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Technology-Based Coopetition and Intellectual Property Management[1]

Chapter

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Abstract

This chapter introduces intellectual property (IP) management in technology-based coopetition. It includes a general description of the role for IP management in competition and collaboration, as well as a framework for classifying IP relevant to coopetition. Based on this framework, IP agreements are shaped to combine the logics of competition and collaboration in coopetition. A key point is that knowledge, technology, and IP can be protected to enable controlled sharing through licensing in coopetition. The chapter also introduces the concept of post-divestiture coopetition, in which IP management is critical, and exemplifies it with two cases from the automotive industry.

1. Introduction

Coopetition, i.e., collaboration between competitors, is challenging but potentially rewarding for the involved parties (Fernandez et al., 2014; Gnyawali & Park, 2011). In technology-based coopetition competitors collaborate in order to advance technological development and/or to share innovation investments. *Technology-based coopetition* is here more specifically defined as a relationship between two or more actors that to some degree collaborate in inventing and

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developing technology, while competing on the related product and service markets. It is driven by factors such as shorter product life cycles, convergence of technologies, and increasing innovation investments (Gnyawali & Park, 2009).

Apart from regulatory challenges, such as antitrust laws and regulations (Jorde & Teece, 1990), technology-based coopetition is related to several managerial challenges, such as technological risks, not-invented-here syndromes, opportunism, and more generally by tensions between collaboration and competition (Fernandez et al., 2014). These tensions have received much attention by extant research on coopetition (e.g., Cassiman et al., 2009; Ritala & Hurmelinna-Laukkanen, 2013). This literature has proposed to organizationally separate collaboration from competition within coopetition actors, since the logics of collaboration and competition are difficult to combine (Bengtsson & Kock, 2000).

One area of management that is particularly relevant in technology-based coopetition is intellectual property (IP) management. The balance between protecting and sharing technology, knowledge, and IP needs to be properly managed in order to succeed with coopetition (Ritala & Hurmelinna-Laukkanen, 2013), and in contrast to organizationally separating the logics of collaboration and competition, IP management can deal with collaboration and competition simultaneously.

This chapter introduces IP management in technology-based coopetition. It includes a general description of the role for IP management in competition and collaboration, as well as a framework for classifying IP relevant to coopetition. A key point is that the sharing of knowledge, technology, and IP in coopetition needs to be controlled. Controlled sharing, in turn, is accomplished by the use of intellectual property rights (IPRs) with associated licenses and license clauses.

The empirical examples relate to a specific type of coopetition that is identified and defined in the chapter, namely post-divestiture coopetition. Such coopetition may result from divestitures (divestments) and mergers and acquisitions (M&A) processes, for example when a business unit of one large firm is sold to a competing large firm, while technological relationships are kept between the former owner and the business unit. Thus, the coopetition is a result of a disintegration process, where the disintegrated parties (competitors) keep collaborating to develop, maintain, and/or use several shared technologies (including technological platforms) or other resources or activities. More specifically, the chapter describes the case of Volvo Cars being divested from Ford Motor Company and acquired by Geely Holding Group and the case of Saab Automobile being divested from General Motors (GM) and acquired by Spyker Cars. In both these cases the management of IP played significant roles.

2. IP management in competition and collaboration

IPRs are often viewed as means for decreasing competition and thereby for improving competitive advantage. IPRs include, for example, patents, copyrights, design rights, trademarks, and trade secret rights, and they make up "a family of temporary, restricted, and transferable or licensable rights to exclude others from commercializing someone's intellectual or intangible creations or inventions under certain conditions" (Granstrand & Holgersson, 2015). Since the legal role of the IPRs is to exclude others from commercializing the related propertized intellectual resources, i.e., the related IP, IPRs are often seen as tools for increasing monopolistic power and for avoiding competition on the market. Society's motives for having IPR systems vary across the different types of IPRs, but typically relate to incentivizing the creation and distribution of intellectual creations, such as technical inventions, music, art, literature, and providing protection for creators and consumers.

