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Knowledge management and coopetition: How do cooperating competitors balance the needs to share and protect their knowledge?

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ABSTRACT

Coopetitors need to manage interorganizational knowledge flows to balance cooperative knowledge sharing and competitive knowledge protection. The question of how to balance these has received little research attention, with most studies analyzing knowledge sharing or protection separately. To address this gap, we develop a theoretical framework on coopetitive knowledge sharing and knowledge protection practices. This framework is based on a literature review of coopetitive interorganizational knowledge management. To complement and refine this initial framework, we build on insights from a qualitative study that gathered data from 11 semi-structured interviews with key informants of Latin American firms. We show that a balance between knowledge sharing and knowledge protection in coopetition is facilitated when coopetitive interorganizational knowledge management helps coopetitors share general and project-specific knowledge while they withhold core knowledge about their firms and clients. To achieve this balance, firms combine formal and informal knowledge protection practices. As theoretical implications, we provide a fine-grained and synoptic understanding of the characteristics of knowledge management among coopetitors. As managerial implications, we call managers' attention to the need to find a balance between knowledge sharing and protection that will help clearly define what kind of knowledge is shared or protected when firms cooperate with rivals.

1. Introduction

Firms that coopete, that is, cooperate and compete with the same partner at the same time (Brandenburger & Nalebuff, 1996), can share costs (Gnyawali & Park, 2009), increase customer value (Le Roy & Fernandez, 2015), enhance innovation (Estrada, Faems, & de Faria, 2016; Ritala & Sainio, 2014), and gain access to resources and knowledge (Enberg, 2012; Quintana-Garcia & Benavides-Velasco, 2004).

To reap the benefits of a coopetitive relationship, firms must carefully choose which knowledge to share and with whom to share it; they must also determine how to protect the knowledge that they do not want to share. In other words, in coopetition, knowledge management, "*a systemic and organizationally specified process for acquiring, organizing, and communicating both tacit and explicit knowledge […]*" (Alavi & Leidner, 1999, p. 6), demands the attention of top management.

The coopetitive relationship between the German automobile giant Volkswagen (VW) and the Japanese manufacturer Suzuki Motor Corporation illustrates a case where knowledge management has not found the balance between knowledge sharing and knowledge protection. One of the major aims of the coopetitive agreement closed in 2009 was to facilitate the firms' knowledge sharing about technologies (McCaw, 2014). However, in October 2011, cooperation between the competitors failed when Suzuki accused VW of not sharing its knowledge on hybrid vehicle technologies. This example highlights tensions in coopetitive knowledge management and the (here partially unrealized) value of balancing knowledge sharing and knowledge protection as complementary parts of knowledge management.

Previous research on coopetitive knowledge management has done a masterful job of outlining the importance and difficulty of interorganizational knowledge management, including knowledge sharing and knowledge protection (Chevallier, Laarraf, Lacam, Miloudi, & Salvetat, 2016; Estrada et al., 2016; Salvetat, Geraudel, & D'Armagnac, 2013). This research stream highlighted the ambiguity of sharing knowledge with a rival (Salvetat et al., 2013), an ambiguity that stems from the simultaneity of cooperation and competition (Chevallier et al., 2016). Coopetitors share general, noncodified (Enberg, 2012) rather than specific knowledge (Soekijad & Andriessen, 2003). Formal and informal protection mechanisms (Estrada et al., 2016; Fernandez & Chiambaretto, 2016; Levy, Loebbecke, & Powell, 2003; Loebbecke, Van Fenema, & Powell, 1999) are used in coopetitive relationships.

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Until now, most of the research on coopetitive knowledge management has focused on knowledge sharing, exchange and integration mechanisms or knowledge protection. Rarely do studies take an overall approach and develop an integrative picture of the balance between knowledge sharing and knowledge protection as parts of coopetitive knowledge management (Nguyen & Nafula, 2016). This gap is unfortunate because in practice, decisions on what to share and what to protect are made not in isolation but rather together, as they are often interrelated. To fill this gap, we develop a more fine-grained understanding of the balance between knowledge sharing and knowledge protection in coopetition. Our research question is “How do firms balance the needs for knowledge sharing and knowledge protection when they engage in coopetition relationships?”

To answer this question, we develop an initial framework for coopetitive knowledge management based on a literature analysis. We then analyze and add to this framework based on a qualitative study of 11 case companies. Our study contributes to theory by producing literature-supporting and -extending findings that facilitate a synoptic view of coopetitive interorganizational knowledge management. This view illustrates the required balance between knowledge sharing and knowledge protection in coopetition in a more meticulous way than has been done previously. Our study contributes to management by calling managers' attention to the practical concern of finding a balance between knowledge sharing and knowledge protection in coopetition. Managers can reach this balance when coopetitive knowledge management facilitates the sharing of general and project-specific knowledge while still protecting against the leakage of coopetitors' specific, core knowledge by means of a combination of formal, legal, informal and relational protection mechanisms.

2. Knowledge management in coopetition: literature and theory

2.1. Coopetition and interorganizational knowledge management

We adopt an interorganizational perspective on knowledge management: on their own, firms rarely have sufficient knowledge (Enberg, 2012), and they often engage in interorganizational relationships. Thus, interorganizational knowledge management is a focal point of management (Czakon, 2009). The functions of interorganizational knowledge management are to allow firms to share sufficient knowledge to facilitate the creation of competitive advantage and to protect knowledge against involuntary spill-overs and leakages (Ritala, Olander, Michailova, & Husted, 2015).

Interorganizational knowledge management is even more important in coopetition, formally defined as “*a strategic and dynamic process in which economic actors jointly create value through cooperative interaction, while they simultaneously compete to capture part of that value*” (Bouncken, Gast, Kraus, & Bogers, 2015, p. 591). Coopetition and knowledge management are interrelated (Kogut, 2000): On the one hand, coopetition allows firms to obtain and integrate knowledge (Enberg, 2012) when they share knowledge with competitors. Knowledge sharing and integration are easier among coopetitors because their knowledge bases, technologies, and capabilities are more similar than those among noncompeting firms (Enberg, 2012; Ritala & Hurmelinna-Laukkanen, 2009). On the other hand, knowledge sharing and integration between coopetitors comes with risks and challenges (Bouncken et al., 2015; Gast, Filser, Gundolf, & Kraus, 2015), including knowledge leakage (Estrada et al., 2016; Ritala, 2012) and opportunism (Bouncken & Kraus, 2013; Pellegrin-Boucher, Le Roy, & Gurău, 2013), which lead to an involuntary loss of knowledge to competitors who may use that knowledge at the expense of their partners. Therefore, although knowledge sharing is needed to achieve the common goal of coopetition (Gnyawali & Park, 2011), coopetitors need to protect their core knowledge from their competitors (Ritala et al., 2015) and implement knowledge protection mechanisms to ensure safe knowledge sharing (Hurmelinna-Laukkanen, 2009).

This question of how to *balance* knowledge sharing and protection is a challenging key tension in coopetition (Bengtsson, Raza-Ullah, & Vanyushyn, 2016; Raza-Ullah, Bengtsson, & Kock, 2014; Tidström, 2014). In fact, given the duality of competition and cooperation, coopetition can lead to different tensions (Fernandez & Chiambaretto, 2016; Fernandez, Le Roy, & Gnyawali, 2014; Tidström, 2014), including tensions related to roles (e.g., Bengtsson & Kock, 2000), power and dependence (e.g., Osarenkhoe, 2010), opportunism (e.g., Lado, Boyd, & Hanlon, 1997; Osarenkhoe, 2010) and knowledge (Chin, Chan, & Lam, 2008; Morris, Koçak, & Özer, 2007; Tsai, 2002). Since knowledge and knowledge sharing represent a source of competitive advantage, the process for discerning the appropriate balance between knowledge sharing and knowledge protection is particularly critical to successful coopetition (Chin et al., 2008).

