Beyond "*sharitories*": a network perspective of co-opetition. Examining implications for knowledge exploration and exploitation

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Abstract :

In a context of hypercompetitive business environments, emergent research on the concept of co-opetition, regarded as the relationship between actors simultaneously involved in cooperation and competition, has provided scholars and practitioners with a new understanding of inter-firm relationships. Research on co-opetition conducted during the past two decades as contributed to shape new perspectives of the ways firms realize strategic advantages, highlighting the positive outcomes of co-opetitive relationships on a firm's innovation performance. However, despite growing literature examining inter-organizational co-opetition, the research field has been little investigated in terms of the nature, dynamics and sustainability of the phenomenon within firms. This contrasts with the fact that, in relation with the expansion of information technologies as well as increased competitive pressure, organizations have to cope with growing complexity and changing roles assumed by actors within intra-firms networks. This context calls for the development of new conceptions to better understand organizational dynamics.

The present paper reviews and analyzes important theoretical work conducted in the fields of co-opetition, knowledge networks and organizational ambidexterity. The authors examine and compare intra-firm co-opetitive dynamics in different contexts, reviewing work conducted on

intra-firm networks, and aims to expand and add to the existing theoretical knowledge on intra-organizational co-opetitive interactions. By reviewing intra-firm co-opetitive dynamics at different levels, the paper contributes to appreciate a knowledge-based framework as driver of firm's innovation capabilities. Implications for firm's knowledge management strategies and practices are discussed.

Keywords : intra-organizational networks, co-opetition, knowledge-based innovation, ambidexterity, multi-level

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INTRODUCTION

Scholarly publications have described co-opetition in different settings, forms, and levels, with a number of studies focusing on industry clusters, innovation networks and firm alliances (e.g. Brolos, 2009; Mishra and Shah, 2009; Enberg, 2012; Vasudeva et al, 2013; Fernandez et al. 2014). Although various studies have explored co-opetition at the inter-firm level, with an important part of studies dedicated to co-opetition for technological innovation, research at the intra-firm level is still scarce: this gap in the literature is particularly noteworthy as regards to multi-units and diversified firms. Based on this, the present paper aims to provide a better understanding of knowledge dynamics within and beyond the firm's boundaries in relation to the firm's innovation performance. In particular, and in contrast with inter-firm co-opetition research, there is very few understanding of dynamic processes involved in exchange of resources and of knowledge at the inter-unit level (Tsai, 2000). Based on this, the main purpose of this study is to investigate the effects of intra-organizational co-opetition on knowledge processes that are exploration and exploitation dynamics in knowledge intensive industries. This is because, the simultaneity of such knowledge dynamics - relating to the exploitation of current knowledge and exploration of new knowledge - is characteristic of the concept of ambidexterity, which is considered by scholars as a basis of sustainable innovation and long-term performance (Andriopoulos and Lewis, 2009).

1. FROM CO-OPETITION TO INNOVATION PERFORMANCE: INSIGHTS ON KNOWLEDGE-BASED INNOVATION

Co-opetition is a recent research stream anchored in multiple levels of analysis. The concept has first been modeled through the game theory (Brandenburger and Nalebuff, 1996), arguing that rivals tend to join together and form alliances in order to neutralize potential threats from third-party competitors (Tidstrom, 2008). In subsequent research, co-opetition has been conceived as a strategy focused on innovation outputs and research and development efforts (Biondi and Giannoccolo, 2012). This is supported by empirical studies illustrating the fact that, in situations of competitive relationships, firms tend to give increasing importance to knowledge and intangible assets (Martín-de Castro et al., 2011). What is more, the key importance of knowledge in a highly competitive economy has been increasingly stressed out in recent academic research (Johannessen and Olsen, 2010; Amalia and Nugroho, 2011).