A specific and especially important type of IPR in technology-based businesses is the patent. For a patent to be granted the underlying invention needs to be novel, sufficiently inventive, and useful/technically applicable. In exchange for the patent right the patentee provides financial payments to the national patent offices where patent protection is wanted as well as a detailed description of the invention that is published. With a patent, the inventor has the right to initiate litigation against infringers (i.e., an indirect right to exclude others from using its invention), and by that limit/delay imitations of the patented invention. Patents are therefore important strategic tools for appropriating value from innovations, including new products, services, and processes (Granstrand, 1999).

Patents can typically last up to 20 years, and the relevant time window for technology-related IP management consequently consists of at least 40 years. At each point in time IP management needs to consider up to 20 year old patents as well as new patents that may stay alive up to 20 years into the future. An alternative to patenting is the use of trade secrets (Arundel, 2001; Holgersson & Wallin, 2017). These may leak quickly but they may also be kept for a very long time (consider for example the recipe to Coca-Cola). Copyrights and trademarks may also last longer than 20 years, meaning that the time window for IP management more generally may extend well beyond 40 years. This has implications for coopetition, since IPRs from times of pure competition or collaboration still need to be considered if the relationship transforms into coopetition.

Contrary to common belief, knowledge sharing is an important function of the patent system. As described above, the patentee needs to provide a detailed description of the invention when applying for a patent. This description is then published, so that everyone can learn from it, contributing to cumulative knowledge development over time. The collaborative function of patents extend beyond the mere publications, however. Much recent research has

identified the role of patents for enabling R&D collaborations (Alexy et al., 2009; Granstrand & Holgersson, 2014; Hagedoorn & Zobel, 2015). Actually, research has shown that it is more important for firms to protect their technology with patents when engaged in R&D collaborations, or in other terms when involved in various forms of open innovation, than when employing a fully integrated strategy. This indicates that in order for firms to be willing to share their technologies with collaborators, they first want to be somewhat protected through patents (Holgersson & Granstrand, 2017). When sharing technologies with collaborators, firms expose themselves to opportunistic threats, which to some degree can be mitigated by protecting the technologies with patents, and by clearly outlining how the technologies may be used by collaborators in the related (license) contracts.

Coopetition combines the logics of collaboration and competition, and collaboration between competitors is related to even larger concerns about opportunism, as compared to collaboration between non-competitors (Ritala & Hurmelinna-Laukkanen, 2009). This may hamper the use of coopetition, limiting the related benefits. Therefore, IP management that balances and combines the logics of competition and collaboration has an important role to play in coopetition.

3. Relevant IP in coopetition

When managing IP in coopetition, several different categories of IP need to be considered. Four important categories, as described by Granstrand and Holgersson (2014), are outlined below (see Figure 1). These categories of IP (or technology or knowledge more generally) are relevant also in pure collaborative relationships, but they are even more important to properly manage in coopetition due to the larger risks for and consequences of opportunistic actions.

Imagine a simple case with two parties that compete on a product and/or service market. They are now about to start collaborating in developing a technology in order to share

innovation investments and/or advance technological developments in a faster/better way (i.e., they become technology-based coopetitors). When initiating the collaboration, both parties may have available IP that is relevant for the collaboration to build upon. This category of IP is called *background IP*, and initially they have to agree upon how each party's background IP can be used by the other party. The second category of IP is called *foreground IP*. This includes IP that is in some sense jointly developed as part of the collaboration. The parties need to agree upon how the foreground IP can be used by the different parties. For example, they might decide that one of them is allowed to commercialize products based on the IP in some specific markets while the other is allowed to commercialize products based on the IP in all other markets (e.g., Bez et al., 2016), or they might agree that both parties are allowed to use all foreground IP for any purposes.

