

Managing coopetition:

Is transparency a fallacy or a mandatory condition?

A case study of a coopetition project with an opportunistic partner

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Abstract :

We investigate why and how knowledge transparency between competitors are needed for radical innovation. Previous scholars considered that coopetition (i.e. collaboration between competing firms) could not be a suitable strategy. Knowledge transparency invites opportunism. Thus, even for a radical innovation purpose, being highly transparent with a competitor is a fallacy. Our research goes beyond this specific approach of coopetition and reveals that firms can preserve transparency even if the partners behave opportunistically. We develop counter-intuitive propositions based on a conceptual discussion followed by insight from an extreme case study of a pharmaceutical company opening its innovation project to a competitor who behaves opportunistically (i.e. the Plavix).

Our study mainly highlights that firms need to fight against the intuitive reaction of reducing transparency when the partner behaves opportunistically. Reducing the transparency inevitably leads to “shooting itself in the foot” because the reduction of transparency of one partner leads to the destruction of any possibility to create a radical innovation. Moreover, our research represents interesting guidelines for top managers by : (1) confirming that coopetition strategies are relevant in addressing the challenges of radical innovation, and (2) highlighting a specific organization design to manage transparency in a cooperative project.

Key words: coopetition, radical innovation, transparency, coopetition management

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INTRODUCTION

The creation of new layers of knowledge for radical innovation is a key driver and the major objective of coopetition strategies (Belderbos, Carree, & Lokshin, 2004; Quintana-García & Benavides-Velasco, 2004; Srivastava & Gnyawali, 2011; Tether, 2002). However, the outcomes of coopetition regarding new layers of knowledge for radical innovation remains unsettled in the literature (Estrada, Faems, & de Faria, 2016). According to the *resources and capability-based* perspective, a competitor could be the best source of external knowledge for radical innovation (Estrada et al., 2016; Gnyawali & Park, 2011). As competitors have similar and complementary knowledge portfolios, coopetition should increase their innovative capabilities, and thus impact positively the radical innovation success (Gnyawali & Park, 2011; Jorde & Teece, 1990; Quintana-García & Benavides-Velasco, 2004). However, others scholars adopting a *Transaction Cost Theory (TCT)* perspective consider that coopetition could not be a suitable strategy for the creation of new layers of knowledge (Nieto & Santamaría, 2007; Santamaria & Surroca, 2011). The fear of opportunism and knowledge losses would undermine the needed transparency and thus the cooperative success (Arranz & de Arroyabe, 2008; Fernandez, Le Roy, & Gnyawali, 2014; Nieto & Santamaría, 2007; Park & Russo, 1996). Consequently, high reciprocal transparency between two competitors would be only a fallacy.

These two approaches are opposed concerning their conclusion about the outcomes of coopetition for radical innovation. However, when we look at the drivers of these positive (*Resources and Capability-based perspective*) or negative outcomes (*Transaction Cost Theory perspective*), they agree on the crucial role of transparency. The distinction is that for the former, it is possible to be transparent with a competitor, and for the latter, the transparency invites opportunism thus being highly transparent with a competitor is a fallacy.

Our research aims to go deeper in this interesting debate and generates new insights into transparency as a mediator variable between coopetition strategy and radical innovation (i.e. creation of the needed new layer of knowledge).

To address this goal in two phases. First, we review relevant literature to develop conceptual arguments regarding the transparency, the impact of opportunism and the role of management in the success of a high reciprocal transparency between competitors. Second, we confront these conceptual arguments to an extreme case study of coopetition between two rival pharmaceutical firms Sanofi and Bristol-Myers Squibb (BMS). Even though sharing in a transparent way the critical knowledge make the partner-competitor stronger, Sanofi and Bristol-Myers Squibb transparently shared their knowledge for co-developing and co-commercializing a revolutionary drug (i.e. Plavix). This extreme case study aims at generates new insights that would be obscure or even absent from a “typical” case (Eisenhardt, Graebner, & Sonenshein, 2016). For intense, it allows us to identify unique counterfactuals (i.e. non-occurrences) (Eisenhardt, 1989).

This paper contributes to both coopetition and innovation literature. First, it enriches our understanding of why and how high reciprocal transparency can occur between competing firms. Second, we demonstrate that opportunism should not be perceived as a barrier of transparency. It is an indicator of value creation which needs to be treated as a punctual conflict. We also highlight why coopetition may not generate radical innovations. The reason is the absent of a specific management of transparency. This management needs to minimize the willingness of the partner to behave opportunistically but not hinders its ability to do it.

Finally, we argue that transparency and its management is the missing link between coopetition strategy and radical innovation.

THEORETICAL BACKGROUND:

COOPETITION FOR RADICAL INNOVATION

Coopetition is a unique and performant strategy capitalizing on the benefits of collaboration and competition (Gnyawali & Park, 2011; Le Roy & Czakon, 2016). When a firm engages a cooportunistic strategy, the firm has to accept to “sleep with the enemy” (i.e. to collaborate with a competitor) (Coy, 2006) and thus to be engaged simultaneously in a cooperative and competitive relationship.

In this section, as most of the researchers from the “Activity School of Thought” of cooptation, collaboration and competition are not mutually exclusive, but often coexist and can even create benefits from their joint dynamics (Bengtsson & Raza-Ullah, 2016; Gnyawali & Park, 2011; Le Roy & Czakon, 2016; Le Roy & Fernandez, 2015; Ritala, Kraus, & Bouncken, 2016).

