REVERSE KNOWLEDGE TRANSFER AND INNOVATION IN MNCs

Accepted manuscript

Jiménez-Jiménez, D., Martínez-Costa, M. and Sanz-Valle, R. (2020), "Reverse knowledge transfer and innovation in MNCs", ***European Journal of Innovation Management***, Vol. 23 No. 4, pp. 629-648.https://doi.org/10.1108/EJIM-10-2018-0226

Abstract

Purpose

The purpose of this paper is twofold: to study the relationship between reverse knowledge transfer (RKT) and headquarters´ innovation, examining potential moderators of such relationship, and to analyze the role of headquarters' absorptive capacity (AC) and the coordination mechanisms they adopt as antecedents of RKT.

Design/methodology/approach

Quantitative data was collected from 104 Spanish multinational companies. Structural equation modelling was used to test hypotheses.

Findings

Findings provide evidence of a positive relationship between RKT and headquarters´ innovation. This relationship is higher when the knowledge transferred from subsidiaries to parent units is of a more tacit nature, and also when the organizational distance between them is larger. The results also show that the parent unit's AC and the use of mechanisms for coordinating company units can facilitate RKT.

Practical implications

MNCs that wish to be more innovative should be aware that it is worth the effort of fostering RKT, especially when knowledge is more tacit and comes from subsidiaries with different organizational practices and culture because these two variables increase the positive relationship that it was found between effective RKT and the development of innovation in the headquarters. Additionally, results show that in order to facilitate RKT, the improvement of headquarters' AC and the use of mechanisms of coordination between them and its subsidiaries can be useful.

The authors acknowledge the funding received from the Spanish Ministry of Science and Technology (Research Project ECO2009-12825,) and from Fundación CajaMurcia, to undertake this research.

Originality/value

Up to our knowledge, this is the first empirical study that examines the link between RKT and headquarters' innovation, and one of the few that focuses on headquarters' characteristics as determinants of RKT. Thus, our findings contribute to the literature that highlights the benefits of RKT for MNC´s competitiveness, and seeks to know how to promote RKT.

Keywords

Innovation; Absorptive Capacity, Tacit knowledge; Coordination mechanisms, Reverse knowledge transfer, Organizational distance.

Paper type

Research paper

1. Introduction

Innovation is considered to be one of the most important sources of a firm's competitive advantage and performance (Damanpour and Gopalakrishnan, 2001; Dittrich and Duysters, 2007; Kim *et al.,* 2012; Anderson *et al.,* 2014). Knowledge is crucial to a company's innovation and, therefore, firms that intend to be more innovative should reconfigure their current knowledge assets and resources, and should explore for new ones (Nonaka and Takeuchi, 1995).

According to the literature, MNCs have more opportunities to leverage their knowledge-based resources than domestic firms because their network of foreign subsidiaries can provide them with the access to new knowledge across borders (Bartlett and Ghoshal, 1989; Gupta and Govindarajan, 2000; Michailova and Mustaffa, 2012). But for this potential advantage to be realized, the knowledge generated in subsidiaries should be effectively transferred to headquarters. Although the literature highlights the benefits for the MNC's competitive advantage of transferring the knowledge generated within the subsidiaries to the parent company, research on intra-firm knowledge flows in MNCs have focused primarily on the process of knowledge transfer from the headquarters to their foreign subsidiaries (Minbaeva *et al.*, 2003; Kotabe *et al.,* 2007; Minbaeva *et al*., 2007; Phene and Almeida, 2008; Perez-Nordtvedt *et al*., 2008).

Recently, attention has increasingly shifted to flows of knowledge in the opposite direction, the transfer of knowledge from foreign affiliates to the headquarters (Ambos *et al*., 2006; Rabbiosi, 2011; Nafaji-Tavani, 2012; McGuinness *et al*., 2013; Rabbiosi and Santangelo 2013;

Mudambi *et al*., 2014; Nair *et al*., 2015; Driffield *et al*., 2016; Nair *et al*., 2018). This process has been called reverse knowledge transfer (RKT). This line of research highlights the benefits of RKT for the parent company and for the MNC as a whole, but it also notes that RKT is not an automatic or easy process, and requires time and economic resources (Nair et al., 2018). Since empirical evidence on the benefits that RKT can provide the parent company is still limited (Driffield *et al*., 2016; Nair *et al*., 2018), more research in this line would help to know whether it is worth the effort needed to promote RKT. This paper aims to contribute to the literature on the benefits of RKT for the headquarters by analyzing the relationship between RKT and innovation in the parent unit. Moreover, up to our knowledge, this is the first empirical study that examines that relationship. Since, as mentioned before, innovation is considered to be one of the most important sources of competitive advantage for a firm, our findings can be of interest for MNCs seeking to be more innovative.

In order to go further in the analysis of the relationship between RKT and innovation in headquarters, this paper also examines whether that relationship is moderated by two factors associated to the type of knowledge that is transferred: the extent to which the knowledge that is transferred is tacit, and the organizational distance between the parent unit and its subsidiaries. Traditionally, these two variables have been considered to make knowledge transfer more difficult (Gupta and Govindarajan, 2000; Subramanian and Venkatraman, 2001; Minbaeva *et al*., 2003; Ambos *et al*., 2006; Minbaeva *et al*., 2007; Rabbiosi and Santangelo, 2013; Nair *et al*., 2018). However, based on the resource-based view of the firm, recent research suggests that, although this may be true, MNC's innovation may benefit from knowledge tacitness (Park *et al*., 2015) and from the new knowledge coming from subsidiaries with different values and practices (Ambos *et al*., 2006). This proposition is tested in this paper.

Another purpose of this paper is to explore some determinants of RKT. Research on intra-firm knowledge transfer suggests that its main determinants are knowledge sender and knowledge recipient –subsidiaries and parent unit-, as well as the characteristics of the knowledge that it is transferred, and the context in which it is shared (Szulanski, 1996; Gupta and Govindarajan, 2000; Minbaeva, 2007). In the context of RKT the subsidiary -knowledge sender- has been the focal unit in most of the studies (Rabbiosi, 2011; Najafi-Tavani *et al*., 2012; McGuiness *et al*., 2013; Rabbiosi and Santangelo, 2013; Mudambi *et al*. 2014; Nair *et al*., 2016). This paper focuses on the other principal actor in the RKT process, the parent unit -the knowledge recipient-, in particular on its absorptive capacity (AC) and on the use of coordination mechanisms with its subsidiaries.