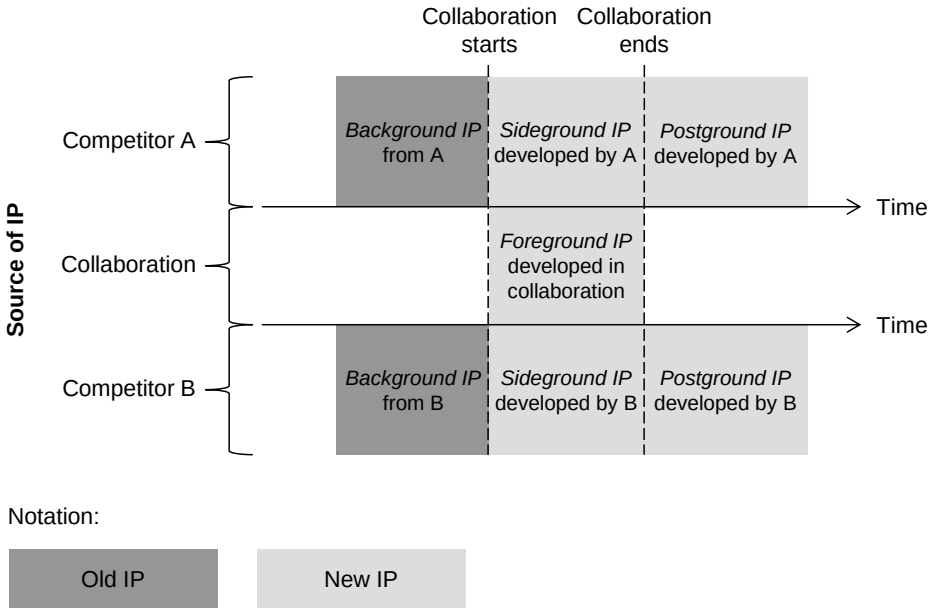

Figure 1 IP categories relevant for coopetition (adapted from Granstrand & Holgersson, 2014)

The third category of IP is called *sideground IP* and includes IP that is relevant for the collaboration but developed outside the collaboration by one of the parties while the collaboration is still ongoing. The fourth category of IP is called *postground IP* and includes IP

that is relevant for the collaboration but developed after the collaboration has ended by one of the parties.

Sideground and postground IP is closely related to the concept of knowledge/technology spillovers (Arora et al., 2016; Jaffe, 1986). One competitor may for example learn about the other competitor's background IP from their joint collaboration, and develop complements or substitutes to the technologies, products, and/or services of its competitor. Consequently, there is a tension for each competitor between on the one hand enabling foreground IP and value-enhancing sideground and postground IP (from both competitors) through a joint collaboration, and on the other hand risking increased competition due to substitute technologies, products, and/or services from the competitor.

Sideground and postground IP may for example include complementary components or improvements of jointly developed technologies. It is then important for coopetitors to ensure accessibility to such sideground and postground IP developed by the other party, since the future value and relative competitiveness of their background and foreground IP might otherwise be severely limited, and the other party may enjoy a strengthened competitive position due to its exclusive position in improvements, complements, and/or substitutes.

Substitutes turned out to play a major role in a case presented by Granstrand and Holgersson (2014), involving a small firm with strong capabilities in research and development (R&D) and a large firm with a strong position in complementary assets (Teece, 1986), including production and marketing. In such a setup, in which the small firm is dependent upon the capabilities of its partner for commercialization, the large firm can learn from the small R&D firm and the development of foreground IP, and develop substitutes to it. In the end, the large firm can choose to commercialize its own substitute sideground IP instead of the joint

foreground IP, and in that way appropriate more value, while the small firm is left without commercialization opportunities.[2] Challenges like these may be especially severe for small firms in coopetition with large firms (Alvarez & Barney, 2001), or in other types of relationships with unbalanced bargaining power.

