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The influence of TMT social capital on R&D subsidiary roles: a network approach

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INDEX

ABSTRACT	3
1. INTRODUCTION	4
2. LITERATURE REVIEW	7
2.1 Subsidiary R&D activities and strategic roles	7
2.2 Knowledge transfer and networks.....	10
2.3 Micro-foundations and Upper Echelon Theory	12
2.4 TMT's Social Capital	13
2.4.1 Internal TMT's Social Capital (Bonding).....	14
2.4.2 External TMT's Social Capital (Bridging)	15
2.5 Macro-micro level perspective	17
3. PROPOSITIONS DEVELOPMENT	19
4. CONCLUSIONS.....	24
5. LIMITATIONS AND FUTURE RESEARCH	26
REFERENCES:.....	28

ABSTRACT

Increasing attention has been paid to the globalization of research and development (R&D) by multinational corporations (MNCs), especially on how the subsidiaries manage their networks to perform a specific strategic R&D role. This study focusses on analyzing the relationship of social capital (SC) developed by subsidiaries' top management team (TMT) in the context of internal multinational network and the external business network, in order to examine its influence on the subsidiary's strategic role (exploitative and creative). Due to the necessity to go down on the micro-level to examine the affectation of the structural background of the main actors in charge of the strategic role, a dynamic approach was presented focusing both on pre-existing structures (or 'networks') and on the individual experiences of competent (knowledgeable social actors). SC was divided into internal (bonding) and external (bridging) in order to get analyze the functions of integrating and brokering collective knowledge. This study goes beyond the usual analysis of a macro-organizational perspective, incorporating itself to the microfoundation 'movement'. Using a macro-micro perspective, propositions were developed and they were presented jointly with an explorative model to evaluate the effect of the SC and networks embeddedness on the subsidiary strategic role. This study makes a distinct theoretical contribution to the subsidiary R&D role theory and network theory.

Keywords: Social Capital, TMT, subsidiary role, networks, MNC

JEL classification: D85, F23, O19, D9

1. INTRODUCTION

Multinational companies (MNCs) are increasingly opting to localize R&D activities in their foreign subsidiaries. These units play a crucial role in what has been called as the “globalization of innovation” by carrying out R&D themselves (De Beule & Van Beveren, 2019). The internationalization of their R&D activities is an important strategic option of cross-country capacity expansion, R&D globalization provides MNCs opportunities to exploit firm-specific technological capabilities in new markets, and to access new sources of knowledge that can be used to expand those capabilities as well as by diversification and complementary augmentation of its technologies (Cantwell & Piscitello, 2000; Kuemmerle, 1999).

While some subsidiaries are mandated to contribute to the MNC by generating and disseminating new knowledge, others may primarily aim to implement or exploit headquarters’ knowledge in the local context (Ambos, Ambos, & Schlegelmilch, 2006). Therefore, the foreign subsidiary can play two roles: facilitate the local adaptation of the MNC’s products and services (exploiting role) or enable the creation and acquisition of globally relevant technology for the entire corporation (exploring or creating role) (Feinberg & Gupta, 2004; March, 1991).

MNCs are crucial actors in a global knowledge-based economy. Many scholars consider the sharing and combining of knowledge as the ‘raison d’être’ of the MNC (Meyer, Li, and Schotter, 2020). The study of characteristics of knowledge networks and relations between actors have been increasing during recent decades (*see e.g.*, Andersson, Holm, and Johanson, 2005; Gulati, Nohria, and Zaheer, 2000). The network approach argues that a multinational subsidiary is simultaneously embedded in two business contexts: the internal (headquarter - peer subsidiaries) and the external (business actors in host country) environment (Wang, Liu, & Li, 2009). It has been demonstrating the knowledge flow between the internal and external network take advantage when is dually embedded (Achcaoucaou, Miravittles, & León-Darder, 2014; Ferraris, Santoro, & Scuotto, 2018; Wang et al., 2009).

This interest in ‘knowledge in organizations’ and the principle that knowledge assets are crucial to value creation and competitive advantages have made scholars concerned about the role played by the organizational members, causing much of the early interest on microfoundation approach in international management to study the genesis of knowledge management in the MNC network (Felin, Foss, and Ployhart, 2015; Foss and Pedersen, 2019; Nuruzzaman, Gaur, and Sambharya, 2019).

Under the umbrella of the Upper-Echelon Theory (UET), it has been well documented that top management teams (TMT) characteristics as diversity, tenure, experience or education, influence firms knowledge management processes (Chen, Kang, & Butler, 2019; Li, 2013; Li, Lin, & Huang, 2014). Li, (2013) asserts that one of the most important responsibilities of higher executives is processing information, the effectiveness of implementing this task influences strategic choices. Through the management of complex activities and information, the top executives help to identify market opportunities and transfer the resources gained from R&D investment and international diversification (Li et al., 2014). Implicitly, this suggests that, TMT also cultivate interpersonal relations and connections with actors in other firms or government officials by their work experience.

By combining multiple relationships within and across firm boundaries, MNCs can leverage upon a variety of knowledge source and is a key aspect of the cross-border organization of R&D which is still under-explored and calls for greater consideration (Papanastassiou, Pearce, & Zanfei, 2019). To analyze these relationships, the concept of social capital (SC) of TMT defined as elements of the social structure that affects relations among people and inputs or arguments of the production and/or utility function (Schiff, 1992), seems relevant. This is significant to business innovation since executives are crucial actors in business operations. Zheng *et al.*, (2019) identified two kinds of social capital developed by TMT: internal SC which includes sharing values among team members, and external SC which is a bridge to connect with other members and organizations.

Some studies, such as Yli-Renko, Autio, and Sapienza, (2001); Zheng *et al.*, (2019) have observed what seems to be a relation between the characteristics of the social capital on the network relation deployed by the subsidiary. Schotter *et al.*, (2017) provide a link of the upper echelon perspective to the broader microfoundations approach using the boundary-spanning but focusing on MNC capabilities. In a similar way, Nuruzzaman, Gaur, and Sambharya, (2019) incorporated the social interaction between key individuals within the MNC as well as with the stakeholders but focusing only in management experience. Most of the empirical studies (e.g., Ferraris *et al.*, 2018; Scott-Kennel and Saittakari, 2020; Wu and Ang, 2020) have used the network perspective to explore internal and external sources of knowledge derived from multiple contexts, but there is a lack of *micro-level focus*, in part due to the fact that the units of analysis and variables defined in the mainstream body of literature tend to be organizational-level constructs and aggregate concepts (*see* Becker-Ritterspach, 2006). While many subsidiary management phenomena are inherently multi-level, only a few studies connect the activities of subsidiary managers and other

individuals to subsidiary-level constructs (Meyer *et al.*, 2020). Recent theory-building has increasingly focused on proposing microfoundations mechanisms to help explain how firms develop capabilities that drive superior performance (Morris, Hammond, & Snell, 2014). This study goes beyond the usual analysis of a macro-organizational perspective, incorporating itself to the microfoundation 'movement' (Foss & Pedersen, 2019b), presenting a macro-micro level perspective to explore the character of relationships at TMT level and how the network configurations influence the subsidiaries' role. Foss *et al.*, (2010) state that knowledge sharing is designed to transform individual knowledge into organizational knowledge, it directly involves the levels issue (individual, organizational)

Thus, this study focusses on analyzing the relationship of the social capital developed by subsidiaries' TMT in both, the multinational internal and external network, in order to examine its influence on the subsidiary's strategic role. To accomplish this objective, the following research questions are explored: (I) How the subsidiary manages its networks dual embeddedness for R&D knowledge transfer and evolution of a strategic role? (II) Are the different types of TMT social capital (internal and external) affecting the relation of organizational networks at the development of the R&D subsidiary role?