Accordingly, the goal of coopetitors is to share enough knowledge to learn and create advantages while at the same time preventing unwanted sharing of core knowledge (Hamel, Doz, & Prahalad, 1989). Coopetitors benefit from knowledge sharing if sufficiently strong knowledge protection facilitates safe knowledge sharing (Ritala & Hurmelinna-Laukkanen, 2013) and knowledge sharing practices are carefully balanced with knowledge protection practices (Gnyawali & Park, 2011; Levy et al., 2003). Typically, cooperating competitors encounter difficulties “to obtain the appropriate balance between knowledge sharing and knowledge protection” (Li, Eden, Hitt, Ireland, & Garrette, 2012, p. 1191), and they risk becoming “hollowed out” by “predatory” partners (Hamel et al., 1989; Kogut & Zander, 1996).

Therefore, coopetitive interorganizational knowledge management needs to define how knowledge can be shared and core knowledge can be protected (Estrada et al., 2016; Levy et al., 2003). Rules and regulations may be implemented to facilitate the management of this knowledge-related tension (Morris et al., 2007), as they help define what is needed to find a balance between what to share and what to protect in coopetition (Tidström, 2014). Effective coordination and control and a deliberate strategic approach to knowledge management are indispensable in coopetition (Loebbecke & Angehrn, 2010). Thus, coopetition requires interorganizational knowledge management to define “*what to share, with whom, when and under which conditions*” (Levy et al., 2003, p. 642).

2.2. Coopetition and knowledge sharing

When knowledge is dispersed among firms (Enberg, 2012) and firms depend on each other's knowledge (Khanna, Gulati, & Nohria, 1998), knowledge sharing, i.e., “the act of making knowledge available to others” (Ipe, 2003, p. 341) increases a firm's stock of knowledge and enhances its performance (Chevallier et al., 2016).

Cooperative relationships with partners such as suppliers, customers or competitors can be a valuable source of external knowledge (Tether, 2002; Un, Cuervo-Cazurra, & Asakawa, 2010). One of the particularities of cooperation with competitors is that coopetitors operate in the same or similar contexts and therefore possess comparable knowledge (Estrada et al., 2016; Ritala & Hurmelinna-Laukkanen, 2009). Given this similarity, coopetitors tend to have more common knowledge between them, which can be shared and integrated relatively easily (Ritala & Hurmelinna-Laukkanen, 2009). Coopetition is thus a context in which knowledge sharing is facilitated (Osarenkhoe, 2010). Especially in knowledge-intensive industries, coopetition is important, as in this context, coopetition helps firms to procure external knowledge and to develop R&D and technological innovation (Bouncken & Kraus, 2013; Carayannis, Depeige, & Sindakis, 2014).

Typically, coopetitors share general, noncodified knowledge among coopetitors (Enberg, 2012; Gnyawali, He, & Madhavan, 2006; Loebbecke et al., 1999). This general knowledge may include knowledge about industry conditions, marketing and sales information, local business opportunities, and economic developments (Loebbecke et al., 1999). Furthermore, coopetitors share knowledge (Gnyawali et al.,

2006) on resources and strategic goals (Zineldin, 2004), which helps each firm to get to know the "enemy" and may inform competitive action.

While coopetitors are open to sharing general knowledge (Enberg, 2012), highly firm-specific knowledge regarding, for instance, clients, production processes or firm vision, is often excluded from sharing (Soekijad & Andriessen, 2003), as it represents a firm's core knowledge and thus a source of competitive advantage.

2.3. Coopetition and knowledge protection

Leaking knowledge is a particularly important risk in coopetition. The similarity between the partners makes it easy to share knowledge, and rivals can use this knowledge without bearing the costs of its creation (Estrada et al., 2016). Leaked knowledge can have severe consequences because it may harm firms' innovative skills and capabilities (Nieto & Santamaría, 2007). Moreover, coopetitors may act opportunistically, that is, pursue their "self-interest [seeking] with guile" (Williamson, 1975, p. 6), where guile refers to "lying, stealing, cheating, and calculated efforts to mislead, distort, disguise, obfuscate, or otherwise confuse." (Williamson, 1985, p. 45). Because coopetitors' resources, knowledge and strategic goals are similar (Estrada et al., 2016), opportunistic knowledge acquisition is a particular risk in coopetition (Chevallier et al., 2016). Particularly when there are power differences between coopetitors, opportunistic behavior is a concern. Coopetitors may use their power and force the other party to act in a way that is only in the best interest of the stronger firm and may use jointly developed expertise for their own advantage at the expense of the other firm (Bouncken & Kraus, 2013). Or, firms can become less committed to the coopetitive agreement over time and try to gain more knowledge from their rivals than they are willing to share themselves (Bouncken et al., 2015).

2.3.1. Coopetition and formal and informal knowledge protection

To avoid unwanted knowledge transfers, competitors prefer to cooperate on activities far away from the customer, that is, on activities closer to research and innovation than to actual market introductions of new products/services (Bengtsson & Kock, 2000). However, although this strategy may mitigate some risks, it does not eliminate them. Therefore, coopetitors often make additional use of protection practices. Such protection practices can facilitate coopetitors' interaction (Fernandez & Chiambaretto, 2016), as they provide guidance on what to share and what to protect. Considering possible protection practices, we distinguish between formal and informal protection.

To reduce the risks of coopetition, formal protection practices define knowledge-sharing boundaries (Estrada et al., 2016), which enable necessary knowledge sharing while mitigating the risk of knowledge leakage (Bouncken et al., 2015; Estrada et al., 2016). Such formal protection practices can take the form of legal instruments or formal procedures and structures to control which knowledge is shared and which is protected.

First, legal instruments are often applied to prevent unintended knowledge spillover to external parties (Rivette & Kline, 2000) by defining rules and punishments (Fernandez & Chiambaretto, 2016; Jiang, Li, Gao, Bao, & Jiang, 2013; Salvetat et al., 2013). These instruments include contracts with or without specific clauses regarding confidentiality or nondisclosure (Salvetat et al., 2013), patents and copyrights (Estrada et al., 2016; Salvetat et al., 2013) and intellectual property rights (Ritala & Hurmelinna-Laukkanen, 2013).

Second, formal protection may assume the form of "formal procedures and structures to support" firms' strategies (Fernandez & Chiambaretto, 2016, p. 68). Accordingly, coopetitors use modern information technology and security systems (Fernandez & Chiambaretto, 2016; Levy et al., 2003) to create technical barriers between knowledge sharing and knowledge protection (Fernandez & Chiambaretto, 2016). Furthermore, the use of clearly defined statements of work, planning and process specifications, and standardized forms for reporting results facilitate the management of coopetitive knowledge sharing by simultaneously enabling and restraining knowledge sharing (Enberg, 2012).

Informal protection practices (Fernandez & Chiambaretto, 2016; Seran, Pellegrin-Boucher, & Gurau, 2016) support coopeting firms' daily decision making (Hurmelinna-Laukkanen & Olander, 2014; Ritala, Hurmelinna-Laukkanen, & Blomqvist, 2009). Since formal protection practices cannot completely protect knowledge, as unintended knowledge sharing beyond formal boundaries may persist, informal protection complements formal protection (Ritala, 2009).

In coopetition, informal protection practices take the form of relational norms or human resource management (HRM) practices. First, regarding relational norms, reputation and trust are identified as important informal mechanisms (Fernandez & Chiambaretto, 2016; Jiang et al., 2013). Although it takes time to build up trust and reputation, both may reduce (Carayannis, Alexander, & Ioannidis, 2000) but not eliminate (Jiang et al., 2013) the risk of opportunistic behavior when insufficient contractual rules are in place. Second, HRM practices such as limited employee access to core knowledge and an emphasis on employee awareness in social situations (Loebbecke et al., 1999) are used to facilitate the balance between knowledge sharing and knowledge protection on a daily basis.

In Fig. 1, we propose a theoretical framework that integrates prior literature's insights on coopetitive knowledge management, which balances knowledge sharing and knowledge protection practices.

