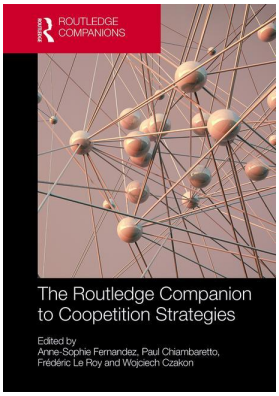

The Routledge Companion to Coopetition Strategies

Anne-Sophie Fernandez, Paul Chiambaretto, Wojciech Czakon

Knowledge management in coopetition

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Knowledge management in coopetition

Isabel Estrada

Introduction

Coopetition, which implies the concurrent presence of cooperation and competition (Brandenburger & Nalebuff, 1996), is central to innovation. Firms face increasing pressure to cooperate in the innovation arena with other organizations with whom they compete fiercely in the marketplace (e.g., Gnyawali & Park, 2011; Le Roy & Czakon, 2016). The global automotive industry provides a good example of this. Leading carmakers such as Toyota and BMW are getting together to develop components that are so complex and costly (e.g., fuel-cell technology) that could not be easily developed by one firm on its own.[1] This chapter focuses on this form of coopetition: collaborative agreements between competing firms to jointly develop an innovation-oriented project, such as research and development (R&D), co-development of technologies, processes and/or products, etc.

In these coopetition settings, knowledge management is center stage (e.g., Fernandez & Chiambaretto, 2016; Ritala et al., 2015; Tsai, 2002). While the potential advantages of cooperating with competitors are evident (e.g., access to complementary knowledge), realizing these advantages requires intense knowledge sharing (Dussauge et al., 2000), which has been described as a "double-edged sword": a firm's core knowledge might end up reinforcing its competitor's market position (Bouncken & Kraus, 2013). Therefore, firms collaborating with competitors face a salient tension between knowledge sharing and knowledge protection (e.g., Estrada et al., 2016). Firms need to enforce the exchange of knowledge relevant to the joint project, while making sure that competitors will neither misuse that knowledge (Walter et al., 2015), nor accidentally access other valuable knowledge (Oxley & Sampson, 2004). Since knowledge is core to innovation, it is crucial to deal with the knowledge sharing–knowledge protection tension when working with competitors on innovation (e.g., Estrada et al., 2016; Ritala et al., 2015).

Against this backdrop, this chapter aims to review our current understanding of knowledge management issues in coopetition and propose some directions for future research on the phenomenon. The chapter's structure is as follows. First, the knowledge sharing–knowledge protection tension in coopetition is discussed. Second, an overview of recent research on knowledge management in coopetition is presented. Next, this literature is critically discussed, highlighting key research gaps and opportunities for future research. The chapter finishes with a short conclusion.

Coopetition and the knowledge sharing–knowledge protection tension[2]

As widely noted in the literature (e.g., Estrada et al., 2016; Ritala & Hurmelinna-Laukkanen, 2013), two important frameworks to study coopetition are the resource-based view of the firm (RBV[3]; Makadok, 2001) and transaction costs economics (TCE; Williamson, 1991). On the one hand, the RBV highlights that coopetition is an important strategy for value generation (Dussage et al., 2000). Coopetitors can possess mutually complementary resources, and normally use similar production processes and technology (Kim & Parkhe, 2009); this situation may smooth the process of bringing together their capabilities, generating fertile ground for synergies and innovation (Dussauge et al., 2000; Yan et al., 2017). On the other hand, TCE suggests that cooperating with competing firms encompasses hazards of value appropriation (e.g., García-Canal et al., 2008). Since coopetitors are market rivals, they could use a joint project to strengthen their market position vis- à-vis one another (Hamel, 1991). Furthermore, rivalry may contaminate and eventually take over the alliance (Park & Russo, 1996). Also, one party could take advantage by misappropriating resources of the other firm or of the alliance to opportunistically boost its own competitive position (Walter et al., 2015).

While both frameworks surely provide central ideas, coopetition arguably brings about both opportunities and hazards (Das & Teng, 2003; Dussauge et al., 2000). From this viewpoint, it is suggested that these two perspectives are complementary rather than competing (e.g., Castañer et al., 2014). Hence, the tension between value creation and value appropriation, idiosyncratic to the phenomenon of coopetition (Brandenburger & Nalebuff, 1996), is brought to the fore. In innovation settings, this tension finds its highest expression in the knowledge sharing–knowledge protection tension (e.g., Estrada et al., 2016; Ritala et al., 2015).