1.1. CO-OPETITION AS A BENEFICIAL STRATEGY

It is noteworthy that co-opetition strategy is presented in the literature as a beneficial interactional design, comparing to other traditional forms of competition. Several studies have concluded that co-opetition benefits lead to enhanced competitive advantage such as technological innovations and increased technological diversity (Gnyawali and Park, 2009). Additionally, external knowledge, networking and relationships appear to be key driver of technological innovation (Martín-de Castro et al., 2011). Under certain conditions, companies evolving in co-opetition may even achieve to impact the adoption of innovations at a market level. While the study of implications of co-opetition for firm's innovativeness has received increased consideration in the literature, little attention has been dedicated to the study of co-opetition perceptions at an internal level. Mostly, the role of knowledge in inter-organizational co-opetition has been extensively researched. Knowledge spillovers and transactions reportedly play an important role in the firm's ability to derive benefits from co-opetitive relationships: as inherently linked to the interconnections between two or more actors cooperating and competing at the same time, the relationships and complementarity between actors in co-opetitive settings (complementors) are perceived as a potential source of value creation, sharing, and appropriation. Whereas in practice, it may occur that one

department cooperates with another department or several other departments on a given project, the department might be at the same time competing with this same other department on various projects (new product development, resource allocation; etc...). Similarly, it has been demonstrated that managers cooperating on a project may demonstrate considerable competing tendencies (Walley, 2007).

1.2. CO-OPETITION AND THE DYNAMICS BETWEEN ACTORS

Several research gaps emerge as regards the influence of co-opetition perceptions on organization's performance and outcomes (employee performance, team performance, organizational performance) as well as the alliance performance between the players. What is more, it is noteworthy to remind that studies examining co-opetition at intra-organizational levels such as strategic business units are quasi-absent (Ghobadi and D'Ambra, 2012). In fact, and despite the growing number of publications in the field of co-opetition, research has not yet covered how firms simultaneously manage cooperation and competition internally, and potentially generate value. From a value chain point of view, relationships and value creation processes are growingly examined through the lens of the ecosystem, with a focus on value networks and value co-creation. One argument for this paradigm shift is that an ecological view puts an emphasis on the dynamics between actors. The value ecology also sets as underlying idea the interaction of both cooperative and competitive processes, while the value chain assumes that value creation follows a linear process that is either cooperative or competitive (Hearn and Pace, 2006). Processes of re-iteration and feedback are also an important component of such value creation dynamics, setting interactions and multi-directional cluster of networks as inherent to the value creating ecologies (Hearn and Pace, 2006). Putting all these together, we see that networks based on and developed under these values are likely to lead to the development of sustainable innovations that maintain and increase the overall capital stock (social, economic, and environmental) of a firm. The inter-individual dimension of network dynamics is however absent from literature exploring co-opetition within firms.

As an illustration of this gap, academic research lacks of studies aiming to explore how internal and external firm factors affect knowledge exchange in ambidexterity implementation (De Clercq et al., 2014). This sets the background of previous academic studies, which have pointed out the lack of integrative research encompassing knowledge dynamics both within

and beyond a firm's boundaries (Lichtenthaler and Lichtenthaler, 2009). Furthermore, and while evidences of linkages between co-opetitive interactions and innovation performance are both theoretically and empirically reported, studies attempting to explain the mechanisms underlying this relationship are still coming short, despite the fact that the adoption of a dialectic approach is considered as critical for deepening current understanding of knowledge creation and innovativeness (Ritala et al., 2009). This facet of literature appears as largely under-researched, even though critical to understand intra-organizational dynamics. In this context, it appears that *"it is worth considering the consequences co-opetition could bring about when it emerges among different individuals and groups within an organization*" (Rosales et al. 2014, p. 13). Consequently, this research work is based on the underlying assumption that, intra-organizational co-opetition plays an important role in the emergence of knowledge-based innovation. More specifically, its aim is to define the role of intra-organizational co-opetition in facilitating or inhibiting exploration and exploitation dynamics.

2. INTRA-ORGANIZATIONAL DYNAMICS OF CO-OPETITION: FROM PARADOX TO EQUILIBRIUM

Co-opetition is described by scholars as a concept that has the potential to challenge and moreover to complement existing competition frameworks (Bengtsson et al., 2010). In this context, co-opetition refers to a phenomenon where cooperation and competition co-exist and thus reveal an inherent duality: creating value (through cooperation) and capturing value (through competition) in interdependence (Luo, 2005). Similarly, co-opetition dynamics are based on complementarities and rivalries between involved actors, which also encompass costs and benefits for participants (Katsanakis and Kossyva, 2012). In intra-organizational co-opetition, we suggest that each entity (individual, teams, and units) may have varied goals, whereas the corporate organization constitutes an inclusive overarching goal: actors evolve in *"sharitories"*. This allows the firm to manage paradoxical mechanisms and dynamics emerging with the knowledge-based view of the firm (collective vs. individual knowledge, diversified vs. unified knowledge, local vs. global knowledge). In particular, recent models have argued that exploration and exploitation are dynamic mechanisms, which are likely to vary over time so as to optimize goals associated to the acquisition of resources and benefits (Berger-Tal and Nathan, 2014). In this perspective, recent developments of knowledge-based

frameworks constitute a useful understanding of the links between knowledge and the firm's innovation performance (Martín-de Castro et al., 2011).

