Too much of two good things: Explicating the limited complementarity between drivers of MNC headquarters' absorptive capacity

Abstract

This study examines how MNC knowledge management mechanisms and international exposure affect MNC headquarters' absorptive capacity (AC). We build on Cohen and Levinthal's (1990) under-researched trade-off between the inward- and outward-looking drivers of AC in the context of the MNC international knowledge transfer. First, we hypothesize that knowledge management mechanisms (the inward-looking driver) and international exposure (the outward-looking driver) directly influence headquarters' AC. Our findings from a sample of 106 Brazilian and Portuguese MNC headquarters support this view. Second, because "not-invented-here" behaviors and distance can affect knowledge flows from subsidiaries, we develop a hypothesis suggesting that the effect of knowledge management mechanisms on the AC of headquarters inversely depends on the international exposure of the MNC. We observe that the trade-off between inward- and outward- drivers of AC was supported for high levels of knowledge coordination and international exposure. Hence, coordination mechanisms become less effective to absorb subsidiary knowledge as the MNC increases its international footprint. We also conclude that the headquarters of highly internationalized MNCs can regard socialization mechanisms as facilitators of the absorption of knowledge generated by subsidiaries.

Keywords: absorptive capacity, knowledge management mechanisms, international exposure, multinational corporation.

1. Introduction

The ability to recognize, assimilate, and apply new external knowledge - defined as absorptive capacity (AC) (Cohen & Levinthal, 1990) - is critical for MNCs as it reduces knowledge gaps (Petersen et al., 2008), and fosters learning, innovation and cross-border knowledge transfers (Lane et al., 2001). In their seminal paper, Cohen and Levinthal (1990) introduce a helpful distinction between "inward-looking" and "outward-looking" AC. The former relates to the efficiency of the firm's internal communication and the commonality of knowledge, whereas the latter refers to its points of contact with external sources of knowledge and diversity of knowledge (Cohen and Levinthal, 1990, p. 133). This distinction provides a starting point for identifying organizational determinants of AC, where some determinants affect the inward-looking AC while others are oriented towards the outward-looking AC.

Cohen and Levinthal (1990) further proposed a trade-off between the two dimensions of AC. While both types of AC are needed, the authors suggest that too much of one or the other may be detrimental to learning. The problem is that firms cannot at the same time maximize commonality and diversity of knowledge, as they will crowd out each other, so the creation of AC will suffer. However, Cohen and Levinthal (1990) do not specify the proposed trade-off between inward-looking AC and outward-looking AC. Consequently, scholars have recently called for more studies focused on this particular aspect of AC (Pedersen et al., 2020; Volberda et al., 2010).

We respond to this call by carefully examining the interplay between the inward-looking and outward-looking determinants of AC. More specifically, we elaborate and test the direct and interaction effects of determinants of AC of the multinational corporation (MNC) headquarters. A unique feature of MNCs is that they have geographically scattered activities and are thus exposed to multiple external sources of dispersed knowledge. The more internationally exposed the MNC, the greater is its exposure and contact with diverse knowledge (Barkema & Vermeulen, 1998; Hitt et al., 1997; Jiménez-Jiménez et al., 2014) that promotes outward-looking AC. The subsidiaries are the operational units exposed to external sources of knowledge. In this sense, the subsidiaries are the outpost sensing the diverse external knowledge that needs to be shared through internal communication channels in the MNC. The inward-looking determinants of AC that promote internal communication efficiency are MNC knowledge management mechanisms of systems, coordination, and socialization (Jansen et al., 2005; Van den Bosch et al., 1999).

Our main contribution lies in our exploration of the expected trade-off, which revolves around analyzing the interaction between the internal knowledge management mechanisms and the level of international exposure. Our research question is the following: To what extent do MNC knowledge management mechanisms (the inward-looking determinant of AC) and international exposure (the outward-looking determinant of AC) affect headquarters' absorptive capacity?

The idea of looking at headquarters lies in its central role in allocating resources and tools to foster the knowledge transfer process (Ciabuschi et al., 2010; Schleimer & Pedersen, 2014), especially considering that foreign subsidiaries have become a significant source of knowledge capture (Blomkvist et al., 2017; Forsgren, 2002). In fact, the literature has called for more

studies on the contextual conditions that make reverse knowledge transfers effective in MNCs (Gaur et al., 2019).

To shed light on this question, we conducted a quantitative study with survey data from a sample of 106 Brazilian and Portuguese MNC headquarters. We found support for our four hypotheses that predicted a positive direct effect of knowledge management mechanisms (systems, coordination and socialization) and international exposure on the AC of MNC headquarters. We also found support for one of our three hypotheses predicting a trade-off between inward and outward determinants of AC. Our findings suggested that when both coordination mechanisms and international exposure are high, the AC of MNC headquarters is reduced.

2. Theoretical background and hypotheses

2.1. MNC headquarters' absorptive capacity

The knowledge-based view suggests that knowledge is vital to differentiate one firm from another and lead to competitive advantages (Conner & Prahalad, 1996). Grant (1996) argues that the firm's primary role is to integrate diverse specialist knowledge into goods and services. MNCs are regarded as networks of firms with a superior ability to effectively transfer and manage dispersed knowledge across borders (Kogut & Zander, 1993). This ability makes them exploit knowledge more effectively and efficiently in the intra-corporate context than through external market mechanisms (Gupta & Govindarajan, 2000).

In line with this view, MNCs use their subsidiaries as instruments for sensing environmental change and accessing external knowledge (e.g., from clients, suppliers, research institutes) (Mudambi, 2002) that is instrumental in triggering product innovation, operating model adjustments and supply chain reconfigurations. Foreign subsidiaries have thus become a significant source of knowledge (Blomkvist et al., 2017; Forsgren, 2002), and in some circumstances, they may become centers of excellence in the MNC's network (Frost et al., 2002; Holm & Pedersen, 2000).

MNC headquarters need to absorb foreign subsidiaries' knowledge from their external network to conduct seizing and reconfiguring activities in response to environmental change. This view does not suggest that subsidiaries are reactive in the reverse knowledge transfer process. Instead, it indicates that MNC headquarters reverse transfer subsidiary knowledge by stimulating its flow (Ciabuschi et al., 2011; Schleimer & Pedersen, 2014) and introducing proper knowledge management mechanisms (Gupta & Govindarajan, 1991; Rabbiosi, 2011), thus increasing their AC (Ambos et al., 2006).

Absorptive capacity has been widely studied as one of the most critical aspects of organizational knowledge transfer and firm innovativeness (Lane et al., 2006; Van Wijk et al., 2008; Volberda et al., 2010). The concept first appeared in a study on international technology transfers by Kedia and Bhagat (1988) (according to the bibliometric analysis of Volberda et al., 2010). It was then scrutinized by Cohen and Levinthal (1989, 1990, 1994), who conceptualized it as the ability of firms to recognize, assimilate, and apply new external knowledge. In this study, we draw theoretical perspectives on AC from the organizational learning literature, as several early

studies link a firm's ability to absorb knowledge to its learning and performance outcomes (Cohen & Levinthal, 1990; Fiol & Lyles, 1985; Kedia & Bhagat, 1988; Levitt & March, 1988). Later studies proposed reconceptualizations of AC, thereby adding to the richness of the construct (Lane et al., 2006; Lane & Lubatkin, 1998; Zahra & George, 2002).