Coopetitors need to work closely with one another to effectively pool their knowledge and capitalize on their joint innovation options (Dussauge et al., 2000). Close interaction enables partnering firms to become familiar with each other's organizations; yet, in coopetition, this exposure may be problematic (Das & Teng, 2003); competitors may have opportunity, motivation, and ability to assimilate core knowledge from each other (Argote et al., 2003; Estrada et al., 2016). Thus, firms working with competitors incur salient risks of misuse and unintended leakage of information (e.g., Oxley & Sampson, 2004).

In a nutshell, firms seeking to profit from the innovation opportunities offered by coopetition (Yan et al., 2017) cannot escape the danger of giving away core knowledge to competitors (e.g., Castañer et al., 2014; Dussage et al., 2000). To the extent that these knowledge-related tensions impact the governance and outcomes of innovation agreements between competitors, knowledge management is crucial to these strategies (Fernandez & Chiambaretto, 2016; Ritala & Hurmelinna-Laukkanen, 2013).

The literature on knowledge management in coopetition: An overview

Table 15.1 summarizes examples of recent contributions relevant for the phenomenon of knowledge management in coopetition. Studies in this literature[4] can be classified into two main streams of research, depending on their main level of analysis (i.e., inter-organizational and intra-organizational). In this chapter, studies in these two streams are referred to, respectively, as relationship-level and firm-level studies.

Below, each stream is reviewed; afterwards, an overview of key insights is presented, bringing contributions from relationship-level and firm-level studies together, as well as from some recent studies that address both levels of analysis.

Table 15.1 Examples of relevant studies for the field of knowledge management in coopetition

Study	*Foci of Analysis**		*Purpose*	*Setting*	*Key Findings*
	R	*F*			
Baum et al. (2000)	✓		To analyze the impact of the network composition of start-up companies on the performance achieved in the first stages after founding.	Start-ups in the Canadian biotechnology industry, founded between 1991 and 1996.	Startups that ally with established potential competitors typically exhibit lower initial performance. The impact of alliances with potential competitors varies with relative market scope and the competitor's innovative capabilities. For example, start-ups show better initial performance when they have relatively broader scope than their rivals.
Oxley &Sampson (2004)	✓		To analyze under which conditions alliance scope is used as a governance mechanism (to enable knowledge sharing while preventing knowledge leakages) in R&D alliances.	International R&D alliances formed by at least one firm in telecommunications equipment and/or electronics industries.	In R&D alliances, partners are less likely to select a broad alliance scope when: the overlap between their end-product markets is high (due to direct competition), and the overlap between their technology domains is low (due to lack of absorptive capacity). Partners are more likely to choose broad alliance scope when: all partners in the alliance are industry laggards, and the alliance is structured as an equity joint venture (and vice versa).
Enberg (2012)	✓		To analyze how knowledge integration can be managed in R&D projects between competitors.	Case study of Future Combat Air System (FCAS) project, a R&D project between five competing firms in five different countries.	Knowledge integration needs project management mechanisms like planning and process specification that foster shared understanding of the project. These mechanisms, while supporting knowledge integration, allow the partners to clearly demarcate what knowledge can be shared and to structure their face-to-face communication accordingly. Decision making should be a project team activity. Problem solving should be an individual activity to lessen unwanted knowledge leakages.

(*continued*)

Table 15.1 (Cont.)