The interaction of knowledge dimensions and individual action is a fairly underexplored area in the knowledge sharing literature (Foss, Husted, & Michailova, 2010). This document also responds to the claim of Nuruzzaman *et al.*, (2019) about there are a limited theory and evidence linking individual positions in individual-level networks using the microfoundations approach with firm-level knowledge roles. Besides, the lack of attention to microfoundations has the potential of making it difficult to come forward with managerial advice (Foss *et al.*, 2010). Therefore, this research pretends to contribute to the issue of knowledge sharing, taking on board the concept of social capital at the TMT level as a factor to consider in the development of the subsidiary R&D strategic role and it would be useful not only for MNC managers or human resources divisions by providing a more nuanced assessment of the individuals' interactions on knowledge management but also for policymakers, especially from host countries who help on R&D collaborations.

The remainder of the paper proceeds as follows. The next section considers the relevant literature and sets out the propositions of this study. Then, the study presents a model that colludes the concepts analyzed and, in the end, the conclusions and future research statements are provided.

2. LITERATURE REVIEW

This literature review is divided in four sections. First part is compounded by the aspects of the subsidiary R&D activities and strategic roles. The second part encompass the MNC knowledge flowing through networks. The third part of this literature review is briefly dedicated to explaining the antecedents and context of the microfoundations and the Upper-Echelons theory; the next part focuses on the conceptualization of the TMT Social Capital and, finally, the combination of these two aspects in the unit of analysis (subsidiary) denominated macro-micro perspective.

2.1 Subsidiary R&D activities and strategic roles

R&D has remained among the least internationalized and most centralized value chain activities of many MNCs (Huggins, Demirbag, & Ratcheva, 2007). Traditionally, when companies localized R&D activity in foreign subsidiaries, they did so with the aim of adapting their products developed in the home countries to local tastes or customer needs (Cantwell & Mudambi, 2005). Thus, the intrinsic motivation was the dissimilarity between home and foreign markets rather than by the rationale of sourcing technology abroad (Cantwell & Piscitello, 2000).

The MNCs have increasingly faced the necessity of exploring new strengths innovation opportunities around the world to be exploited in the future, it implied to decentralize part of its R&D activity on the foreign subsidiary (Cantwell & Mudambi, 2005). This shift away from a hierarchical relationship, where the partner company creates technological knowledge and them put it in the disposition of their subsidiaries worldwide, has been changing from the beginning of the 1980s (Almeida & Phene, 2004; Cantwell & Piscitello, 2000) to a new environment where the subsidiary plays a role of diffuses new knowledge back to the HQ and the rest of the MNC (Buckley & Ghauri, 2004). This new perspective was a consequence of a widening of the internationalization of technology, jointly with the strengthening of the international corporate network. Moggridge, Vernon, and Dunning, (1972) state that communication costs contributed to the expansion of internationalization of technological activity. Besides, Cantwell and Piscitello, (2000) pointed out that the rapid changing of technological knowledge itself and the development of scientific and engineering communities became more susceptible to transmission between fields of activities and between countries, which fostered a new vision of corporate growth.

As the subsidiary manage portfolios of activities and resources, some of this are specific to the subsidiary in a specific host country, it is a combination between firm-specific advantages of the

MNC's home country and country-specific advantages of the host country or local environment, they are known in the literature as subsidiary-specific advantages (Rugman & Verbeke, 1998) or subsidiary capabilities (Birkinshaw, Hood, & Jonsson, 1998), which motivates the classification of the role developed by the subsidiaries.

Subsidiary roles vary in terms of their motivations of establishment, their mandates and objectives, and thus their relevant performance criteria (Paterson & Brock, 2002). Meyer *et al.*, (2020) argue that typologies of subsidiary roles provide the foundation for the analysis of subsidiary management. After Ghoshal and Bartlett, (1990) conceptualized the MNC as an internally differentiated network, and the organizational and strategic challenges that this implies, a number of contributions have been added on these foundational insights to examine the different subsidiary roles.

In an early stage, the classic work of John Dunning, (1993), combined market and efficiency-seeking motives, where four motives for establishing foreign subsidiaries were proposed: *market seeking*, *efficiency seeking*, *natural resource seeking*, and *strategic asset seeking*. Another typology was derived from the integration-responsiveness framework developed by Ghoshal and Bartlett, (1990), where the relevance was given to the *global integration* (or standardization) and *local responsiveness* (or adaptation) of the operations developed by the subsidiaries of the same MNC. Furthermore, other terms recognize the specialization of subsidiaries in different functions or market segments and focus on the contribution of the subsidiary to the global operations of the MNC, such as *specialized contributor*, *strategic leader*, and *active subsidiary*, which refers to those subsidiaries that contribute substantially to firm-specific advantage, while terms such as *implementer* and *branch plant* are used to refer to those that do not (Birkinshaw et al., 1998).

Based on knowledge flows between the subsidiary and the parent organization, Gupta and Govindarajan, (1991), proposed a 2x2 matrix of knowledge inflows and outflows, coming to light four types of subsidiaries: the *Global Innovator* serves as the originator of knowledge for other units; the *Integrated Player* has the aim to create knowledge that can be utilized by other subsidiaries; the *Local Innovator* role implies that the subsidiary has almost complete local responsibility for the creation of relevant know-how in all key functional divisions; and the *Implementor* role is the one where the subsidiary engages in little knowledge creation of its own and relies heavily on knowledge inflows from peer subsidiaries.

The different typologies of the role developed by the subsidiary depends of the lens and contexts that the scholars focus their research (*see also* Meyer *et al.*, 2020). However, the R&D activities conducted in subsidiaries implies the creation of value across the broader organization through R&D collaborations that facilitate the transfer, integration, and creation of new knowledge (Un & Rodríguez, 2018).