Section 4 will now provide an introduction to how license agreements can be set up to mitigate these kinds of tensions. By structuring the IP portfolio according to the different types of IP above, and matching it with different types of licenses, the logics of collaboration and competition can be combined to enable well-functioning coopetition, enabling access to IP while at the same time limiting and establishing boundaries for the use of it.[3]

4. License contracting in technology-based coopetition

When two or more competitors start to collaborate, the background and foreground IP is related to a set of available and future IPRs, respectively, with ownership distributed across the coopetitors. Licenses are required to give coopetitors access to the foreground IP and the required background IP, and the license clauses stipulate how, where, and when each actor can commercially use the IPRs of the others. Consequently, proprietary technologies can be protected with patents or other IPRs while simultaneously being shared with partners, mixing open and closed innovation strategies (Chesbrough, 2003; Holgersson & Granstrand, 2017) and managing the tension between collaboration and competition.

Clever licensing can be used to turn the risks and threats related to exposing background IP to competitors into an opportunity. Different license clauses can be combined to

[2] In fact, this logic may turn a purely collaborative relationship into coopetition and eventually pure competition between two former collaborators competing with substitute foreground and sideground IP.

[3] Typically, direct joint ownership of IPRs is not recommended for various reasons (Granstrand & Holgersson, 2013). If the foreground IP should be jointly owned by the coopetitors they may set up an IP holding joint venture that takes full ownership to the IP, while the holding company is jointly owned by the coopetitors. More commonly, however, collaborators and coopetitors use license contracting to ensure accessibility to IP for the involved parties, and this is in focus here.

obtain a good balance between collaboration in technology development and competition on product and service markets within the technology-based coopetitive relationship. *Field-of-use clauses* can be used to specify for which fields of use a specific technology or other type of IP can be used by the licensee (the actor who licenses from the IP owner). For example, two coopetitors within the automotive industry may agree that both of them are free to use the foreground IP from a project on electric vehicles (EVs) in any type of vehicle, including internal combustion engine (ICE) or hybrid vehicles, but that the background IP of each party can only be used specifically in EVs by the other party. In that way each party avoids that its background IP ends up in all vehicles produced by the other party, which would have led to reduced differentiation and increased competition on the ICE market. Thus, the agreement improves the innovativeness of the coopetitors within the EV business, while allowing for competition on the EV market. Similarly, the license contracts can specify on which *geographic markets* the licensee can use the licensed IP, during which *time period* this right is valid, and whether or not the licensee has the *exclusive right* in various fields of use and/or geographic markets.

The license agreements may also include other types of clauses, such as change-of-technology clauses and change-of-control clauses. *Change-of-technology clauses* relate to changes in the object of the license (i.e., the licensed IP). These include *assign-back clauses* which stipulate "that the licensee must transfer ownership of any improvements it makes to the licensed technology back to the licensor", *grant-back clauses* which stipulate "that the licensee must license any improvements it makes to the licensed technology back to the licensor", and *grant-forward clauses* which stipulate "that the licensor must offer the licensee a license on any improvements of the licensed technology made by the licensor" (Granstrand & Holgersson, 2014, p. 23). These types of clauses are especially useful for dealing with sideground and postground IP, reducing the risks associated with these as discussed above. In the case with the

EV project above, adding grant-back and grant-forward clauses to the agreement may for example ensure that postground IP related to improvements of the foreground technologies developed in the collaboration will be accessible for both parties.

Change-of-control clauses relate to changes in the subject of the license (i.e., the licensee), and stipulate "that the licensor has the right to terminate the license agreement in case of a change of ownership of the licensee" (Ibid.). These are useful for a party to ensure that IP that is licensed to a coopetitor does not eventually end up in the hands of a third party through an acquisition of the coopetitor, potentially increasing competition.

Finally, *up-front royalty payments* and/or *termination clauses* can be designed to incentivize the commercialization of foreground IP rather than sideground or postground substitutes (Ibid.). *Royalties* and payment schemes (including up-front and running royalties) are more generally included to compensate for possible imbalances between the different coopetitors with regards to the value of background IP brought into the collaboration and/or with regards to the amount of investments the different parties make to contribute to foreground IP. Antitrust issues, especially relating to illegal market division, need to be considered when making all of the above agreements.