Study	*Foci of Analysis**		*Purpose*	*Setting*	*Key Findings*
	R	*F*			
Ho & Ganesan (2013)	✓		To analyze under which conditions suppliers in coopetitive partnerships engage in mutual knowledge sharing.	Scenario experiment and survey study on firms in three technology-based industries (optics, automotive, and computing).	Under high customer participation and anticipated customer value, knowledge base compatibility between suppliers in coopetition increases knowledge sharing. If customer participation is high but customer value is low, knowledge base compatibility decreases knowledge sharing.
Ritala & Hurmelinna-Laukkanen (2013)		✓	To analyze the effects of a firm's potential absorptive capacity (PACAP) and appropriability regime on coopetition innovation outcomes.	Finnish firms in multiple industries involved in collaborative innovation with competitors.	PACAP positively affects incremental innovation. Appropriability regime is relevant for incremental and radical innovation. There is a positive interaction between PACAP and appropriability regime, which may be especially relevant for radical innovation.
Castañer et al. (2014)		✓	To analyze the performance implications of governance mode and governance fit in make-or-ally decisions.	Product innovation decisions (autonomous governance versus horizontal collaboration) in the aircraft industry.	Horizontal collaboration has a combination advantage and a governance disadvantage. It allows for higher market sales but also higher time to market than autonomous governance. Horizontal collaboration can yield superior performance when it fits the firm's resource endowment respect to the product's resource requirements (e.g., firms lack the required resources for that product).
Walter et al. (2015)	✓		To analyze the effects of formalization and communication quality on perceived opportunism in R&D alliances between competitors.	German technology ventures in multiple industries involved in R&D alliances with competing incumbents.	The higher the degree of formalization (communication quality) in the relationship, the stronger (weaker) the perceptions of opportunistic behavior. The effect of formalization is more pronounced for knowledge appropriation than for other opportunism forms (strategic manipulation).

Ritala & Tidström (2014)	✓	✓	To analyze value creation and value appropriation in coopetition networks, distinguishing between firm-level and relational-level strategies of the involved coopetitors.	Longitudinal in-depth case study of a coopetitive network formed by four Finnish manufacturing firms.	Participating firms held value-creation (collaborative versus competitive) and value-appropriation (positive-sum versus zero-sum) objectives at both firm and relational levels. Objectives at these two levels exhibited different levels of alignment, and tended to evolve over time. Hence, different value-creation and value-appropriation approaches could be identified across the network life cycle, eliciting different relational and firm strategies (e.g., firm-level strategy; value-creation approaches: "consistent coopetitive approach," "purely collaborative approach," and "fading interest").
Le Roy & Fernandez (2015)	✓		To analyze how coopetition tensions are managed at the working-group level (i.e., project team).	Longitudinal in-depth case study of a coopetitive project between two manufacturing firms in the aerospace industry.	To deal with tensions, the competitors combined integration-separation at two levels. They created a project team structure, purposefully separated from the other operations of the firms. At the working-group level, they applied the integration principle via "co-management" of the project.
Pahnke et al. (2015)		✓	To analyze the impact of indirect ties to competitors (via shared venture capitalist partners) on the innovation performance of entrepreneurial firms.	Firms in the medical device industry (minimally invasive surgical sector).	The number of indirect competitor ties has a negative effect on innovation, which is stronger when the focal firm-shared investor tie (i) is older, (ii) implies less commitment, and (iii) is formed at a higher geographic distance, in respect to the competitor-shared investor tie.
Bengtsson et al. (2016)	✓	✓	To analyze the relationships between coopetition paradox, external tension, and internal tension, and the role of coopetition capability herein.	Swedish firms active in multiple industries.	The extent of coopetition paradox (cooperation intensity-competition intensity) positively affects how managers perceive external tensions, which in turn shapes their perception of internal tensions. Coopetition capability exerts a moderating effect on the coopetition paradox-external tension relationship: firms with strong coopetition capability show a tendency to describe a moderate degree of external tension (regardless of the extent of coopetition paradox).

(*continued*)

Table 15.1 (Cont.)

Study	*Foci of Analysis**		*Purpose*	*Setting*	*Key Findings*
	R	*F*			
Bouncken et al. (2016)	✓		To analyze the relationship between alliance governance and coopetition intensity in product innovation alliances.	Vertical alliances formed by firms in the European medical device industry with major operations in Germany.	Alliance governance and coopetition intensity collectively impact product innovativeness in vertical innovation alliances. There is a negative (positive) interaction effect between singular transactional (relational) governance and coopetition intensity on product innovativeness. There is a positive interaction effect between plural governance (i.e., relational and transactional governance are jointly applied) and coopetition intensity on product innovativeness.
Estrada et al. (2016)		✓	To analyze the relationship between technological collaboration with competitors and firms' product innovation performance, examining the role of internal knowledge sharing and formal knowledge protection mechanisms herein.	Flemish manufacturing firms involved in technological collaboration with competitors.	When firms implement simultaneously (i) knowledge sharing mechanisms and (ii) knowledge protection mechanisms, collaboration with competitors has a positive impact on a focal firm's product innovation performance.
Fernandez & Chiambaretto (2016)	✓		To analyze how information-related tensions can be effectively managed in coopetition settings.	Longitudinal in-depth case study of a coopetitive project between two manufacturing firms in the aerospace industry.	The coopetitors faced tensions regarding financial and technical information, which they managed through combining formal and informal control mechanisms. They distinguished between critical and non-critical information and acted accordingly. They use formal control mechanisms (e.g., common information system) to share critical information. Then, the managers found informal ways to safely share critical information with one another (e.g., disguising details about cost structures).