When a passive R&D role is developed by the subsidiaries located abroad, aimed on the exploitation of the competences established at the of their parent companies, the subsidiary is performing a "competence-exploiting" role (Cantwell & Mudambi, 2005). On the other hand, the implementation of exploration activities is a relative new subsidiary role that has been largely analyzed as contributor to the development of firm-specific advantages, and that has been recognized to be one of the most important key drivers, not only to create competitive advantage (Grant, 1996; Wang *et al.*, 2009) but also, to maintain such advantage in the whole MNC global network, it has been labeled as "competence-creating" role (Cantwell & Mudambi, 2005). Cantwell and Mudambi, (2005) refer to the competence-exploiting and competence-creating activities as analogous to the distinction between exploitation and exploration in organizational learning theory, which is the base of the ambidexterity concept (O'Reilly & Tushman, 2008). He and Wong, (2014) states that exploration and exploitation are fundamentally different logics that compete for firms' scarce resources and create tensions. However, the balance to create synergistic effect is the resulting of the firm's manage trade-offs between the two.

Un and Rodríguez, (2017) argue that the reason regarding the benefits of establishing R&D collaborations is that R&D partners (e.g. competitors, customers, suppliers, universities) may help the company to innovate because they provide the knowledge needed to complement its own internal knowledge. The resource-based perspective has framed the creation and sharing of knowledge-based resources as a reflection of the organization's ability to recognize valuable external information, assimilate and apply it (Song, 2014) and, has been shown to significantly affect the level of knowledge transfer to the subsidiary.

2.2 Knowledge transfer and networks

Since the change of paradigm about the role developed by the subsidiary (Ghoshal & Bartlett, 1990), where they were merely geographically dispersed agents of the MNC with a knowledge transfer process usually structured in one direction, (e.g., from HQ to subsidiaries), to subsidiaries internally differentiated and goal-disparate units with their own external stakeholder networks, a special attention has been centralized in the organizational and contextual factors that may promote knowledge transfer from subsidiaries, these factors can be summarized as pertaining to the knowledge itself, the characteristics of the senders and recipients, and their relationship (Ciabuschi, Kong, & Su, 2017).

Despite all resources potentially useful to a firm, knowledge may be the most important for the firm to create and maintain competitiveness in the market (Wang et al., 2009) at a time of fast-increasing global competition (Ciabuschi et al., 2017). In a multiunit organization, a unit can access new knowledge through a network of interunit links (Hansen, 1999), this networking effort is different from just investing in R&D (Tsai, 2001). A unit may want to obtain knowledge from other units but may not be able to access it. Even though the knowledge is available, the unit may not have the capacity to absorb and apply it for its own use (Tsai, 2001). Consequently, companies tend to develop routines through a combination of existing knowledge and newly acquired and assimilated knowledge (Ferraris, Santoro, and Scuotto, 2018).

Organizational units are embedded in a network coordinated through processes of knowledge transfer and resource sharing, the network of interunit links enables organizational units to gain critical competencies that contribute to their competitiveness in the marketplace (Tsai, 2001). On one hand, internal MNC network is defined by the relationship between all units of the MNC operating outside of the country of the focal unit. For HQ, this will include international subsidiaries, affiliated firms and intermediary headquarters. For subsidiaries, this will include (intermediary) headquarters and sister subsidiaries (Kähäri, Saittakari, Piekkari, & Barner-Rasmussen, 2017). By the other hand, the external business network includes all partners, namely agents, customers, suppliers and collaborative business partners of the focal unit based in the local context (Scott-Kennel & Saittakari, 2020).

The knowledge flowing and sharing within the MNC network occurs in three different contexts: The first is the intra-corporate knowledge dependence between HQ and subsidiaries, where knowledge creation and transfer is the role of the first one (Birkinshaw et al., 1998). The second

is linked with the host environment, the MNC subsidiary plays a role focused on the inter-firm knowledge transfer with the external network in the host country (Perri & Andersson, 2014). The third one suggests that the internal and external networks should work in a dynamic environment to generate outcomes from R&D subsidiaries (e.g. Achcaoucaou *et al.*, 2014). However, the design of control structures to implement dual embeddedness is a delicate balancing act that could create a conflict of interest in the subsidiary, pitting its loyalties to its local network against those to its parent company.

Thus, with this multiple embeddedness approach, the subsidiaries are forced to be responsive to local pressures deriving from the contexts where they are active; but also they must comply with the rules of corporate governance leading to the integration of individual affiliates within the multinational corporation (Papanastassiou *et al.*, 2019). Foss, Husted, and Michailova, (2010) also contributes to the literature of knowledge sharing by addressing formal and informal organizational antecedents. While formal organization influences network positions and network relations by defining tasks, task composition, roles, etc., informal network relations influence communication channels in organizations, and how such channels determine knowledge sharing outcomes at organizational level (Tsai, 2001).

The constructs to examine knowledge literature as such as capabilities, dynamic capabilities, absorptive capacity, are macro-level constructs usually firm-level ones. Foss, Husted, and Michailova, (2010) argued that these constructs are not clearly rooted in microfoundations, which, among other things, means that their origin and nature remain unclear. Network approaches have been highly influential in work on knowledge sharing (Hansen, Podolny, & Pfeffer, 2001; Tsai, 2001), but such works do not consider potentially critical micro-issues. Even when actors have not been neglected in network analysis, it remains that relations are the focal units of analysis, and the approach does not go very far with respect to accounting for individual interests, knowledge, preferences, expectations, etc., which are the ingredients of the microfoundation analysis in management research.

2.3 Micro-foundations and Upper Echelon Theory

When we refer to microfoundations, we are arguing about a set of high-level heuristics concerning theory-building and, per implication, theory-based empiricism (Foss & Pedersen, 2019). This “movement” or way of thinking has spread across a broad array of macro theories. Microfoundations studies have centered its impetus to unpack collective concepts to understand how individual-level factors impact organizations, how the interaction of individuals leads to emergent, collective, and organization-level outcomes and performance, and how relations between macro variables are mediated by micro actions and interactions (Abell, Felin, & Foss, 2008). Microfoundations research shares much in common with related streams of research such as behavioral strategy and organization theory (Felin et al., 2015). Kano and Verbeke, (2019) have found that although the theories typically are built on micro-level assumptions, these are neither articulated nor linked to key decisions.

Felin, Foss, and Ployhart, (2015) identified the upper echelon theory (UET) as a suitable lens to study innovation from the microfoundations perspective because of its focus on the top managers in an organization. This perspective that focuses only on a handful of high-ranking individuals in the organization, identifies that knowledge resides in organizational actors influenced by organizational structure (e.g., hierarchy) that shapes the interactions among them. According to the upper echelons theory (Hambrick & Mason, 1984), the characteristics, background and experience of the top managers shape the managers’ organizational choices (e.g. product innovation, diversification and acquisition strategies) as well as organizational performance are strongly influenced by the views and characteristics of top management.