From an organizational learning perspective, Cohen and Levinthal (1990, p.129) posit that AC is primarily a function of a firm's prior related knowledge, which "enhances learning because memory - or the storage of knowledge - is developed by associative learning in which events are recorded into memory by establishing linkages with pre-existing concepts." This notion implies that shared knowledge and expertise permit effective internal communication at the organizational level, which the authors term "inward-looking AC."

However, while prior related knowledge is the primary element in the learning process, it is insufficient to develop effective AC. According to Cohen and Levinthal (1990, p.131), the diversity of the knowledge plays an important role, as diversity "provides a more robust basis for learning because it (…) facilitates the innovative process by enabling the individual to make novel associations and linkages". This diversity mainly emerges through interactions with external sources of knowledge by the operation unit (i.e., the subsidiaries) who act as gatekeepers or boundary-spanners and, as such, translate the obtained knowledge into the MNC-context. Cohen and Levinthal (1990) refer to the firm's ability to absorb knowledge from external sources as "outward-looking AC."

Cohen and Levinthal (1990) highlight that while both inward and outward-looking components are essential, excessive dominance of either one may be detrimental to organizational learning: "If all actors in the organization share the same specialized language, they will be effective in communicating with one another, but they may not be able to tap into diverse external knowledge sources" (Cohen & Levinthal, 1990, p.133). This observation raises issues like how inward- and outward-looking ACs interact. Are they complementary or crowding each other out, as indicated by Cohen and Levinthal? Given these gaps in the extant research, scholars have called for more investigations of these aspects of AC (Pedersen et al., 2020; Volberda et al., 2010).

Bibliometric studies show that the majority of the literature focuses on the outcomes of AC as opposed to its antecedents (Lane et al., 2006; Van Wijk et al., 2008; Volberda et al., 2010). For instance, Volberda et al. (2010) identify three types of antecedents of AC: i) interorganizational, ii) managerial, and iii) intraorganizational. They also note that the latter receives less attention in the literature. These authors argue that internal mechanisms that can influence AC at the firm level, such as the structure of communication, organizational structure, and human resource management (HRM) practices, should be further explored in subsequent studies. In their meta-analytic study on knowledge transfer, Van Wijk et al. (2008, p. 844) claim that "given its importance to organizational knowledge transfer, it is surprising that organizational antecedents of absorptive capacity have been largely ignored."

The extant literature has advanced our understanding of the determinants of AC, but it has left a few essential gaps that motivate this paper. A summary of the critical studies and gaps of interest is presented in Table 1 and further discussed in the next section.

Insert Table 1 about here.

In this paper, we intend to explore further the rationale of inward and outward-looking AC mentioned by Cohen and Levinthal (1990) by proposing a limited complementarity between such antecedents of AC. Drawing on Kotabe et al.'s (2017) definition of complementarity, this implies that a dependent variable (i.e., AC) is jointly affected by two independent variables (i.e., knowledge management capabilities and international exposure), meaning a negative interaction effect besides the expected positive individual direct effects. Therefore, we investigate the extent to which MNC knowledge management mechanisms and international exposure affect headquarters' AC and test the under-researched trade-off between these two components of AC by exploring their interaction effect.

The theoretical underpinnings in this paper suggest the conceptual framework depicted in Figure 1. We will develop and discuss it next.

Insert Figure 1 about here.

2.2.*Knowledge management mechanisms and absorptive capacity*

As previously mentioned, AC is primarily a function of prior related knowledge. Cohen and Levinthal (1990) based their reasoning on studies that showed that memory is self-reinforcing; the more information is stored, the greater the ability to put new knowledge into memory. In addition, Cohen and Levinthal (1990, p.129-130) suggest that: "the notion that prior knowledge facilitates the learning of new related knowledge can be extended to include the case in which the knowledge in question may itself be a set of learning skills." Therefore, our focus is on the organization's learning and knowledge management mechanisms.

To understand the sources of a firm's AC at the organizational level, Cohen and Levinthal (1990) examine the structure of communication and the learning incentives within the organization (i.e., knowledge management mechanisms). Van den Bosch et al. (1999) show that these mechanisms play a salient role in forming AC. They define three categories of knowledge management mechanisms: systems, coordination, and socialization, arguing that firms may use these mechanisms differently to promote changes in the efficiency, scope, and flexibility of knowledge absorption. Later, Jansen et al. (2005) empirically show how each of these mechanisms affects different dimensions of AC. Furthermore, following the widespread

application of the absorptive capacity concept in the management literature, the meta-analytic study by Volberda et al. (2010) highlighted that organizational structures and processes, incentives, informal networks, and internal communication were the most important antecedents of AC.

We posit that these sets of knowledge management mechanisms represent the inward-looking determinant of AC. They promote efficiency in communication, which enhances a firm's ability to recognize the value of new information, assimilate it, and apply it to commercial ends (Cohen & Levinthal, 1990). Therefore, we expect knowledge management mechanisms (the inward-looking component) to affect MNCs' headquarters' AC directly. We extend Jansen et al. (2005)´s study by testing the effect of such mechanisms on the AC of headquarters in the context of international knowledge transfers.

In such a context, headquarters enhance their learning abilities and AC by adopting knowledge management mechanisms to foster communication with subsidiaries. While subsidiaries may be unwilling to share knowledge, research has shown that their motivational disposition does not significantly affect knowledge outflows (Gupta & Govindarajan, 2000). Headquarters can also employ mechanisms to overcome such unwillingness (Blomkvist, 2012; Kong et al., 2018).

When analyzing the barriers to internal knowledge transfer, Szulanski (1996) suggested that knowledge-related factors such as the recipient's lack of absorptive capacity play an important role. We argue that by using knowledge management mechanisms to transfer knowledge in multiple directions within the MNC, the headquarters, as an orchestrator of knowledge flows, expands its sources of learning and, thus, reaps additional benefits from the transfers, such as increasing its own absorptive capacity. In addition, following Lenox and King (2004), who suggest that prior related knowledge should be distributed throughout the organization to more effectively influence AC, we argue that these knowledge management mechanisms should be implemented in the headquarters and throughout the subsidiaries to optimize their effect on AC.

2.2.1. Knowledge systems mechanisms and absorptive capacity

Van den Bosch et al. (1999, p.556) define knowledge systems as "the degree to which rules, procedures, instructions, and communications are laid down in written documents or formal systems." Research on organizational learning has examined the role of systems in promoting knowledge absorption by integrating explicit knowledge (Nonaka, 1994) and framing behaviors for handling structured situations (Galbraith, 1973; Van den Bosch et al., 1999). It has also investigated the underlying mechanisms by which knowledge systems help promote managerial relationships and facilitate knowledge sharing and communication (Inkpen, 1998; Niederman, 2005). These mechanisms include electronic-based conduits, such as groupware applications, instant messaging, and virtual community platforms (Buckley & Carter, 1999; Rabbiosi, 2011), which are instrumental in capturing, disseminating, and transferring knowledge internationally (Almeida et al., 2002; Andersen & Foss, 2005; Persaud, 2005). This is particularly true among geographically-dispersed units (Carbonara, 2005; Jasimuddin, 2007). By enacting virtual collaboration and learning, systems reduce the time barriers and transaction costs involved in

coordinating information-intensive activities (Carbonara, 2005). They also promote incremental learning, the utilization of existing knowledge, and knowledge homogeneity (Kane et al., 2005), ultimately increasing firm competitiveness (Andreeva & Kianto, 2012).