* In this column, studies are classified as relationship-level studies (R) and/or firm-level studies (F), depending on their main level of analysis (i.e., inter-organizational and/or intra-organizational).

Knowledge management in coopetition (i): Relationship-level studies

The first stream of research focuses on the inter-organizational level, adopting the coopetitors' relationship as the main unit of analysis. A basic premise here is that the coopetitors' capability to manage the knowledge sharing–knowledge protection tension is determined by how they structure and orchestrate their relationship (e.g., Walter et al., 2015).

Within this stream, a first set of papers emphasizes the role of macro-structural aspects of collaborative agreements between competitors (e.g., Baum et al., 2000; Oxley & Sampson, 2004). When opportunism hazards are high, as occurs in coopetition, firms may tend to select protective governance structures such as joint ventures (e.g., García-Canal et al., 2008). Oxley and Sampson (2004) highlight alliance scope as an alternative mechanism to orchestrate knowledge exchange in R&D alliances while mitigating unintended information leakages. These authors conclude, amongst other things, that when partners are direct competitors in the market, they tend to limit their exposure by setting narrow scope agreements (i.e., they collaborate only on R&D activities). Other alliance structural characteristics, such as the alliance resource configuration (e.g., Baum et al., 2000; Ho & Ganesan, 2013), have been identified as relevant factors for the knowledge sharing–knowledge protection tension. For example, Baum et al. (2000) stress that although allying with competitors causes severe risks for start-ups due to the potential loss of proprietary information, these risks can be mitigated by prudently selecting coopetitors. To boost learning opportunities while lessening learning race risk, start-ups could select coopetitors with a relatively narrower market domain.

A second set of papers zooms in on the organization of the relationship itself, focusing on micro-structural aspects of coopetition (e.g., Bouncken et al., 2016; Enberg, 2012; Walter et al., 2015). These studies highlight more specific mechanisms adopted by competitors to structure, monitor, govern, and manage their collaborative agreements. For example, studying R&D alliances between competitors, Walter et al. (2015) analyze the effects of formalization and communication quality on perceived opportunism (e.g., the likelihood of knowledge misappropriation). They find that high communication quality mitigates opportunism perceptions, while formalization has the opposite effect. Enberg (2012) studies a R&D project between multiple competing firms in the aerospace industry and shows that to facilitate healthy knowledge integration, coopetitors should implement project management mechanisms (e.g., planning and process specification) that demarcate what knowledge can be shared and structure face-to-face discussions accordingly.

Overall, these relationship-level studies show that macro- and micro-structural aspects of relationships between coopetitors play an important role in managing the knowledge sharing–knowledge protection tension. Thus, the management of knowledge-related tensions is different for different coopetition relationships.

Knowledge management in coopetition (ii): Firm-level studies

This second stream of research examines the management of knowledge-related coopetition tensions at the intra-organizational level of analysis, thereby adopting a focal firm perspective (e.g., Pahnke et al., 2015; Ritala & Hurmelinna-Laukkanen, 2013). A core tenet in these papers is that a focal firm's ability to manage coopetition tensions is contingent on a variety of firm-level factors. Within this collection of literature, some papers underline the role of macro-organizational aspects, such as the firm's resource profile (e.g., Castañer et al., 2014) or network composition (e.g., Pahnke et al., 2015). For example, Pahnke et al. (2015) stress that, for entrepreneurial firms, sharing a venture capitalist partner with a competitor involves the serious