There is a general agreement in prior research that effective knowledge transfer requires that knowledge recipient has AC, that is to say, has the ability of acquiring knowledge and, afterwards, assimilating it and using it (i.e. Szulanski, 1996; Gupta and Govindarajan, 2000; Ambos et al., 2006; Minbaeva, 2007; Rabbiosi and Santangelo, 2013; Nair *et al.,* 2016). In the context of RKT, empirical studies have usually considered AC, but as a control variable, not as an independent variable (Ambos *et al.*, 2006 is one of the few exceptions). By focusing on AC, this paper intends to make a contribution to the literature on RKT. Another characteristic of the knowledge recipient the literature considers that has an impact on intra-firm knowledge transfer, is its motivational disposition to acquire knowledge (Szulanski, 1996; Gupta and Govindarajn, 2000). This paper suggests that the use of coordination mechanism with the subsidiaries by the parent company reflects such a motivational disposition. Although the link between this variable and RKT has been previously examined in some studies (Ambos and Ambos, 2009), Rabbiosi, 2011; Rabbiosi and Santangelo, 2013), more research in this line is needed.

Briefly, this paper examines if there is a relationship between RKT and innovation in the parent´s unit, if some knowledge characteristics can enhance that relationship, and if the AC and motivational disposition to acquire knowledge of the parent company foster RKT. In order to achieve its objectives, the paper is structured as follows. Firstly, previous literature on the relationships to be tested is reviewed and hypotheses derived from that review are proposed. Secondly, hypotheses are tested using a sample of 104 Spanish MNCs. Finally, findings and the conclusions of the study are described, highlighting the contributions of the paper and suggesting directions for practice and further research.

2. Theoretical framework

2.1. RKT and innovation in MNCs

It is widely assumed that knowledge is a strategic resource and one of the most important sources of corporate competitive advantage. This assumption is based on both, the Resource-based view and the knowledge-based view. According to the former theory, a resource should be valuable, rare, difficult to imitate and difficult to substitute in order to be a source of competitive advantage (Barney, 1991), and knowledge fulfills these conditions. The latter

theory goes further and defends that knowledge is the most critical resource to firms (Kogut and Zander, 1992; Nonaka and Takeuchi, 1995; Grant, 1996).

For MNCs, knowledge is particularly important (Gupta and Govindarajan, 2000; Rabbiosi and Santangelo, 2013) because they face more intense competition than domestic firms. At the same time, as MNCs operate in different local environments, they are considered to have more opportunities for developing their knowledge-based assets (Bartlett and Ghoshal, 1989; Gupta and Govindarajan, 2000; Michailova and Mustaffa, 2012). In this vein, the literature on internationalization of firms emphasizes that the ability of MNCs to integrate and create new knowledge is one of the main competitive advantages of these firms, and defines MNCs as social communities that specialize in the creation and transfer of knowledge across borders (Kogut and Zander, 1992). That is to say, this line of research suggests that MNCs can develop knowledge in one location and exploit it in other locations, implying an effective internal transfer of knowledge between the MNCs´ units.

Knowledge transfer is usually understood as a process of knowledge flow from a source to a recipient that has a benefit on the recipient unit. In this line, Argote and Ingram (2000), defines knowledge transfer as "the process through which one unit (e.g., group, department, or division) is affected by the experience of another". In the literature on knowledge transfer, scholars have developed different models regarding the stages of that process. Frank and Duarte-Ribeiro (2014) examine them and propose an integrative model for the specific case of knowledge transfer between new products development project teams that starts with the knowledge generation by the source to the knowledge application by the recipient.

In the context of MNCs, knowledge transfer is also considered to be a process covering several stages that includes not only the movement of knowledge from the MNC unit that is the source of the knowledge but also its subsequent utilization by the receiving unit (i.e. Minbaeva *et al.,* 2003). In particular, traditional research on knowledge transfer within MNCs has seen it as a unidirectional process, whereby headquarters transfer knowledge and skills they have created to their subsidiaries around the world (Driffield *et al*., 2016), and most of prior empirical research has usually focused on knowledge transfer from parent units to their overseas affiliates (Minbaeva *et al*., 2003; Kotabe et al., 2007; Minbaeva *et al*., 2007; Phene and Almeida, 2008; Perez-Nordtvedt *et al*., 2008). This view is consistent with the idea that foreign direct investment is a mechanism through which a company can earn rents by exploiting abroad the knowledge-based assets created at home (Eden, 2009).

However, the recent literature on internationalization of firms points to the strategic importance of going abroad, not only to exploit the knowledge generated at home, but also to explore for new knowledge and to bring it back home (Ambos *et al*., 2006; Eden 2009; McGuinness et al., 2013; Michailova and Mustaffa, 2012; Mudambi *et al*., 2014; Najafi-Tavani *et al*., 2012; Rabbiosi and Santangelo 2013; Nair *et al*., 2015; Driffield *et al*., 2016). This field of research defends that subsidiaries are not only recipients of headquarters' knowledge but they can also be crucial in the process of knowledge creation in the MNC because they can acquire valuable knowledge through their external linkages with local customers, suppliers, competitors and institutions. Thus, through its subsidiaries, parent units can have access to the knowledge embedded in the country they are located in, as well as to new knowledge subsidiaries may develop themselves through local research and development (Najafi-Tavani *et al*., 2012; Yang *et al*., 2008). Therefore, subsidiaries can act as nodes of a knowledge network through which MNCs can acquire heterogeneous knowledge (Zhang *et al*., 2009), which can give headquarters a competitive advantage over domestic competitors (Yang *et al*., 2008).

