



Knowledge complementarity, knowledge absorption effectiveness, and new product performance: The exploration of international joint ventures in China[☆]

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ABSTRACT

Firms use international joint ventures (IJVs) to access and learn from partners' knowledge and thus enhance their new product performance, especially when the partners have complementary knowledge bases. Most of the existing literature assumes that knowledge complementarity can directly lead to enhanced new product performance, while ignoring the mediating role of knowledge absorption effectiveness and moderating effects of organizational structure and organizational culture to integrate and manage knowledge complementarity. Using dyadic data from 119 IJVs in China, this article suggests that knowledge complementarity influences IJV new product performance through the full mediation of knowledge absorption effectiveness. Also, the results suggest that an IJV's departmentalization of organizational structure significantly hurts the effect of knowledge complementarity on knowledge absorption effectiveness, while a strong learning culture of the IJV can significantly enhance such effects.

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1. Introduction

The last two decades have witnessed a surge of international joint ventures (IJVs) as firms and markets become more globally interconnected (Glaister, Husan, & Buckley, 2003). Rapid technological advances, shorter product life cycles, and the rising costs of simultaneously innovating in diverse sectors have increased the difficulty of relying solely on internally developed innovations (Narula & Hagedoorn, 1999). Although firms form IJVs for a variety of reasons, important motivations include access to new market knowledge and creation of new innovation knowledge to improve new product development (NPD) performance (Inkpen & Dinur, 1998; Narula & Hagedoorn, 1999; Si & Bruton, 1999; Sinha & Cusumano, 1991).

From a resource-based view of IJVs, firms engage in IJVs to gain access to complementary resources and knowledge in sectors in which they lack a relative competitive advantage (Kwon, 2008; Lambe, Spekman, & Hunt, 2002; Narula & Hagedoorn, 1999). The existing literature advises that complementary knowledge resources provide potential opportunities for the local and foreign firms in IJVs to explore new and different ideas about product design, concepts, and development, as well as to break away from previously specified rules and procedures (Das & Teng, 2000; Fang & Zou, 2009). Researchers

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argue that synergy may be created when firms bring complementary resources to joint ventures (Berdrow & Lane, 2003; Stafford, 1994). Implicit in this notion is the belief that knowledge complementary is related to better NPD performance. However, much of the existing literature on the resource-based view of NPD performance in IJVs assumes a direct link between complementary knowledge resources and NPD performance, ignoring the intermediate role of knowledge absorption effectiveness to realize the synergy effect from complementary knowledge bases.

In this article, we advance the concept of knowledge absorption effectiveness, the aptitude of an IJV to organize and share existing knowledge, gather and assimilate each partner's complementary knowledge, and collectively generate new knowledge that otherwise would not have existed. Additionally, we submit that knowledge absorption effectiveness is the key mediating variable for the knowledge complementarity–NPD performance relationship. Moreover, since IJVs differ in their ability to transfer, integrate, and utilize new knowledge gained from external sources (Cohen & Levinthal, 1990; Park, 2011; Tsai, 2001), we suggest that IJV *culture* (e.g., learning culture) and *structure* (e.g., departmentalization) are imperative in facilitating the development of knowledge absorption effectiveness (Grant, 1996; Kwon, 2008). Thus, we also examine how IJV learning culture and departmentalization structure can moderate the effect of knowledge complementarity on knowledge absorption effectiveness. This approach has significant theoretical merits since few studies have viewed IJVs as a living resource for partner firms to jointly develop their knowledge absorption effectiveness, and little empirical evidence is available to substantiate the moderating roles of organizational structure and culture on complementary knowledge bases and NPD performance.

The empirical context of this article is 119 IJVs in China. We select the context of China because, first, China has become the world's largest recipient of foreign direct investment (FDI), which is often absorbed via IJVs (Fang & Zou, 2009). Thus, IJVs in China are a growing and significant economic phenomenon that are of timely concern for managers. Second, most foreign firms and local Chinese firms establish IJVs to gain access to each other's complementary knowledge bases (Luo, 2000). In particular, local Chinese firms seek foreign partners' R&D knowledge and engineering management, while foreign firms are interested primarily in local partners' knowledge in managing customer and distributor relationships in the Chinese market. The results support our basic premise that knowledge complementarity improves IJV new product performance through the full mediation of knowledge absorption effectiveness. Also, the results suggest that an IJV's departmentalization structure can hurt the effect of knowledge complementarity on knowledge absorption effectiveness, while the learning culture of the IJV can significantly enhance such effects.

The remainder of this article is organized as follows. We first introduce our conceptual framework and individual hypotheses. Subsequently, we explain our empirical context, data collection procedures, and construct measurements. We then discuss our data analysis and empirical results. Finally, we illustrate the theoretical and managerial implications of the results, followed by limitations and future research directions.

2. Conceptual framework and hypotheses

Interorganizational learning is a key reason why firms form IJVs (Lane, Salk, & Lyles, 2001). IJVs are especially appealing when they provide strategic opportunities to gain access to complementary resources that are not available within the boundaries of a firm. As such, firms can utilize IJV organizational learning mechanisms to acquire, manage, and create new knowledge (Inkpen & Dinur, 1998). Moreover, the IJV knowledge acquisition and creation process can be enabled by specific adaptation mechanisms, such as organizational learning capacity and goal congruency, or structural mechanisms, such as managerial assistance, training, and technology (Lyles & Salk, 1996). These organizational learning and structural mechanisms enhance the IJV's ability to leverage complementary knowledge, skills, and other valuable resources.

In particular, knowledge complementarity is considered to be a major source of interfirm knowledge synergy in IJVs (Berdrow & Lane, 2003; Lofstrom, 2000; Zahra & George, 2002). IJV partner firms must possess a sufficient foundation of complementary knowledge that includes related skills, technological understanding, and language, to enable effective communication and overcome cognitive barriers to interorganizational learning (Li, Poppo, & Zhou, 2010). The resulting synergy is achieved when an IJV provides access to external knowledge resources that can be utilized to improve each firm's competitive advantage (Anh et al., 2006). Thus, two firms may participate in an IJV with the specific intent to learn from each other's complementary knowledge bases. According to Kim and Finkelstein (2009), knowledge complementarity in an IJV setting exists when each partner brings in unique knowledge bases that may be combined and integrated to create value that did not exist in either firm prior to formation of the IJV. Thus, knowledge complementarity is defined as low degrees of knowledge redundancy in the form of dissimilar product development knowledge and skills, which comprise a large potential for learning and value creation through the combination of these different skills and resources. In other words, knowledge complementarity emphasizes the knowledge differences that exist between two strategic partners (Kim & Finkelstein, 2009; Luo, 2005a).

Realizing knowledge complementarity benefits depends upon an IJV's achievement of "successfully managing such differences" (Kim & Finkelstein, 2009, p. 2), which is an ability we refer to as knowledge absorption effectiveness. We define knowledge absorption effectiveness as the aptitude of the IJV to organize and share existing knowledge, gather and assimilate each partner's complementary knowledge, and collectively generate new knowledge (Gold, Malhotra, & Segars, 2001; Tanriverdi, 2005). When transferring knowledge across firms in multinational settings, such as IJVs, it is particularly important to develop firm-level capabilities that enable knowledge absorption (Zhao & Anand, 2009). This is due, in part,

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