More precisely, following Ritala et al. (2016) and other past research (Bouncken & Fredrich, 2012; Gnyawali & Park, 2011; Le Roy & Fernandez, 2015), we provide an overview of the cooptation literature and discuss : (1.1) the drivers and performance of choosing a competitor for radical innovation; (1.2) the key role of “high mutual transparency” in explaining the radical innovation in a cooptative project; (1.3) the current issues of a “high mutual transparency” which may only be a fallacy; (1.4) how management can overcome the fallacy. The conceptual foundation laid in this section provides the basis for usual settings and expected perspectives (Eisenhardt et al., 2016).

1.1. CHOOSING COOPTATION FOR RADICAL INNOVATION: THEORETICALLY HIGH PERFORMANCE BUT MIXED EMPIRICAL RESULTS

Radical innovation is about new products and services. It requires the development of completely new knowledge (Foss, Lyngsie, & Zahra, 2013). These innovations are generated by a firm’s combinative capabilities to generate new applications from existing knowledge (Kogut & Zander, 1992).

Most of the firms want to develop it based on their internal knowledge (e.g. as driven by R&D). But this choice is only possible if the firm is able to develop the offering itself without help (Ritala & Hurmelinna-Laukkanen, 2009). However, most firms need external knowledge to fill some gaps in their products or capabilities (Foss et al., 2013). This need increased with the intensification of global competition, the dispersion of the most efficient knowledge between different firms around the globe, and the need for fast development and reduced time to market (Foss et al., 2013). Moreover, firms need to combine external knowledge with internal knowledge to limit decision traps - i.e. related to information deficits, ambiguous information, and wishful thinking, especially for complex and new innovation development (West, 2014).

Based on the resource-based view and capabilities based view, we argue that having cooperation and competition simultaneously provides the required conditions for the development of completely new knowledge (e.g. ideas and solutions) needed for radical innovation. In other words, competitors are the best source of external knowledge for innovation (Kang & Kang, 2010; Le Roy, Robert, & Lasch, 2016). Several reasons make us argue that competitors' external knowledge is the most appropriate knowledge for innovation compared to other external knowledge (e.g. from suppliers, customers, etc.). These reasons are directly linked to unique conditions which stem from the simultaneous pursuit of the competitive relationship and collaborative relationship (i.e. co-competitive relationship).

First, the fact that the partners are also competitors creates a common language and similar processes facilitating the successful combination of their knowledge (Gnyawali & Park, 2011; Inkpen, 2000). For example, when a firm chooses a competitor, this partner-competitor has the same common market vision thus it is easier to align the joint goal on this same common market. This context favors the potential of creating new synergic and complementary knowledge needed for innovation product success.

Secondly, as partners are competitors, their resource profiles are distinct and complementary (Luo, 2007; Peng & Bourne, 2009). Thus, by the merging of their portfolio, they access to a wider portfolio of knowledge, resources and competencies. This wider portfolio increases the firms' ability to create new knowledge. Moreover, a stronger competitor by nature has useful and superior resources and capabilities helpful to achieve their innovation objectives (Gnyawali & Park, 2011; Ritala & Hurmelinna-Laukkanen, 2009).

Thirdly, for a successful new knowledge development, both partners need to be willing to learn (Hamel, 1991). One of the major risks in knowledge development is the lack of motivation to assert its receptive abilities due to disinterest, neglect or other priorities. For instance, a "good student" attitude is likely to motivate more than a "teacher" attitude (Larsson & Bengtsson, 1998). As the partner is a competitor, if a firm shares strategic knowledge, the competitor has a high incentive to learn it. It will be a virtuous circle: the more critical knowledge is shared for the cooperative purpose, the more the competitor-partner will be willing to learn.

Thus, it is the syncretism between competition and cooperation that foster greater knowledge seeking and knowledge development and technological progress than either competition or cooperation pursued separately (Lado, Boyd, & Hanlon, 1997).

Past research based on case studies has already confirmed that competitors can be motivated and able to collectively develop the knowledge needed for radical innovation. For instance, in the space industry, two competitors EADS and Thales managed to share their knowledge in the manufacturing of telecommunications satellite and get through one of the most important and worldwide space program (i.e. manufacturing of a dual system of telecommunications satellite) (Le Roy & Fernandez, 2015). Or, in the high technology industry, Samsung Electronics and Sony Corporation managed by a common joint venture to co-develop a radical innovation, based on the combination of Samsung's strong capability in the LCD technology and Sony Corporation's TV making expertise (e.g. the flat-screen LCD) (Gnyawali & Park, 2011).

Moreover, there is also *quantitative research that supports the idea that cooperation between competitors contributes to create completely new products than cooperation between non-competing firm* (Belderbos et al., 2004; Le Roy et al., 2016; Neyens, Faems, & Sels, 2010; Tomlinson, 2010). For instance, based on a survey of 469 firms, Bouncken and Fredrich (2012) find that coopetition increases the radical innovation of firms more strongly than incremental innovation. Their argument is that cooperation among competitors potentially breaks lock-in situations and that groupthink within an organization stimulates creativity.