3. Methodology

3.1. Research approach and data collection

As this study provides a synoptic analysis of how coopetitors balance the need for knowledge sharing and protection, a qualitative research approach was selected to provide an in-depth analysis of the studied issue based on its context relatedness (Eriksson & Kovalainen, 2015). Qualitative data were gathered through semistructured interviews (Corbin & Strauss, 2007; Miles & Huberman, 2003). The data sought pertained to attitudes, beliefs, thoughts, intentions, actions, and experiences (Dana & Dumez, 2015) related to coopetitive knowledge management.

Our respondents are managers from Latin American countries, as these countries provide an ideal context for this research. First, as Latin American countries enjoy mediocre (at best) intellectual property rights protection compared to most Western countries, it is essential that companies employ knowledge protection strategies by themselves (Property Rights Alliance, 2018). Second, coopetition is often used in Latin American countries, where it is reported to be the foundation of joint ventures between competitors (Quiroga, Cuellar, Cobo, & Benavides, 2017).

We focus on small- and medium-sized enterprises (SMEs), as more than 90% of all enterprises in Latin America belong to this group (Francis, Rodriguez Meza, & Yang, 2013; Herrera & Lora, 2005). We focus on private enterprises, as state-owned enterprises may be restricted in their choice of strategy and may be subject to special legislation. This specification is relevant because some Latin American countries, especially those with socialist governments, have a high share of state-owned enterprises (Francis et al., 2013).

Based on an extensive internet search of trade pages, local journal websites, and company lists published by public institutions, a list of private SMEs ($N = 783$) was developed. To screen those who were coopeting and willing to participate in our study, we contacted firms by email and briefly presented our research project and aim. We received positive responses to our participation request from 23 SMEs. In the end, given time constraints, key informants of 11 SMEs were willing to participate in a complete interview with us. The interviewed firms are presented in Table 1.

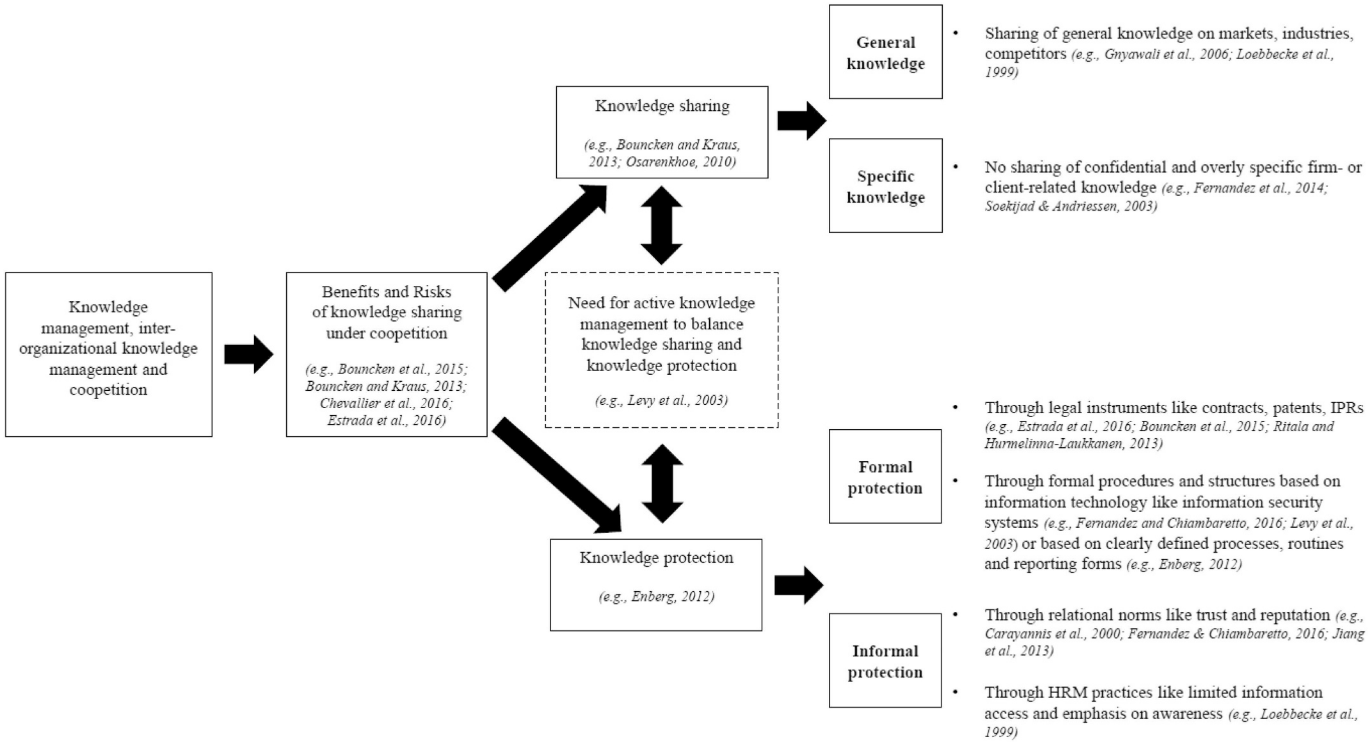

Fig. 1. Summarizing framework on coopetitive knowledge management practices. Source: own illustration.

As the firms' CEOs/founder-CEOs, all interview partners were key informants. Given their position, tenure and experience, they were well informed about the studied topic, their firm's general position, and their industry. The interviewees are presented in Table 2.

The interviews followed an interview guideline that covered the following topics: company information, respondent's profile, perception of the competitive environment in the specific sector, and firm's actions, practices and experiences regarding coopetition as a means to access additional knowledge through knowledge sharing, and knowledge protection. The average duration of the interviews was approximately 30 min.

3.2. Data processing and analysis

The interviews were transcribed, processed, and analyzed using QSR Nvivo 11. We followed a hybrid approach of deductive and inductive thematic analysis (Fereday & Muir-Cochrane, 2006). In the deductive phase, we created an initial codebook that included codes based on our initial framework (Miles & Huberman, 2003). These literature-based codes were supplemented and adapted using data-driven codes (Boyatzis, 1998), which emerged directly from the empirical data (Miles & Huberman, 2003). This additional step reflected the inductive part of our analysis and refined the coding scheme based on our data. To corroborate the coded themes (Crabtree & Miller, 1999), we clustered the previously identified codes into themes and subthemes as presented in Table 3. Table 3 also includes illustrative quotes for each subtheme and reports the inductive, data-driven codes using an asterisk (*).

4. Results

4.1. Coopetition and interorganizational knowledge management

The interviews reveal the potential benefits and risks of knowledge sharing through coopetition that requires a balance between knowledge sharing and knowledge protection. On the one hand, our interviewees engage in coopetition to profit from mutual interactions and benefits of coopetitive relationships; for instance, coopetition can help to manage projects that would be impossible to handle without the knowledge of a competitor (F2). On the other hand, the interviewees also recognize that this knowledge sharing can have significant negative implications. For instance, coopetitors' opportunistic behavior, personal rivalries or

Table 1
Overview of the interviewed firms.

Firm	Industry	Location	Employees	Years in market	Annual revenue
F1	Pharmaceuticals	Dominican Republic	70	17	10 M €
F2	IT	Colombia/USA	16	16	700 K €
F3	IT	Dominican Republic	16	15	500 K €
F4	Energy (fuels)	Dominican Republic	15	15	600 K €
F5	IT	Dominican Republic	5	11	700 K €
F6	Food distribution	Mexico	55	15	5.5 M €
F7	Agro-industry	Argentina	70	30	20 M €
F8	IT	Ecuador	18	10	2.0 M €
F9	Distribution	Costa Rica	12	10	1.2 M €
F10	Fuel retailing	Dominican Republic	30	50	6.2 M €
F11	Tourism and Transportation	Colombia	90	21	15 M €

Table 2
Overview of the interviewees.