2.1. THE MANAGEMENT OF KNOWLEDGE UNDER CO-OPETITION

In coherence with a resource-complementarity view, Alter (2013) states that companies need to foster a culture of cooperation in order to innovate. Likewise, Ritala (2009) reports that knowledge is closely related to both individual and organizational aspects, including social and emotional components. In this regard, it is argued that the identification and management of knowledge generated within the firm's boundaries plays a decisive role in open innovation strategies. The importance of the subject is supported by previous studies, from which emerges the argument that an organization's innovative capabilities are likely to be influenced by the cooperation-competition interplay. For instance, Luo et al. (2006) indicate that enhanced customer and financial performance, as well as heightened innovativeness constitute the main outcomes of intra-organizational co-opetition. Ritala et al. (2009) have taken a step further in this direction, by studying the links between co-opetition and knowledge creation, as well as the contribution of co-opetition to the overall firm's performance. Their study concluded that co-opetition has "*an own distinct logic of increasing the benefits of knowledge sharing and utilization*" and requires a thorough managerial understanding of *"how to deal with contradiction in organizational knowledge*" (Ritala et al., 2009, p.70-71).

In this context, it comes forward that organizations must consider the management of knowledge both at an organizational level (including inter-unit knowledge flows) and at the individual and team level, in order to maintain their competitive advantage (Jackson et al., 2003). In particular, both under inter-organizational and intra-organizational governance forms lead to the constitution of knowledge networks, set as the reference framework for knowledge management under co-opetition, and are funded by three main components: the knowledge, the knowledge agents and the knowledge networks (Loebbecke and Anghern, 2010). These networks, called the "CoLKENs" (Co-opetitive Learning and Knowledge Exchange Networks) by the researchers are assumed to differentiate one from another according to different dimensions, such as the degree of internal competition, or the size of the network. Although the direction of knowledge flows (unilateral or bi-lateral) is acknowledged as an important driver to take into account in knowledge management under

co-opetition, it is not explicitly investigated in the current research. Rather, co-opetition management drivers identified as levers for CoLKENs refer to the extent of learning and knowledge sharing, the stability of the co-opetition relationship and the ability of partners to collaborate.

Intra-organizational competition thus refers to the extent to which individuals interact with other actors that also are competitors for the firm's resources, shall it be tangible or intangible resources (De Clerq et al., 2014). In relation to this, authors highlight the fact that, from a theoretical standpoint, existing cooperation and competition frameworks used in the study of intra-organizational dynamics tend to focus or one or the other of the two forces. In contrast to this, co-opetition refers to co-occurring, intertwined, dynamic, and paradoxically combined mechanisms and processes. Finding the right balance between cooperation and competition is therefore crucial for companies, however it requires dedicated coordination and control processes as competitors usually share interest for the same resources (Loebbecke and Anghern, 2010; Ingram and Yue, 2008). This starts from the assumption that co-opetitive relationships may either occur as a planned strategy pushed by the organization (example of co-opetitive development teams), or as an emergent and natural aspect of business relationships (Tidström, 2008). As an example, and in intra-firm settings in particular, actors are led to compete for internal resources, such as funds allocation, while other activities, such as new product development, lead them to work on a cooperation mode (Dagnino, 2011).

2.2. DYNAMICS OF VALUE CREATION IN CO-OPETITION: THE ROLE OF KNOWLEDGE FLOWS

Tsai (2002) was the first scholar to simultaneously integrate both cooperation and competition as intertwined intra-organizational interactions, and demonstrated the importance of coordination mechanisms in knowledge sharing within networks tied by both collaborative and competitive dynamics. In this regard, her study on multi-national companies provided insightful aspects of co-opetition between sub-units, and precised the role of knowledge sharing in jointly cooperative and competitive intra-organizational relationships: while internal competition appears as a moderator for the relation between coordination mechanisms and knowledge sharing within the company, other research additionally indicates that, as competition levels rise, the utilization of knowledge increases as well (Biondi and Giannoccolo, 2012). Tsai (2002) further suggested that internal knowledge sharing is impacted to a greater extent by market competition rather than by competition for internal