The actual performance of cooperation for innovation describes above seems to be much more disappointing than the often rosy picture painted that we just described. The relation between cooperation and radical innovation is still an ongoing debate. In contradiction with the positive links highlighted above, some empirical studies have found negative or no effects of cooperation on radical innovation performance (Nieto & Santamaría, 2007; Ritala, Hallikas, & Sissonen, 2008; Santamaria & Surroca, 2011). For instance, Nieto and Santamaría (2007) found that the cooperation with competitors has a negative impact the newness of innovation in a longitudinal study of Spanish manufacturing firms. According to Czakon et al. (2014) and Le Roy and Czakon (2016), the contradiction in empirical results is in line with the paradoxical nature of cooperation and it the proof that more research is needed on the moderating, mediating variable between cooperation and performance. Those moderator variables can be market uncertainty, network externalities and competitive intensity (Ritala, 2012) or geographical distance (Le Roy et al., 2016). The mediator variable can be the management of cooperation and its tensions (Le Roy & Czakon, 2016).

For information, in this paper, as other researchers like Larson and Bengtsson (1998), instead of attempting to explain directly overall cooperation effectiveness, we prefer to focus on the collective learning process as a key component in the performance of the cooperation.

1.2. HIGH RECIPROCAL TRANSPARENCY BETWEEN COMPETITOR: THE MISSING LINK BETWEEN COOPERATION STRATEGY AND RADICAL INNOVATION

Before explaining why “high reciprocal transparency” is a mediator of cooperative strategy and radical innovation, we would like to define transparency. Transparency refers to any action in the knowledge sharing that allows accessing and internalizing some critical information, capability, or skill from the partner. This is the kind of transparency that has been most referred to in the literature on cooperation and knowledge loss (Fernandez & Chiambaretto, 2016; Kale, Singh, & Perlmutter, 2000; Larsson & Bengtsson, 1998).

Radical Innovation is a risky process in which the exact path to success is unknown. Technological and environmental uncertainties make impossible the identification of the knowledge needed for radical innovation (Ritala et al., 2016). The whole point of cooperation (in radical innovation) is to create a new layer of knowledge and not only create a condition for organizational learning. To reach this goal, the two collaborating competitors need to create a condition for collective knowledge development (also called inter-organizational learning).

The collective knowledge development is defined as the learning synergy or interaction effect between the organizations that would not have occurred if there had not been any interaction (Larsson & Bengtsson, 1998; Soekijad & Andriessen, 2003). Thus, to achieve this collective knowledge development, the existing knowledge from the two partners needs to be transferred to each other, and after through interaction, they will be able to create completely new knowledge. Both transfer and creation of knowledge require simultaneous transparency and receptivity at some level among the organizations (Larsson & Bengtsson, 1998). Larsson and Bengtsson (1998) illustrate this need by explaining: “If no organization is transparent, no existing knowledge is disclosed and thereby cannot be received by the others or used collectively to generate new knowledge—nor can transparency be utilized without the receptive ability and motivation to absorb the disclosed or generated knowledge”(p.291).

As stated before, as the partners are competitors, the more strategic knowledge is transferred, the more receptive the competitor will be. However, the question is more complex

for the transparency. The more strategic knowledge needs to be shared with a competitor for the innovation success, the more reluctant to transparency the firm will (Fernandez & Chiambaretto, 2016; Ritala & Hurmelinna-Laukkanen, 2009). It is why we deliberately focus on the first step of collective knowledge development: transparency.

Past research has extensively focused on the idea that the firm has the choice between sharing or protecting core knowledge. However, we highlighted that for collective knowledge development and thus radical innovation, transparency is mandatory. We argue that firm can be a constraint to share in a transparent way if they want to develop a radical innovation with a competitor. And not only one of the partners needs to be transparent; both partners have to be transparent. Thus, a high reciprocal transparency is needed for radical innovation through cooptition. Larsson et al. (1998) call this situation where both firms are receptive and transparent “collaborative learning.” This is illustrated by one combination of high transparency between two cooptitors to the extreme right and bottom in Table 1.

Thus, high reciprocal transparency is the missing link between cooptition strategy and high radical innovation. If one partner is less transparent, the success of radical innovation is compromised (cf. table 1).

1.3. HIGH RECIPROCAL TRANSPARENCY BETWEEN COMPETITORS: A FALLACY?

Cooptition (in innovation) has not only beneficial aspect, but it can also have detrimental features from the standpoint of an individual firm (Hamel, 1991; Le Roy & Czakon, 2016; Ritala & Hurmelinna-Laukkanen, 2009).

The detrimental features are due to the unique challenges of being simultaneously in cooperation and competition. The challenges are unique because the focal firm engaged in cooptitive relationship bears a specific risk that we do not observe when non-competitor firms cooperate. When the partners are non-competitors, an opportunistic behavior leads to reducing the value appropriate from the co-created value. When the partner is a competitor, in addition to the reduction of the value appropriate, the opportunistic behavior strengthens a competitor and weakens itself. For example, if knowledge is learned by the partner-competitor, the focal firm attractiveness to the other would then be diminished. It is the same for the value appropriation if the competitor appropriates more value than the focal firm, the partner becomes stronger.