Firm	Nationality of interviewee	Current position	Overall working experience (in years)	Working experience in the firm (in years)	Gender
F1	Dominican	CEO	8	5	M
F2	Colombian	Founder CEO	26	16	M
F3	Dominican	Founder CEO	20	15	M
F4	Dominican	Founder CEO	18	8	M
F5	Dominican	Founder CEO	25	11	M
F6	Mexican	Founder CEO	22	15	M
F7	Argentinian	CEO	30	30	F
F8	Ecuadorian	Founder CEO	20	10	M
F9	Spanish	Founder CEO	22	10	M
F10	Dominican	CEO	28	28	M
F11	Colombian	Founder CEO	30	21	M

unfair competition may inhibit the establishment of coopetition and the creation of an accompanied win-win situation based on mutual benefits for all participating firms. Such fear of opportunistic behavior relates, for example, to the fear of being confronted with a situation in which the other company will "*be acting in an opportunistic way*" (F10) by, e.g., "*taking the clients*" (F4) or taking over the entire firm (F8). Fears such as this explain why knowledge protection plays a major role in coopetitive interorganizational knowledge management.

The interviews emphasize the importance and difficulty of balancing knowledge sharing and knowledge protection through interorganizational knowledge management. According to our respondents, coopetitive knowledge management is particularly important because of the difficult and "*delicate*" (F2) nature of balancing knowledge sharing and knowledge protection. The decision regarding what and how much to share and to protect from coopetitors is even said to be one of the trickiest parts of coopetition (F1), as coopetition "*requires a lot of management and follow up to assure the success of the collaboration.*" (F11). The interviewees, therefore, advocate that firms "*have to be more careful*" (F3) when cooperating with competitors rather than non-competitors and that this balancing act is facilitated when "*collaboration between direct competitors [is] done on a clear basis.*" (F5).

4.2. Coopetition and knowledge sharing: general knowledge versus specific knowledge

The interviews show that coopetitors distinguish between the sharing of *general knowledge* such as industry and market know-how and more firm- and project-*specific knowledge.* But the interviewees report that the sharing of the latter category is more limited due to the fear of opportunism and knowledge leakage.Starting with the exchange of *general knowledge*, the interviewees note that they share knowledge regarding market and industry characteristics (see theme number/box 2.1 in Table 3 and Fig. 2, respectively): "*I am willing to share information about the market*" (F11) and "*I would share general information about the industry and market knowledge, but not particular data about my company*" (F4). This market and industry knowledge refers to "*financial and strategic information about the market*" (F11), "*information regarding the prices on the market*" (F1), "*information regarding the dollar rate for imported products, the price list and its lifetime, and information regarding the delays on payments from the clients.*" (F5), "*information about business intelligence, customer needs*" (F4) and general information regarding clients' profiles (F1, F8). Moreover, coopetitors share information about the quality standards of their markets (F1, F4, F5).

Regarding the sharing of *specific knowledge*, our respondents reveal a particularly cautious attitude (see theme number/box 3.1 in Table 3 and Fig. 2, respectively). This specific knowledge that our interviewees typically exclude from sharing relates to, for instance, firms' financial or economic situation, costs, prices or sales figures, or client information. We observe that coopetitors try to protect such specific firm- or client-related knowledge as much as possible, as this knowledge represents a part of their most important knowledge: "*The most important part of my market is the information of my clients, I do not give them my client'sinformation.*" (F4) and "*I would be willing to share all information not related to my sales andoperational costs.*" (F10). As such, they prefer to share "*just strategic and financial information regarding that specific shared activity.*" (F11).

Specific knowledge is not excluded entirely from knowledge sharing. *Specific knowledge* that is shared includes knowledge directly connected to or necessary for the execution of the particular coopetition project (see theme number/box 3.2 in Table 3 and Fig. 2, respectively). As F3, for example, explains, we share "*all the information regarding the project prepared by both companies*" (F3). Similarly, F2 mentions: "*when we make a software together, we share all the information regarding the project. That means that the confidentiality agreements that we sign with the client have to be signed by the partners. We share information like methodologies, libraries, and codes that our partners sometimes need to develop their parts.*" However, the interviewed parties limit this exchange of more specific knowledge because they "*wouldn't be willing to share any information more than that related to the project*" (F8). F11 even claims that coopetitors always have to remember that they remain competitors despite their cooperation and that the sharing of "*any additional information to that joint activity represents a risk.*"

4.3. Coopetition and knowledge protection: formal versus informal protection practices

To protect their companies from opportunistic behavior and leakage of important knowledge, firms apply different protection practices, including formal and informal instruments. Formal protection practices refer primarily to the use of contracts (see theme number/box 4.1 in Table 3 and Fig. 2, respectively), such as confidentiality agreements, nondisclosure agreements (NDA), privacy policies, or verbal contracts that reflect rigorous internal procedures concerning coopetition. For the majority of the interviewed firms, these contractual agreements represent the only effective protection practice when using coopetition as a business strategy because some of the Latin American countries lack outlined governmental rules and regulations: "*The only thing I can do are confidential agreements. I haven't seen anything more solid and important than that*" (F2). These contracts are typically very detailed and document specific rights and responsibilities as well as limitations of the cooperation between the competitors: "*We have a privacy policy where the level of access to the information for each person and company is clearly documented. This policy establishes under which criteria the information will be shared, which documents need to be signed*" (F3).

Additionally, interviewees include privacy and unfair competition clauses in these contracts to ensure a clear and safe relationship between the partners and to prevent the partners from opportunistically appropriating knowledge from each other: "*we signed an NDA*

Table 3
Overview of identified themes, subthemes, and illustrative quotes.

Theme	Subtheme & illustrative quotes
1. Coopetition and Knowledge management	1.1 Benefits of knowledge sharing under coopetition *"Satisfying for both parties" (F2)* *"Sometimes there are projects that cannot be handled by just one enterprise. So, I ask myself 'I lose the client? I lose the business?'. That is not a good idea, not for me, not for the client. So, in that case (…) we ask a friend with a company in the same sector, with the resources we lacked, if they want to collaborate on the development of that specific project." (F2)* 1.2 Risk of knowledge sharing under coopetition *"I already have the experience that I must be careful with the information I share." (F4)* *"I think the leakage of sensitive information is a risk that is not possible to mitigate 100%." (F8)* *"We knew the products and distribution channel, and he had the knowledge of the market in the north and the customer relationships in that zone. We made a contract, and he was supposed to resell the products I imported, but after a couple of months, he broke the contract and started to import the same products as me." (F9)* 1.3 Importance and difficulty of striking a careful balance between knowledge sharing and knowledge protection *"The tricky part [of coopetition is to think] (…) how much to tell or how much not to tell" (F1)* *"Well, when it is a competitor, we have to be more careful to collaborate with them or to share information with them because not everybody is honest." (F3)* *"I think that collaboration between direct competitors must be done on a clear basis." (F5)* *"Generally speaking I feel stressed about it. For my own experience, I think it requires a lot of management and following up to assure the success of the collaboration." (F11)*
2. Knowledge sharing of general knowledge	2.1 Exchange of market, industry, competitor knowledge *"We share more market information." (F1)* *"I like coopetition because you know your enemy." (F1)* *"I share general information about the industry and market knowledge, but no particular data about my company." (F4)* *"I would be willing to share information regarding the prices on the market because we all have to follow the same quality standards to enter the market." (F7)* 2.1.1 Exchange of knowledge on quality standards *"I could also collaborate (with a competitor) to protect us as a group in the sector, specifying the quality standards." (F4)* *"maybe [I would share] information related to quality standards" (F5)*
3. Knowledge sharing of specific knowledge	3.1 No exchange of overly specific firm- or client-related knowledge *"I do not give them my client's information." (F4)* *"I wouldn't be able to share my client's information, financial information. (…) there is no need to share important information regarding my company." (F4)* *"We have to remember that although we are cooperating in one specific process, we are competitors, and giving any additional information to that joint activity represents a risk." (F11)* 3.2 Exchange of knowledge directly related to and required for the execution of the coopetition project (*) *"Basically, when we make a software, we share all the information regarding the client (i.e., coopetition project)." (F2)* *"All the information needed for the project: methodologies, codes, libraries, ideas. That is in general what I would be able to share." (F2)* *"All the information regarding the project prepared by both companies." (F3)* *"I wouldn't be willing to share any information more than that related to the project we were jointly working on and information regarding that specific client." (F8)*
4. Knowledge protection through formal protection	4.1 Protection through legal instruments *"We have a privacy policy where the level of access to the information for each person and company is clearly documented. This policy establishes under which criteria the information will be shared, which documents need to be signed (…)." (F3)* *"First, we sign an NDA (Non-Disclosure Agreement) and a confidentiality agreement, then we have a representation contract that also has privacy and unfair competition clauses." (F4)* *"I have signed a confidential agreement with all my employees to protect important information. One of the agreement clauses says that employees can be sued if we find that they were responsible for leaking confidential information." (F8)* 4.2 Protection through IT tools *"We try to save everything in the cloud to protect the information." (F2)* *"Everything that could be used as a security tool surely has to be well established and correctly implemented in any company with certain renown. I mean, the use of firewalls, strong passwords, security certificates; anything that could be used as a security measure to protect the information." (F3)* *"I'm protechnology, and I understand that important information must be protected; in fact, the system we have implemented in the company has control access, and it keeps registration logs regarding which employee has access to each information and when." (F9)* *"We use technology to protect confidential information (…) We have restricted access according to each employee's needs." (F11)*
5. Knowledge protection through informal protection	5.1 Protection through relational norms included in organizational culture (*) *"At the end, you have to trust the people who work with you." (F1)* *"The only way to do it is by working your organizational culture and by making your employees feel part of the company and by economic incentives. (…) We try to constantly work to improve the commitment of the employees by offering economic incentives if they find a project and by letting them feel part of the company." (F8)* *"more than using technology to protect the information, I educate the employees to feel part of the company" (F11)* 5.2 Protection through HRM practices *"We never give them the opportunity to meet with other employees of our company" (F1)* *"There is no need for them to come to my office and meet my key employees." (F11)*

