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Local and Global Knowledge Complementarity: R & D Collaborations and Innovation of Foreign and Domestic Firms☆

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ABSTRACT

We analyze how research and development (R & D) collaborations affect product innovation for subsidiaries of foreign multinational firms and domestic firms. We build on the knowledge-based view to propose that subsidiaries and domestic firms differ in their ability to benefit from alternative R & D partners as a result of the variation in their knowledge complementarities. Specifically, we propose that subsidiaries may benefit more from undertaking R & D collaborations with customers and competitors, whose deeper knowledge of local conditions better complements the more global knowledge base of subsidiaries. In contrast, we argue that domestic firms may benefit more from engaging in R & D collaborations with suppliers and universities, whose more global nature of knowledge better complement the deeper local knowledge base of domestic firms.

1. Introduction

Innovation requires knowledge variety, and thus, firms that are better at searching for and integrating different types of knowledge are more innovative than others (Kogut and Zander, 1992; Teece, 2014). Collaborating with different R & D sources is one way in which firms can search for different types of knowledge for innovation (Hannigan et al., 2015; Mudambi et al., 2007). Firms collaborate in R & D with various partners, such as with universities, suppliers, customers or competitors, to acquire the complementary knowledge they lack and improve their ability to innovate (Belderbos et al., 2004; Nieto and Santamaría, 2007). Many studies on R & D collaborations have focused on providing a deep understanding of the collaborations with a particular type of partner, such as with universities (Soh and Subramanian, 2014), customers (von Hippel, 2011), suppliers (Clegg et al., 2013), or competitors (Lhuillery and Pfister, 2009). Other studies compared their relative effects on innovation types to determine which partners are more suitable for each type (Nieto and Santamaría, 2007; Tether, 2002; Un et al., 2010; Un and Asakawa, 2015; Wu, 2012).

Building on these studies, we go one step further and analyze how R & D collaborations affect product innovation differently for subsidiaries of foreign multinational enterprises (MNEs) and domestic firms. Such comparison is not only novel but also important. On the one hand, studies on R & D collaboration of subsidiaries have focused primarily on R & D subsidiaries (Awate et al., 2015;

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Cantwell and Mudambi, 2005; Frost et al., 2002) and analyzed their R & D collaboration with local universities or with local competitors (e.g., Guimón and Salazar-Elena, 2015; Hamel et al., 1989; Li, 2010). However, few provide a complete comparison of multiple types of R & D partners (for exceptions see Ebersberger et al., 2011; and Holl and Rama, 2014). On the other hand, there are differences in the behavior of subsidiaries of foreign firms and domestic companies (Mata and Portugal, 2002; Mezias, 2002; Nachum, 2010; Un, 2011, 2016; Zaheer, 1995). Therefore, lessons from studies that analyzed R & D collaborations for all firms may need modification to explain differences in behavior of the two types of firms.

We build on the knowledge-based view (KBV) (Grant, 2013; Kogut and Zander, 1992, 1993; Nonaka, 1994) because of its focus on knowledge and innovation, and more specifically, on the open innovation research stream (Chesbrough, 2006; Laursen and Salter, 2006) that emphasizes the role of external sources of knowledge in the innovation process. We argue that subsidiaries and domestic firms differ in their ability to benefit from alternative R & D partners as a result of the variation in knowledge complementarities in their local and global knowledge bases.

Specifically, we propose that subsidiaries of foreign firms may benefit more from engaging in R & D collaboration with customers and competitors. Subsidiaries have a relatively more global knowledge base. They receive a more global variety of knowledge from other countries via the multinational network of the parent and other countries subsidiaries (Ghoshal and Bartlett, 1990). They are also more globally integrated and coordinated in their knowledge within the multinational (Bartlett and Ghoshal, 2001; for a recent review, see Scott-Kennel and Giroud, 2015). Therefore, when engaging in R & D collaborations they may benefit relatively more from their collaborations with customers and competitors. These partners have relatively more local knowledge bases than other R & D partners, enabling the subsidiaries to achieve higher knowledge complementarities that support innovation.