For MNCs to benefit from the knowledge generated or acquired by their subsidiaries, it is critical that this knowledge is effectively transferred to the headquarters (Ambos *et al*., 2006; Michailova and Mustaffa, 2012). The process through which knowledge is transferred from a subsidiary to its parent company, and the assimilation and use of that knowledge in the latter organizational unit has been named as reverse knowledge transfer (RKT). Recently, RKT has emerged as an area of increasing interest for researchers (Ambos *et al.*, 2006; Eden, 2009; Najafi-Tavani *et al*., 2012; McGuinness *et al*., 2013; Michailova and Mustaffa, 2012; Rabbiosi and Santangelo, 2013; Nair *et al*., 2015; Driffield *et al*., 2016; Nair *et al*., 2018).

This stream of literature highlights the benefits of RKT for parent units, and its positive effect on the competitive advantage of the MNCs as a whole. Assuming this idea, empirical research on knowledge transfer in MNCs is paying more attention to RKT. Most of the studies on this field focus on the determinants of knowledge transfer from subsidiaries to parent units (Rabbiosi, 2011; Najafi-Tavani *et al*., 2012; McGuiness *et al*., 2013; Rabbiosi and Santangelo, 2013; Mudambi *et al*., 2014; Nair *et al*., 2015 and 2016), but recent research highlights the need of focusing on the impact of RKT on the parent unit's competitive advantage (Driffield et al., 2016; Nair et al. 2018). For instance, Nair *et al.* (2018) note that understanding whether the parent units benefit from RKT is of vital importance because RKT is "costly and involves significant investments in terms of resources and time". One of the few empirical papers on this line is that performed by Driffield *et al*. (2016). Using a large sample of MNCs and their

subsidiaries, they find that subsidiaries productivity has a positive effect on headquarters productivity, which they interpret as evidence that RKT is beneficial for parent units. More recently, Nair *et al*. (2018), focusing on emerging markets MNCs that have affiliates on development markets, provide evidence that supports the relationship between the extent of knowledge and skills the subsidiary provides its parent unit, and benefits of RKT in terms of improvements in technology, marketing and management in general.

This paper seeks to contribute to this very recent line of research by examining the relationship between RKT and parent unit´s innovation. We focus on innovation because there is a general agreement in the literature that it is one of the most important sources of competitive advantage and, therefore, of performance improvement (i.e. Damanpour and Gopalakrishnan, 2001; Kim *et al*. 2012; Anderson *et al*., 2014). Moreover, according to the literature, that is particularly true in the context of MNCs (Almeida and Phene, 2004; Frenz *et al*., 2004; Kotabe, 2007).

The Oslo Manual defines innovation as "the implementation of a new or significantly improved product, process, marketing method, or organizational method in business practices, workplace organization or external relations" (OECD, 2005). Innovations can be classified according to different criteria. Following Damanpour (1991), the object of the innovation and its radicalness are the criteria the most widely used in the literature. The definition of innovation provided by the Oslo Manual mentions the types of innovation followed the first criteria. According to the second one, innovations vary along a continuum from incremental to radical, depending on the novelty of the changes and the degree of departure from existing practices they imply. This paper adopts the wide definition of innovation proposed by the Oslo Manual. Thus, it doesn´t make a distinction between different types of innovation.

This paper suggests that effective RKT can foster innovation in headquarters. On the one hand, as it was previously mentioned, recent literature in the context of MNCs defends that subsidiaries can be a source of new and relevant knowledge for the MNC as a whole, since they have access to value knowledge embedded in in their host locations (Ambos *et al.,* 2006; Eden *et al*., 2009; Michailova and Mustafa, 2012; Najafi-Tavani *et al*., 2012; Rabbiosi and Santangelo, 2013; Nair et al., 2015, Driffield *et al.,* 2016; Nair *et al.,* 2018). On the other hand, there is a general consensus in the literature that innovation is a knowledge-intense business process, which requires that the firm continuously renew its knowledge database through the acquisition and creation of new knowledge (i.e. Nonaka and Takeuchi, 1995; Zhou and Li, 2012). Thus, by effective RKT headquarters have the potential to acquire new knowledge, which combined with the knowledge and skills they already possess, can promote the

development of innovations (Yamin and Anderson, 2011). In this vein, Kotabe et al. (2011) note that RKT provides the headquarters with the potential opportunities for the development of new products.

As far as we know, there are not prior empirical studies that examine the link between RKT and the development of innovations in the parent company. However, some studies focusing on knowledge flows in the context of MNCs show that cross-border knowledge transfers have positive effects on the innovative performance of the receiving unit (Subramanian and Venkatraman, 2001; Yamin and Otto, 2004; Kotabe et al. 2007). Furthermore, the study of Rabbiosi and Santangelo (2013) shows a positive relationship between the use by the parent company of know-how related to R&D developed by its subsidiary and the parent´s innovative capacity.

In sum, the literature both, on the relationship between knowledge and innovation and on KT in the context of MNCs suggest that there are reasons to expect that RKT foster innovation in the parent unit. Therefore, the following hypothesis can be formulated:

H_1. RKT is positively related to innovation in the parent unit.

In addition to the hypothesized direct relationship between RKT and innovation in headquarters, we further propose that two variables that literature usually considers as barriers for RKT moderate such relationship. Both variables are related with the type of knowledge that is transferred from the subsidiaries to their headquarters.

Knowledge characteristics are usually considered to affect knowledge transfer within the MNC (Gupta and Govindarajan, 2000; Minbaeva *et al*., 2007; Perez-Nordtvedt *et al*., 2008; Yang *et al*., 2008; Michailova and Mustaffa, 2012; Rabbiosi and Santangelo, 2013; Nair *et al*., 2015; Park *et al*., 2015). Michailova and Mustaffa (2012) show that the tacit/explicit continuum is the knowledge characteristic that has been examined most extensively. Explicit knowledge can be codified and articulated in formal and systematic language, which makes it easier to share and transfer it in written documents such as manuals and reports (Holtbrugge and Berg, 2004). Tacit knowledge, on the other hand, is abstract, based on experience, and difficult to codify. These characteristics of tacit knowledge contribute to its stickiness (Szulanksi, 1996), and make this knowledge more difficult to be transferred (Kogut and Zander, 1993; Subramanian and Venkatraman, 2001). This is considered to be particularly true in the case of RKT as

knowledge sender and recipient are geographically separated (Rabbiosi and Santangelo, 2013; Nair *et al*., 2018).