threat that core knowledge spills over to that competitor. Their analyses suggest that firms could mitigate information outflows through, for example, minimizing the indirect ties to competitors via shared investors. Other studies offer a close-up view of the role of firm-level factors in managing knowledge-related dilemmas, focusing on fine-grained organizational aspects (e.g., Estrada et al., 2016; Ritala & Hurmelinna-Laukkanen, 2013). For example, Ritala and Hurmelinna-Laukkanen (2013) suggest that a firm's potential absorptive capacity and appropriability regime influence its ability to balance knowledge sharing and knowledge protection in coopetition settings. Potential absorptive capacity is crucial to learning from competitors, while a suitable appropriability regime guarantees safe knowledge transfer. Complementing this evidence, Estrada et al. (2016) stress two complementary organizational mechanisms: internal knowledge sharing (i.e., incentives for employees to internally share knowledge) and formal knowledge protection (e.g., patents). Knowledge sharing mechanisms bridge the gap between potential and realized absorptive capacity, enabling the combination of the competitors' and focal firm's knowledge; knowledge protection mechanisms demarcate knowledge limits, attenuating the risk that competitors inadvertently access core knowledge.

Together, these firm-level studies indicate that macro and micro intra-organizational characteristics are crucial to a firm's ability to manage knowledge-related tensions in coopetition. Thus, firms' capabilities to manage these tensions are heterogeneous.

Knowledge management in coopetition (iii): Key insights

Bringing together lessons generated by relationship-level and firm-level studies, it can be concluded that management of the knowledge sharing–knowledge protection tension is context-specific and firm-specific, in that it differs both across relationships and firms. Thus, two coopetitors' capability to effectively exchange knowledge depends on the overall structure of their alliance (e.g., governance form and scope) but also on the specific management mechanisms they implement to govern their relationship (e.g., formalization, communication quality). Also, a focal firm's ability to manage these coopetition tensions has to do with its overall alliance strategy (e.g., criteria used to select direct and indirect ties to competitors) and how well equipped the firm is to deal with these tensions (e.g., absorptive capacity, knowledge protection mechanisms). Therefore, both the inter-organizational and intra-organizational dimensions of knowledge management are key to dealing with knowledge-related tensions in coopetition.

Furthermore, some recent studies that conduct both relational and firm-level analyses suggest that the inter- and intra-organizational dimensions of knowledge management in coopetition may be highly interrelated. Based on the longitudinal study of a coopetition network, Ritala and Tidström (2014) reveal how coopetitors may follow different and dynamic value-creation and value-appropriation strategies on both firm and relationship levels. Other papers examining coopetition tensions in R&D alliances in general (i.e., not necessarily among competitors), also show that management solutions adopted at different levels can play out in balancing these tensions (e.g., Cassiman et al., 2009). More recently, some studies have started examining coopetition capabilities, highlighting both relational and firm-level implications (e.g., Bengtsson et al., 2016). Building on earlier work on coopetition (e.g., Gnyawali & Park, 2011) and the ambidexterity literature, Bengtsson et al. (2016) argue that coopetition implies relationship-level tensions (e.g., top managers face conflicts between knowledge sharing and protection), which in turn trigger firm-level tensions (e.g., employees do not understand managers' decisions). These authors conclude that coopetition capabilities aid managers' efforts to mitigate the relational coopetition paradox and bring employees on board, smoothing tensions within their organization.

To sum up, studies addressing the phenomenon from relationship-level and/or firm-level perspectives have suggested a range of mechanisms that coopetitors, individually and/or collectively, can implement to effectively orchestrate their agreements. Despite these remarkable contributions, this literature also presents some important gaps and limitations. The following section elaborates these issues and presents some promising avenues to further develop this research field.

Knowledge management in coopetition: Research gaps and agenda

Foci of analysis: Inter-organizational versus intra-organizational

As discussed, the majority of existing studies examine the management of the knowledge sharing–knowledge protection tension either focusing on the coopetitors' relationship or adopting a focal firm perspective. This tendency to embrace an almost one-sided focus of analysis (i.e., either inter-organizational or intra-organizational) still represents a central limitation of existing research. Coopetition scholars increasingly support this claim (e.g., Bengtsson et al., 2016; Fernandez et al., 2014).