In contrast, we propose that domestic firms may benefit more from collaborating with suppliers and universities. Domestic firms have deeper contextual local market knowledge than subsidiaries because they have emerged in the local context and evolved with it, and in many cases, it is their main market (Mata and Freitas, 2012). Thus, when establishing R & D collaborations, domestic firms may benefit relatively more from their collaborations with suppliers and universities because these R & D partners have relatively more global knowledge bases than other R & D partners, helping domestic firms obtain superior knowledge complementarities that enhance innovation.

We test these arguments on a sample of manufacturing subsidiaries of foreign MNEs and domestic firms operating in Spain. We find that for subsidiaries, R & D collaboration with customers is more likely to result in product innovation than collaborations with other types of partners. For domestic firms, we find that R & D collaborations with suppliers and universities are more likely to result in product innovation than collaborations with customers or competitors.

These ideas contribute to the technology strategy literature and the analysis of the benefits of R & D collaborations (Belderbos et al., 2004; Nieto and Santamaría, 2007; Tether, 2002; Un et al., 2010; Un and Asakawa, 2015; Wu, 2012). We go beyond the usual analysis of how specific R & D collaborations help firms innovate; all R & D collaborations can, in principle, be useful sources of knowledge and support innovation. Instead, we propose that the benefits of such R & D collaborations differ across types of companies depending on their knowledge bases and their need for complementary knowledge.

The ideas also contribute to the international business literature by going deeper in the comparison of differences in the behavior of subsidiaries of foreign firms and domestic firms (Nachum, 2010; Un, 2011, 2016; Westney and Zaheer, 2008). We go beyond the traditional discussion of how these firms differ in terms of their outcomes, such as performance (Zaheer, 1995), survival (Kronborg and Thomsen, 2009; Zaheer and Mosakowski, 1997) or lawsuits (Mezias, 2002), or analyses of how companies differ depending on the comparison group (Mata and Freitas, 2012; Mata and Portugal, 2002; Nachum, 2010). We analyze how their behavior affect their innovativeness (Edman, 2009; Un, 2011, 2016) by explaining how subsidiaries and domestic firms can use the various R & D collaboration partners differently to complement their varied knowledge bases and innovate.

To managerial practice, the ideas provide a more nuanced understanding on the benefits of undertaking R & D collaboration. Managers can explore potential collaborations with all types of partners. However, managers of manufacturing subsidiaries of foreign firms planning to innovate products with the help of R & D collaboration may obtain higher benefits by collaborating with customers than other types of partners. In contrast, managers of domestic firms may find collaborating in R & D with universities and suppliers to be more suitable for innovating products than with other types of R & D collaborators. This does not mean that the various partners cannot help the firm innovate. On the contrary, there may be a synergistic effect of collaborating simultaneously with different types of partner. However, the partners provide different knowledge complementarities and a varying advantage in the firm's innovation effort.

2. Theoretical background

2.1. The knowledge-based view of the firm

We build the arguments on the KBV because its focus on knowledge provides an appropriate theoretical basis for explaining how subsidiaries of foreign firms and domestic firms use R & D collaboration to innovate. According to the KBV, knowledge is the key asset that provides the firm with a more sustainable competitive advantage than any other resources, and thus, it is a strategic asset that requires careful management and development. We now review some of the main arguments of the theory that help explain our arguments. First, knowledge differs across individuals, firms, and organizations, both within and across countries (Grant, 2013; Kogut and Zander, 1992; Kogut and Zander, 1993). As a result, companies benefit from R & D collaboration with external parties because they can obtain knowledge they lack and complement their own knowledge bases. Second, knowledge is difficult to transfer across individuals, firms, and organizations, both within and across countries, because the tacit component of knowledge is difficult to