to the R&D internationalization literature in several ways. First, the results help to validate the importance of R&D internationalization to emerging economy firms, particularly in terms of its functional role in stimulating innovation that is critical to the firm's competitiveness in international markets. Second, we incorporate liability of foreignness and institutional theory into the R&D internationalization literature and develop an integrative theoretical framework to examine the effect of R&D internationalization on firm performance. Third, unlike previous research that suggests a linear effect of R&D internationalization on innovation performance, our study examines a *curvilinear effect* that enables consideration of both the benefits and costs associated with firms dispersing their R&D activities around the world. Fourth, our study addresses explores the possibility of moderating effects of a firm's international experience. Although prior studies acknowledge the essential role of R&D internationalization on innovation performance, but there is limited empirical evidence on the contingency influence on the relationship. Finally, our study examines these issues in the context of an emerging market economy. Our empirical data consists of firm-level data from Taiwan. Previous studies on R&D internationalization have mainly examined firms from advanced economies.

2. Theoretical background and hypotheses

2.1. R&D internationalization literature

Existing studies on R&D internationalization have focused on wide-range of issues including the motives, development modes, and the consequences of R&D internationalization. Research investigating the motives of R&D internationalization has identified input-oriented factors, output-oriented factors, and efficiency-oriented factors as primary motives (Gassmann & von Zedtwitz, 1998). Related studies discussed additional motives such as accessing the local market (von Zedtwitz & Gassmann, 2002), acquiring advanced technology (Kuemmerle, 1999) and skilled local talent (Florida, 1997), leveraging the competitive advantages of nations (Pearson, Brockhoff, & von Boehmer, 1993), and accessing complementary assets (Serapio & Dalton, 1999).

Studies on the geographic dispersion and development modes of R&D internationalization include Gassmann and von Zedtwitz's (1999) classification of five different types of international R&D organizations according to the firm's dispersion of R&D activities and the degree of cooperation between individual R&D units. Asakawa (2001) revealed that the nature of organizational tension (autonomy-control tension and information-processing tension)

actually evolves along the differing stages (i.e. dis-integration and re-integration) of R&D internationalization. In addition, Fisch (2003) proposed a new communication-economic network model to predict the allocation of R&D activities in MNCs. Sanna-Radaccio and Veugelers (2007) used the game-theoretic approach to provide a theoretical model of the trade-offs that an MNC faces when organizing its international R&D as decentralized or centralized. More Recently, Filippaios and colleagues (2009) developed a global innovation strategy (GIS) structure to explore the R&D internationalization activities of the world's 100 largest food and beverage MNCs.

As for the literature on the consequences of R&D internationalization, particularly in relation to innovation performance, we examine this issue more closely in the following sections (see Sections 2.2–2.4) where we also describe two dimensions of R&D internationalization (intensity and diversity) and one contingent moderating effect (a firm's internationalization experience) to explore the relationship between R&D internationalization and innovation performance.

Despite the many studies on R&D internationalization, most have focused on advanced and developed countries; few studies have examined the issue from the perspective of firms from developing and emerging countries (Chen, 2004; Minin, Zhang, & Gammeltoft, 2012; Lu and Liu, 2004). However, as Reddy (2000) indicated, a growing number of MNCs from developing and emerging markets have been internationalizing their R&D activities and developing global R&D networks. R&D internationalization is particularly important for MNCs from emerging economies because these firms tend to use internationalization as a method to acquire their important resources, thereby compensating for their latecomer handicaps and leveraging their ownership specific advantages in global markets (Dunning, 1981). Since innovation is important to creating and sustaining competitive advantage in global markets (Filatotchev & Piesse, 2009), MNCs from emerging economies may internationalize their R&D activities as a springboard strategy to acquire sophisticated technology and advanced manufacturing know-how from overseas, which can promote its innovation performance (Luo & Tung, 2007). In effect, R&D internationalization provides an opportunity for MNCs from emerging economies to move from the position of late-follower to the position of rapid-follower or even leader (Child & Rodrigues, 2005). Additionally, from the perspective of institutional theory, specific institutional constraints in emerging markets can inherently limit the strategic choices available to local companies (Hoskisson, Eden, Lau, & Wright, 2000; Wright, Filatotchev, Hoskisson, & Peng, 2005). For example, government policies in most emerging economies usually favor incumbents rather than new ventures, resulting in a detrimental environment for firm innovation and R&D activity (Peng, 2003; Peng & Zhou, 2005). R&D internationalization can provide a route that emerging market MNCs can use to bypass the institutional constraints at home (Peng, Wang, & Jiang, 2008). Moreover, in comparison with most emerging markets, advanced markets usually provide better intellectual property rights protection, are less corrupt, more transparent, and have better functioning capital markets (Lee, Peng, & Barney, 2007; Peng, 2003). Taking advantage of these conditions can further motivate the R&D internationalization of emerging economy firms.

2.2. Intensity of R&D internationalization and innovation performance

Previous research has found that greater intensity of R&D internationalization leads to better innovation performance (Phene & Almeida, 2008). For instance, Iwasa and Odagiri (2004) empirically verified that a higher degree of R&D internationalization

Download English Version:

<https://daneshyari.com/en/article/1001511>

Download Persian Version:

<https://daneshyari.com/article/1001511>

[Daneshyari.com](https://daneshyari.com)