In the context of knowledge transfers from subsidiaries, the extant research suggests the presence of links between knowledge systems and absorptive capacity. For instance, Gupta and Govindarajan (2000) find that knowledge outflows from a subsidiary are positively related to the richness of transmission channels, and Rabbiosi (2011) shows that knowledge systems positively affect the level of reverse knowledge transfer, especially when used with contributor subsidiaries. Crespo et al. (2014) find that the frequency of communication plays a central role in facilitating knowledge flows from subsidiaries to other units in the MNC. However, these studies do not specifically link such knowledge systems to absorptive capacity. A notable exception is Nair et al. (2016). They examine international reverse knowledge transfers from subsidiaries to headquarters of Indian MNCs and find that the firm's technical knowledge infrastructure (i.e., business intelligence, collaboration, and distributed learning software) positively affects the headquarters' AC. However, their study focused on MNCs from an emerging market, relying on a knowledge-seeking internationalization rationale. We extend previous literature by testing the effect of knowledge systems mechanisms on the AC of MNC headquarters from different markets, where companies also internationalize to exploit headquarters-level advantages (Guillén & García-Canal, 2009). Thus, we arrive at the following hypothesis:

H1: As knowledge systems mechanisms increase, the capacity of MNC headquarters to absorb knowledge from its foreign subsidiaries increases.

2.2.2. Knowledge coordination mechanisms and absorptive capacity

Routines related to coordination generate firm-specific capabilities and interorganizational learning that may help explain why some firms respond better to external changes that affect their competitive position (Teece et al., 1997). Firms may require lateral capabilities in interpersonal and cross-functional links to foster knowledge sharing (Galbraith et al., 2002). In MNCs, lateral integrative mechanisms and performance assessments may vary systematically across subsidiaries and produce different learning outcomes (Gupta & Govindarajan, 1991).

Knowledge coordination mechanisms are associated with formal structural mechanisms, such as R&D departments, interdivisional cooperation mechanisms (Argyres, 1995), matrix structures, and cross-unit interfaces (Galbraith, 1973; Nadler & Tushman, 1987). These structural mechanisms function as liaison devices that cut across functions and lines of authority and facilitate knowledge absorption (Van den Bosch et al., 1999). For instance, Argyres and Silverman (2004) show that organizations with centralized R&D structures can generate innovations that have a broader impact on subsequent technological evolution than organizations with decentralized R&D activities. However, they do not test the effect on absorptive capacity. Jansen et al. (2005) show that knowledge coordination (e.g., cross-functional interfaces, participation in decision-making, and job rotation) are particularly

effective in enhancing a unit's potential AC (i.e., the acquisition and assimilation dimensions of AC) (Zahra & George, 2002). However, their study is limited to the domestic setting.

In their review of the AC literature, Lane et al. (2006) show that organizational antecedents related to HRM mechanisms have largely been ignored. HRM practices also play a pivotal role in ensuring coordination among subunits of a firm to foster knowledge sharing (Cabrera & Cabrera, 2005; Minbaeva et al., 2012). For instance, training programs connect people from different departments or units, creating shared workflow interfaces (Galbraith et al., 2002; Van den Bosch et al., 1999).

In the international business context, Lane et al. (2001) demonstrate that learning structures and processes positively affect the ability of international joint ventures (IJVs) to assimilate new knowledge from parent firms, while the training competence of IJVs affects their ability to apply the embodied knowledge. Furthermore, establishing explicit goals that recognize knowledge-sharing behaviors helps IJVs acquire knowledge from their foreign parents (Lyles & Salk, 1996). However, these studies do not explore knowledge transfers in the opposite direction (i.e., from IJVs to parents). Addressing this gap is essential because reverse and conventional transfers are based on different logics. For instance, knowledge characteristics (e.g., knowledge relevance) are important for reverse knowledge transfers, while organizational factors (e.g., subsidiary role) affect conventional transfers (Yang et al., 2008).

Drawing on previous literature that establishes a link between knowledge coordination mechanisms and firms' learning abilities (Jansen et al., 2005; Lane et al., 2001; Lyles & Salk, 1996; Van den Bosch et al., 1999), we suggest that the use of coordination mechanisms on a global scale will positively influence the AC of the MNC's headquarters. Therefore, as a hypothesis, we propose that:

> *H2: As knowledge coordination mechanisms increase, the capacity of MNC headquarters to absorb knowledge from its foreign subsidiaries increases.*

2.2.3. Knowledge socialization mechanisms and absorptive capacity

Extant research suggests that transfers of tacit knowledge may be more critical than transfers of explicit knowledge (Day & Nedungadi, 1994; Polanyi, 1958). In this sense, Bresman et al. (1999, p.442) argue that "individuals will only participate willingly in knowledge exchange once they share a sense of identity or belonging with their colleagues." Therefore, stimulating social relations between headquarters and subsidiary managers may help enhance identity (Ashforth & Saks, 1996) and commitment and compliance (Adler & Kwon, 2002). Gupta and Govindarajan (2000, p.479) characterize knowledge socialization mechanisms as the practices and interactions that "build interpersonal familiarity, personal affinity and convergence in cognitive maps among personnel from different subsidiaries."

Several researchers suggest that superior knowledge socialization mechanisms are likely to affect intra-MNC knowledge management processes and outcomes directly. For instance, Gooderham, Minbaeva, and Pedersen (2011) show that governance mechanisms, especially

social relations, positively affect firms' social capital, which, in turn, facilitates the transfer of knowledge. Bresman et al. (1999), who focus on knowledge transfers in international acquisitions, show that more tacit forms of knowledge (e.g., technological know-how) are best transferred through extended visits and technical meetings. Ghoshal et al. (1994) find that interpersonal relationships stimulated by joint work in teams, task forces, and meetings are positively related to the frequency of subsidiary-headquarters communications. These authors also highlight the importance of spending time at the firm's headquarters and in inter-unit communities of practice. A similar perspective on the role of extensive travel and joint assignments in enabling subsidiary-headquarters integration is featured in Ghoshal and Bartlett (1988). Nevertheless, none of these studies address the role of knowledge socialization mechanisms in forming AC. This aspect was examined by Van den Bosch et al. (1999) and Jansen et al. (2005), although not in the context of international knowledge transfers. These authors showed that knowledge socialization mechanisms in the form of connectedness and socialization tactics directly affect firms' AC at the national firm level. As previously discussed, an MNC should develop a superior efficiency to transfer knowledge across borders (Kogut & Zander, 1993) considering the particularities of the knowledge flow direction (Yang et al., 2008). Based on these arguments and with a focus on AC at the MNC headquarters level, we derive the following hypothesis:

H3: As knowledge socialization mechanisms increase, the capacity of MNC headquarters to absorb knowledge from its foreign subsidiaries increases.