Although tacit knowledge requires more effort to be transmitted**,** we argue that this type of knowledge is very important for enhancing MNCs' competitive advantage, especially when this is based on innovation. As Park *et al*., (2015) suggest, through explicit knowledge it is possible to get ideas about what innovations to develop, but "knowing how to put it successfully intro practice requires a different type of knowledge that is largely tacit, specialized, and embedded in organizational contexts, routines, and practices". Furthermore, the nature of tacit knowledge makes it more difficult to competitors to imitate, which is related to a more sustained competitive advantage, according to the knowledge-based view of the firm (Gran, 1996; Nonaka and Takeuchi, 1995). Therefore, the potential benefit of acquiring tacit knowledge is clear from this theory.

Some previous studies provide evidence that suggests that tacit knowledge transfer has a positive effect on performance (Becerra et *al.,* 2008; Park et *al.* 2015), but in contexts where knowledge sender and knowledge receiver are different to those our paper focuses on. For instance, Becerra *et al*. (2008) examine knowledge transfers in alliances among Norwegian companies. Their findings show that transfers of tacit knowledge between partners are associated with greater success. Park *et al.* (2015), focusing on knowledge transfer from headquarters to their subsidiaries, also found support for the idea that tacit knowledge acquired from the sender unit is positively related to a higher performance in the recipient unit. More recently, Nair *et al*. (2018) find that knowledge tacitness is positively associated to the benefits of RKT for headquarters. They focus on emergent markets MNCs, in particular Indian companies that have subsidiaries in developed markets, and argue that this fact can explain their finding. We suggest that, although tacit knowledge is more difficult to be transferred, when companies manage to do it, the benefits for them can be higher.

Based on this idea and also on the fact that some scholars highlight the need to examine the tacit/explicit continuum as a moderator in knowledge flows (Michailova and Mustaffa, 2012), we propose:

> *H_2. The tacitness of the knowledge transferred from subsidiaries to their parent unit positively moderates the relationship between RKT and innovation in the parent unit.*

The second variable this paper suggests as a moderator in the relationship between RKT and innovation in the parent unit is organizational distance, since it is related with the type of knowledge that is transferred. Following Ambos *et al*. (2006), we define organizational distance as the context dissimilarities between headquarters and their subsidiaries in terms of processes, practices and values. Research on knowledge transfer within MNCs suggests that organizational distance hinders knowledge transfer. The literature argues that knowledge transfer between any two units in the MNC is easier when their organizational culture, systems and procedures are similar (Ambos *et al*., 2006, Najafi-Tavani *et al.*, 2012; McGuinnes et al. 2013; Nair *et al*., 2015). Organizational similarity provides the two units with the same system of meanings, and increase the degree of interaction between units, which fosters the willingness of the subsidiary to share its knowledge (Najafi-Tavani *et al*., 2012), and helps the parent unit (the recipient) to understand that knowledge correctly (Lane *et al*., 2001). Thus, in general, organizational distance is considered to make knowledge transfer between two organizational units more difficult (Jasimuddin *et al*., 2015), including knowledge transfer from subsidiaries to headquarters (Frost and Changhui 2005; Ambos *et al*., 2006, Millar and Choi 2009; Najafi-Tavani *et al.*, 2012; McGuinnes et al. 2013; Nair *et al*., 2015).

However, some prior studies have found no influence of organizational distance on RKT (Ambos *et al*., 2006; Najafi-Tavani *et al*., 2012; Nair *et al*., 2018). Ambos *et al*. (2006) suggest that one likely explanation for this finding is that, although organizational distance can make knowledge transfer more difficult, subsidiaries with different practices, systems and values can also be an important source of new knowledge for the recipient unit and, therefore, a source of innovation for that unit. This idea is related to the concept of knowledge complementarity proposed by Zahra and George (2002), referring to the extent to which the new knowledge the firm acquires is different from, although at the same time related to, the knowledge the firm possesses already. Gupta and Govindarajan (2000) refer to this type of knowledge as non-duplicative. It seems reasonable to think that organizational units with different practices and processes will generate knowledge that is more different and non-duplicative and, therefore, this knowledge will have more potential to contribute to the renewal of the knowledge database of the recipient unit and, therefore, to foster innovation in that unit. Basing on that idea, in the context of RKT we argue that although organizational distance is expected to hinder the transfer of knowledge from the subsidiaries to their parent units, whether this transfer effectively happens, it will have more potential to foster innovation in the parent unit. Accordingly, we propose:

H_3. Organizational distance between headquarters and subsidiaries positively moderates the relationship between RKT and innovation in the parent unit.

2.3. Determinants of RKT: parent unit absorptive capacity and coordination mechanisms

As mentioned above, prior research on RKT has mainly focused on its antecedents (Ambos *et al*., 2006; Rabbiosi, 2011; Najafi-Tavani *et al*., 2012; McGuiness *et al*., 2013; Rabbiosi and Santangelo, 2013; Mudambi *et al*., 2014; Nair *et al*., 2015 amd 2016). As other studies on knowledge transfer in MNCs (Szulanski, 1996; Gupta and Govindarajan, 2000; Subramanian and Venkatraman, 2001; Minbaeva *et al*., 2003; Kotabe *et al*., 2007; Minbaeva *et al*., 2007; Phene and Almeida, 2008; Yang *et al*., 2008; Qin *et al*., 2017). In 1996, Szulanski examined the major barriers to the process of intra-firm knowledge transfer, concluding that the variables that have a greater impact on that process are, firstly, knowledge sender and knowledge receiver, and secondly, knowledge characteristics and organizational context. The same variables were identified later by Minbaeva (2007) as the main determinants of knowledge transfer among the different units of a MNC.