Growing body of research has been developed on top management teams’ characteristics, such as average tendencies of the team (e.g., average age, tenure, educational level, etc.) and heterogeneity in team composition (diversity in function, educational background, etc.). Lawrence (1996), criticizes the original concept of organizational demography approach of creating a “black box” and not studying the mechanisms through which TMT characteristics lead to firm strategy and behavior. As a result of this criticism, the upper echelons model has been updating by a large number of UET studies focusing on TMT processes as mediators in the relationship between TMT composition and organizational outcomes. However, the proliferation of reviews pertaining to UET research has, in many ways, compounded a challenge of developing a shared understanding the critiques about the UET (*see Neely et al., 2020*).

Micro-level mechanisms might be the most proximate causes of macro phenomena, also individual and group cognition play a central role in the conceptual foundation of UET. The microfoundation perspective covers the foremost aspect for the contextualization of the concept of Social Capital which will be analyzed below.

2.4 TMT's Social Capital

Nahapiet (2008) argues that the dominant tradition in the knowledge sharing/transfer literature is to view knowledge as packages that circulate through structural organization-based linkages, also called 'pipelines' within a sender and a receiver. Knowledge is perceived as shared through interaction where relationships co-evolve in embedded communities of practice. In contrast to the pipes perspective, the 'practice' perspective does not focus to the same extent on the flow between a sender and a receiver, but rather on formal and informal relationships based on trust and opportunities to meet and exchange experiences, thoughts, and ideas (Fenton-O'creevy et al., 2011).

The structural relational approach that has been frequently used in the International Business field to understand knowledge transfer within multinational firms is the *Social Capital Theory*. Nahapiet and Ghoshal, (1998 p.243) define Social Capital as "the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit". This definition comprises both the network and the assets mobilized through the network. Those authors conclude that knowledge is socially embedded and resides in situations and relationships. Therefore, networks of social relations can engender resources that enable individuals and social groupings to share and generate new iterations of knowledge-based practices that they could not otherwise accomplish (Fenton-O'creevy et al., 2011)

Under a sociologist point of view, (Burt, 1992 p.9) define Social Capital as "friends, colleagues, and more general contacts through whom you receive opportunities to use your financial and human capital". Furthermore, Coleman (1990 p.304) argues that Social Capital is created "when the relations among persons change in ways that facilitate action". These definitions embrace a combination of *relations* and *resources*, which will be the approach of this study. Empirical studies show that MNC social capital increases the effectiveness with which the interdependence between HQ and subsidiaries is managed, promotes knowledge transfer between units, and supports

coordination and collaboration across geographical and cultural borders (e.g., Li, Lin, and Huang, 2014; Zheng *et al.*, 2019)

The Social Capital has been studied from different contexts by taking account ties between units of the MNC, (e.g., the overall configuration of these ties, and its dimensions) (Fenton-O’creevy et al., 2011; Nahapiet & Ghoshal, 1998). However, some scholars have taken an approach to divide this concept into internal and external social capital. A focus on external relations foregrounds what has been called "*bridging*" forms of social capital; whereas a focus on internal ties within collectivities highlights "*bonding*" forms of social capital (Adler & Kwon, 2002). Yli-Renko, Autio, and Sapienza, (2001) applied this structure studying internal social capital as the quality of relationships between individuals and departments within a firm and external social capital as management contacts, customer involvement, and supplier involvement. In a similar way, Kim and Cannella, (2008) used this approach, dividing social capital into interpersonal linkages that involve others already in the focal organization, the board of directors in particular, and linkages that involve others outside the organization.

2.4.1 Internal TMT’s Social Capital (Bonding)

Bonding social capital refers to internal ties within a group which gives that group cohesiveness and facilitates the pursuit of collective goals. This foreground the importance of shared goals, shared cognitive representations of the world, and shared discourse. In network terms, bonding social capital arises most strongly in "closed" networks with multiple redundant ties (Adler & Kwon, 2002; Fenton-O’creevy et al., 2011) within the firm, mainly with other managers. Internal social capital among managers reduces various economic costs associated with communication and cooperation at the top management level, enhanced by the trust and the actual extent of obligation held. Trust reduces transactional cost and coordination cost within TMTs (O’Brien and Williamson, 1976 *as cited in* Kim and Cannella, 2008). Internal social capital facilitates the exchange of valuable information and knowledge. By facilitating the flow of information, internal social capital accelerates knowledge transfer (Hansen et al., 2001). TMT's ability to function as a team will be greatly improved when managers have high levels of internal social capital. Internal social capital helps to resolve the problems associated with the lack of team spirit, trust, and collaboration which are critical to fulfilling the subsidiaries’ tasks (Kim & Cannella, 2008).

2.4.2 External TMT's Social Capital (Bridging)

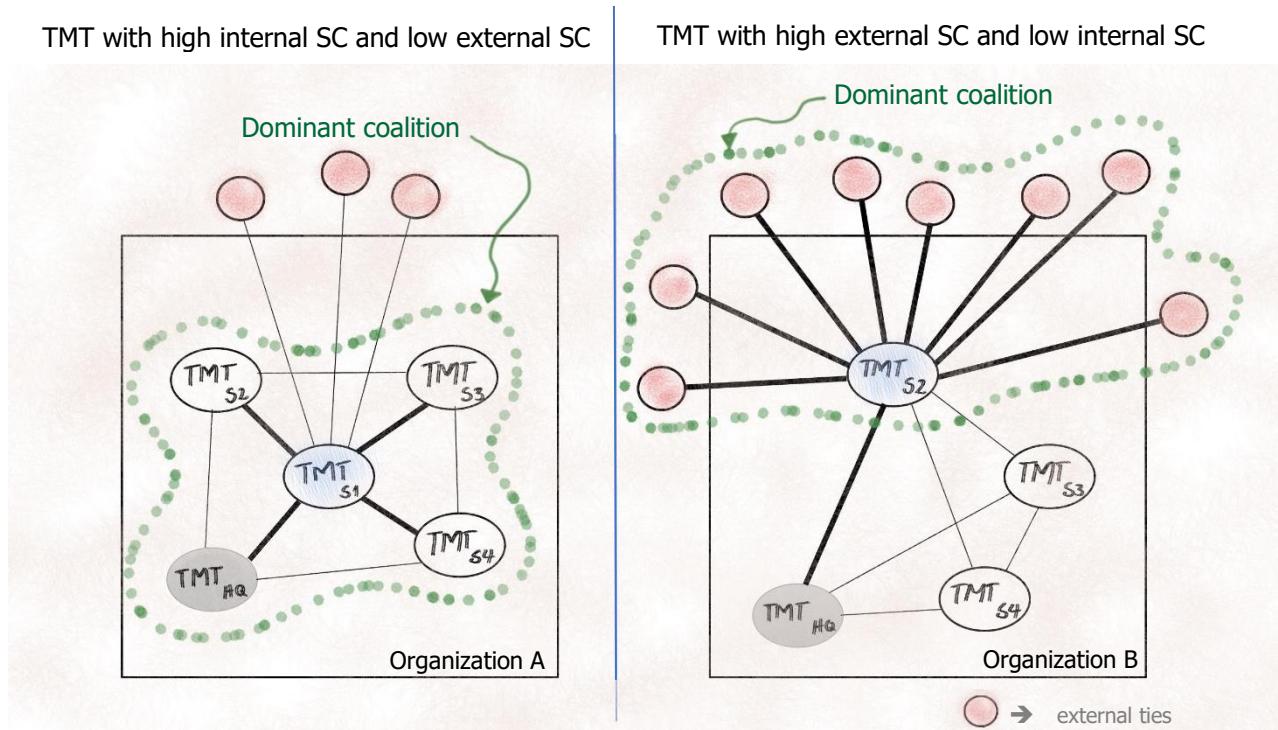
Bridging social capital concerns the "external," between-group, social ties of focal actors that bridge social networks. Dense local ties and sparse bridging ties are embedded in broader, within-country social networks (or institutions) that imply taken-for-granted local cognitive, normative and regulatory frames (Fenton-O'creevy et al., 2011). TMT's external social capital derives from a person's contacts with external stakeholders such as suppliers and clients, investors, political elites, and other business leaders (Kim & Cannella, 2008). TMTs gather information from outside and take actions accordingly to align the organization with the environment.