resources, while coordination mechanisms between competing units stimulate knowledge sharing. In line with this, and following the work of Inkpen and Tsang (2005), we argue that co-opetition in multi-units knowledge-intensive firms can be analyzed as an intra-corporate network, which "*consists of a group of organizations operating under a unified corporate identity, with the headquarters of the network having controlling ownership interest in its subsidiaries*". For this study, it appears relevant to adopt a similar perspective and thus consider such intra-firm networks as inter-organizational groupings, since *"rather than a unitary organization, (...) valuable insights on the internal structures and operations of such an entity can be gained from network-related concepts used for investigating inter-organizational phenomena*" (p. 148).

In general terms (both in inter- or intra-organizational settings), the merge of cooperation and competition would therefore arise in a co-opetitive system of value creation (Padula and Dagnino, 2007), where value creation is premised through the knowledge base of the actors, and processes through which the knowledge held by each party is exchanged (shared), integrated (combined) and utilized for successful innovation (Ritala et al., 2009). This view points out the role of intra-organizational co-opetition in organizational knowledge-based mechanisms, as illustrated in the table below.

Table 1. Mechanisms of value creation in co-opetition: examples at the micro-level

Co-opeting actors	Knowledge value	Economic value
Divisions within a firm	communication and information flows: new knowledge creation and knowledge transfer	transition from R&D to production is quicker and more effective
Workers in a firm	commitment to hard work and create knowledge is greater	commitment to work heightens productivity

(adapted from Dagnino, 2011).

Previous research suggests that "*competitive collaboration also reduces the costs, risks, and uncertainties associated with innovation* (Simoni and Caiazza, 2012, p. 324). For instance, close collaborations, new forms of partnerships and knowledge networking can result in inter-organizational learning and dissemination of new, valuable information. This aspect is

illustrated in Table 2 below.

Table 2. Knowledge outcomes of value-based dynamics in co-opetitive relationships

	Value Chain	Value Network	Value Ecology
Value creation	Knowledge storing	Knowledge transfer	Knowledge dissemination
Value destruction	Knowledge obsolescence	Knowledge hoarding	Knowledge monopoly
Value neutrality	Knowledge retrieval	Knowledge mobilization	Knowledge spillovers

In line with this argument, previous research has shown that networks are facilitating information flows across organizational boundaries, resulting in network organizations demonstrating an increased survival rate while generating weaker competition (Solitander and Tidström, 2010). Powell et al. (2005) also underlined the importance of participating in such networks because of the key growth factors they offer such as: access to new forms of information, reliability, and responsiveness to change. Furthermore, the combination of several network dimensions in clusters (geographical, inter-firm and inter-organizational) creates favorable conditions for the emergence of new businesses (Stenberg and Rocha, 2005). The concept of value creating ecology emphasizes the eventuality of a mutualization of resources and further suggests the diffusion of resources across the business ecosystem.

2.3. THE VARIOUS NETWORKS PERSPECTIVES IN INTER FIRM CO-OPETITION

Adopting a networked perspective of organizations, it is understood that, tensions are inherent to, and accepted in the morphogenetic mindset of co-opetition (Johannessen and Olsen, 2010). This mindset relates to notions of interdependence, heterogeneity, conflicts and more to the generally multi-faceted nature of the co-opetition phenomenon. The emergence of tensions in co-opetition can be conceived as resulting from underlying, simultaneous and conflicting desires and goals (Solitander and Tidstrom, 2010): cooperation vs autonomy in relationships, sharing vs. protection of knowledge, beneficial vs. risky outcomes. In particular, a high internal competition for benefits which are deemed as rare (e.g., promotions, individual bonuses), is thought to impact motivational systems and to result in individuals motivated to behave "*opportunistically by looking for superior access to knowledge and also motivated to*