Recent studies developing a more integrative approach (e.g., Bengtsson et al., 2016; Ritala & Tidström, 2014), have begun to show how important it is to account for the inter-organizational and intra-organizational levels to explaining knowledge management in coopetition. It is suggested that knowledge-related coopetition tensions may have implications on both levels simultaneously (Fernandez et al., 2014); thus, additional integrative studies are needed. Scholars should turn their attention towards the connections between relational and firm-level facets of knowledge management strategies in coopetition. Besides researching further the topic of coopetition capabilities (e.g., Bengtsson et al., 2016), an interesting path for future work could be to examine firm-level mechanisms that can act as bridges between the inter-organizational and intra-organizational aspects of knowledge management strategies. For example, it would be interesting to explore the role of firms' innovation committees or central innovation offices (e.g., Bianchi et al., 2015). While these mechanisms clearly focus on the internal organization of innovation activities, they might also facilitate the management of knowledge-related coopetition tensions in the long term (e.g., demarcating what is core knowledge within the overall innovation strategy of the firm).

Number of coopetitors: Dyadic versus multi-partner coopetition settings

Multi-partner agreements are commonplace coopetition strategies (e.g., Bengtsson & Kock, 2000; Browning et al., 1995). In the presence of multiple coopetitors, knowledge issues become even more salient (Das & Teng, 2002; Li et al., 2012). Yet, in coopetition research the majority of attention is paid to dyadic settings; a relatively smaller number of studies focus on multi-party coopetition (e.g., Enberg, 2012; Ritala & Tidström, 2014); furthermore, these studies mostly analyze coopetition issues without devoting too much attention to the specificities of multi-partner agreements. In other streams of the alliance literature, scholars do highlight the idiosyncratic nature of multi-partner alliances (e.g., Das & Teng, 2002; Thorgren et al., 2011), which can have a significant impact on knowledge-related issues (Li et al., 2012). These studies argue that interaction between two partners is fundamentally different from interaction in a larger group, because these settings involve differing ways for resource exchange and reciprocity (c.f. Das & Teng, 2002; Li et al., 2012; Thorgren et al., 2011). In dyadic agreements, the two partners bilaterally exchange resources and have bilateral reciprocity expectations (i.e., regarding one another). In multi-partner agreements we could find bilateral interaction between a given pair of partners

but also generalized exchanges and reciprocity among all the partners (i.e., partners give to and expect to receive back from the alliance as a whole). This co-occurrence of bilateral and generalized interaction makes knowledge exchange notably complex. For example, in generalized exchanges it is challenging to monitor each party's behavior while the threat of undesirable knowledge leakage rises steeply (e.g., Li et al., 2012) because multiple parties have access to and could potentially misuse alliance knowledge. Thus, knowledge-related tensions may be aggravated in the presence of multiple coopetitors. Taking these ideas together, cross-fertilization between research on coopetition and multi-partner alliances seems very promising. For example, Das and Teng (2002) propose "social sanctions" as a key social control mechanism in multi-partner alliances. It could be interesting to explore the role of social sanctions in knowledge management strategies for multi-party coopetition.

Coopetition and the firm's alliance portfolio

Firms increasingly collaborate concurrently with different partners, thus building and maintaining portfolios of alliances (e.g., Sarkar et al., 2009). However, coopetition research tends to study coopetition agreements without specifically examining them as being part of firms' alliance portfolios—for two recent exceptions, see Chiambaretto and Fernandez (2016) and Park et al. (2014). Adopting an alliance portfolio perspective is relevant because alliances are interdependent (i.e., the effects of an alliance may depend on other alliances in the portfolio). Consequently, firms should design alliance portfolio management strategies (Faems et al., 2012) where formal and informal communication can play a crucial role (e.g., Sarkar et al., 2009). What are the implications of knowledge-related coopetition tensions for the management of alliance portfolios? Can these tensions contaminate other alliances in the portfolio? As suggested by the recent study by Park et al. (2014), it is relevant to systematically examine these questions. For example, Faems et al. (2012) propose two approaches to manage alliance portfolios: "standardization" (i.e., all alliances are managed using the same procedures) and "customization" (i.e., the firm tailors its management procedures to each type of partner). Future work could examine which approach is more effective to manage knowledge across the firm's alliance portfolio in the presence of coopetition. This line of research resembles the separation–integration dilemma stressed by some coopetition scholars (e.g., Le Roy & Fernandez, 2015), but proposes to extend its investigation to the alliance portfolio level.