These cooptitive dynamics represent a certain vulnerability of firms which need to carefully balance knowledge sharing against knowledge protection and withholding

(Baumard, 2010). One rational reaction to this fear of knowledge loss and the fear to make the competitor stronger is to reduce the transparency on the knowledge shared (Ritala, Olander, Michailova, & Husted, 2015; Simonin, 1999). However, lower the transparency of one partner will undercut the process of creating these joint knowledge development outcomes (Larsson & Bengtsson, 1998) (cf. the combination of deadlock and asymmetric transparency in Table 1).

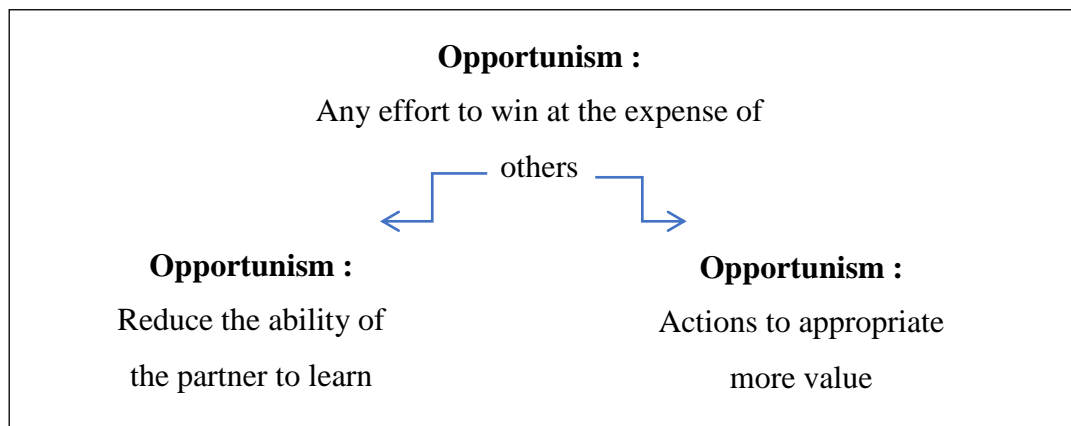
Thus, coopetition for product innovation is inherently risky, and a high reciprocal transparency is an invitation to opportunism. This insight is confirmed by the dynamic stand point of game theories (Parkhe, 1993), opportunism can create a dysfunctional collective knowledge development. As one partner maximize its appropriation of the joint outcome of collective learning, and the other mostly is not an altruistic giver, the first reaction to a partners' opportunism or expected opportunism is to reduce the transparency of the knowledge shared (Larsson & Bengtsson, 1998). Reduce the transparency as it hinders the ability of the coopetitor to learn is the best way to safeguard the knowledge and to make the partner dependent of the focal firm (Loebecke, Fenema, & Powell, 1999).

Most of the empirical studies which found a negative link between coopetition and innovation performance explained the negative results by the presence and threat of opportunistic behaviors and the lack of trust between coopetitors (Nieto & Santamaría, 2007; Santamaria & Surroca, 2011). Thus, from their point of view, high reciprocal transparency is a fallacy because it invites a partner to behave opportunistically and thus leads firms to reduce.

Moreover, there are contexts in which the threat of opportunism is higher. Opportunistic behaviors make the *high reciprocal transparency* untenable especially as products come closer to market. The temptation of opportunism becomes too high. Thus, the transparency could be possible only in pre-competitive phases of innovation, i.e., when products are far from being introduced to the market (Bengtsson & Kock, 2000; Yami & Neme, 2014).

Multiple definitions were given to opportunism from broader to more focused definitions. A narrow definition considers opportunism as firm actions to assert their receptivity and simultaneously reduce their transparency (Larsson & Bengtsson, 1998), a more broad definition consists in any effort to win at the expense of others (Parkhe, 1993). The first one is interesting because it refers to hinder the ability of the partner to access the knowledge and learn, and the second one includes the first one and add any actions to appropriate more value than the partner from the co-created value (cf. figure 1).

Figure 1 : the definitions of opportunism



Source : the authors

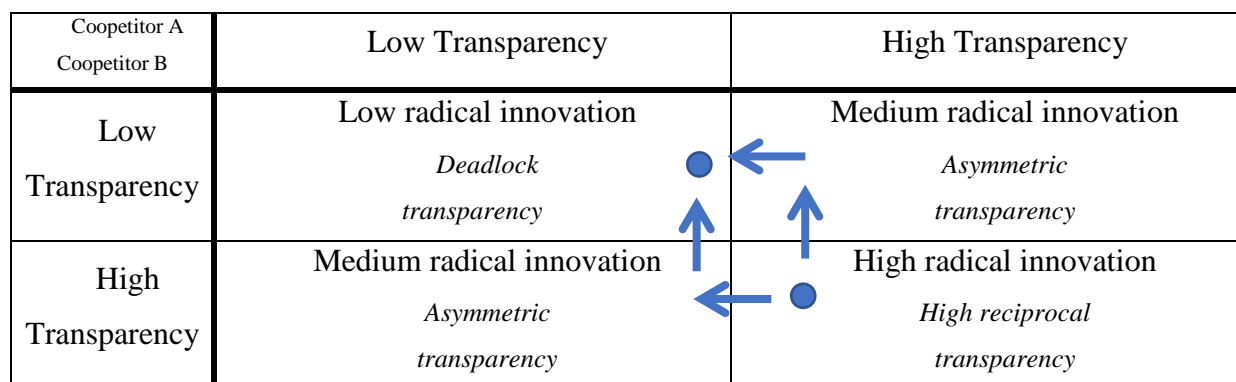
In this paper, we choose the broader definition because any action that feels unfair can lead to the defensive behavior of reducing the needed transparency. And this is the core stone of the challenge of having “high reciprocal transparency.”