In the context of RKT, as noted by Michailova and Mustafa (2012), most of the empirical research has focused on the knowledge sender, the subsidiary (Rabbiosi, 2011; Najafi-Tavani *et al*., 2012; McGuiness *et al*., 2013; Rabbiosi and Santangelo, 2013; Mudambi *et al*. 2014; Nair *et al*., 2015). By contrast, the role of the headquarters in the RKT process has received less attention until now, despite the fact that the ability and willingness of the recipient unit is considered of great importance in any knowledge transfer process (Szulanski, 1996; Gupta and Govindarajan, 2000; Tsai, 2001; Minbaeva *et al*., 2003; Ambos *et al*., 2006; Minbaeva *et al*., 2007; Oddou *et al*., 2009; Rabbiosi and Santangelo, 2013; Nair *et al*., 2016). By focusing on the headquarters role in RKT, this paper aims to contribute to the literature on knowledge transfer within the MNCs. In particular, this paper focuses on two variables that are expected to influence the extent in which the parent company can effectively acquire knowledge from their subsidiaries, its AC and the use of coordination mechanisms with subsidiaries, which we understand that reflects the motivational disposition to acquire knowledge of headquarters.

According to the literature, effective RKT requires the parent unit to have AC (Ambos e*t al.*, 2006; Rabbiosi and Santangelo, 2013; Nair *et al.*, 2016; Nair *et al.*, 2018). AC is an important concept in the literature on knowledge transfer that was introduced by Cohen and Levinthal (1990). They defined it as "a firm´s ability to recognize the value of new external information,

assimilate it, and apply it to commercial ends". Later, Zahra and George (2002) suggest that AC is "a set of organizational routines by which firms acquire, assimilate, transform, and exploit knowledge to produce a dynamic organizational capacity". These two definitions are usually adopted in the research of knowledge transfer in the MNCs context, although, as the research of Michailova and Mustafa (2012) reveals, AC has been measured in different ways in empirical studies.

Literature suggests that AC can make headquarters pay more attention to subsidiaries' knowledge and foresee its potential benefits for them (Nair *et al*., 2016), which can also make them more willing to assimilate this knowledge and accept changes it may imply. Previous research has provided evidence that the recipient's AC matters in knowledge transfer in the MNCs, but most of the research has focused on knowledge flows from the parent company to the subsidiaries (Minbaeva *et al*., 2003; Tsai, 2001). Only two studies have examined the relationship between the parent unit's AC and RKT (Ambos *et al*., 2006; Nair *et al*., 2016). Using a sample of 294 intra-MNC knowledge transfers, Ambos et al (2006) found that headquarters' AC is positively related to the benefits they obtain from RKT. Nair *et al*. (2016) found that there is a positive relationship between the AC of parent unit and RKT.

Based on the previous research, and in an attempt to provide more empirical support for the general assumption that the parent unit' AC is a determinant of RKT, we propose:

H_4. Parent unit's absorptive capacity has a positive effect on RKT.

Another variable that may reflect the willingness of headquarters to learn from their overseas subsidiaries is that they use coordination mechanisms between the parent unit and its subsidiaries (Gupta and Govindarajan, 2000; Ambos and Ambos, 2009; Schotter and Bontis, 2009; Rabbiosi, 2011). Companies can use a variety of mechanisms to coordinate their different units and to transfer knowledge among them (Ambos and Ambos, 2009; Schotter and Bontis, 2009; Rabbiosi, 2011). They can use written systems, including the Internet, e-mails, and on-line forums. Units can also communicate and exchange repositories of best practices, databases, and so on. These mechanisms are technology-based coordination mechanisms (Ambos and Ambos, 2009). On the other hand, companies can use personal-based mechanisms, such as meetings among employees from the parent unit and subsidiaries, visits of employees from one of its units to another, or teamwork involving people from different units.

Technology-based coordination mechanisms are usually oriented to maximize the exploitation of resources that are embedded in the network of different units of the MNC (Ambos and Ambos 2009), while face-to face interactions are considered to be particularly relevant for transferring tacit knowledge (Tsai, 2001; Schotter and Bontis, 2009; Rabbiosi and Santangelo, 2013). According to Rabbiosi and Santangelo (2013) the latter include socialization mechanisms that help to create information-processing routines that facilitates RKT. Based on the social capital literature, they argue that these interactions contribute to intra-firm trust and a shared vision, which also facilitate knowledge transfer.

Some studies provide empirical support for the link between the use of coordination mechanisms and RKT. One of them is reported in Ambos and Ambos (2009), which uses data on 324 knowledge transfer relationships in MNC units. Rabbiosi (2011) focuses on 280 dyads between foreign subsidiaries and their parent companies, and finds that the employment of coordination mechanisms, both technology-based mechanisms and personal-based mechanisms, are positively related to RKT. In their research on the effect of subsidiary age in RKT, Rabbiosi and Santangelo (2013) also find that coordination mechanisms, which they call socialization mechanisms and they consider a control variable, are positively related to RKT in the 184 transfers of knowledge they analyze.

Thus, we propose:

> *H_5. The use of coordination mechanisms between the parent unit and its subsidiaries has a positive effect on RKT.*

Figure 1 shows the theoretical model that summarizes the five hypotheses proposed in this paper.

Insert Figure 1 around here

3. Methodology

3.1. Population, data collection and sample

The current study is part of a larger research project about RKT. The sample for that research, and for the current study, includes Spanish companies that have at least one subsidiary in a

foreign country, more than 100 employees and more than five years old. The last requisite was established to increase the likelihood that the company has developed innovations and has invested in international markets (Elango and Sambharya, 2004). According to the Amadeus database, the number of MNCs fulfilling these requirements in Spain was 1397.

A questionnaire survey methodology was chosen for data collection and two questionnaires were developed. The first one was administered at the HRM manager of the 1397 companies. The target respondent of the second questionnaire was the CEO or innovation executive. This second questionnaire was only addressed to the companies that had answered the first one. A specialized market research company collected the data through telephone interviews. The company called the target respondent of each organization, and explained the purpose of the survey and the research process to him/her. The company also provided the respondent with the authors' emails and telephones, and offered the respondent a copy of the report of the main research findings. Quality of data collection was monitored by contacting a randomly selected sample of the firms that had answered the questionnaire.