*increase their knowledge hoarding" (*Kaše et al, 2009, p. 622). Reversely, another study conducted by Ghobadi and D'Ambra (2013) on cross-functional teams within organizations, concluded that social relationships between actors, and more specifically cooperative behaviors, do not always result in positive impacts. Therefore, the emergence of tensions in co-opetition is likely to impact the efficiency of co-opetitive relationships. In other words, conflicts may arise from antagonist interests whenever one of the partners replicates the benefits of the co-opetitive relationships in other cooperation contexts. Such situation concurs to increase the power of the initial partners' competitors and raise concern as regards upcoming course of action in the relationship as well as strategic choices (Dagnino and Padula, 2002). This is supported by another study indicating that tensions emerging from co-opetition are most likely to affect knowledge flows between actors (Solitander and Tidstrom, 2010**).** In fact, they may even trigger harmful effects such as impeding innovation. However such risks have rarely been studied, essentially because the literature has mainly focused on the potential benefits generated by engaging in coopetition (Bonel et. al, 2008). Therefore, coopetition outcomes need to be brought into light (Czakon et al., 2014) by examining both benefits as well as unexpected and potentially negative effects of coopetitive relationships. In sum, it is suggested that that an actor's decision to interact with others (cooperate or compete) may impact the general dynamic of co-opetition and its outcomes over time.

This facet of literature, covering the interplay between cooperation and competition, as well as potential effects on knowledge processes and performance, is largely under-researched - even though critical to understand the complexity of intra-organizational dynamics. In this perspective, authors argue that the knowledge-based view of the firm offers news insights regarding operational impacts of the gaps and complementarity of knowledge resources mobilized in intra-organizational co-opetition, and suggests managerial implications to achieve organizational ambidexterity. Such insights reflect the originality if this research's contribution in revealing new ways of understanding actors' interactions, thus providing a basis for new theoretical developments (Corley and Gioia, 2011). Actors can actually decide to cooperate or to compete based on the availability of intangible resources involved: more specifically, organizational actors involved need to examine under which conditions they share these resources (e.g. knowledge, networks, marketability, budget positioning, etc.) with each other, appropriate them, and how and to what extent benefits can be expected from either of the behaviors adopted (cooperative behavior or competitive behavior). Authors further

advocate that co-opetitive relationships lead actors involved to benefit from a pool of resources and capabilities, which are combined in order to mutually support learning mechanisms as well as the emergence of knowledge creating interactions: for Lin and Lo (2010), cooperation appears as the first step for knowledge diffusion, although in some cases (e.g. in cross-national cooperation) a high degree of interaction would be required so as to obtain a common knowledge base.

On the other hand, competition between ideas appears as complementary and fosters interaction and discussions of new ideas, while emerging ideas themselves may evolve and induce competition with each other. Despite these favorable outcomes, studies examining the impact on co-opetition on knowledge sharing in multinationals (Tsai, 2002), and the appeal of the concept of co-opetition from a strategic point of view, the co-opetition/innovation relationship is not concealed as straightforward. In knowledge-based innovation literature, firm's critical knowledge processes mostly refer to knowledge exploration (creation) and knowledge exploitation (application), while besides these; the capacity to retain knowledge appears to be fundamental (Lichtenthaler and Lichtenthaler, 2009). Other studies have also pointed out that phases of exploration and exploitation are enabled by different organizational mechanisms and structures (Siggelkow and Levinthal, 2003). Knowledge processes related to knowledge value creation (knowledge exploration and exploitation) are examined in the next part.

3. FROM THE DUALITY OF CO-OPETITION TO CONTEXTUAL AMBIDEXTERITY: A DYNAMIC VIEW ON KNOWLEDGE EXPLORATION AND EXPLOITATION MECHANISMS

Diversified firms are facing multiple environmental challenges: as firms push for new products and services development, and more generally for innovation (exploration dynamics), they also seek to maintain a certain degree of stability, which expresses through exploitation dynamics (Jansen et al., 2005). This challenging entanglement of dual dynamics is extensively illustrated in the knowledge management literature, where innovation is conceived as emerging from the firm's abilities to both identify and utilize ideas (Andriopoulos and Lewis, 2009). It is further argued in the literature that firms, which are ambidextrous, are successful because they are able to generate rents by combining

complementary dynamics: evolutionary and revolutionary change, sustainability and change, exploitative and exploratory innovation (Jansen et al., 2005).