2.3. International exposure and absorptive capacity

Knowledge diversity is needed to access relevant knowledge bases outside the firm. It also complements existing knowledge in the formation of AC, as Cohen and Levinthal (1990, p.133) state:

> "Assuming a sufficient level of knowledge overlap to ensure effective communication, interactions across individuals who each possess diverse and different knowledge structures will augment the organization's capacity for making novel linkages and associations - innovating - beyond what any one individual can achieve."

International exposure reflects the magnitude of an MNC's foreign operations and geographical dispersion (Gomes & Ramaswamy, 1999; Ietto-Gillies, 1998; Sullivan, 1994). MNCs operate in different cultural, administrative, geographical and economic settings (Ghemawat, 2001) and are continuously exposed to various external knowledge sources as subsidiaries sense and respond to country-level shifts in consumer preferences, political and regulatory frameworks, socioeconomic trends and stakeholder demands. Therefore, in the context of international knowledge transfers, the international exposure of an MNC is a source of knowledge diversity. Their international exposure thus extends the firm's knowledge base and brings new learning opportunities (Johanson & Vahlne, 1977, 2003).

Building on Cohen and Levinthal's (1990) reasoning, we argue that the knowledge diversity from international exposure complements the MNC headquarters' existing knowledge in

forming AC. As the MNC internationalizes, it should expose itself to more diverse knowledge bases. The interactions between subsidiaries and headquarters should allow the latter to make new associations with prior knowledge and create opportunities to exploit external knowledge. This argument suggests a positive relationship between international exposure and headquarters' AC. It also aligns with the notion that accessing and interpreting knowledge from various sources leads to more organizational learning (Huber, 1991) and innovation (Laursen & Salter, 2006).

The extant literature has implicitly suggested this potential relationship between international exposure and AC. For instance, Barkema and Vermeulen (1998) empirically show that global diversity helps firms develop richer knowledge structures and more robust technological capabilities, while Hitt et al. (1997) find a positive effect of international diversification on firm innovation. Denison et al. (1996) argue that experience in global markets increases CEO perceptions of foreign investments as opportunities rather than threats. These studies do not test whether international exposure leads to absorptive capacity, although Denison et al. (1996) consider the concept of absorptive capacity in their rationale. According to these authors, the organizational memory of past foreign direct investment (FDI) behaviors and routines increases the firm's absorptive capacity and creates more positive interpretations of subsequent transactions. MNCs with greater absorptive capacity can better perceive benefits from subsidiary knowledge transfers (Ambos et al., 2006). International exposure also positively affects the level of knowledge transfer from subsidiaries, affecting firm innovation (Jiménez-Jiménez et al., 2014). Thus, we hypothesize that:

H4: As international exposure increases, the capacity of MNC headquarters to absorb knowledge from its foreign subsidiaries increases.

2.4. Interaction effects of international exposure and knowledge management mechanisms

Building on our previous arguments, we can theorize how interactions between an MNC's international exposure and its knowledge management mechanisms may affect its headquarters' AC. Although we expect a positive relationship between the inward-looking determinant (knowledge management mechanisms) and the outward-looking determinant (international exposure) and AC, too much of both could be detrimental. As Cohen and Levinthal (1990, p.133) state:

> "With regard to the absorptive capacity of the firm as a whole, there may, however, be a trade-off in the efficiency of internal communication against the ability of the subunit to assimilate and exploit information originating from other subunits or the environment. This can be seen as a trade-off between inward-looking versus outward-looking absorptive capacities."

Their argument suggests a negative interaction between knowledge management mechanisms and international exposure. When knowledge management mechanisms are highly developed (i.e., widely used and functioning in the entire MNC), units should effectively communicate with one another. Still, they may not recognize and value knowledge from diverse external

sources, such as the various geographies of the MNC. As Cohen and Levinthal (1990, p.134) note: "While common knowledge improves communication, commonality should not be carried so far that diversity across individuals is substantially diminished." This phenomenon may be explained by the not-invented-here (NIH) syndrome (Cohen & Levinthal, 1990; Volberda et al., 2010). The NIH syndrome involves a group's perception that it possesses a monopoly on knowledge, which leads it to reject new ideas from the outside (Katz & Allen, 1982). This dysfunction, in turn, negatively affects firm innovation (Burcharth et al., 2014) and performance outcomes (Antons & Piller, 2015). Therefore, too much commonality among knowledge management mechanisms within the MNC may reduce its openness to new, external knowledge and jeopardize its learning ability. Although the extant literature acknowledges the need to assess the amount of knowledge overlap optimal for value creation (Ambos et al., 2013), no studies have theoretically or empirically explored this trade-off (Volberda et al., 2010).

Correspondingly, too high international exposure can hinder accessing, interpreting, and translating new external knowledge into a form that is understandable by the firm, thereby reducing internal communication efficiency, as such new knowledge may be too distant from the firm's existing knowledge base (Lane & Lubatkin, 1998). We posit that this is the case in highly internationalized MNCs, as they face significant challenges in transferring knowledge from subsidiaries to headquarters due to geographical, cultural, and linguistic distance (Ambos & Ambos, 2009; Lyles & Salk, 1996; Van Wijk et al., 2008). In such situations, it is more difficult and costly to achieve coordination and synergy among units (Argyres, 1996; Gupta & Govindarajan, 1991), and organizational complexity may increase to a point where information overload hampers learning (Barkema & Vermeulen, 1998).

Distance matters in this regard, as greater international exposure increases managerial transaction costs and information-processing demands (Hitt et al., 1997). For instance, Gomes and Ramaswamy (1999) show that higher levels of multinationality are beneficial up to a certain point beyond which performance benefits decrease. Eriksson et al. (2000) argue that firms that start their international expansion in culturally distant countries are more likely to lack internationalization knowledge. As the global footprint of MNCs widens, the complexity of integrating increasingly diverse subsidiary knowledge reduces the effectiveness of knowledge transfer mechanisms at the headquarters level. Indeed, as Gaur et al. (2019, p.1895) point out: "When knowledge generated in one subsidiary needs to be combined with the knowledge generated at another subsidiary, the transfer challenges get accentuated." Martin and Salomon (2003, p. 357) add to this rationale. They posit that "the level of tacitness of such knowledge places major constraints on the extent and manner in which it can be used to support corporate expansion." Meyer et al. (2011) refer to this compromise as "multiple embeddedness". In other words, an MNC must find a balance between their "'internal' embeddedness within the MNE network, and their 'external' embeddedness in the host milieu" (Meyer et al., 2011, p.235), without being overwhelmed by the managerial challenges created by diversity.