TMTs external social capital can be used as a channel through which they deliver information on their behalf to important institutional actors such as government officials, regulators, media, and investors (Kim & Cannella, 2008). TMTs are frequently called to work jointly with universities, ONGs, legislation government teams, which is a great opportunity to connect with important decision-makers in the institutional environment. The top managers of an organization can develop social capital through a variety of personal, social, and economic relationships with their suppliers, customers, competitors, trade or employee associations, government's political institutions, and community organizations (Fernández, Verdú, and Benitez, 2013). Through close social interaction, firms are able to increase the depth, breadth, and efficiency of mutual knowledge exchanges (Lane & Lubatkin, 1998). The implication is that MNCs that lack such bridging linkages and individuals will experience considerable difficulty in integrating and brokering collective knowledge (Fenton-O'creevy et al., 2011).

Fig. 1, show us two TMT's with different combination of Social Capital. On the left side (A) is an example of a TMT with high internal social capital and low external social capital, the bold lines indicate strong ties within the members of the coalition which halt the building of the diverse external networks. Conversely, the right side (B) illustrates a TMT with high external social capital and low internal social capital, it can be observed how many outside players to the organization are linked to the TMT but there are few strong ties with members inside of Organization B.

Besides, Table 1. summarize the main aspects related to the TMT social capital (internal and external).

Fig. 1 TMT with different types of Social Capital
 Bold lines reflect strong ties while lighter lines reflect weak ties



Source: Adapted from Kim and Cannella, (2008)

Table 1: Top Management Team (TMT) Social Capital

Top Management Team (TMT) Social Capital	
Internal	External
Bonding Function	Bridging Function
<ul style="list-style-type: none"> - Ties and relations with other people within the firm - Strongly collaboration with other managers - Trust and collaboration among network members - Enhancing teamwork - High maintenance costs 	<ul style="list-style-type: none"> - Ties and relations with various outside contacts, including investors, customers, suppliers, authorities, politicians, etc., - Provide additive information, and cooptation benefits to the subsidiary and the organization - Distant from other dominant coalition members
Network profile	Network profile
<ul style="list-style-type: none"> - Dense and small network with few structural holes 	<ul style="list-style-type: none"> - Sparse and large networks with many structural holes

Source: Adapted from Kim and Cannella, (2008)

2.5 Macro-micro level perspective

The network form has profoundly impacted the way that companies innovate. The dramatic disintegration of the value chain in many industries (e.g., high-tech industry) has made it possible that some activities along the value chain can be carried out efficiently by different firms (Dhanaraj & Parkhe, 2006). Cano-Kollmann *et al.*, (2016) argue that innovation requires two processes: search (the discovery of new knowledge) and transfer (the movement of the knowledge to the point of use). This process of knowledge exchange and the ability to exploit this knowledge is produced by being in a dynamic relationship between the internal MNC network globally and the external business network in the local environment (Achcaoucaou *et al.*, 2014; Ferraris *et al.*, 2018a). Andersson, Forsgren, and Pedersen, (2001) argue that this double way of interaction creates differences in their level of competence, which in turn creates differences in the roles the subsidiaries can play. The ability to shift between different forms of embeddedness and disembeddedness is, therefore, the major advantage of MNCs in comparison with other companies (Heidenreich, 2012), but all of this under a macro-organizational level perspective.

However, citing to Granovetter, (1985 p.504) 'How behavior and institutions are affected by social relations is one of the classic questions of social theory', claiming for a relational understanding of embeddedness. This concept was taken to highlight the social dimensions of economic action and assumes that 'economic behavior is closely embedded in networks of interpersonal relations'. In contrast to an 'over-socialized approach of generalized morality' and an 'under-socialized one of impersonal, institutional arrangements'. What he proposes is a dynamic, process -and experience-based approach to trust and order which focuses both on pre-existing structures (or 'networks') and on the individual experiences of competent, knowledgeable social actors (Granovetter, 1985 as cited in Heidenreich, 2012).

The organizational-relational structure between the subsidiary's networks and TMT's social capital could be seen as a macro-micro perspective. Macro refers to the organizational level, while micro is the level of individual action and interaction. Foss *et al.*, (2010) state that explanations focused solely on macro variables and/or embedded in macro-macro links overlook the micro-level processes that mediate between macro variables and create observed correlation between those variables. Macro links are always mediated by micro links (Gupta, Tesluk, and Taylor, 2007), and macro explanation is therefore inherently shorthand for a more complicated, multi-level explanation (Coleman, 1990 *as cited in* Foss, Husted, and Michailova, 2010). This multilevel perspective aims at helping to better understand how phenomena at one level of analysis are

linked to those at another and, in so doing, provides a more rich and complete perspective of a given phenomenon such as innovation (Gupta et al., 2007).