Due to the inherently competitive nature, coopetition is fraught with the risk of opportunism and knowledge leakage (Ritala & Hurmelinna-Laukkanen, 2009). These risks are of importance when dealing with coopetitive innovation, as they can hamper the transparency and thus the generation of radical innovations (Cassiman, Di Guardo, & Valentini, 2009). We argue that “high reciprocal transparency” invites and rewards opportunism (Larsson & Bengtsson, 1998) and the dynamic action/reaction leads to the underperformance radical performance (cf. the process with blue line in table 1)

Table 1 : Transparency the missing link between coopetition and radical innovation performance

(The blue line represents the process when one firm fear or notice that the partner behaves opportunistically)

Coopetitor A Coopetitor B	Low Transparency	High Transparency
Low Transparency	Low radical innovation <i>Deadlock transparency</i>	Medium radical innovation <i>Asymmetric transparency</i>
High Transparency	Medium radical innovation <i>Asymmetric transparency</i>	High radical innovation <i>High reciprocal transparency</i>



Source : the authors

1.4. THE KEY ROLE OF MANAGEMENT TO SIMULTANEOUSLY BE TRANSPARENT AND SAFEGUARD AGAINST OPPORTUNISM

According to the TCT, the risk of opportunism is inherent in coepetition strategies; thus, coepetitive capabilities must be developed to negate this inherent risk of opportunism (Cassiman et al., 2009; Fernandez & Chiambaretto, 2016). For instance, Fernandez & Chiambaretto (2016) highlight that it is possible to share knowledge in a coepetitive project without making it appropriable. That means, share knowledge with a low transparency.

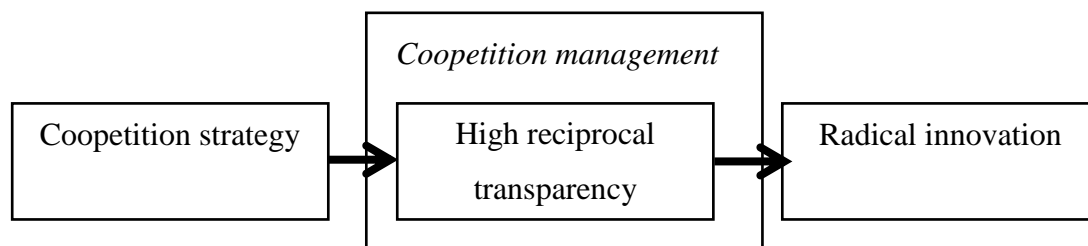
However, as we explain earlier, the rational solution to reduce transparency is not an appropriate solution because it hinders the collective knowledge development. The partner learning is crucial to create a new layer of knowledge. Thus, there is a dilemma between being transparent and take the risk of opportunism or sharing without transparency but undermine the joint project outcome as mostly be perceived as mutually exclusive. The former leads to radical innovation but can have a high downside for the focal firm, and the latter is not a suitable strategy for radical innovation.

In contrast to this extreme approach, authors like Kale and al. (2000) but also others (Jarvenpaa & Majchrzak, 2016) argue that being transparent and curb opportunism is possible. In order to do that, it is required from partner firms to engage in close and intense interaction at multiple levels across the coepetition interface. These interactions will develop at the working project team level relational capital and integrative conflict management. Two cumulative conditions for allowing learning (i.e. transparency and receptivity) and hindering the partners' opportunistic behavior (i.e. safeguard against opportunism). Thus, the management of coepetition, and more specifically the transparency, at the group level seems key in coepetitive success.

The need to create deeper insight into the working group level for understanding the success of coopetition is consistent with past research in the coopetition literature (Bengtsson & Raza-Ullah, 2016; Fernandez et al., 2014; Le Roy & Czakon, 2016; Le Roy & Fernandez, 2015)

Without appropriate management, coopetition turns into low transparency relationship, while with appropriate management; coopetition can become a high reciprocal transparent relationship allowing coopetitors to achieve radical innovation. Thus, managing transparency in coopetition is considered the missing link between coopetition strategy and radical innovation. The role of management in the cooperative relationship had already been highlighted (Le Roy & Czakon, 2016). We go deeper by arguing that is the management of transparency that allows radical innovation through coopetition (cf. our framework figure 2).

Figure 2 : Theoretical framework



Source : the authors

So far, we have reviewed the relevant literature and developed conceptual argument regarding the role transparency, the opportunism impact and the management of coopetition between competitors working together for radical innovation. Now, we turn to an extreme case to illuminate and expand conceptual arguments.

After a thorough discussion of the case, we will propose a new insight into the coopetition management and the perception of opportunism in coopetition relationship.

2. METHODOLOGY: AN EXTREME CASE STUDY

2.1. RESEARCH DESIGN AND CASE SELECTION

Our research investigates the existence of transparency in coopetition for radical innovation. Being transparent when the partner is a competitor is counter-intuitive and in

contradiction with past research (cf. section above 1.2). Based on these theories, when the partner is a competitor and there is a high risk of opportunism, firms reduce the transparency or hinder opportunism (cf. section above 1.3).