(nondisclosure agreement) and a confidentiality agreement, then we have a representation contract that also has privacy and unfair competition clauses" (F4). Firms even extend the use of confidentiality agreements to their employees and threaten with legal steps once employees are responsible for knowledge leakage: "*The leaking of sensitive information generally comes from the inside of the company. So, I have signed a confidential agreement with all my employees to protect important information. One of the agreement clauses says that employees can be sued if we find that they were responsible for leaking confidential information.*" (F8).

Another formal method of protection is the use of modern, even cloud-based IT systems, as they can serve as "security tools" (F3) (see theme number/box 4.2 in Table 3 and Fig. 2, respectively). These

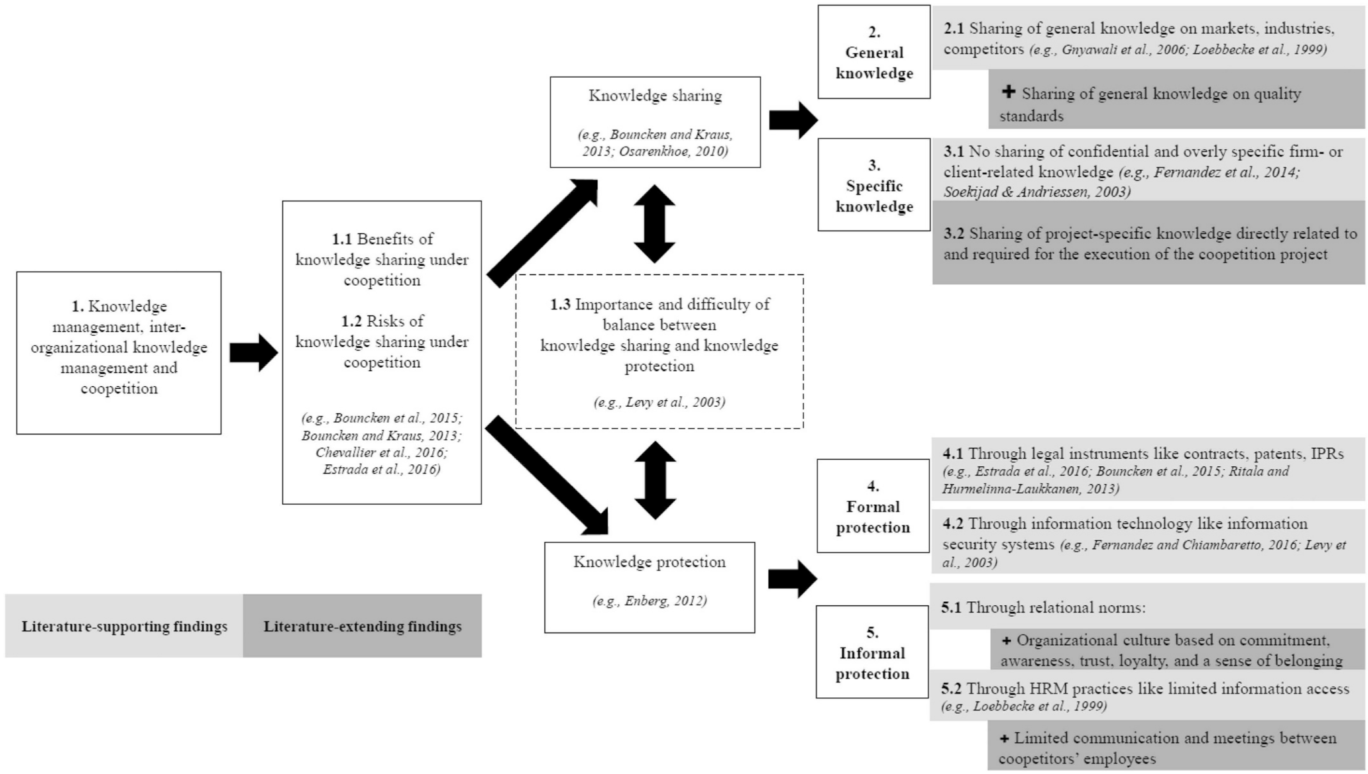

Fig. 2. Extended framework on coopetitive knowledge-management practices. Source: own illustration.

systems allow coopeting firms to control and protect access to core knowledge and confidential information: "*We have a very good computer system where only a few people have access to take away information*" (F1); "*We use technology to protect confidential information (…) We have restricted access according to each employee's needs*" (F11). The introduction and application of such oftentimes costly IT systems, however, must be reasonable in terms of expenses, risks and benefits: "*I (…) use technology if the cost/benefit relationships are reasonable*" (F2) and "*I agree with the use of technology to protect the sensitive information as long as the risk/cost is significant.*" (F11).

Despite the potential advantages of such IT tools, the interviewees note that the use of technology "*is not the most important factor for information leakage*" (F8). Therefore, interviewees choose additional, less legislative strategies when collaborating with a direct competitor. In fact, according to F8, "*most of the cases of information leakage are made by employees from inside the company. (…) who share the information, sometimes intentionally, sometimes unintentionally.*". Hence, coopetitors count on building up an organizational culture that is particularly based on awareness, trust, loyalty, and a sense of belonging to avoid intentional or unintentional exchanges of knowledge (see theme number/box 5.1 in Table 3 and Fig. 2, respectively): "*more than using technology to protect the information, I educate the employees to feel part of the company*" (F11). This creation of commitment to the firm can even be combined with the offer of economic incentives: "*the only way to mitigate that risk is to work on your organizational culture and by making your employees feel part of the company and by economic incentives.*" (F8).

Additionally, firms make sure to externalize their meetings with competitors (see theme number/box 5.2 in Table 3 and Fig. 2, respectively). In other words, meetings among coopetitors are held outside the involved firms' offices, on external premises: "*we never meet in the company; we either meet at a restaurant or a café.*" (F1), and "*all the meetings we have had, they have been either in a restaurant or in the garage we share. There is no need for them to come into my office and meet my key employees*" (F11). As such, firms try to minimize the contact and communication between the coopetitors' employees.