Scholars have mentioned that the creation of a stronger competitive advantage through social capital and emphasizing organizational relationship leverage would be the main objective of any research on technological knowledge transfer (Gulati et al., 2000; Nahapiet & Ghoshal, 1998; Tsai, 2001). Knowledge is imperfectly distributed across individuals and organizations, it never exists in a concentrated or integrated form but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess (Hayek, 1945). At a fundamental level, knowledge is created by individuals. From an ontological perspective, an organization cannot create knowledge without individuals (Nonaka, 1994). The organization supports creative individuals or provides a context for such individuals to create knowledge. Organizational knowledge creation, thus, should be understood as a base process that not only amplifies the knowledge created by individuals, but also crystallizes it as a part of the knowledge network of the organization (Nonaka, 1994). The concern of the firm is to convert the most amount of *tacit knowledge* that is embedded in individuals, and is not fully controlled by organizations, into *explicit knowledge* that will result in inputs to innovation, through processes such as the codification or direct personal interfaces between individuals to share the knowledge (Nonaka & Lewin, 1994). The MNCs has to adopt consistent organizational practices transfers that have to be supported not only by appropriate processes and incentives but also, by interpersonal interactions (Meyer et al., 2020). The subsidiary's TMT is called to adopt a systematic management of training and practice adoption, which could include an overall heuristic design for cultivating collective learning routines and the responsive management of knowledge repositories (Hong, Easterby-Smith, & Snell, 2006).

Research that is not based on clear micro-foundations has the potential of making it difficult to come forward with managerial advice (Foss et al., 2010). Most of the contributions to the organization-knowledge link are unit-level, focusing on the link between organizational antecedents and knowledge outcomes on the organizational level, even when macro-micro links are mentioned, explanation mainly takes place on the collective level examining macro-macro link (*see review Foss et al., 2010*). The large majority of contributions to the knowledge sharing literature are not founded on clear assumptions about individual action/behaviors and the interaction of actions/behaviors, it is clear that the behavioral and cognitive assumption have to be underlying.

3. PROPOSITIONS DEVELOPMENT

The truly multinational enterprise must, by definition, be able to exploit the benefits of multinationality (Dunning, 1988). To exploit and efficiently channel and link resources and capabilities available between locations, the MNC must have incentives among internal agents to maximize goal congruency amongst the various internal subsidiaries and constituencies within the firm (Meyer et al., 2011). A subsidiary accumulates external knowledge and builds a stock of knowledge, which allows it easy to absorb new internal knowledge. In this context, a subsidiary needs multiple intra-organizational networks to diffuse knowledge effectively and to facilitate knowledge transfer and acquisition within an MNC (Ferraris et al., 2018).

The effectiveness of knowledge management derives from both the interaction of individuals within an organization as well as the creation of systems that allow for the codification of knowledge to promote its dissemination (Criscuolo & Narula, 2007). When different MNC units are committed to a clearly defined mutual objective it is likely to build a stronger shared experience base, which allows to the subsidiary's TMT participate in interunit meetings and get a deeper interaction because they work around a shared process (Mäkelä & Brewster, 2009), this allows generating internal social capital which would be used to create an environment conducive to valued discretionary behaviors on both sides, HQ and the subsidiaries.

The deeper interaction is yielded from the development of project groups and cross-border teams, which typically incorporate an extensive shared experience and richer interaction ties, which are associated with successively more opportunities for knowledge sharing (Mäkelä & Brewster, 2009). However, this internal interaction requires a shared framework for collaboration around knowledge because knowledge sharing requires at least some level of shared cognitive base to be effective. Besides, as a product of the shared ground, TMT shared vision can act as a bonding mechanism to enable MNC to integrate organizational resources, a freely exchanging ideas with greater flexibility and eliminates misunderstandings between top managers (Li et al., 2014).

An assumption, relative in conceptualizing a competence exploiting role is that the main objective is not to require the greatest local collaboration possible, given that external sourcing leads to a greater extent of operational complexity and result in increased coordination, communication, and monitoring challenge (Hsu, Lien, & Chen, 2015). The bonding function of TMT Social Capital enhance trust between those who share it, and trust can reduce the transactional costs and coordination costs which can be exploited in the implementation of scale economies. As has been

mentioned before, greatest amount of TMT internal SC reduces various economic costs associated with communication and cooperation (Kim & Cannella, 2008). Mäkelä and Brewster, (2009) argue that the different interaction contexts may be associated with differing levels of trust that are built on the relative extensiveness of shared experience and richness of interunit interaction that characterize them.

To be able to absorb intra-network knowledge, a subsidiary has to develop close links with other network units to enable intra-organizational learning characterized by frequent and intense interactions with other subsidiaries (Demeter, Szász, & Rácz, 2016). Cohesive networks show high density (or strong ties) and require major investment in time and financial resources. The cohesive ties not only ensure strategic conformity, which enhances organizational efficiency but also promotes industry norms and procedures although diminishes the top manager's capabilities in identifying new opportunities in international markets (Pinho, 2011) which leaves them at the mercy of the HQ's strategic decisions.

Subsidiaries' TMT that have developed trust through interactions with HQ contacts during specific assignments its likely to provide knowledge about the implementation of specific HQ practices or the acquisition of strategic resources (Reiche, 2012). TMT with dense internal networks, where top managers are connected to each other by strong bonds and develop strong norms that support collaboration and the sharing of knowledge information, are expected to enhance their abilities of information processing (Li et al., 2014), ensuring a greater integration and in-depth deliberations in resource exchange and recombination, trust is likely to facilitate exploitation (Atuahene-Gima & Murray, 2007). Thus:

Proposition 1a: The greater their intra-organizational network embeddedness, and the greater of internal social capital accumulated in the subsidiary TMT, the greater is its probability to reinforce their competence-exploiting R&D role.

Sometimes, subsidiaries are more likely to become highly embedded in the external network, if they maintain a low degree of internal embeddedness. Narula, (2014) states that for regular, efficient, and intensive two-way knowledge flows it is necessary high levels of 'bandwidth' connections, for instance through systematic face-to-face engagement between scientists, engineers, and managers in different units. High bandwidth links are also resource-intensive, they

are costly, hard to build, and take time to establish (Criscuolo & Narula, 2007). Furthermore, subsidiaries tend to have a predilection for those external actors who share important values or knowledge sets, and will have a wide 'bandwidth' with such subsidiaries, but there is a disadvantage, the 'homophily' (preferring to those with whom you share characteristics) which it does not encourage novelty, for example, a greater overlap of technological specialization between establishments eases communications, but reduces novelty, while a small overlap of technological specialization increases the potential of novelty, but it makes communications difficult within the establishments.

HQ themselves are influenced by powerful locally embedded subsidiaries that typically control knowledge resources (Andersson et al., 2001). It is important that the subsidiary have access to specialized labor, and access to specialized intermediate inputs in the host country which it could be facilitated by the TMT external ties. Further, in the case of R&D activities, TMT's external SC as suppliers, professors, private research teams members and informal networks take considerable effort to create, and they are specific to particular research areas which makes challenging to transfer from one location to another without fall into a drop in efficiency or relationship attrition (Narula, 2014).