Although the extant studies suggest limited complementarity between knowledge management mechanisms and international exposure, most of them do not test the effects of these interactions on knowledge outcomes. They also neglect the potential trade-off between these components of AC. In this study, we specifically address this gap in the literature. Thus, we

expect the trade-off between knowledge management mechanisms (the inward-looking determinant of AC) and international exposure (the outward-looking determinant of AC) to result in a negative interaction effect, such that headquarters will be less effective in their capacity to absorb knowledge from foreign subsidiaries when MNCs are highly internationally exposed and make extensive use of knowledge management mechanisms across their global operations. Hence, we hypothesize that:

> *H5: International exposure and knowledge management mechanisms (H5a: systems; H5b: coordination; H5c: socialization) have a negative interaction effect on the capacity of MNC headquarters to absorb knowledge from its foreign subsidiaries.*

3. Methods

3.1. Data collection and sample

We collected firm-level, cross-sectional data on Brazilian and Portuguese MNCs to test our hypotheses. There are some considerations when selecting samples from these two countries. Brazil and Portugal vary on institutional, economic, and cultural dimensions. Internationalization motives and subsidiary roles also differ across MNCs from these countries, as emerging market MNCs tend to focus on acquiring new capabilities and sources of competitive advantage instead of exploiting existing headquarters-level advantages (Guillén & García-Canal, 2009). These context dissimilarities could affect the headquarters' benefits from subsidiary knowledge transfers (Ambos et al., 2006). Thus, given the difficulty of measuring intangibles, such as knowledge management mechanisms and absorptive capacity (Chetty et al., 2014; Hitt et al., 1998), we analyzed these two empirical settings to increase the cross-country validity of the measures and findings.

An international research team with members from both countries co-designed the survey procedure and data collection instruments. Members of the research team were trained using uniform protocols to ensure consistency in the measurement items, sampling, data collection, and coding procedures. An initial dataset of 176 MNCs (87 from Brazil and 89 from Portugal) was selected from business directories and professional networks, guided by the following criteria: (i) firms engaged in FDI activities (e.g., commercial office, assembly, distribution center, production, research and development, and services); and (ii) capital controlled by domestic entities. As the official language of Brazil and Portugal is Portuguese, the same questionnaire with 22 indicators was used with adaptations to reflect local terminology. The questionnaire consisted of two sections covering questions related to the international managers' perceptions of their MNCs' knowledge management mechanisms and absorptive capacity. It also included objective measures of firms' activities (i.e., total and international revenues, assets, and employees). We collected the latter information through the survey because our sample included several medium-sized and unlisted enterprises that rarely publish financial and operational data.

The respondents were mainly senior managers in charge of the MNC's international operations (75% C-level and 25% middle managers). To increase the accuracy of answers, we instructed respondents to answer the questions on their firms' knowledge management mechanisms and absorptive capacity in articulation with the main person in charge of the company's strategy (often the CEO). Their contact was requested in the questionnaire for follow-up by the research team. We also instructed respondents to collect financial and operational data from internal sources whenever necessary. For instance, information on the company´s assets, revenues (total and foreign), and employees was typically provided by the finance and HR departments, respectively. Departments usually involved in the survey were: international relations, business development, communication, finance, and HR. The research team conducted follow-up calls to respond to concerns and stimulate answers. Data collection took place from May through August 2017.

The use of perceptual measures to operationalize knowledge management mechanisms and absorptive capacity may entail common method bias. To address this issue, we followed Podsakoff et al. (2003) recommendation to ensure respondent and firm anonymity, thereby reducing the propensity for acquiescent or socially acceptable responses. Also, using objective measures for the construct of international exposure reduces the potential impact of common method bias. We could further control for common method bias by using separate samples for explanatory and explained variables or different data sources. However, due to sample size constraints, independent samples might lead to information loss and spurious results. In addition, we did not identify alternative data sources that would provide a valid representation of the variables.

The final sample comprised 106 MNCs (52 from Brazil and 54 from Portugal), which gives an overall response rate of 60.2% (59.7% in Brazil and 60.7% in Portugal). The high response rates were due to the follow-up efforts in the data collection phase. The sample size raises no generalizability or statistical power concerns in light of the 96 degrees of freedom (106 observations – 10 estimated parameters) and the ratio of observations to independent variables of 11.7:1 (106 observations/9 independent variables), which exceeds the threshold of 5:1 that is considered appropriate for multiple regression analyses (Hair et al., 2005). A maximum of two missing values was found in 7 of the 22 indicators, with 9 "no responses" out of 2,332 data points (0.39%). This incidence is unlikely to create limitations in statistical tests. A Little's MCAR test showed that the missing values were randomly spread (chi-squared = 74.766, DF = 80, Sig. = 0.644). We, therefore, replaced them with the item's mean, as suggested by Hair et al. (2005).

3.2. Measures

We used both objective and subjective measures. The measures were based on validated scales and indexes found in the extant literature and adapted to the context of interest (international knowledge transfers) following qualitative interviews with international managers of seven MNCs (four in Brazil and three in Portugal).

Dependent variable. *Absorptive capacity* was measured using a four-item scale that reflected the ability of the MNC headquarters to absorb knowledge from its foreign subsidiaries. Given

calls for more studies adopting a capabilities approach to AC (Lane et al., 2006), we consulted previous literature (Jansen et al., 2005; Zahra & George, 2002) and made adaptations to the existing scales based on interviews with the companies and the context of the study. The respondents answered the questions using a seven-point Likert-type scale, ranging from 1 (completely disagree) to 7 (completely agree). The items reflected the dimensions proposed by Zahra and George (2002): "The headquarters frequently interacts with foreign subsidiaries to acquire new knowledge" (acquisition); "Our company easily assimilates opportunities in the international market identified by our foreign subsidiaries" (assimilation); "Our company systematically grasps the knowledge generated in foreign subsidiaries" (transformation); and "Our company constantly tries better to exploit knowledge from foreign subsidiaries" (exploitation). The final scale displayed good reliability (Cronbach's alpha = 0.92) (Nunnally, 1978). Therefore, the items were averaged to compute the overall AC.

Independent variables. Knowledge management mechanisms were measured using a five-point scale focused on the extent to which the MNCs used several mechanisms globally to transfer knowledge from their subsidiaries. We adapted the systems, coordination, and socialization mechanisms proposed by Van den Bosch et al. (1999) and Jansen et al. (2005). To build our scales, we also considered other literature on knowledge transfers (Ambos et al., 2006; Argyres & Silverman, 2004; Cabrera & Cabrera, 2005; Lane & Lubatkin, 1998; Lane et al., 2001; Lyles & Salk, 1996; Minbaeva et al., 2012; Rabbiosi, 2011). Systems mechanisms were measured in terms of the global use of three mechanisms to transfer knowledge internationally: webcasts (online speeches), social networks for knowledge sharing, and virtual platforms for knowledge sharing (Cronbach's alpha = 0.79). Coordination mechanisms were measured as the extent of global use of three mechanisms to foster international knowledge transfers: R&D department, training on innovation and knowledge sharing, and goals for innovation and knowledge sharing (Cronbach's alpha = 0.72). Socialization mechanisms were measured by the global use of four mechanisms to transfer knowledge internationally: meetings, communities of practice, international trips, and international project teams (Cronbach's alpha = 0.71).