5. Coopetition in M&As and divestitures: Post-divestiture coopetition

One type of coopetition that to date has received limited attention relates to M&A and divestiture processes. This type of *post-divestiture coopetition* includes a selling firm that has divested a business unit (BU) and sold it to an acquiring firm. The relationship consists of competitive elements between the selling firm and the acquirer (including the acquired BU) as well as of collaborative elements connected to interdependences between the BU and the remaining businesses in the selling firm.

Consider a firm consisting of several business units, in between which there are interdependences that may for example include joint supplier agreements, a shared technology base/platform, and/or joint distribution channels. If that firm would sell one of its business units to a competing firm, that focal business unit (BU) would typically remain interdependent and in collaboration with the other business units within the selling firm, at least throughout a transition period, while at the same time becoming part of a competing business. This process is illustrated in Figure 2.

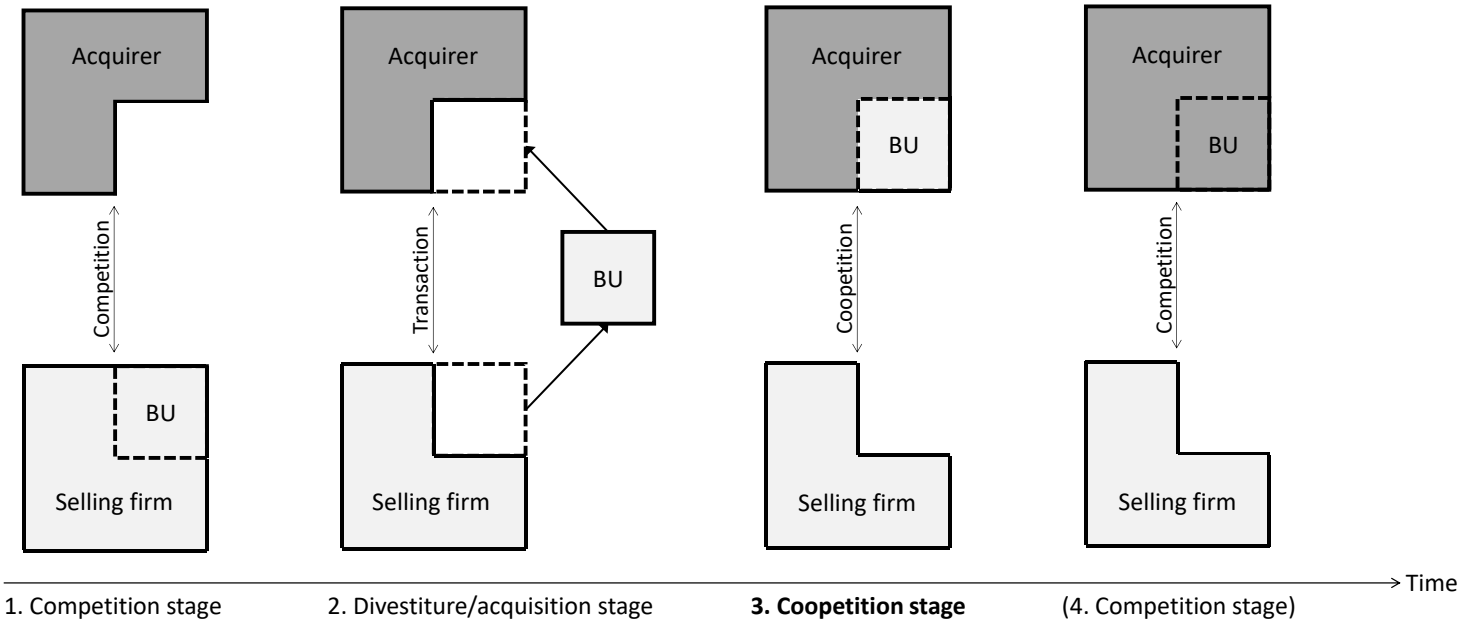

Figure 2 Development of post-divestiture coopetition in the divestiture process of a business unit (BU) from a selling firm to a competing acquirer (same shade of grey indicates complementary resources and/or activities)

The requirements for an M&A and divestiture process to lead to post-divestiture coopetition are (1) that there is collaboration between the selling firm and the BU, typically due to complementarities between the activities and/or resources of the BU and the remaining businesses in the selling firm, including background IP in the selling firm that the BU is dependent upon, and vice versa, and (2) that the selling firm is competing with the acquirer

and/or with the BU after the transaction stage, typically with substitutes on product and/or service markets. After the transaction, the selling firm and the BU keeps collaborating due to interdependencies in background IP, for example leading to improvements of a shared technology, i.e., leading to foreground IP.