5. Discussion

5.1. How do cooperating competitors balance the needs to share and protect their knowledge?

To understand coopetitive knowledge sharing and knowledge protection, we presented a synoptic and fine-grained analysis of how cooperating competitors balance knowledge sharing and knowledge protection. Our research question was "How do firms balance the needs for knowledge sharing and knowledge protection when they engage in coopetition relationships?"

Our findings reveal that it is important to balance interorganizational knowledge management because knowledge sharing and knowledge protection are two particularly important knowledge-related topics in this particular setting (Estrada et al., 2016), and it is helpful for firms to consciously create a balance between knowledge sharing and knowledge protection.

Analyzing knowledge sharing practices, we observe that coopetitors proactively decide which knowledge to share with their competitors and which knowledge to protect. While the studied firms share general knowledge about industries, sectors, or markets rather easily, the sharing of specific knowledge regarding innovations, experiences, or confidential information is much more limited and extremely protected. This finding supports prior insights that reveal the exchange of general, nonclassified (Enberg, 2012) knowledge, such as knowledge of markets, industries and competitors (Gnyawali et al., 2006) or marketing and sales, local business opportunities and economic developments (Loebbecke et al., 1999). By contrast, more specific and confidential knowledge with respect to firms' clients or strategic vision is excluded from sharing (Fernandez et al., 2014; Soekijad & Andriessen, 2003). The proactive distinction between general and specific knowledge is understandable because general knowledge can be easily acquired and rarely represents the firms' core knowledge (Jensen & Meckling, 1992). Specific knowledge, however, is much more important to firms' core business, which explains why coopetitors are more skeptical concerning the exchange of specific knowledge.

Nevertheless, the transfer of general knowledge in the form of industry insights through coopetition can represent a crucial success factor and helps firms achieve a competitive advantage (Loebbecke et al., 1999). Extending these prior insights, we find that easily shared general knowledge may also refer to an industry's particular quality standards and that specific knowledge is not always entirely excluded from knowledge sharing. In particular, we show that specific knowledge is shared when it directly relates to the execution and potential success of a coopetition project.

Supporting prior research, our interviewees fear opportunistic behavior when applying a coopetition strategy (Bouncken & Kraus, 2013; Estrada et al., 2016) that induces coopetitors to apply particular knowledge protection practices. The need for knowledge protection is particularly high under coopetition because coopetitors receive and provide privileged access to their partners' and their own knowledge bases, respectively, which are typically both complementary for the other firm given their firm-specific uniqueness (Ritala & Sainio, 2014). As such, our interviewees fear that partners exploit and use the accessed knowledge to be more competitive (Chevallier et al., 2016).

Our findings advocate the suggestion that firms strongly rely on the use of formal protection practices (Estrada et al., 2016) that include contractual agreements (Jiang et al., 2013; Salvetat et al., 2013) such as confidentiality agreements or NDAs (Salvetat et al., 2013) to mitigate the risks of unintended knowledge leakage. This use of contracts as legal instruments is particularly relevant when firms share similar knowledge and strategies (Kim & Parkhe, 2009; Park, Srivastava, & Gnyawali, 2014), as is often the case with coopetitors. Legal protection helps coopetitors to protect codified knowledge (James, Leiblein, & Lu, 2013), to define their knowledge sharing boundaries (Estrada et al., 2016), and to create a common understanding of and mutual commitment to coopetition (Lacoste, 2014). Additionally, we reinforce the finding that firms opt for IT “security tools” to ensure a clear, technical distinction between what knowledge is shared and what knowledge is protected (Fernandez & Chiambaretto, 2016; Levy et al., 2003). These technological instruments help coopetitors to better control and foresee access to shared and protected knowledge.

Moreover, similarly to what has been observed previously, our studied firms trust not only formal but also informal knowledge protection (Fernandez & Chiambaretto, 2016) because several informal policies can be implemented to ensure that key knowledge is not unintentionally shared. Prior research already highlights the role of trust and reputation (Carayannis et al., 2000; Fernandez & Chiambaretto, 2016; Jiang et al., 2013) as soft factors enabling informal knowledge protection. Based on our analysis, however, we extend this research stream by revealing that coopetitors seek to protect core knowledge by focusing on the nature of their firms' organizational culture. In particular, coopetitors aim to build up an organizational culture characterized by a high level of organizational commitment and complemented by values such as awareness, trust, loyalty, and a sense of belonging. This atmosphere helps firms to ensure their employees' loyalty, thus discouraging employees from engaging in intentional or unintentional knowledge leakage.

Confirming the importance of additional, nonformal protection because legal instruments cannot specify everything (Loebbecke et al., 1999), our findings support and extend the insight on the use of HRM practices to deter knowledge leakage among coopetitors. In particular, we find that the analyzed firms indeed base their informal protection on particular HRM practices. Instead of only focusing on limited information access or emphasizing awareness and safety in social situations (Loebbecke et al., 1999), we observe that coopetitors pro-actively limit the contact and communication between coopetitors' key employees and avoid any meetings within the coopetitors' premises. Thus, our findings indicate that HRM practices utilized by coopetitors seek to control employees who are involved in coopetitive relationships by, for instance, formally restricting their access to core knowledge; moreover, firms also try to control the nature of the interaction between coopeting firms' employees. By monitoring and limiting direct communication and excluding the possibility of meeting competitors on the cooperating competitors' premises, coopetitors prevent competitors from glimpsing how they are doing business and thus protect their best practices from imitation.

Altogether, these insights support the suggestion that coopetitive interorganizational knowledge management may be facilitated not only by formal contracts but also by the development of relational norms (Fernandez & Chiambaretto, 2016). This study thus extends previous insights regarding importance of combining formal and informal protection practices (Ritala, 2009).

5.2. *Implications*

5.2.1. *Implications for research*

From a theoretical perspective, this study contributes to the literature on coopetition and interorganizational knowledge management in two ways. First, we find that coopetitors are aware of the importance of knowledge management as an underlying process of coopetition since they are seeking to implement both cooperative knowledge sharing and competitive knowledge protection practices. While prior research highlights the importance and ambiguity of both knowledge sharing and knowledge protection for coopetition (Fernandez & Chiambaretto, 2016; Levy et al., 2003; Loebbecke et al., 1999; Salvetat et al., 2013), our study contributes to this literature in that we present a more nuanced view of how cooperating competitors balance their needs to share and protect knowledge in coopetition. Regarding knowledge sharing, we particularly show that coopetitors distinguish between the sharing of general and specific knowledge. Further, to counterbalance the risks of knowledge sharing in coopetition and to obtain optimal protection of core knowledge, they complement formal with informal protection mechanisms.

Second, we contribute to an increasing understanding of the tensions inherent in coopetition (Fernandez et al., 2014; Fernandez & Chiambaretto, 2016; Tidström, 2014). With a particular focus on the balance between knowledge sharing and knowledge protection, we elaborate on knowledge-related tensions (Bengtsson et al., 2016; Raza-Ullah et al., 2014; Tidström, 2014). Our framework advances the perception and comprehension of what underlies knowledge-related tensions of coopetition and help to determine appropriate management strategies to cope with this tension. To address this knowledge-related tension and to create an appropriate balance of knowledge sharing and knowledge protection, we find that coopetitors share general and project-specific knowledge while they withhold core knowledge about their firms and clients. To achieve this balance, firms combine formal and informal knowledge protection practices.

5.2.2. *Implications for practice*

From a managerial point of view, our findings imply that firms engaging in coopetition should be aware of the role and importance of interorganizational knowledge management, including knowledge sharing and knowledge protection practices. To benefit from coopetitive knowledge transfer and to prevent knowledge leakage, coopetitors must ensure that knowledge sharing and knowledge protection practices are carefully balanced. Regarding knowledge sharing, decision makers of coopeting firms are advised to distinguish between general and specific knowledge because specific knowledge can be more important for the creation and maintenance of competitive advantages. Furthermore, regarding knowledge protection, decision makers should realize that while certain types of formal protection, such as contractual agreements, can help to avoid involuntary knowledge leakage, informal protection, such as organizational commitment, is also essential. Our study provides professionals who work in coopeting firms with insights about how to manage and organize coopetitive knowledge sharing and how to avoid pitfalls and risks by implementing appropriate knowledge protection measures.