Individual items captured the extent of global implementation (as opposed to mere existence) of each knowledge management mechanism. The scales ranged from 1 to 5 (1 = "The company does not use"; 2 = "In development"; 3 = "Only the headquarters use OR only the foreign subsidiaries use"; 4 = "The headquarters and some foreign subsidiaries use"; 5 = "The headquarters and all foreign subsidiaries use").

We conducted an exploratory factor analysis (EFA) to confirm that the scale was multidimensional and that items presented factor loadings in the expected dimension. The EFA resulted in three factors that explained 63.77% of the variance (Kaiser-Meyer-Olkin: KMO = 0.803/Bartlett's test of sphericity: chi-squared 343.625, df = 45, $p < 0.000$). As the items used in these three dimensions are not necessarily correlated and cannot be treated as interchangeable, we operationalized coordination, systems, and socialization mechanisms as formative constructs (Jarvis et al., 2003). Our final variables accounted for the corresponding factor loadings resulting from each EFA dimension.

International exposure was measured using a composite index focused on the intensity of foreign activities and geographical diversity. The index is the weighted average of two items: i) the ratio of foreign assets to total assets, which mainly captures global production (Daniels & Bracker, 1989; Ramaswamy, 1993), and ii) the ratio of foreign employees to total employees, which captures the global workforce. The items were averaged and weighted by the number of countries the MNC operates to account for its geographical diversity. Given that international exposure is a multidimensional construct (Gomes & Ramaswamy, 1999; Sullivan, 1994), these measures encompass the various forms of internationalization among companies from different industries. The final scale ranged from 0 to 1, with values closer to 0 reflecting lower degrees of international exposure and values closer to 1 reflecting higher degrees of international exposure. Similar composite measures have been used in research that assesses the level of internationalization of firms (Ramsey et al., 2013; Ietto-Gillies, 1998; Tuselmann et al., 2008.

We conducted a confirmatory factor analysis (CFA) to further check for construct validity and model fit (Bagozzi et al., 1991; Hair et al., 2005). We added the corresponding items used to measure the reflective constructs (i.e., AC and international exposure). For the formative construct of knowledge management mechanisms, we added the three variables (systems, coordination, and socialization) resulting from the EFA (for model fit purposes). The item loadings of the reflective constructs of AC and international exposure were all greater than 0.500 and significant ($p < 0.000$) in their respective dimensions, which provides evidence of convergent validity. We also calculated construct reliability (CR) and all constructs presented values higher than 0.70 (AC = 0.93, international exposure = 0.89). With regard to average variance extracted (AVE), the values were higher than the recommended threshold of 0.50 (AC = 0.76, international exposure = 0.74) (Fornell & Larcker, 1981; Hair et al., 2005). The AVEs were also higher than the constructs' bivariate correlations, indicating that the constructs differ. Thus, the assumption of discriminant validity between AC and international exposure is confirmed. Finally, the results indicate that the model fits the data well (chi-squared = 37.858, df = 32, $p = 0.219$, goodness-of-fit index (GFI) = 0.936, comparative fit index (CFI) = 0.991, root-mean-square error of approximation (RMSEA) = 0.042). For the tests of the hypotheses, which included interaction terms, all independent variables and interaction terms were standardized (Field, 2013).

Control variables. We controlled for several firm characteristics to minimize spurious effects. We included a control for the effects of *firm nationality* (0 = Brazilian; 1 = Portuguese), as the benefits of subsidiary knowledge transfers may vary due to contextual differences (Ambos et al., 2006; Gaur et al., 2019). As previously mentioned, controlling for firm nationality also plays a role in determining whether our findings are country-specific. *Firm industry* was included to measure the value added by the firm's activities (1 = natural resources; 2 = manufacturing; 3 = services), as industries vary in knowledge intensity and dynamics (Cho & Padmanabhan, 2005; Gupta & Govindarajan, 2000). *Firm size*, which is also a determinant of knowledge transfer (Van Wijk et al., 2008), was measured by the MNC's total revenue in the previous year (i.e., 2016). We also controlled for firms' *international experience*, as firms that operate internationally for more extended periods may accumulate a more extensive knowledge base (Johanson & Vahlne, 1977, 2003), affecting their absorptive capacity. We measured this

variable as the number of years since the firm established its first international subsidiary. Finally, we controlled whether firms were *listed* on a stock exchange (0 = not listed; 1 = listed), as listing requirements may lead to a greater formalization of knowledge and transparency (Hoskisson et al., 2000).

4. Results

To test our hypotheses, we estimated a series of multivariate ordinary least squares regressions. Before this estimation, we performed the usual diagnostics tests to examine the distribution properties of the data and produce reliable estimators. The results were satisfactory, as there were no substantial deviations from homoscedasticity, normality, or linearity. Table 2 presents descriptive statistics for the variables. Table 3, which displays the correlations, indicates that all correlations among predictor variables were less than 0.5, and correlations above the 0.8 threshold would be problematic (Field, 2013). We also checked for possible multicollinearity issues, and the results were acceptable. The maximum variance inflation factor (VIF) was 8.4. All but two variables had VIFs of less than 3.5, which is below the cut-off of 10 recommended for multiple regression analyses (Neter et al., 1985; Wooldridge, 2003).

Insert Table 2 about here.

Insert Table 3 about here.

Concerning the control variables, firm nationality is significantly and negatively correlated with coordination mechanisms, suggesting that Brazilian MNCs make greater use of these mechanisms to transfer knowledge internationally than Portuguese MNCs. In addition, firms in higher value-adding industries (e.g., services) adopt systems mechanisms more intensively. In comparison, firms in lower value-adding sectors (e.g., natural resources and manufacturing) rely on coordination mechanisms to manage knowledge internationally. Finally, firms with more international experience tend to exhibit higher international exposure and rely on socialization mechanisms across their global operations.

We used hierarchical entry of the independent variables to compute the regressions, starting with a base model with controls (Model 1). Each independent variable's main and interaction effects were entered in Models 2 to 4, respectively. The fifth model included all direct effects, and the three interaction effects were then added to the full model (Model 6). Our hierarchical models were analyzed as indicated in Table 4.

Insert Table 4 about here.

The results of Model 6 support H1, which predicts that systems mechanisms positively affect MNC headquarters' absorptive capacity (β = 0.233, p = 0.002). The interaction term was in the hypothesized direction but not significant (β = -0.068, p = 0.474), which leads us to reject H5a. When analyzed separately from the other knowledge management mechanisms, systems mechanisms have an insignificant direct effect (β = 0.191, p = 0.051) but a significant negative interaction with international exposure, as shown in Model 2 (β = -0.289, p = 0.010).

Concerning coordination mechanisms, Model 6 offers support for H2, which proposes a direct effect on MNC headquarters' absorptive capacity (β = 0.309, p < 0.000). The interaction with international exposure is also significant, thus providing support for H5b (β = -0.247, p = 0.002), which proposes a trade-off between this inward-looking determinant of AC and the outward-looking determinant. We also found support for both hypotheses when testing coordination mechanisms separately from the others, as shown in Model 3 (β = 0.317, p = 0.002 for the direct effect; β = -0.249, p = 0.014 for the interaction effect).