The coopetition stage may eventually move back to a pure competition stage, for example if the BU changes to a technological platform that is independent of the selling firm. However, the element of collaboration may also increase over time, essentially extending the stage of coopetition in time, for example if the shared technology platform of the selling firm and the BU is increasingly used and improved throughout other businesses of the acquirer after integrating the BU.

6. Cases from the automotive industry

The case of Ford divesting Volvo Cars and selling it to Geely in 2010 can illustrate the development of post-divestiture coopetition in such a setting. IP management is then especially challenging, and important, due to the large technological overlaps and interdependences across business units.

Around 2008/2009 Ford initiated the divestiture process of Volvo and eventually sold it to Geely. At the time of transaction all Volvo's cars were based on technologies and platforms that were shared with other car models within the Ford group. In the transaction stage, i.e., when the agreements surrounding the deal were to be created, the parties needed firstly to agree to which unit (Volvo or Ford) that each IPR was to be kept/transferred in connection to the transaction, and secondly to agree how each IPR could be used by the other party. In other terms, the parties needed to disassemble the portfolio of background IP to ensure that both Volvo's and Ford's businesses could continue after the transaction (Granstrand & Holgersson, 2013). Such portfolios may consist of up to 20 year old patents as argued above (and even older

IPRs of other types), making it a challenging task to disassemble them as illustrated by the following quote:

> *An external lawyer said that she had never seen anything like this [in terms of the number and comprehensiveness of IP contracts]. […] We had busloads of consultants and lawyers coming here each week to handle the separation.*
>
> - Paul Welander, Senior Vice President, Volvo Cars

At the center of this process were considerations of how to collaborate in the continued use of the shared technologies and platforms (background IP), how to make and deal with improvements of these (foreground IP), and how and where to compete with products based on the shared technologies and platforms.

After the transaction, Volvo developed new technologies and platforms that were independent of Ford's technologies, meaning that the interdependences and collaborative elements of the coopetition between Ford and Volvo decreased over time. As Volvo's product lines kept undergoing generation shifts the element of collaboration kept decreasing as the background and foreground IP became obsolete. Roughly a decade after the divestiture Volvo's all product lines will be based on independent platforms, moving the relationship from a stage of coopetition to a purely competitive stage, as illustrated in Figure 2. The length of the coopetition stage is thus related to the frequency of product, service, or process generation shifts, to which degree new generations build on previous ones, and the remaining lifetime of the related IPRs.

The development of post-divestiture coopetition does not always start with a stage of competition between the selling firm and the acquirer (cf. stage 1 in Figure 2). The coopetition may result from competition between the selling firm and the BU, while the other business units of the acquirer do not compete with the selling firm. The case of GM divesting

Saab and selling it to Spyker can illustrate this, again also illustrating the important role of IP management.

As a result of the financial crisis 2008 and the subsequent downturn on the automotive market, GM divested Saab and sold it to Spyker in 2010. Spyker was a Dutch sports car manufacturer and not really a competitor to GM before acquiring Saab. The deal included supplier agreements and licenses to GM technologies (background IP) which Saab needed to commercialize its cars. Saab had just introduced the new 2010 Saab 9-5, which was built on the Epsilon II platform which in turn was shared with other GM models. The relationship thus included elements of collaboration in supply and technologies and elements of competition on product markets.