Conclusion

Competitors working together in innovation-oriented projects face a fundamental tension between knowledge sharing and knowledge protection. Therefore, knowledge management strategies are center stage in these coopetition settings. This chapter has presented a discussion of existing research on the topic, offering suggestions for further development of the field. From this discussion, three themes have been identified as key areas that merit further scholarly effort: the connections between inter- and intra-organizational aspects of knowledge management in coopetition; the management of knowledge-related tensions in multi-partner settings; and the implications of these tensions for knowledge management within alliance portfolios.

Notes

1 For example, see www.nytimes.com/2013/07/03/business/for-gm-and-honda-a-fuel-cell-partnership.html.
2 For a more comprehensive development of this topic, the reader is referred to Estrada et al. (2016).

3 RBV is used here as a broad term including the capabilities-based and knowledge-based views of the firm.
4 This review is meant to be illustrative rather than exhaustive. For more elaborate reviews of the coopetition literature, see, for example, Bengtsson and Raza-Ullah (2016) and Dorn, Schweiger, and Albers (2016).

References

Argote, L., McEvily, B., & Reagans, R. (2003). Managing knowledge in organizations: An integrative framework and review of emerging themes. *Management Science*, 49(4), 571–582.

Baum, J. A., Calabrese, T., & Silverman, B. S. (2000). Don't go it alone: Alliance network composition and startups' performance in Canadian biotechnology. *Strategic Management Journal*, 267–294.

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. (2016). A systematic review of research on coopetition: Toward a multilevel understanding. *Industrial Marketing Management*, 57, 23–39.

Bengtsson, M., Raza-Ullah, T., & Vanyushyn, V. (2016). The coopetition paradox and tension: The moderating role of coopetition capability. *Industrial Marketing Management*, 53, 19–30.

Bianchi, M., Croce, A., Dell'Era, C., Di Benedetto, C. A., & Frattini, F. (2015). Organizing for inbound open innovation: How external consultants and a dedicated R&D unit influence product innovation performance. *Journal of Product Innovation Management*, 33 (4), 492–510.

Bouncken, R. B. & Kraus, S. (2013). Innovation in knowledge-intensive industries: The double-edged sword of coopetition. *Journal of Business Research*, 66(10), 2060–2070.

Bouncken, R. B., Clauß, T., & Fredrich, V. (2016). Product innovation through coopetition in alliances: Singular or plural governance? *Industrial Marketing Management*, 53, 77–90.

Brandenburger, A. M. & Nalebuff, B. F. (1996). *Coopetition*. London: Harper Collins.

Browning, L. D., Beyer, J. M., & Shetler, J. C. (1995). Building cooperation in a competitive industry: SEMATECH and the semiconductor industry. *Academy of Management Journal*, 38(1), 113–151.

Cassiman, B., Di Guardo, M. C., & Valentini, G. (2009). Organising R&D projects to profit from innovation: Insights from co-opetition. *Long Range Planning*, 42(2), 216–233.

Castañer, X., Mulotte, L., Garrette, B., & Dussauge, P. (2014). Governance mode vs. governance fit: Performance implications of make-or-ally choices for product innovation in the worldwide aircraft industry, 1942–2000. *Strategic Management Journal*, 35(9), 1386–1397.

Chiambaretto, P. & Fernandez, A.-S. (2016). The evolution of coopetitive and collaborative alliances in an alliance portfolio: the Air France case. *Industrial Marketing Management*, 57, 75–85.

Das, T. K. & Teng, B. S. (2002). Alliance constellations: A social exchange perspective. *Academy of Management Review*, 27(3), 445–456.

Das, T. K. & Teng, B. S. (2003). Partner analysis and alliance performance. *Scandinavian Journal of Management*, 19(3), 279–308.

Dorn, S., Schweiger, B., & Albers, S. (2016). Levels, phases and themes of coopetition: A systematic literature review and research agenda. *European Management Journal*, 34(5), 484–500.