3.1. CONTRIBUTIONS FROM AMBIDEXTERITY TO KNOWLEDGE EXPLORATION AND EXPLORATION CONCEPTUALIZATIONS

Levinthal and March (2003, p.193) primarily conceived exploration activities as *"pursuing knowledge of things that might come to be known*", in contrast with exploitation activities which concern *"the use and development of things already known*". This allows firms to specify knowledge exploration and exploitation conceptualizations from a unit and organizational point of view. Empirical research supports the idea that ambidextrous units demonstrate a superior performance, as ambidexterity enables both innovation and the accumulation of experience. Moreover, the combination of knowledge exploration and exploitation, as well as of induced benefits of value creation and capture, are highly dependent of higher-order goals and interests (Jansen et al. 2012). In relation to this view, previous studies have shown that, actors in co-opetition cooperate based on knowledge complementarities, which lead to value creation through the emergence of new knowledge. Actors also compete to exploit and appropriate the generated value at an individual level. This suggests that the co-existence of cooperation and competition is linked to partial convergent interests to create new value (Dagnino and Padula, 2002).

A knowledge-based view of this duality of interests in value creation and value appropriation is expressed through the distinction between knowledge exploration (towards the creation of new knowledge) and knowledge exploitation (towards the appropriation and reuse of existing knowledge) flows. Along with this, an in-depth study of the interplay between exploration and exploitation at different organizational levels has highlighted that a higher level of between-group processes (in comparison to within-group processes) positively enhances organizational performance (Kuntz, 2011). Consequently, the outcomes of a unit's ambidextrous position and its underlying intra-firm knowledge processes depend on contingent factors, which emerge and occur at different scales (individual, intra-group, inter-group). Other studies have grounded their findings in the assumption that human behavior is determinant for KM initiatives to fail or success (Donate and Guadamillas, 2011), while those are oriented towards knowledge generation (exploration) and knowledge application

(exploitation). This argument is reinforced by previous research, which concludes that beneficial outcomes of ambidexterity are contingent upon internal and external elements, and impact intra-firm knowledge exchanges: this applies to relationships characterized by rivalry (De Clerq et al, 2014), and henceforth, to co-opetitive relationships. These mechanisms further illustrate two distinct action and knowledge modes where tensions are conceived as alternatively interwoven (integration mechanisms) or separately focused upon (differentiation). This sets a broad perspective of "*two separate, interrelated and non-substitutable sets*" of activities (De Clerq et al., 2014, p.191), where, on one hand, change, adaptability and breakthrough innovation are supported and enhanced by knowledge exploration; while, on the other hand, organizational sustainability, alignment and incremental innovation are achieved by activities exploiting existing knowledge.

Current studies indicate that knowledge exploration relates to the emergence of new intuitions and, in addition, emphasizes on the process of idea selection (Lichtenthaler and Lichtenthaler, 2009). Knowledge exploitation, on the other hand, refers to the application of knowledge in different settings, and is characterized by a replicative dimension. Generally speaking, actors in co-opetitive settings are led to share knowledge, which is possibly source of competitive advantage, while knowledge gained from cooperating with others may as well be used for competition purposes (Levy et al., 2003). Taking this into account, we argue that co-opetition dynamics (the joint occurrence of cooperation and competition) offer a favorable ground to stimulate and cultivate ambidexterity at the department and unit level. However, while multiple trails leading to organizational ambidexterity are covered in the literature (Andriopoulos and Lewis, 2009), there is a clear distinction between architectural ambidexterity, and contextual ambidexterity. In particular, previous research work has highlighted the need of research examining individual factors affecting organizational ambidexterity, as well as "*similarities, contradictions and interrelations between an individual's a group's and an organization's activities that affect ambidexterity*" (Raisch et al., 2009, p. 693). Additionally, it is argued in the literature that the study of both exploration and exploitation processes as occurring at the group-level have received little emphasis (Kunz, 2011), whereas this level of analysis mediates exploration and exploitation at the individual and organizational levels. This is supported by further claims in different research streams, which call for more attention regards to micro-foundations phenomena while studying the firm's strategic dynamics, processes and choices of action.