The current study uses data from the second survey. A total of 104 usable questionnaires were obtained (a response rate of 7.44%). The responding companies belong to different industries. The food and beverage industry, furniture industry, and metal industry have the highest representation in the sample. Chi-squared distribution analysis did not reveal significant differences between the sample and the population regarding industry distribution, number of employees, and sales volume.

3.2. Measures

Most of the data used to test our hypotheses was collected from the survey. The questions were based on 5-point Likert scales, which were taken from prior research. Appendix 1 shows detailed wording of the scales.

Innovation. Previous research has measured innovation in a variety of ways. In the present study, we focused on the implementation of the four types of innovation identified in the Oslo Manual (OECD, 2005): product, process, commercialization and management. In particular, we asked the respondent about the innovations in products, processes, management systems and procedures, and marketing that his/her company had introduced in the last three years in comparison to their competitors. After the scale cleaning process through confirmatory factor analysis (CFA), the item associated to innovation in commercialization was deleted.

Reverse knowledge transfer was measured by asking the respondent the extent to which the knowledge the parent company had acquired from its subsidiaries had been useful to improve a series of ten operations, among them purchasing, manufacturing, logistic/distribution, R&D, or human resources management. We based our measure on Rabbiosi (2011). After the scale cleaning process, a six-scale measure was used.

Knowledge tacitness. According to Michailova and Mustaffa (2012), this variable is best depicted as a continuum. Thus, we measured it as the extent to which knowledge from subsidiaries is mainly acquired by communication face to face. One item from the scale of Pedersen *et al*. (2003) was used to measure this variable.

Organizational distance is measured using three items adopted from Simonin (1999) and Ambos *et al*., (2006). The respondents were asked to indicate how similar were the headquarters and their subsidiaries in terms of organizational culture and leadership style, human resource management policies, and overall processes and practices. Items were reverse-coded in order to measure organizational distance.

Absorptive capacity has been measured in different ways in the previous literature (Michailova and Mustaffa, 2012), among them the stock of knowledge the members of the recipient unit possess (Ambos et al., 2006; Zhao and Anand, 2009); employee´s ability and motivation (Minbaeva *et al*., 2003); or the learning tools and infrastructure available to foster the capacity of employees to create and share knowledge (Mahnke *et al*., 2005). This paper adopts this last perspective and measures parent unit's AC as the effort that it makes to foster employees' orientation to acquire and share knowledge, using a scale of seven items based on the dimensions of the Learning Organization Questionnaire developed by Marsick and Watkins (2003). After the scale cleaning process, one of the items was deleted.

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The use of *coordination mechanisms* between parent unit and its subsidiaries was measured using the scale of Rabbiosi (2011). Respondents were asked to indicate how frequently they employed five coordination mechanisms, including both technology-based mechanisms and personal-based mechanisms. After the scale cleaning process through confirmatory factor analysis (CFA), a three-scale measure was used, which only includes personal-based mechanisms.

Control variables. Age (numbers of years since the headquarters' establishment), size (number of headquarters employees) and the number of subsidiaries were taken from the AMADEUS database. They were re-coded on the same scale as the other variables of the model.

3.3. Measures statistics and properties

Table 1 shows means, standard deviations, and correlations among the variables.

Insert Table 1 around here

To ensure that each construct was unidimensional, different explorative factor analyses were developed. After that, following the two-stage model-building process for applying SEM the literature suggests (Hoyle and Panter, 1995; Jöreskog and Sörbom, 1996; Hair et al., 1998), we carried out a confirmatory factor analysis (CFA) and then we tested the structural model . The results of these analyses will be shown in the next section.

First, table 2 show the CFA of the five constructs including all the items (Anderson and Gerbing, 1988). The results of the CFA indicate a good fit for the model ($\chi^2_{(179)}$ = 277.300; CFI=0.910; IFI=0.913; BNNFI=0.895; RMSEA=0.073).

Insert Table 2 around here

Reliability of the measures was calculated with Bagozzi and Yi's (1998) Composite Reliability Index, and with Fornell and Lacker's (1981) Average Variance Extracted Index. For all the measures, both indices were higher than the evaluation criteria of 0.6 for the composite reliability and 0.5 for the average variance extracted (Bagozzi and Yi, 1998). Furthermore, all items loaded on their hypothesized factors and the estimates are positive and significant, which provides evidence of convergent validity (Bagozzi and Yi, 1998).

Discriminant validity was tested using three different procedures recommended by Anderson and Gerbing (1988) and Fornell and Larcker (1981). First, discriminant validity is indicated since the confidence interval (± 2 S.E.) around the correlation estimated between any two latent indicators never includes 1.0 (Anderson and Gerbing, 1988). Second, discriminant validity was tested by comparing the square root of the AVEs for a particular construct with its correlation with the other constructs (Fornell and Larcker, 1981). Finally, we compared the Chi-squared statistic of the constrained model, where the correlation of a pair of factors was fixed to unity, and the chi-squared statistic of the unconstrained model, where the correlation is freely estimated (Anderson and Gerbing, 1988). The results of the three tests provided strong evidence for the discriminant validity of the constructs. The absence of multicollinearity problems was also checked by using variance inflation factors (VIF), which was below the recommended values of 3.3 (Belsey, 1991; Roberts and Thatcher, 2009).

Finally, we assessed the issue of common method variance that might result from collecting all variables from the same respondent by using Harman's single-factor test on our data. Analysis of discriminant and convergent validity, especially the goodness-of-fit indices of the model, also indicated that common method variance was unlikely to be a serious problem in our study (Podsakoff et al., 2003; Podsakoff and Organ, 1986). However, these results should be considered with precaution since, as Guide and Ketokivi (2015) suggested, common method bias is impossible to address in survey research in an adequate manner unless one uses multiple informants per observational unit.

4. Analysis and Results

The theoretical model was tested with structural equation modelling, using the statistical program EQS 6.2 for Windows. Conventional maximum likelihood estimation techniques were used to test the model (Jöreskog and Sörbom, 1996). The fit of the model that included the two moderators was satisfactory ($\chi^2_{(279)}$= 459.191; CFI=0.871; IFI=0.877; BNNFI=0.837; RMSEA=0.079), thereby suggesting that the nomological network of relations fits the data. This is another indicator that supports the validity of these scales (Churchill, 1979).