5.3. Limitations and further research directions

We recognize that our study design does not allow us to generalize our findings and conclusions. First, even though our sample consisting of managers from Latin American countries represents an ideal research context for our study, the geographical location of the respondent firms may have affected our results, in that Latin American countries may be culturally distinct from other parts of the world. Further, although Latin American countries generally have similar business cultures due to their historical and political backgrounds, there may be differences between the distinct countries, and our interviewed firms represent only nine of 26 Latin American countries.

Second, most of the interviewed firms belong to the IT sector, where coopetition tends to be more accepted than in other industries because coopetition is of high relevance in such innovation-intensive, dynamic, and complex fields (Carayannis & Alexander, 1999). Similarly, our respondents were working for SMEs, which may reveal a particular stance towards coopetition and knowledge management given their shortcomings in terms of resources, capabilities, and knowledge (Levy et al., 2003). The results may be different for large corporations, which may possess, for instance, more advanced opportunities to protect their key knowledge through well-established practices and regulations.

Fourth, like most qualitative research that uses an interpretative approach, this research is limited by the number of interview participants. Despite the quality of the responses and the results of the interviews, the use of only eleven interviews does not enable us to present a full and accurate vision of the real perception of Latin American firms regarding coopetition and knowledge sharing.

Our results open up some possible directions for further research. Researchers could look into the balancing act between knowledge sharing and knowledge protection in a wider range of geographical areas, industries, and firm types. Focusing on other cultural, industrial or firm contexts would help to discover potential contextual effects and thus offer deeper insights into coopetitive knowledge management and knowledge-related tensions in coopetition. Additionally, researchers could conduct quantitative studies to further precise our understanding of coopetitive knowledge management.

As a final note, our study represents one of the first integrative pictures illustrating how the need to find a balance between knowledge sharing and knowledge protection can be reached as a fundamental component of coopetitive interorganizational knowledge management. Therefore, we provide insights that may help cooperating competitors cope with the paradox of sharing sufficient knowledge to learn and obtain competitive advantages while simultaneously mitigating the risks of unwanted knowledge leakage.

Declarations of interest

None.

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References

Alavi, M., & Leidner, D. E. (1999). Knowledge management systems: Issues, challenges, and benefits. *Communications of the AIS, 1*(2es), 1.
Bengtsson, M., & Kock, S. (2000). "Coopetition" in business networks: To cooperate and compete simultaneously. *Industrial Marketing Management, 29*(5), 411–426.
Bengtsson, M., Raza-Ullah, T., & Vanyushyn, V. (2016). The coopetition paradox and tension: The moderating role of coopetition capability. *Industrial Marketing Management, 53*(1), 19–30.
Bouncken, R., Gast, J., Kraus, S., & Bogers, M. (2015). Coopetition: A review, synthesis, and future research directions. *Review of Managerial Science, 9*(3), 577–601.
Bouncken, R., & Kraus, S. (2013). Innovation in knowledge-intensive industries: The double-edged sword of coopetition. *Journal of Business Research, 66*(10), 2060–2070.
Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development.* Thousand Oaks, CA: Sage.
Brandenburger, A., & Nalebuff, B. (1996). *Co-opetition.* New York: Doubleday Publishing.
Carayannis, E. G., & Alexander, J. (1999). The wealth of knowledge: Converting intellectual property to intellectual capital in co-opetitive research and technology management settings. *International Journal of Technology Management, 18*(3), 326–352.
Carayannis, E. G., Alexander, J., & Ioannidis, A. (2000). Leveraging knowledge, learning, and innovation in forming strategic government–university–industry (GUI) R&D partnerships in the US, Germany, and France. *Technovation, 20*(9), 477–488.
Carayannis, E. G., Depeige, A., & Sindakis, S. (2014). Dynamics of ultra-organizational coopetition and circuits of knowledge: A knowledge-based view of value ecology. *Journal of Knowledge Management, 18*(5), 1020–1035.
Chevallier, C., Laarraf, Z., Lacam, J. S., Miloudi, A., & Salvetat, D. (2016). Competitive intelligence, knowledge management and coopetition: The case of european high-technology firms. *Business Process Management Journal, 22*(6), 1192–1211.
Chin, K., Chan, B., & Lam, P. (2008). Identifying and prioritizing critical success factors for coopetition strategy. *Industrial Management & Data Systems, 108*(4), 437–454.
Corbin, J. M., & Strauss, A. C. (2007). *Basics of qualitative research – Techniques and procedures for developing grounded theory* (3rd edn.). Thousand Oaks, CA: Sage.
Crabtree, B. F., & Miller, W. F. (1999). *A template approach to text analysis: Developing and using codebooks.* Newbury Park, CA: Sage.
Czakon, W. (2009). Interorganizational knowledge management – Towards coopetition strategies. *Argumenta Oeconomica, 2*(23), 113–125.
Dana, L.-P., & Dumez, H. (2015). Qualitative research revisited: Epistemology of a comprehensive approach. *International Journal of Entrepreneurship and Small Business, 26*(2), 154–170.
Enberg, C. (2012). Enabling knowledge integration in coopetitive R&D projects: The management of conflicting logics. *International Journal of Project Management, 30*(7), 771–780.
Eriksson, P., & Kovalainen, A. (2015). *Qualitative methods in business research: A practical guide to social research.* London: Sage Publications Ltd.
Estrada, I., Faems, D., & de Faria, P. (2016). Coopetition and product innovation performance: The role of internal knowledge sharing mechanisms and formal knowledge protection mechanisms. *Industrial Marketing Management, 53*(1), 56–65.
Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods, 5*(1), 80–92.
Fernandez, A.-S., & Chiambaretto, P. (2016). Managing tensions related to information in coopetition. *Industrial Marketing Management, 53*(1), 66–76.
Fernandez, A.-S., Le Roy, F., & Gnyawali, D. R. (2014). Sources and management of tension in co-opetition case evidence from telecommunications satellites manufacturing in Europe. *Industrial Marketing Management, 43*(2), 222–235.
Francis, D. C., Rodriguez Meza, J. L., & Yang, J. (2013). Mapping enterprises in latin America and the Caribbean. In World Bank Group (Ed.). *Latin American and the Caribean Series Note No. 1*.
Gast, J., Filser, M., Gundolf, K., & Kraus, S. (2015). Coopetition research: Towards a better understanding of past trends and future directions. *International Journal of Entrepreneurship and Small Business, 24*(4), 492–521.
Gnyawali, D. R., He, J., & Madhavan, R. (2006). Impact of co-opetition on firm competitive behavior: An empirical examination. *Journal of Management, 32*(4), 507–530.
Gnyawali, D. R., & Park, B. (2009). Co-opetition and technological innovation in small and medium-sized enterprises: A multilevel conceptual model. *Journal of Small Business Management, 47*(3), 308–330.
Gnyawali, D. R., & Park, B. (2011). Co-opetition between giants: Collaboration with competitors for technological innovation. *Research Policy, 40*(5), 650–663.
Hamel, G., Doz, Y., & Prahalad, C. (1989). Collaborate with your competitors and win. *Harvard Business Review, 67*(1), 133–139.
Herrera, A. M., & Lora, E. (2005). Why so small? Explaining the size of firms in Latin America. *The World Economy, 28*(7), 1005–1028.
Hurmelinna-Laukkanen, P. (2009). The availability, strength and efficiency of appropriability mechanisms–protecting investments in knowledge creation. *International Journal of Technology Management, 45*(3–4), 282–290.
Hurmelinna-Laukkanen, P., & Olander, H. (2014). Coping with rivals' absorptive capacity in innovation activities. *Technovation, 34*(1), 3–11.
Ipe, M. (2003). Knowledge sharing in organizations: A conceptual framework. *Human Resource Development Review, 2*(4), 337–359.
James, S. D., Leiblein, M. J., & Lu, S. (2013). How firms capture value from their innovations. *Journal of Management, 39*(5), 1123–1155.
Jensen, M. C., & Meckling, W. H. (1992). Specific and general knowledge and organizational structure. *Journal of Applied Corporate Finance, 8*(2), 4–18.
Jiang, X., Li, M., Gao, S., Bao, Y., & Jiang, F. (2013). Managing knowledge leakage in strategic alliances: The effects of trust and formal contracts. *Industrial Marketing Management, 42*(6), 983–991.
Khanna, T., Gulati, R., & Nohria, N. (1998). The dynamics of learning alliances: Competition, cooperation, and relative scope. *Strategic Management Journal, 19*(3), 193–210.