3.2. IDENTIFICATION OF FUNDAMENTAL KNOWLEDGE PROCESSES BETWEEN AND WITHIN UNITS

Jansen et al. (2005) indicate that multi-unit firms develop ambidextrous characteristics, in situations where they have to compete in highly dynamic environments. In line with this, their research points out that a unit's ambidextrous traits are more likely to emerge as the unit is decentralized and densely connected to other units. Alternatively, researchers have highlighted the fact that, *"companies that excel in a particular field of knowledge tend to undervalue the development of new knowledge (...) in order to maintain competitive superiority, it is necessary to continually seek out and create fresh knowledge*" (Takai, 2004, p. 198). It is argued that such networks of knowledge, aiming for competitive advantage, are not exclusive to external or outbound flows. Rather, multinational companies may use such knowledge networks in-house to fuel their innovation capabilities, by organizing networks internally (an example of this being to systematize them together with their subsidiaries). This recalls results reported by Zheng et al. (2011, p. 1048), which demonstrated that network embeddedness constitute an important antecedent of dynamic capabilities, and further suggested that *"knowledge combination capability promotes innovation performance directly and mediations the process between knowledge acquisition, knowledge generation and innovation*". In addition to this, it is claimed that the knowledge pool of each organizational group (such as business units and departments), is built upon separable knowledge units (Kunz, 2011). Therefore, and taking Kunz's work into account for the investigation of the effects of intra-organizational co-opetition on organizational knowledge processes, we define knowledge exploration between-units as *"the knowledge activities that unit members jointly undertake with other units' members, aiming at creating new knowledge"*, while knowledge exploitation between-units is conceived as *"the knowledge exchange activities that occur between members of different unit*. Similarly, we identify knowledge exploration within-units as *"the knowledge creation activities that unit members undertake with other members of the same unit",* while knowledge exploitation within-units is characterized as *"the knowledge exchange activities that occur between members of the same unit"*. In light of this, we propose in the following part a novel framework aiming to enrich current understanding and analysis for knowledge exploration and exploitation under intra-organizational co-opetition. We do so by relating to organizational issues and practices, drawing from practice-oriented

dimensions and incorporating views into a comprehensive framework (Corley and Gioia, 2011).

3.3. DUALITY AND TENSIONS IN INTRA-ORGANIZATIONAL CO-OPETITION: IMPLICATIONS FOR KNOWLEDGE EXPLORATION AND EXPLOITATION DYNAMICS

In a context where networked organizations are considered most successful, it is noteworthy that existing literature and academic research on organizational dynamics tend to overlook either the cooperative or competitive side of organizational relationships, focusing on either of the two (Simoni and Caiazza, 2012). In particular, research that examines the combination of both cooperative and competitive forces within firms is scarce, mainly because it is strongly assumed that actors belonging to the same organization cooperate with each other. On the other hand, literature on internal competition fails to consider the fact that actors in competition can be simultaneously involved in cooperation with the same actors - meaning that both dynamics co-occur and thus need to be investigated conjointly. This conceptual argument leads to the case that there actually is room for discussion on processes (Stutton and Staw, 1995) underlying the coopetition phenomenon, as well grounding forces in the broader organizational ecosystem.

In fact, co-opetitive relationships can be conceived as fundamentally tied to network dynamics occurring between different types of actors (i.e. individuals, teams, departments, sub-units and business units). In particular, the duality formed by the articulation of both collaborative and competitive links between units remains a major challenge for multinational companies looking to manage intra-organizational knowledge flows (Luo, 2005): the individual's decision to cooperate or compete with others may change the general dynamic of co-opetition and its outcomes on knowledge flows within the firm. In a seminal work on co-opetition in multinationals, Tsai (2002) also established links between co-opetition and knowledge processes to describe tensions underlying cooperation and competition dynamics. Both forces encompass knowledge flows, one triggering the share of knowledge among organizational actors, the other pushing them to seek for and leverage knowledge beyond the one that is readily available. This contrasts with an ambidextrous view of the organization, where exploitation requires *"efficiency and convergent thinking"*, while exploration involves *"search, variation and experimentation efforts"* (Andriopoulos and Lewis, 2009, p. 197). This leads to explore the role of several characteristics of units in the firm, such as their

expertise, similarity, relationship quality and localization, as well as motivational and emotional factors (Argot and Miron-Spektor, 2011). We can therefore argue that the intent, nature of social ties between actors and perceptions related to the value of knowledge impacts knowledge flows between actors and related processes. Authors further suggest that the simultaneous integration of cooperation and competition at the organizational level helps to reduce tensions linked to the predominance of one of the forces, and thus underpins the balance required to achieve organizational ambidexterity.