Granovetter, (1985) argues that weak ties or at least weak ties that bridge otherwise unconnected groups are important to integrate subgroups with strong internal ties. Although, external SC requires considerable investment in establishing and maintaining relationships and in certain situations it may not be cost-efficient (Adler & Kwon, 2002). The power of information sharing could also be affected, if the TMT gain information benefits by having a lot of external contacts who themselves have many ties, the focal relation with the HQ could be decayed. Further, institutional and cultural differences in the multiple national environments in which MNCs operate often result in a lack of shared norms and values within the organization (Kostova & Roth, 2003).

In consequence, a subsidiary that focuses on building external SC can reduce risks, respond to the local policy change, and also take advantage of local political support, but the preference of building more external SC than internal SC can lead to its reserving more efforts to better exploit the MNC's advantages. Thus:

Proposition 1b: The greater their inter-organizational network embeddedness, and the greater of external social capital accumulated in the subsidiary TMT, the greater is its probability to decrement their competence-exploiting R&D role.

Competence creating efforts in MNC subsidiaries entail that they create new knowledge in areas that are not among the traditional strengths of their own MNC group as these activities extend the range of the competencies of the corporate group of which they are part (De Beule & Van Beveren, 2019). Implicitly, it would suggest that knowledge creation requires a combination of both, science-based knowledge from the business network sources and industry-based knowledge sources where the TMT's SC bonding function plays a crucial role, in order to yield successful new product creation. A failed explorative effort may disrupt successful routines in a firm's existing domains, without any significant success in the new field to compensate for the loss in existing business (He & Wong, 2014).

There must be strong internal embeddedness to other establishments elsewhere (parent company, the regional HQ, or with another subsidiary located in a third country) that ensure the dissemination of valuable knowledge and innovation capabilities to the rest of the MNC (Narula, 2014). The tacit and firm-specific nature of technology means that knowledge spillovers across disciplines and units are more efficiently internalized when there is close physical proximity between the units, or between the individual researchers (Narula, 2014). Uzzi and Lancaster (2003) found that embedded interpersonal relationships characterized by a high level of trust are more important carriers of knowledge than arm's length ones.

Knowledge sharing requires that the sender and receiver have a common set of prior knowledge. Gooderham, Minbaeva, and Pedersen, (2011) propose that the application of social governance mechanisms serves to increase the sense of mutual goodwill on the individual level, which provides a positive foundation for knowledge transfer across the MNC. By the other side, Conroy and Collings, (2016) states that is also important to consider the personal legitimacy of key individuals at the subsidiary level, they use this legitimacy to attract supportive corporate headquarters attention to key issues, thus provide opportunities for individuals to regularly interact with key corporate decision-makers and identify with decision-makers' preferences and values. From the bonding view, the corporate organization can leverage the outcomes of networking relationships within a group for the exchange and acquisition of both tacit and explicit knowledge and for mutual learning. Thus:

Proposition 2a: The greater their intra-organizational network embeddedness, and the greater of internal social capital accumulated in the subsidiary TMT, the greater is its reinforcement of their R&D competence-creating role.

For accurate knowledge, it is necessary that the subsidiary understands the general decision-making models adopted among those living in the host country. On one hand, foreign partner ties such as local distributors (or agents) ties are characterized by the low density that bridge firms' boundaries in accessing new information and new foreign market opportunities, they provide to the MNC diversity of information and brokerage of opportunities (non-redundant information) created by the lack of connection between separate clusters in a social network, thus several actors may span the structural holes of the network and enjoy the associated informational advantages (Burt, 1992).

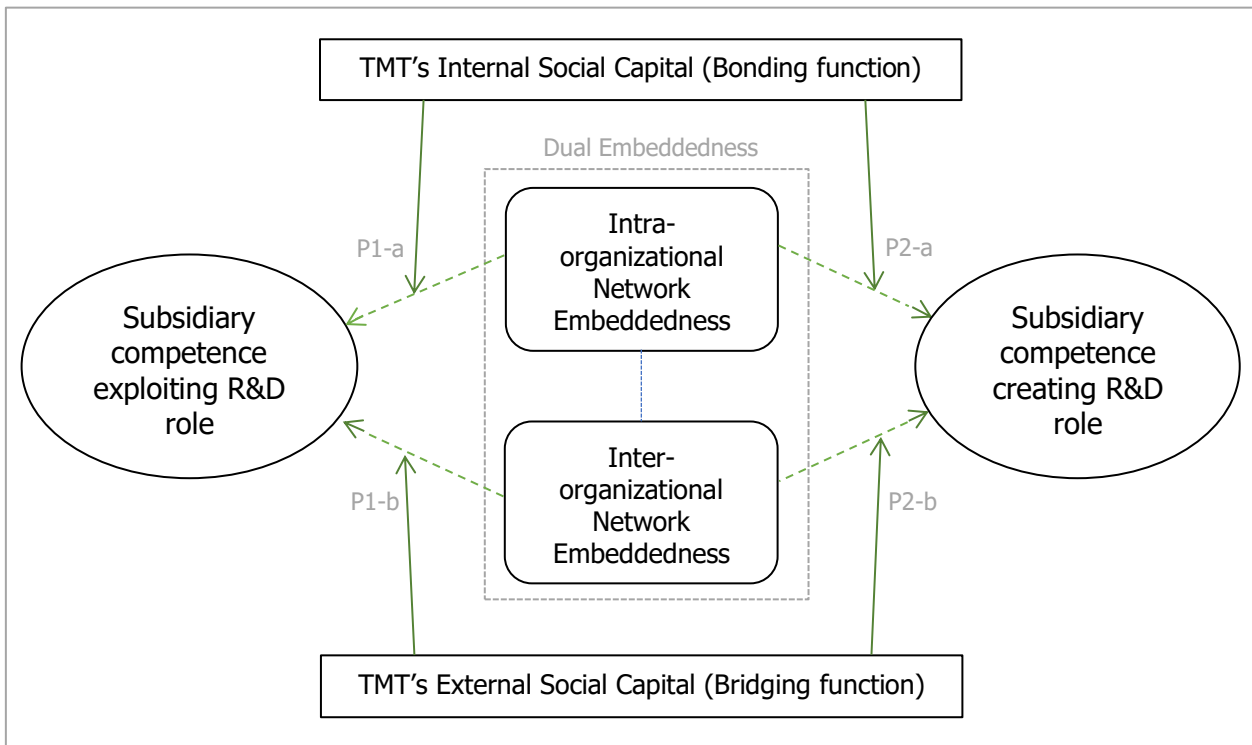
Subsidiary R&D activities are part of the MNC strategy to explore local knowledge, especially when the host country has a comparative advantage in a particular field of technology (Nuruzzaman *et al.*, 2019). Leiponen and Helfat, (2011) found that knowledge acquisition from customers, suppliers, and universities, increases the likelihood that firms develop new products. Similarly, Nieto and Santamaría, (2007) support this idea arguing that collaboration with entities on the business network like suppliers, customers, and research organizations (e.g., universities), positively impacts on the novelty of product innovation, whereas cooperation with competitors has a negative effect on this variable.