For socialization mechanisms, we found a strong positive direct effect on MNC headquarters' absorptive capacity (β = 0.562, p < 0.000), as depicted in Model 6, which provides support for H3. The interaction term is insignificant (β = 0.034, p = 0.689), which leads us to reject H5c. The results of Model 4, which excludes other knowledge management mechanisms, indicate that socialization mechanisms increase MNC headquarters' absorptive capacity without the trade-off effect with international exposure (β = 0.561, p < 0.000 for the direct effect; β = 0.025, p = 0.778 for the interaction effect).

International exposure has a positive, direct effect on MNC headquarters' absorptive capacity, as shown in Model 6. This supports H4 (β = 0.183, p = 0.042). Therefore, diversity of knowledge, as expressed by MNCs' international operations, increases MNC headquarters' absorptive capacity when accounting for all three knowledge management mechanisms. The direct effects of international exposure differ across Models 2 to 5, as international exposure is only significant in the model accounting for systems mechanisms (β = 0.279, p = 0.018).

As for control variables, firm nationality (β = 0.045, p = 0.590) and firm industry (β =-0.093, p = 0.231) have no significant impact on AC. This finding suggests that firms may have similar conditions to increase their AC when learning from foreign subsidiaries regardless of industry or nationality. As expected, firm size plays a role in the formation of headquarters AC (β = 0.229, p = 0.003), possibly because larger firms tend to transfer more knowledge (Van Wijk et al., 2008) and have better access to local market knowledge (Petersen et al., 2008). Contrary to our expectations, firm listing (β = -0.189, p = 0.027) and firm international experience (β = -0.167, p = 0.031) have a negative impact on headquarters AC. As listed firms tend to employ more mechanisms to formalize tacit knowledge per transparency requirements (Hoskisson et al., 2000), they may become too embedded in their internal communication and thus suffer from the NIH syndrome, reducing their AC. Similarly, firms operating abroad for longer periods may

be dealing with information overload and increased complexity of coordinating too diverse knowledge (given that they are usually high in international exposure), also having the AC reduced. Similarly, firms operating abroad for longer periods may be dealing with information overload and increased complexity of coordinating too diverse knowledge (given that they are usually high in international exposure as well), also having the AC reduced.

All models provided significant solutions, as shown by the F values ($p < 0.000$) (except for Model 1 with controls only). Model 6, which comprises all variables (controls, three knowledge management mechanisms, international exposure, and interaction effects), explains more of the variance in MNC headquarters' absorptive capacity. The R^2 and adjusted R^2 are the highest among the six models ($R^2 = 0.570$; adjusted $R^2 = 0.515$).

To assess the validity of findings across Brazil and Portugal, we controlled for firm nationality (Model 6), which had no significant effect. As for the other control variables, the results of Model 6 indicate that listed firms and firms that have more international experience tend to have lower absorptive capacity at the headquarters level. Conversely, larger MNCs display higher AC at the headquarters level when accounting for the other variables in the study.

5. Discussion and contributions

In this article, we have explored the influence of inward-looking and outward-looking drivers of the capacity of MNC headquarters to absorb knowledge from foreign subsidiaries (knowledge management mechanisms and international exposure, respectively). We have elaborated theoretically on the nature of the trade-off effect proposed by Cohen and Levinthal (1990) between the inward-looking and outward-looking determinants of AC. We have empirically analyzed the interactions between them. Our approach and findings are novel as, to our knowledge, no previous studies have explored this trade-off effect, and no other studies have explicated the characteristics of the interplay between these drivers of AC (Volberda et al., 2010). Overall, our conceptualization and operationalization of this contingent effect have useful research implications.

Our results confirmed our hypothesis that systems mechanisms improve the AC of MNC headquarters concerning knowledge generated by foreign subsidiaries. This finding extends the literature on the influence of systems mechanisms on AC (Jansen et al., 2005; Van den Bosch et al., 1999) to the context of international knowledge transfers. It also adds to the emerging discussion of how systems mechanisms influence the reverse knowledge transfer process (Crespo et al., 2014; Gupta & Govindarajan, 2000; Rabbiosi, 2011) and advances that line of research by showing the direct link with AC. Although the interaction between systems mechanisms and international exposure was not confirmed in the main model (Model 6), the results of Model 2 indicated a significant, negative effect, signaling a potential trade-off that deserves additional attention in future studies.

Our findings also confirmed that coordination mechanisms increase the ability of MNC headquarters to absorb knowledge generated by foreign subsidiaries. This result aligns with previous studies showing a direct effect of coordination mechanisms on AC (Jansen et al., 2005; Lane et al., 2001; Lyles & Salk, 1996; Van den Bosch et al., 1999) and extends them to the

context of subsidiary knowledge transfers. It also diverges from Argyres and Silverman (2004) by suggesting that globally widespread (instead of centralized) R&D structures can enhance knowledge outcomes. However, we found a significant negative interaction effect of knowledge coordination mechanisms and international exposure on headquarters' AC. This finding is novel in the knowledge management literature. By explaining the nature of the interrelations between knowledge management mechanisms and international exposure as drivers of AC, this study suggests that highly internationalized MNCs that deploy coordination mechanisms extensively tend to absorb less knowledge from foreign subsidiaries. For instance, if an MNC is highly internationalized and dispersed across several countries, it may miss opportunities to benefit from external knowledge sources if it becomes too embedded in its coordination mechanisms due to the NIH syndrome (Antons & Piller, 2015; Katz & Allen, 1982). A very high level of international exposure may also create additional challenges for internal communication due to difficulties transferring tacit knowledge among different languages and cultures (Ambos & Ambos, 2009; Martin & Salomon, 2003). As developing absorptive capacity is about adding knowledge to the firm's existing knowledge pool (Cohen & Levinthal, 1990), knowledge coming from subsidiaries of highly internationalized firms might become too distant from the existing knowledge base, thus hampering the absorption process (Lane & Lubatkin, 1998). An alternative explanation for this finding may be due to the institutional nature of the mechanisms analyzed. For instance, the proliferation of cross-unit and matrix interfaces between subsidiaries and headquarters may reduce their willingness to engage in knowledge transfer activities.

Of the knowledge management mechanisms we analyzed, socialization mechanisms had the most substantial direct effect on MNC headquarters' AC. Notably, we found no significant trade-off in this regard. As such, socialization mechanisms may be particularly effective in increasing the ability of MNC headquarters to learn from foreign subsidiaries regardless of the firm's level of international exposure. These results align with extant literature indicating a positive relationship between knowledge socialization mechanisms and AC (Jansen et al., 2005; Van den Bosch et al., 1999). They also extend previous literature that discusses the importance of social interactions and personal mechanisms for subsidiary-headquarters transfers (Bresman et al., 1999; Ghoshal & Bartlett, 1988; Ghoshal et al., 1994; Gooderham et al., 2011; Rabbiosi, 2011) by highlighting the direct link with headquarters' AC.