Research at the inter-organizational level further argues that it is easier to implement knowledge exploitation as knowledge transfer within an organization than between organizations. Consequently, it can be argued that patterns of knowledge exploration are more frequent between units that are competing: this is because units attempt to differentiate from one another and adapt to the constantly evolving organizational environment. In this regard, knowledge exploration can be conceived as bimodal: "*ensuring the pooling of new knowledge (...), while enhancing explorer's absorptive capacity"* (Nishimura, 2004, p.232). In other words, units will explore other units' knowledge in situations where competition exists and if the knowledge of other units appears as relevant to the unit's current environment and evolution perspectives. In contrast to this, cooperative dynamics tend to be grounded into more standardized structures and processes, applying knowledge currently existing to other units, while allowing new knowledge to be generated within the unit. In fact, in the collaborative dimension, knowledge sharing across units of multinationals tends to reflect unique competencies allowing them to sustain competitive advantage (Luo, 2005). In light of the above, we suggest that co-opetition dynamics, through their co-evolution and complementarity, support the development of knowledge mechanisms underlying the organization's dynamic capabilities, which are: knowledge exploration, knowledge exploitation, and knowledge retention. Subsequent research work will seek to empirically support this proposition, so as to bring a balance in weighing both the theoretical side of the research developed herewith, with its empirical side (Sutton and Staw, 1995).

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

A study of Walley (2007) has identified internal co-opetition as one of eight future research directions, while emerges the need to elaborate a model for both cooperative and competitive

behaviors at the intra-organizational level (Ghobadi and D'Ambra, 2012). The present research attempts to answer this need by adopting an integrated approach of intra-firm relationships, and bringing cooperation and competition dynamics into a single framework. What is more, it complements prior research suggesting that the ways through which the balance between exploration and exploitation can be achieved constitute research avenues that remain open for discussion (Kunz, 2011). Consequently, the fact that internal frictions may possibly emerge from the adoption of an ambidextrous posture shall not be overlooked (De Clercq et al., 2014). Based on this view, and in line with the arguments of Corley and Gioia (2011), this research therefore attempts to advance and influence the framing of theory development on co-opetition, and so achieve greater potential to provide guidance to organizations. The effectiveness of managing micro-foundations or a unit's level of ambidexterity has to take into account the complementarity of both internal cooperation and competition as complementary interactions, rather than exclusive configurations.

What is more, the evolution of strategic management research towards new managerial models further reflects the increased dynamism of industries, giving birth to new forms of organizations. This illustrates the theoretical positioning of this study, which by highlighting interaction among concepts such as cooperation, competition, as well as knowledge exploration and exploitation enables to examine practical implications of such connections (Corley and Gioia, 2011). In particular, in a context where the number and quality of industry relationships and technological innovation plays a critical role in sustaining competitive advantage, an important implication for research on intra-organizational co-opetition relates to the mechanisms through which knowledge is shared and regulated within the organization, among different entities and across boundaries. This is consistent with previous research highlighting the role of collaboration as a social action and concluding that *"innovations emerge as a synthesis of complementary knowledge among asymmetric actors'* (Blomqvist and Levy, 2006, p. 41). This further suggests that the inclination to share knowledge and the level of sharing varies according to the nature of cooperation and competition ties across business units and hereby implies that, the level of exposure of critical knowledge as well as recurrent exchanges between various organizational units is highly dependent on corporate arrangements. Furthermore, authors proposed that organizational entities/units who are able to focus on the exploitation of complementary resources might outperform other entities/units who are solely focusing on the exploration of new knowledge.

While empirical research supports the idea that ambidextrous units demonstrate a superior performance, the distinctive aspect of intra-organizational co-opetition resides in the individual actor as driving the firm's global value ecosystem. In this context, it is argued that the re-definition of roles and relationships of individuals within and outside the firm's traditional boundaries leads to the emergence of new organizational forms that are successfully capable to integrate globally interconnected actors, as well as traditional views on intra-firm cooperation and competition dynamics. In this regard, the study contributes to improve the understanding of organizational networks by highlighting how and why co-opetition emerges as well as brings new insights into new organizational configurations, placing and unifying co-opetition as strategy and co-opetition as emerging from business relationships into a wider framework. This foresees important implications for the investigation of organizational dynamics and of relationships among individuals and organizational actors in general. In particular, this research precludes the development of managerial approaches and tools aiming to identify, reduce, and resolve dilemmas, tensions and conflicts susceptible to appear when exclusively focusing on one or the other of the forces. Additionally, and, as the effect of intra-organizational co-opetition on knowledge processes is partially addressed in the present study, and will be tested empirically in an upcoming study, firms may use findings in order to draw from business complexity and grow the existing resources and capabilities to attain their strategic objectives.

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