Dussauge, P., Garrette, B., & Mitchell, W. (2000). Learning from competing partners: outcomes and durations of scale and link alliances in Europe, North America and Asia. *Strategic Management Journal,* 21(2), 99–126.

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.

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, 56–65.

Faems, D., Janssens, M., & Neyens, I. (2012). Alliance portfolios and innovation performance: connecting structural and managerial perspectives. *Group & Organization Management*, 37(2), 241–268.

Fernandez, A.-S. & Chiambaretto, P. (2016). Managing tensions related to information in coopetition. *Industrial Marketing Management*, 53, 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.

García-Canal, E., Valdés-Llaneza, A., & Sánchez-Lorda, P. (2008). Technological flows and choice of joint ventures in technology alliances. *Research Policy*, 37(1), 97–114.

Gnyawali, D. R. & Park, B. (2011). Coopetition between giants: Collaboration with competitors for technological innovation. *Research Policy*, 40, 650–63.

Hamel, G. (1991). Competition for competence and inter-partner learning within international strategic alliances. *Strategic Management Journal*, 12, 83–103.

Ho, H. & Ganesan, S. (2013). Does knowledge base compatibility help or hurt knowledge sharing between suppliers in coopetition? The role of customer participation. *Journal of Marketing*, 77(6), 91–107.

Kim, J. & Parkhe, A. (2009). Competing and cooperating similarity in global strategic alliances: an exploratory examination. *British Journal of Management*, 20(3), 363–376.

Le Roy, F. & Czakon, W. (2016). Managing coopetition: The missing link between strategy and performance. *Industrial Marketing Management*, 53, 3–6.

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.

Li, D., Eden, L., Hitt, M. A., Ireland, R. D., & Garrett, R. P. (2012). Governance in multilateral R&D alliances. *Organization Science*, 23(4), 1191–1210.

Makadok, R. (2001). Toward a synthesis of the resource-based and dynamic-capability views of rent creation. *Strategic Management Journal*, 22(5), 387–401.

Oxley, J. E. & Sampson, R. C. (2004). The scope and governance of international R&D alliances. *Strategic Management Journal*, 25(8–9), 723–749.

Pahnke, E. C., McDonald, R., Wang, D., & Hallen, B. (2015). Exposed: Venture capital, competitor ties, and entrepreneurial innovation. *Academy of Management Journal*, 58(5), 1334–1360.

Park, S. & M. Russo (1996). When competition eclipses cooperation: An event history analysis of joint venture failure. *Management Science,* 42(6), 875–890.

Park, B. J., Srivastava, M. K., & Gnyawali, D. R. (2014). Impact of coopetition in the alliance portfolio and coopetition experience on firm innovation. *Technology Analysis & Strategic Management*, 26(8), 893–907.

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., Olander, H., Michailova, S., & Husted, K. (2015). Knowledge sharing, knowledge leaking and relative innovation performance: An empirical study. *Technovation*, 35, 22–31.

Ritala, P. & Tidström, A. (2014). Untangling the value-creation and value-appropriation elements of coopetition strategy: A longitudinal analysis on the firm and relational levels. *Scandinavian Journal of Management*, 30(4), 498–515.

Sarkar, M. B., Aulakh, P. S., & Madhok, A. (2009). Process capabilities and value generation in alliance portfolios. *Organization Science*, 20(3), 583–600.

Thorgren, S., Wincent, J., & Eriksson, J. (2011). Too small or too large to trust your partners in multipartner alliances? The role of effort in initiating generalized exchanges. *Scandinavian Journal of Management*, 27(1), 99–112.

Tsai, W. (2002). Social structure of "coopetition" within a multiunit organization: Coordination, competition, and intraorganizational knowledge sharing. *Organization Science*, 13(2), 179–190.

Walter, S. G., Walter, A., & Müller, D. (2015). Formalization, communication quality, and opportunistic behavior in R&D alliances between competitors. *Journal of Product Innovation Management*, 32(6), 954–970.

Williamson, O. E. (1991). Comparative economic organization: The analysis of discrete structural alternatives. *Administrative Science Quarterly*, 36, 269–296.

Yan, Y., Faems, D., & Dong, J. (2017). Technological performance impacts of the overlaps with coopetitors. *Academy of Management Proceedings* (Vol. 2017, No. 1, p. 14395).