Kim, J., & Parkhe, A. (2009). Competing and cooperating similarity in global strategic alliances: An exploratory examination. *British Journal of Management, 20*(3), 363–376.
Kogut, B. (2000). The network as knowledge: Generative rules and the emergence of structure. *Strategic Management Journal, 21*(3), 405–425.
Kogut, B., & Zander, U. (1996). What firms do? Coordination, identity, and learning. *Organization Science, 7*(5), 502–518.
Lacoste, S. M. (2014). Coopetition and framework contracts in industrial customer-supplier relationships. [Article]. *Qualitative Market Research: An International Journal, 17*(1), 43–57. https://doi.org/10.1108/QMR-01-2012-0006.
Lado, A., Boyd, N., & Hanlon, S. (1997). Competition, cooperation, and the search for economic rents: A syncretic model. *Academy of Management Review, 22*(1), 110–141.
Le Roy, F., & Fernandez, A. S. (2015). Managing coopetitive tensions at the working-group level: The rise of the coopetitive project team. *British Journal of Management, 26*(4), 671–688.
Levy, M., Loebbecke, C., & Powell, P. (2003). SMEs, co-opetition and knowledge sharing: The role of information systems. *European Journal of Information Systems, 12*(1), 3–17.
Li, D., Eden, L., Hitt, M. A., Ireland, R. D., & Garrette, R. P. (2012). Governance in multilateral R&D alliances. *Organization Science, 23*(4), 1191–1210.
Loebbecke, C., & Angehrn, A. (2010). *Knowledge management under coopetition encyclopedia of knowledge management.* IGI Global791–803.
Loebbecke, C., Van Fenema, P., & Powell, P. (1999). Co-opetition and knowledge transfer. *ACM SIGMIS Database, 30*(2), 14–25.
McCaw, M. (2014). In bed with big brother: Apple and IBM form strategic alliance retrieved 11 september, 2018. from https://www.theneweconomy.com/strategy/strategic-alliance-ibm-apple.
Miles, M. B., & Huberman, A. M. (2003). *Qualitative data analysis: An expanded sourcebook* (2nd ed.). Thousand Oaks: Sage.
Morris, M., Koçak, A., & Özer, A. (2007). Coopetition as a small business strategy: Implications for performance. *Journal of Small Business Strategy, 18*(1), 35–55.
Nguyen, H., & Nafula, K. (2016). *Balancing the tension between knowledge sharing and knowledge protection in coopetition: Empirical study of high-tech companies* (Master Thesis)Umeå: Umeå Univerrsity.
Nieto, M. J., & Santamaría, L. (2007). The importance of diverse collaborative networks for the novelty of product innovation. *Technovation, 27*(6), 367–377.
Osarenkhoe, A. (2010). A coopetition strategy: A study of inter-firm dynamics between competition and cooperation. *Business Strategy Series, 11*(6), 343–362.
Park, B., Srivastava, M. K., & Gnyawali, D. R. (2014). Walking the tight rope of coopetition: Impact of competition and cooperation intensities and balance on firm innovation performance. *Industrial Marketing Management, 43*(2), 210–221.
Pellegrin-Boucher, E., Le Roy, F., & Gurău, C. (2013). Coopetitive strategies in the ICT sector: Typology and stability. *Technology Analysis and Strategic Management, 25*(1), 71–89.
Property Rights Alliance (2018). International Property Rights Index Retrieved February, 2, 2018. from https://internationalpropertyrightsindex.org/countries.
Quintana-Garcia, C., & Benavides-Velasco, C. A. (2004). Cooperation, competition, and innovative capability: A panel data of European dedicated biotechnology firms. *Technovation, 24*(12), 927–938.
Quiroga, J. E. M., Cuellar, S., Cobo, J. C., & Benavides, D. (2017). Business networks in the Colombian pharmaceutical industry. *Paper presented at the XVII Congreso Latino-Iberoamericano de Gestión Tecnológica ALTEC 2017, Ciudad de Mexico*.
Raza-Ullah, T., Bengtsson, M., & Kock, S. (2014). The coopetition paradox and tension in coopetition at multiple levels. *Industrial Marketing Management, 43*(2), 189–198.
Ritala, P. (2009). Is coopetition different from cooperation? The impact of market rivalry on value creation in alliances. *International Journal of Intellectual Property Management, 3*(1), 39–55.
Ritala, P. (2012). Coopetition strategy: When is it successful? Empirical evidence on innovation and market performance. *British Journal of Management, 23*(3), 307–324.
Ritala, P., & Hurmelinna-Laukkanen, P. (2009). What's in it for me? Creating and appropriating value in innovation-related coopetition. *Technovation, 29*(12), 819–828.
Ritala, P., & Hurmelinna-Laukkanen, P. (2013). Incremental and radical innovation in coopetition: The role of absorptive capacity and appropriability. *Journal of Product Innovation Management, 30*(1), 154–169.
Ritala, P., Hurmelinna-Laukkanen, P., & Blomqvist, K. (2009). Tug of war in innovation-coopetitive service development. *International Journal of Services Technology and Management, 12*(3), 255–272.
Ritala, P., Olander, H., Michailova, S., & Husted, K. (2015). Knowledge sharing, knowledge leaking and relative innovation performance: An empirical study. *Technovation, 35*, 22–31.
Ritala, P., & Sainio, L.-M. (2014). Coopetition for radical innovation: Technology, market and business-model perspectives. *Technology Analysis and Strategic Management, 26*(2), 155–169.
Rivette, K. G., & Kline, D. (2000). Discovering new value in intellectual property. *Harvard Business Review, 78*, 54–66.
Salvetat, D., Geraudel, M., & D'Armagnac, S. (2013). Inter-organizational knowledge management in a coopetitive context in the aeronautic and space industry. *Knowledge Management Research & Practice, 11*, 265–277.
Seran, T., Pellegrin-Boucher, E., & Gurau, C. (2016). The management of coopetitive tensions within multi-unit organizations. *Industrial Marketing Management, 53*, 31–41.
Soekijad, M., & Andriessen, E. (2003). Conditions for knowledge sharing in competitive alliances. *European Management Journal, 21*(5), 578–587.
Tether, B. S. (2002). Who co-operates for innovation, and why: An empirical analysis. *Research Policy, 31*(6), 947–967.
Tidström, A. (2014). Managing tensions in coopetition. *Industrial Marketing Management, 43*(2), 261–271.
Tsai, W. (2002). Social structure of "coopetition" within a multiunit organization: Coordination, competition, and intraorganizational knowledge sharing. *Organization Science, 13*(2), 179–190.
Un, C. A., Cuervo-Cazurra, A., & Asakawa, K. (2010). R&D collaborations and product innovation. *Journal of Product Innovation Management, 27*(5), 673–689.
Williamson, O. E. (1975). *Markets and hierarchies, analysis and antitrust implications.* New York: Free Press.
Williamson, O. E. (1985). *The economic institutions of capitalism.* New York: Free Press.
Zineldin, M. (2004). Co-opetition: The organisation of the future. *Marketing Intelligence and Planning, 22*(7), 780–790.