Extreme cases are best suited to generate insights that would otherwise be obscure or even absent from a “typical” case (Eisenhardt et al., 2016). For instance, it allows identifying unique counterfactuals (i.e. non-occurrences) (Eisenhardt, 1989).

We found an extreme case with unusual settings and unexpected perspectives. We found two competitors from the pharmaceutical industry which collaborate for developing one radical new drug (i.e. Plavix). The surprising fact is that these partner-competitors (i.e., coopetitors) shared their strategic knowledge with high transparency **even if** on a long-term perspective, it made the coopetitor stronger. For example, Sanofi were almost absent from the US market (one of the biggest markets in the world in terms of drug consumption), and for the success of the innovation process, BMS taught Sanofi how to succeed in an FDA process (i.e. how to succeed in the authorization process to put the drug on the American market). After that, Sanofi could access the American market by its own.

Moreover, this “high transparency” was not just a discourse but a reality. The proof is the fact that together they managed to generate two radical innovations. This radical innovation generated huge health progress (i.e., Plavix for the risk and mortality due to heart disease and stroke). For instance, according to Sanofi annual report, since 1998, Plavix is approximately used by more than 115 million patients in 115 countries.

Going deeper in this extreme case study is a way to try to develop a provocative theoretical argument (Eisenhardt et al., 2016; Gittelman, 2016). And it is consistent with past research on cooperation. Bengtsson and colleagues’ (2010) have recommended the use of in-depth and longitudinal case studies to investigate collaboration between competitors. The case study is the best way to explore a multi-faceted and paradoxical phenomenon especially when collaboration between competitors is involved (Dowling et al., 1996; Luo et al., 2006; Tsai 2002; Tsai and Hsu, 2014).

Having a longitudinal approach is value added because we can cover the whole value chain from the research to the commercialization. Thus, we can observe the opportunistic behavior at different stages: at the development (far from the market) to the commercialization (close to the market). As we said earlier, some authors argue that cooperation is only possible in pre-competitive phases of innovation, i.e., when products are far from being introduced to the market

because the pay-off of being opportunistic is too high (Bengtsson & Kock, 2000; Yami & Nemeh, 2014)

2.2. THE CASE: BMS-SANOFI INNOVATION PROJECT

Sanofi and BMS are competitors in pharmaceutical industry. They have the same goal which is to research, develop, manufacture and commercialize innovative therapeutic solutions. They are directly competing in the generic market of the same molecule and same geographical areas. For example, in France and Portugal, Sanofi and BMS are simultaneously selling generics of Pravastatin which is a molecule used for lowering cholesterol and preventing cardiovascular disease.

Despite this competition, they enter open innovation from 1993 to 2011. It concerned two molecules discovered and patented by Sanofi and generated 100 billion dollars. We focused on one of the two drugs: Plavix. Plavix became a blockbuster used by 92 million patients in 115 countries. A blockbuster is a very innovative medicine, Its forecast annual sales peak during the service life must exceed \$ 1 billion. Plavix is a type blockbuster drug because and it has been in the charts of the first five global blockbusters for several years. Compared to the criterion of 1 billion dollars per year, Plavix is a drug that has exceeded this limit for ten years (during these years of the peak, it reached almost 7 billion and more than \$ 100 billion). Actually, Sanofi still uses the cash flow of Plavix to invest in other innovative drugs.

2.3. DATA COLLECTION

Our goal is to get insight into Sanofi's transparency in a cooperative project and how this transparency evolved when an opportunistic behavior was expected or noticed.

This research is based on primary data, and it is triangulated with secondary data. This choice is voluntary. In order to identify the existence of transparency and the barrier of transparency (i.e. opportunism), we collected primary data. We decided to mainly focus on one partner Sanofi.

We conducted 27 semi-structured interviews: 17 with people from Sanofi involved at different periods of this alliance, 4 additional interviews were made with people from Sanofi not involved in this alliance but their insight helped to the construction of the results and added robustness to the results, and five interviews were done with people from BMS. We mainly used the interviews of people involved in the overall strategy of the Plavix throughout the process: the beginning of collaboration to the loss of monopoly and in different areas. Thus, our interviews were conducted with alliances managers of the Alliance, Project Chief of Plavix, researchers who discovered the molecule and then developed it, experts participating in the development of the molecule at the beginning of the alliance prior to commercialization, and various experts in charge of marketing at global and local level.

Table 2. List of the interviews

(legend: Int X= interviewee number X)

	BEGINNING OF THE ALLIANCE	DEVELOPMENT AND PRODUCTION	AFTER THE PRODUCT WAS FOR THE FIRST TIME COMMERCIALIZED
Top Managers in the firm	Int 9 –Sanofi's first Alliance manager (first in charge of Sanofi-BMS and then in charge of all the alliances)		Int 14 – Sanofi's R&D director Int 4 – Sanofi's director for all the alliance and directly in charge of Sanofi-BMS alliance <i>Int 2 - Sanofi's Alliance manager for commercial alliances</i> <i>Int 19 – Director of Montpellier area of R&D</i> Int 26 – BMS's Director, Product and Portfolio Strategy
Project	Int 10 – Sanofi's	Int 16 – Sanofi's project	Int 15 - Sanofi's project