Our findings also suggest that international exposure promotes AC at the headquarters level, which may relate to these firms' greater knowledge outreach and accumulated learning (Bilkey, 1978; Eriksson et al., 1997; Johanson & Vahlne, 1977, 2009). Cohen and Levinthal (1990) stress the importance of knowledge diversity for AC, while other studies explore the contribution of international diversity to knowledge outcomes (Barkema & Vermeulen, 1998; Hitt et al., 1997) and CEOs' perceptions of FDI (Denison et al., 1996). Our study extends this stream of research by exploring the specific relationship between international exposure and the AC of MNC headquarters.

Interestingly, our results showed that MNC headquarters' AC did not vary significantly across firm nationality or industry, signaling initial support for our findings' cross-country and cross-industry validity. We found a positive relationship between the size of MNCs and AC at the

headquarters level, suggesting that larger firms are better able to learn from their foreign subsidiaries because they control more advanced resources and enjoy more opportunities to access local market knowledge (Petersen et al., 2008).

5.1. Theoretical implications

This study has important implications for theory. First, we empirically examine the trade-off between inward-looking and outward-looking determinants of AC proposed by Cohen and Levinthal (1990). We provide initial insights into the manifestation of this trade-off in the context of subsidiary knowledge transfers when both the inward-looking determinant (i.e., coordination mechanism) and the outward-looking determinant (i.e., international exposure) are high. The AC literature following Cohen and Levinthal (1990) has thus far neglected this conceptual aspect of the construct (see the studies from Lane et al., 2006; Lane & Lubatkin, 1998; Volberda et al., 2010, for some excellent reviews of absorptive capacity). Therefore, we respond to recent calls for more clarification on the amount of knowledge overlap that is beneficial to the firm (Ambos et al., 2013), and for a deeper investigation of the trade-off between inward-looking and outward-looking AC (Pedersen et al., 2020; Volberda et al., 2010).

This study also adds to research on intra-organizational learning by suggesting that the limited complementarity between knowledge coordination mechanisms and international exposure may affect the speed of AC development (Schleimer & Pedersen, 2014). Furthermore, by suggesting that a diverse international setting may reduce the effects of coordination mechanisms on the AC of MNC headquarters, this paper contributes to other emerging streams of research. In particular, it adds to the contingency approach for subsidiary knowledge transfers, as called for by Ambos et al. (2006). It also attempts to address calls for more studies exploring the role of international exposure and how it may constrain learning and innovation (Barkema & Vermeulen, 1998; Hitt et al., 1997). In addition, our study contributes to the literature on AC as a dynamic capability (Zahra and George, 2002). Finally, this study helps integrate the organizational learning and knowledge management perspectives, as we considered the interdependencies of the knowledge creation, acquisition, and transfer processes (Castaneda et al., 2018).

5.2.Managerial implications

Taken together, the arguments in this article have implications for management practice concerning the ways headquarters learn from subsidiaries. Headquarters absorb more knowledge from subsidiaries when they develop superior knowledge management mechanisms. Our study suggests some practical knowledge transfer mechanisms that MNCs can implement regardless of their international footprint. For instance, companies can deploy systems tools that support webcasts, social networks, and virtual platforms for knowledge sharing. They can also use coordination mechanisms, such as R&D departments, innovation and knowledge sharing training, and goals for innovation and knowledge sharing. Socialization mechanisms, such as meetings, communities of practice, international trips for knowledge sharing, and international project teams are particularly effective in promoting knowledge transfer from subsidiaries to headquarters.

Our findings also suggest that as MNCs advance along their internationalization paths, it makes sense to emphasize knowledge socialization mechanisms. Expansion to geographies with different cultures adds complexity, making tacit knowledge exchange through formal coordination mechanisms less effective. Moreover, the adoption of knowledge coordination mechanisms throughout most or all foreign subsidiaries may lead to excessive knowledge overlap among subsidiaries. For instance, if all subsidiaries of an MNC have their R&D department and share similar training and goals for innovation, communication may improve, but the range of ideas may be reduced. Thus, the headquarters of highly internationalized MNCs should foster interpersonal relationships when absorbing knowledge generated by subsidiaries is a key objective. Personal interactions help reduce the cultural and linguistic barriers that stem from high levels of international exposure while promoting openness to new external knowledge. In other words, socialization mechanisms may help headquarters managers create awareness of new knowledge that is distant from their existing knowledge base, thereby avoiding the NIH syndrome. Over time, they should also help managers mobilize internal resources to assimilate strategically-relevant knowledge that would otherwise not emerge from structured coordination mechanisms.

5.3. Limitations and future research

Some limitations of this article should be mentioned. First, our study is mainly exploratory, as it is based on a sample of MNCs registered in two countries - Brazil and Portugal. Conditions for international knowledge transfers in these countries may differ from those in other settings. Despite our results' absence of country differences, caution is warranted when generalizing to different contexts. Subsequent studies in other national settings should be conducted to test our findings' robustness further.

Second, we examined the context of subsidiary knowledge transfers given the increased relevance of the knowledge generated by subsidiaries for MNCs (Blomkvist et al., 2017; Yang et al., 2008), especially for their headquarters. Future studies can explore the proposed determinants of absorptive capacity in other types of knowledge flows, such as from headquarters to subsidiaries or among subsidiaries. For instance, some knowledge management mechanisms (e.g., instant messaging, virtual community platforms, matrix structures and cross-unit interfaces) may favor knowledge flows in multiple directions across the MNC network. Future studies could also consider the potential interaction among such mechanisms in determining AC.

Third, we did not investigate the influence of knowledge management mechanisms on the ability of MNCs to transfer and absorb different types of knowledge (Apriliyanti & Alon, 2017; Kenney & Gudergan, 2006). However, recent research suggests that organizations with knowledge management mechanisms can share knowledge regardless of its type (Balle et al., 2019).

Fourth, our international exposure variable did not consider the types of subsidiaries. As subsidiaries of different types should use other mechanisms to promote subsidiary knowledge transfers (Rabbiosi, 2011), future studies may focus on this consideration.

Fifth, as we based our study on cross-sectional data, inferences regarding the causality of the relationships are not advisable. This observation highlights the importance of continued longitudinal research focused on investigating causality in our hypotheses, as past knowledge management mechanisms may influence the absorptive capacity of MNCs in the future.

Finally, we acknowledge the limitations of using perceptual instruments to measure knowledge management mechanisms and absorptive capacity. This aspect also highlights the need for research that tests the proposed relationships using objective measures and, thereby, checks the consistency of our results.

5.4. Concluding remarks

The research advanced in this paper adds to recent developments in the literature on international business and knowledge management. We demonstrate that the ability of MNCs to absorb knowledge from their subsidiaries can be explained by the complex interplay among inward-looking and outward-looking determinants, consisting of direct and interactive effects between firm-level knowledge management mechanisms and its international exposure. Our study unveils the limited complementarity between these determinants, particularly when the MNC is highly internationalized and possesses advanced coordination mechanisms. In such cases, we found a detrimental effect on the absorptive capacity of headquarters. Beyond the optimal level, the advantages of operating with superior coordination mechanisms in various geographies are reduced, perhaps due to the excessive embeddedness of subsidiaries in similar types of knowledge and the complexities of managing different settings. Hopefully, future studies will build on these findings to add to and enhance our understanding of how MNCs can learn from foreign subsidiaries and create international value.

6. References

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