Table 3 shows the results obtained in hypotheses testing. As it can be seen, they support hypothesis H_1 (β = 0.436; $p<0.001$), meaning that, as proposed, the acquisition and use of knowledge coming from foreign subsidiaries is positively related to the development of innovations in the parent unit, showing the benefits for the MNC of promoting RKT.

Insert Table 3 around here

H_2 and H_3 propose that the relationship between RKT and the company's innovation is moderated by, respectively, the extent to which transferred knowledge is tacit, and by organizational distance between the parent unit and its subsidiaries. The findings provide evidence for both hypotheses since they show that the relationship between RKT and the MNC's innovation increases, first, with the degree of tacitness of the knowledge transferred from subsidiaries to headquarters (H_2; β = 0.330; $p<0.01$) and, second, with organizational distance between both of them (H_3; β =0.310; $p<0.01$). These results suggest that benefits derived from RKT are dependent of the type of knowledge that is transferred. To strengthen the consistency of our results, we have performed a bootstrapping analysis for testing the significance of moderation effects. Thus, using 500 resamples, we generated a 95% percentile

confidence interval (Cepeda-Carrión *et al.* , 2017). As it can be seen in Table 4, the confidence intervals for the moderation effect does not contain the value zero, thus, indicating the existence of a mediating effect at the significance level of 0.05.

Insert Table 4 around here

Finally, as expected, the findings support H_4 and H_5 as well. As table 3 shows, there is a positive relationship between the AC of the parent unit and RKT (H_4; β =0.269; $p<0.01$), and a positive relationship between the latter variable and the use of coordination mechanisms between the parent unit and its subsidiaries (H_5; β = 0.454; $p<0.01$), which means that fostering these two variables is important in order to improve RKT.

5. Conclusions and Discussion

Although previous literature highlights the relevance of RKT for MNCs' competitiveness, the empirical research in this field is still limited. This paper has intended to contribute to this line of research by examining the relationship between RKT and MNCs' innovation, and by studying the role of headquarters, the knowledge recipient in this process of knowledge transfer, as determinants of RKT.

First, findings show that RKT and the development of innovations in headquarters are positively associated. These results are consistent with the few empirical research focusing on the benefits of RKT in the context of MNCs (Driffield *et al*., 2016; Nair *et al*., 2018), and provide evidence that supports the main assumption of recent studies on internationalization of the firms, that RKT is a key process in the development of the MNC´s competitive advantage (Ambos *et al*., 2006; Rabbiosi, 2011; Najafi-Tavani *et al*., 2012; McGuiness *et al*., 2013; Rabbiosi and Santangelo, 2013; Mudambi *et al*., 2014; Nair *et al*., 2015). Furthermore, up to our knowledge, this paper is the first one linking RKT and innovation. Thus, our findings also contribute to the literature on innovation by showing that knowledge creation and effective transfer is also an important determinant of innovation in the context of MNCs.

This paper adds another contribution to the literature on internationalization of the firms, in particular to the research line that focuses on intra-firm knowledge transfer in the context of MNCs, by identifying two factors that act as positive moderators of the link between RKT and MNCs' innovation: the extent to which the knowledge that is transferred is tacit and the organizational distance between the parent unit and the subsidiary. In general, the literature

suggests that both variables are obstacles to knowledge transfer between any two units of MNCs (Gupta and Govindarajan, 2000; Subramanian and Venkatraman, 2001; Minbaeva *et al*., 2003; Ambos *et al*., 2006; Minbaeva *et al.*, 2007; Rabbiosi and Santangelo, 2003; Nair *et al*., 2018), due to the fact that the stickiness of tacit knowledge (Szulanski, 1996) and the lower degree of interaction between units with different organizational practices and culture (Najafi-Tavani *et al*., 2012) can act as a barrier to knowledge transfer. This paper agrees on that idea, but also defends that it is important to make an effort to overcome the obstacles in the acquisition and transfer of tacit knowledge and of knowledge coming from subsidiaries that are different to the parent company in terms of practices and values, because these two types of knowledge are important sources of competitive advantage. With regard to the first variable, the resource-based view explains that the ambiguity associated to tacit knowledge protects it against competitors' imitation. Regarding the second variable, we suggest that different subsidiaries in terms of culture and organizational practices may provide the parent unit with non-duplicative or complementary knowledge, which previous research has highlighted to be a type of knowledge that is vital for enhancing innovation (Zahra and George, 2002).

Our findings show that, as we expected, knowledge tacitness and organizational distance increase the positive relationship between RKT and the development of innovation in the parent company.

Finally, findings show the important role that the parent unit, the knowledge recipient unit, has on RKT. Particularly, they show that there is a positive relationship between both the AC of the parent unit and the coordination mechanism they employ, and RKT. The importance of the AC of the recipient unit in intra-firm knowledge transfer was suggested in previous literature (Szulanski, 1996; Gupta and Govindarajan, 2000; Tsai, 2001; Minbaeva *et al*., 2003; Minbaeva *et al*., 2007) but only a few number of studies had examined it in the context of RKT (Ambos *et al.*, 2006; Nair *et al*., 2016). We found the same situation regarding the effect of the use of coordination mechanisms between headquarters and their subsidiaries, and RKT (Ambos and Ambos, 2009; Rabbiosi, 2011; Rabbiosi and Santangelo, 2013). The results of this paper strengthen the conclusions obtained by the few previous empirical studies on these two variables and contribute to the literature focusing on the determinants/barriers of intra-firm knowledge transfers in the context of the MNCs.