team managers	Project chief of Plavix	chief of Plavix	chief of Plavix
Project team	Int 8 – Sanofi's Research expert in the project team which was part of Plavix's discovery team	Int 7 - clinical & Exploratory Pharmacology Department. Int 3 - New Product Marketing (publication) <i>Int 11 – Toxicologist Expert</i>	Int 17 – Marketing expert
Operational	Int 18 – The finder of Plavix Int 22 - Sanofi's Research who was involved in the team which discovered Plavix	Int 5 - Sanofi's Master Plan Project Coordinator (in charge of the construction of the production building) Int 20 - Sanofi's operational who oversaw the informatic issue of the alliance move from paper to computer data; and now the collaborative innovation director in Montpellier Int 22 - Sanofi's operational in charge of the clinical trial Int 23 - BMS's Development expert	Int 4 - Sanofi's Marketing Director for Plavix in Spain and France Int 24 – BMS's Marketing expert global Int 26 – BMS's Marketing expert global Int 27 – BMS's Marketing expert
Others	Int 11 – Director of Toxicology (hierarchical director of all the toxicologist expert involved in the project) <i>Int 1 – senior expert who help on specific toxicology issue</i> <i>Int 12 – senior expert who help on specific toxicology issue</i>		

Source : the authors

2.4. BOARDER OF THIS RESEARCH

In this research, we focused not on the relationship but on the focal firm and its reaction to expected or noticed opportunistically behavior. The aim is to collect a specific view of the reality. It is to show and analyse the intentions, discourses, and actions of actors from their point of view (Dumez, 2013). Thus, we want to collect their actions and intentions when they share knowledge with their competitor, the impact of the organization design and how they perceive and react to a potential opportunistic behavior.

Of course, we triangulate this opportunistic behavior and transparency with some interview with BMS and secondary data (press articles). But it was not the main objective.

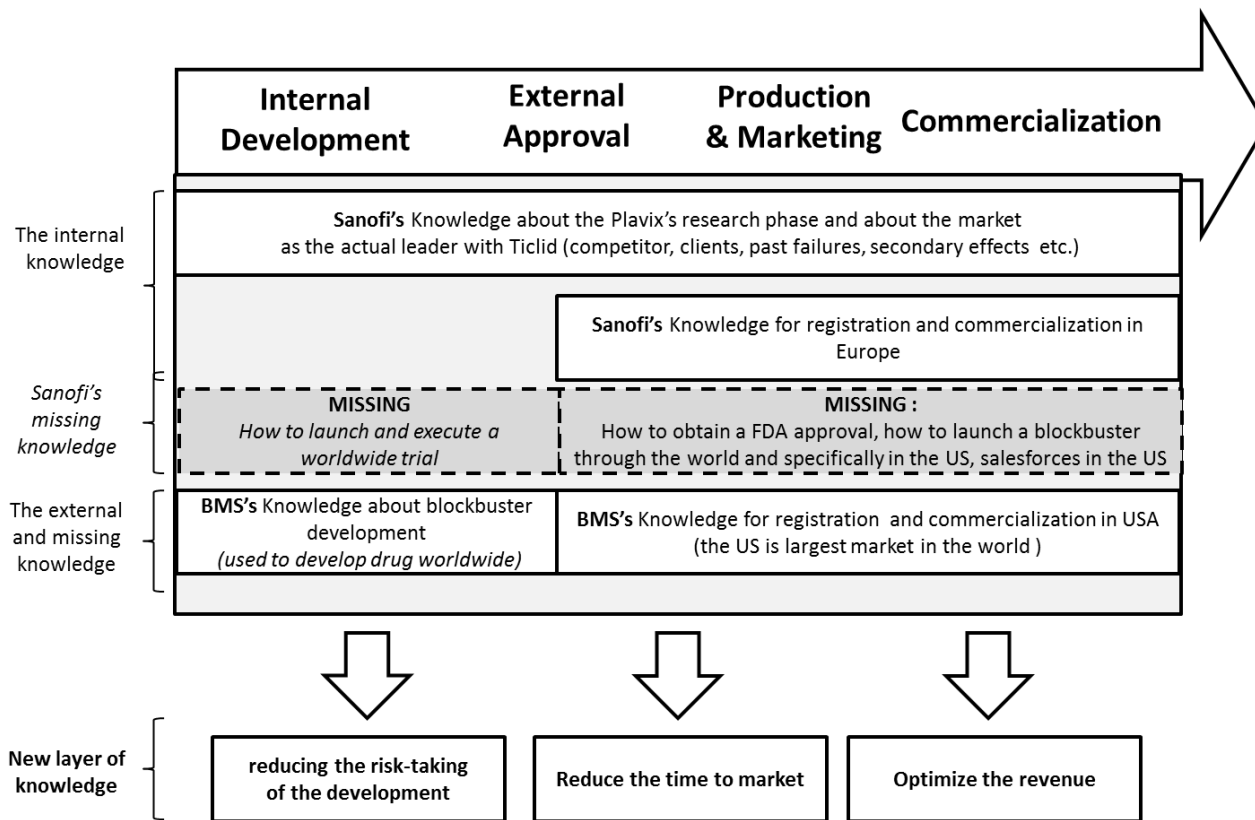
3. RESULTS

We organize results from the case study in the following manner: (3.1) we explain the reasons why Sanofi's needed external knowledge for the success of its innovation process. More precisely, we highlight why Sanofi needed to co-create new layers of knowledge for their costly and risky transformation of their discovery into an innovation; (3.2) we highlighted the organizational design chosen by Sanofi and BMS to integrate BMS knowledge into the innovation process. More precisely, we highlight an organization that we call "the mirror organization" and which foster creation of new layers of knowledge by close and multiple interactions; (3.3) we consider the downside of the mirror organization the opportunistic behaviors that it is allowing. But surprisingly, the opportunistic behaviors do not impact the knowledge cocreation of knowledge at the project team level.