In this case, change-of-control clauses played an important role for how GM controlled and limited the competition. Spyker wanted the Chinese firms Pang Da and Youngman to invest in Saab in order to strengthen its finances and improve its access to the Chinese market. However, the agreements between GM and Saab included change-of-control clauses that gave GM the right to cancel them if a sufficient share of Saab's ownership changed, and GM expressed its intention to execute this right given the risk for increased competition on the Chinese market if Saab would come under Chinese ownership:

> *GM would not be able to support a change in the ownership of Saab which could negatively impact GM's existing relationships in China or otherwise adversely affect GM's interests worldwide.*
>
> - James Cain, Spokesman, GM

Saab and Spyker were essentially caught in a catch-22. Additional financing was needed to continue the operations, while such financing would lead to the termination of the necessary agreements that gave Saab access to GM's background IP, in turn stopping

operations. This situation eventually became too challenging, and Saab filed for bankruptcy in late 2011.

The cases of Volvo and Saab exemplify how IP management is necessary in post-divestiture coopetition and technology-based coopetition to enable collaboration in and access to background and foreground IP that is distributed across coopetitors. The cases also exemplify how IP management can be used by coopetitors to effectively control and limit competition. Thus, IP management provides tools for combining collaboration and competition in coopetition.

7. Conclusions and avenues for future research

This chapter has hopefully contributed to a nuanced view of IP in coopetition. The intuition often says that IP mainly deals with protection and proprietary strategies, but this chapter shows that such protection is also an enabler of collaboration. When controlling competitive threats through IP management, firms may be more open to collaborate with their competitors. Thus, IP management may combine the logics of collaboration and competition, which contrasts previous coopetition literature in which a separation between these logics have been proposed (e.g., Bengtsson & Kock, 2000). There are several avenues for future research, and below follow a few of these.

Firstly, future research should further the analysis of how IP management and contracting, including different license clauses, can be used to combine the logics of collaboration and competition. Although the cases in this chapter basically illustrate dyads, IP management can also facilitate coopetition between large numbers of firms, for example through standard-setting and licensing regulations (e.g., Holgersson et al. forthcoming). Again, this is an area for additional research, since formal contracting is likely becoming more important when the number of coopetitors increase.

Secondly, social relationships and trust may play an important role for managing, controlling, and sharing IP, technology, and knowledge in coopetition. Explicit contracting is incomplete (Grossman & Hart, 1986), and it should be complemented with implicit contracting through social relationships, norms, and trust to fully function. This may be especially challenging when the partners are competitors. The use and benefits of implicit contracting of knowledge, technology, and IP in coopetition, and its interaction with explicit contracting, therefore need to be better understood.

Thirdly, both explicit and implicit contracting relate to the framework of relevant IP in coopetition in Figure 1. This framework can be broadened to include not only IP, but also technology and knowledge more generally. Analyzing coopetition with this model is useful, and it raises a number of question for coopetition research more generally. How much of background knowledge and IP should be included in a collaboration, and how can agreements and organizational setups help to control it? How do pure collaborative relationships aimed at enhancing joint development of foreground knowledge/IP need to be adapted when the collaborators are also competitors? What are the risks with knowledge spillovers and sideground/postground IP, and how can the risks be turned into opportunities?

Fourthly, the chapter has introduced the concept of post-divestiture coopetition. As M&As and divestitures increase in both frequency and size (Carlton & Perloff, 2005), post-divestiture coopetition becomes increasingly common and important for firms to manage, not the least in industries where different business units build on shared technology platforms. Extant coopetition research has, if at all, mainly considered M&As and divestitures as consequences of and alternatives to coopetition (e.g., Dowling et al., 1996). This chapter identifies M&As and divestitures also as causes of coopetition. Post-divestiture coopetition is often especially complex, due to the close interdependences between the coopetitors. As such,

it deserves more attention, both in its own right and as an extreme case for understanding other types of coopetition.

Consequently, the coopetition research area may have much to learn from, and teach to, the research area of IP management and the research area of divestitures and M&As. Needless to say, research is often highly competitive. These three research areas, however, have much to gain from some coopetition.

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