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In addition to contribute to the literature on different fields, the findings of this paper have interesting implications for practitioners. First, they show that MNCs that wish to be more innovative should pay more attention to their subsidiaries. Traditionally, they have been used

to exploit the knowledge generated by the parent unit. However, this paper provides evidence that subsidiaries, themselves, can provide their headquarters with new and valuable knowledge able to foster MNC's innovation. Consequently, our results suggest that MNCs should change their view of the role that their subsidiaries can play in the development of the company´s competitive advantage, and should make an effort to foster RKT. This effort should be particularly important as more tacit is the knowledge that is going to be transmitted from subsidiaries, and when knowledge comes from subsidiaries that have different organizational practices and culture, since, according to our findings, these two variables increase the positive effect of RKT on innovation. Finally, this paper also offers some ideas about how to promote RKT as it provides empirical evidence that the employment of mechanisms of coordination between the parent unit and the subsidiaries, and the parent unit's AC are positively related to RKT. Therefore, in order to promote the transfer of knowledge from subsidiaries to the parent unit MNCs should improve headquarters' AC and invest in the implementation of different mechanisms that facilitate the continuous coordination between the parent unit and its overseas affiliates, such as the use of teamwork involving people from the foreign subsidiary and the parent company, the use of short visits of employees from one unit to the other one, or the use of expatriates.

Although this paper offers interesting contributions to the literature and implications for practitioners, it has also some limitations. Firstly, the cross-sectional design of this research, which limits the elucidation of causal relationships between the variables. In order to examine the causality of these relationships, future research should use longitudinal studies. Secondly, the fact that data for the empirical study was collected from one respondent, which may result in a bias. Although, as mentioned before, some analyses we made suggested that this is not a problem, it would be desirable to have multiple informants in future research. Particularly, in the study of RKT, having both the parent unit and the subsidiary perspective would provide more meaningful insights. Further limitations to be mentioned are the fact that the model certainly does not include all possible variables that could potentially have an impact in RKT, and the low response rate of this study, unfortunately common in this kind of research, particularly in the Spanish context. Regarding this issue, it is worth to mention that the studies on RKT that have obtain a higher response rate usually focus, not on different MNCs, but on knowledge transfers between a limited number of subsidiaries and their parent units (i.e. Ambos *et al*., 2006; Rabbiosi and Santangelo, 2013).

Future research should overcome the limitations indicated here. Particularly, it would be of interest to go deeper into the relationships addressed in the model. For instance, this study has analyzed the moderator role that the use of coordination mechanisms has on the relationship between RKT and innovation. For future research we suggest making a distinction between personal-based mechanisms and technology-based mechanisms, following researchers who have concluded that these two types of mechanisms may have different effects on RKT (Schotter and Bontis, 2009; Rabbiosi and Santangelo, 2013). Another recommendation for examining the link between RKT and innovation in more depth is to take into account the radicalness of innovation in future studies and to include other variables in the model that could explain this relationship. More precisely, we suggest taking into account some characteristics of the subsidiary that have an effect on RKT according to the literature, as the role it plays within the MNC, or its age. Previous research has shown that RKT is more intense when subsidiaries have a competence-creating role in the MNC (Driffield *et al.*, 2016; Mudambi *et al*., 2014), and that age is related to the subsidiary's experience in its own country and in the internal MNC network and, consequently, may have an effect on RKT (Rabbiosi and Santangelo, 2013). Finally, for future research, we also suggest focusing on the transfer of knowledge as unit of analysis, as some studies do (Ambos *et al.,* 2006; Rabbiosi and Santangelo, 2013). This would allow to examine the benefits for the parent company of the transfer from the subsidiary of different types of knowledge, as well as taking into account other characteristics that can have an impact on the link between RKT and the development of innovations in the headquarters. Extending research on RKT in these directions will contribute to a further understanding of this process.

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Appendix 1. Questionnaire items (translated from Spanish)

* Items deleted after the scales cleaning process through CFA.

Innovation (created by the authors from OECD 2005´s definition of the main types of innovation)

Please, indicate the extent to which the firm has introduced the following innovations in the last three years in comparison to the competitors (1= below the competitors; 5= above the competitors):

1. Good or services that are new or significantly improved
2. Production or delivery methods that are new or significantly improved
3. New organizational methods in business practices, workplace organization, etc.
4. New marketing methods involving changes in product placement, product promotion, etc.*

Reverse knowledge transfer (based on Rabbiosi, 2011)

Please, indicate the extent to which the knowledge transferred from your foreign subsidiaries has been useful to improve the following headquarters´ operations (1= not useful at all; 5= very useful):

1. Purchasing management
2. Manufacturing
3. Logistic/distribution
4. Marketing/sales*
5. R&D*
6. Human resources management
7. Quality management
8. Financial Management
9. Management of cooperation agreements*
10. General management*

Knowledge tacitness (based on Pedersen *et al.,* 2003)

Please, indicate your degree of agreement with the following statement (1= strongly disagree; 5= strongly agree):

Knowledge from subsidiaries is mainly acquired by communication face to face

Organizational distance (based on Simonin, 1999; and Ambos *et al.,* 2006)

Please, indicate your degree of agreement with the following statements (1= strongly disagree; 5= strongly agree)

1. Organizational culture and leadership style in the parent company and in the subsidiaries are very similar (reverse-coded).
2. Human resources practices in the parent company and in the subsidiaries are very similar (reverse-coded).
3. The rest of business practices and operational processes in the parent company and in the subsidiaries are very similar (reverse-coded).

Absorptive capacity (based on Marsick and Watkins, 2003)

Please, indicate your degree of agreement with the following statements regarding the parent company (1= strongly disagree; 5= strongly agree)

1. Creates continuous learning opportunities for employees
2. Promote inquiry, dialogue and critical thinking
3. Encourage collaboration and team learning
4. Create systems to capture and share learning
5. Empower people toward a collective vision*
6. Foster employees´ market orientation
7. Provide strategic leadership for learning

Coordination mechanisms (based on Rabbiosi, 2011)

Please, indicate how frequently the following mechanisms are to coordinate relations between the parent company and its foreign subsidiaries (1= used rarely; 5 =used very often):

1. The exchange of documents, such as handbooks, blueprints and databases*
2. Internet-based instruments, such as emails, forums, newsletters, etc.*
3. Teamwork involving people from both the foreign subsidiary and the parent company
4. Short visits of employees from the parent company to the subsidiaries or from subsidiaries to the parent company (less than 6 months)
5. Use of expatriates (months or more)

*Items deleted after the scales cleaning process through CFA.