To focus on clarifying the implicit yet ambiguous cognitive and interpretation logics held by its business partners in the host country, it is necessary a strong relation of the external TMT's social capital and an embedded with the different actor of the business network (e.g., suppliers), this extensive knowledge from the interaction with different local actors can also give subsidiaries access to more varied knowledge sources (Nell, Ambos, & Schlegelmilch, 2011). Besides, new knowledge exchanges will require contributions by individuals who have not been previously part of the network and who are geographically and culturally distant (Kostova & Roth, 2003).

TMT's external SC not only can provide a technical resource for the subsidiary, including information transfer and advanced technology introduction via network ties, but also offer specific directional guidance for innovation and deliver innovative signals at the same time that promotes the progress of creative ability (Zheng *et al.*, 2019). In the institutional ground, TMT's ties with government officials may also lead MNC by providing institutional support, tax reduction, or financial incentives to cover R&D expenditure (Li *et al.*, 2014). Thus:

Proposition 2b: The greater their inter-organizational network embeddedness, and the greater of external social capital accumulated in the subsidiary TMT, the greater is its reinforcement of their R&D competence-creating role.

Fig. 2: Model proposed



Source: Own elaboration

4. CONCLUSIONS

The purpose of this study is to analyze the relationship of the social capital developed by subsidiaries' TMT in both, the multinational internal and external network, in order to examine its influence on the subsidiary's strategic role. For answering the research questions, the intra- and inter-organizational network embeddedness and the TMTs' internal and external SC were taken into consideration for the development of the R&D competence- exploiting and creating roles.

First, the central finding of this document indicates that the structural effects of network embeddedness are amplified when a relational component is involved, the structure can only

provide a base level of structural social capital, which would be insufficient to support complex interactions requiring proactive and discretionary behaviors. It is expected that the existence of different types of social capital on the TMTs creates an environment conducive to valued discretionary behaviors on both sides, headquarters, and foreign subunits (Kostova & Roth, 2003).

Second, for the development of the R&D competence-exploiting role, the intra-organizational network embeddedness reinforced with the high internal SC developed by the TMT is a critical element for a subsidiary to exploit knowledge, because the bonding function of social capital develops strong norms and trust that support collaboration and integration of in resource exchange and recombination. By the other side, inter-organizational network embeddedness amplified by a high TMT external SC seems to be not the optimal aspects to develop an exploiting role, due to the cost of maintaining these ties with external actors but also that it could affect the power of information sharing by the trade-off aspect, the more external contacts who themselves have many ties, the less of attention to the focal relation with the HQ (Kostova & Roth, 2003).

Third, for the development of the R&D competence-creating role, the intra-organizational network embeddedness with high TMT internal SC could be the main factor to consider in the subsidiary competence creating efforts, it's important to have strong internal embeddedness that ensures the dissemination of valuable knowledge and innovation capabilities to the rest of the MNC but also a high level of internal SC to attract supportive corporate headquarters attention and also to create successful routines for R&D knowledge codification and sharing. Following the same line, inter-organizational network embeddedness allow knowledge acquisition from customers, suppliers, and universities, in order to increases the likelihood that firms develop new products, foreign partners provide MNC diversity of information and brokerage of opportunities (Burt, 1992), the intensification of this aspect induced by higher levels of TMT external SC, will not only reinforce the development of the exploratory role but also they can provide a technical R&D resource for the subsidiary including information transfer (Zheng et al., 2019), advanced technology introduction and offer specific directional guidance for innovation.

Researches have noted that share cognitive ground has a key impact on the development of subsidiary roles (Foss and Pedersen, 2019; Li, 2013; Mäkelä and Brewster, 2009). This study is expected to make a distinct and advanced theoretical contribution to the classic subsidiary R&D role theory and network theory, by providing a macro-micro approach of the structural-organizational level and the relational-individual level. Besides, a group of propositions and a

model was provided to be evaluated in a specific context of the unit of analysis with the actors involved that might be particularly important for business and strategy development in which the management of knowledge is fundamentally important.

As a managerial contribution, the suggestion is that MNC managers need to dedicate more time and allocate not only resources to the development of internal and external high levels of embeddedness but also to strengthen the types of individual ties in the different subsidiary's environments (internal and external). Specifically, it will help to the challenge that international human resources managers have at the moment to find the correct human capital for the subsidiary TMT in charge of the R&D knowledge transfer. How managers combine internal and external relationships will leverage the development of R&D activities in the host country at the same time that it will create new capabilities at the corporate level.

5. LIMITATIONS AND FUTURE RESEARCH

In order to analyze the dynamics between the internal and external embeddedness of the unit of analysis, it is necessary to test the model provided of the macro-micro level perspective by carrying on a multiple-case study methodology. It could be the fittest methodology to explore the character of relationships at the TMT level and how they influence the network configurations to gain access to knowledge from different sources and amplified the subsidiary's strategic role. An inductive multiple-case study approach will provide us a better understanding of the unexplored dynamics of the phenomenon in its context (Eisenhardt, 2007) and also a stronger base for theory building. It enables us to understand the relationships between individual units as well as the content of these relationships (Garcia-Pont, Canales, & Noboa, 2009). Although multiple-case study results will not be used in predicting future behavior, they do contribute to advancing the field's knowledge base by offering insights and illuminating meanings. Meyer et al., (2020) highlight the necessity to go down to the micro-foundation level under a qualitative approach, to go inside of the TMTs "black box".

Nevertheless, this study is not without limitations, the model proposed does not take into account the evolution of the subsidiary role, the entry mode, and the state of ownership of the subsidiary. These factors could influence subsidiary external and internal embeddedness and also the development of the types of social capital to develop by the manager level, future research could examine different embeddedness patterns considering these factors.

In addition, the likelihood of a successful knowledge transfer also depends on the structural distance between the country of origin and the recipient country because a higher distance increases the liability of foreignness. The Becker-Ritterspach's, (2006) empirical study which focused on proving preference for low-distance strategies are not clear conclusive (see Rugman, Verbeke, and Nguyen, 2011; or Saka-Helmhout and Geppert, 2011), consequently, the institutional distance between home and the host country is a promising future research line that could complement this study. Similarly, future research could also take into account "cultural distance", Foss and Pedersen, (2019) argue that it could be reduced to cognitive and affective states of mind of individuals, and how these states influence individuals' behaviors and interaction might be a critical issue to the discover. Besides, the benefits of knowledge networks and R&D collaborations could vary by industry, and it could reduce the explanatory power of the findings to the country, sector, or industry were the cases were selected.

Despite these limitations, we believe this research is timely, as it adds more depth to the ongoing conversation among researchers and practitioners about what makes knowledge transfer effective and useful for the strategic mandate developed by the subsidiary.

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