3.1. TO TRANSFORM THEIR DISCOVERY INTO INNOVATION, SANOFI NEEDED TO CREATE NEW LAYER OF KNOWLEDGE WITH BMS

To succeed the innovation process, Sanofi needed BMS external knowledge. They needed an interactive knowledge flow. The goal was to create new layers of knowledge through interaction with external knowledge. These new layers of knowledge aimed at (1) reducing the financing and risk-taking challenge due to the cost and risk of the development, (2) reducing the time to market challenges due to some missing knowledge (including know-how, technology, past experiences, etc.), (3) optimizing of the revenue challenge due to a world-wide commercialization (cf. figure 3).

Figure 3: Goals of interactive process



Source : the authors

Reducing the risk-taking challenge due to the development process

The cost and risk of the development were very high. To reduce the cost and the risk, the development strategy must be thought through very carefully. Sanofi asked BMS to challenge every strategic decision.

As a concrete example, one of our interviewees told us that Sanofi and BMS had to answer to one new inquiry of the FDA. The inquiry was a real technical challenge because they ask for some specific tests in a very short delay. The stake was huge, if Sanofi and BMS did not pass the test, they would have to stop selling the drugs. Thus, two teams of experts, one from Sanofi and one from BMS, worked together to find the most efficient protocol for the FDA inquiry. To do it, they fully shared their experiences, their ideas of the most efficient strategy and their resources. Sanofi had an efficient protocol in mind which was not possible because they could not access in time to some rare raw materials. It could take several months for Sanofi to have those raw materials. However, during they collaboration, BMS had informed Sanofi that they had a favor access to this wanted raw material. Thank the interactive knowledge exchange, Sanofi managed to obtain the raw material in one week instead of

several months and Sanofi efficient protocol idea was developed. One research expert confirmed that this solution emerged from the exchanged of experience between the two research teams:

“We had to develop a test, [...] we met between people from BMS and people from Sanofi, i.e. There were people like me, I represented Sanofi; with me, there were development people who were responsible for implementing analyses [...] we were roughly four of each company who meet just to see what we could offer. So here, we exchanged our experiences; we started working on the subject. It was a success because they allowed us to have access to raw material that we were able to get by our self”.

Reducing the time to market challenges due to some missing knowledge

The competition between pharmaceutical firms is about patenting new pharmaceutical products either in an existing therapeutic indication or in a new therapeutic indication. To have the possibility of marketing a new pharmaceutical product, the product needs to be effective, safe, convenient, reliable and available. Moreover, factors such as the price, the third-party reimbursement and the patent exclusivity impact its competitiveness.

However, these product characteristics are not enough to explain the competitive advantage of a firm. The competitive advantage also relies on time market introduction of the drug. Competitive advantage can be gained by reducing the time for complete clinical trials and obtaining the regulatory approval, receiving pricing and reimbursement in certain markets and supplying commercial quantities of products to the market. Knowledge is crucial to enter the market at the best time. This knowledge is an understanding of the actual and past market which allows the firm to see the market's opportunities and risks. The knowledge also includes the ability to fit the internal development to the external demands, such as the legal constraints and patient expectations. Because without shaping the products to respond to the external demand or shaping the external context, the invention will never be a commercial drug.

For example, when Sanofi explain to BMS how they plan to organize the analysis of the results. Due to BMS's experience and some contact into the FDA, BMS proposed to ask the FDA for authorization to begin the analysis of the first part of the tests meanwhile the development team was finishing the tests. Sanofi and BMS co-constructed a special request to the FDA. As the FDA approved this request, the time to market for Plavix was reduced by six

months Sanofi chief of product argues that thank BMS the time innovation process was reduced:

“BMS was in contact with the FDA, which is the U.S. Health Agency. Thus, we could make tactics, let's say - analyzing data even if it was not finished yet. It makes us win six months.”

Moreover, being implemented in the country is crucial for the time to market. Maybe the special request would not have need accepted without BMS. The same chef of product highlights the existence of gateway that could slow down or stop the access:

“There are gateways that you won't ever just with your knowledge or with time. To penetrate the world, you need time and the time you spend is very important. However, [when you are from this country or with a high notoriety in this country], there will always be someone you know that it will open the door quickly and cooperation or a co-[UH]. [coopetition is needed] [...] We do it because by joining forces together we'll get more quickly to the target.”

Optimizing the revenue by a world-wide commercialization.

Global marketing was necessary to redeem the R&D expenses. Indeed, a drug's success on a global level might compensate the high failure rates of other drugs. Moreover, by reaching out to global markets, Sanofi could increase its revenues. Sanofi was well established in the European market, which is its domestic market. But despite the acquisition of Sterling Drug in the United States, Sanofi was almost unknown on the American market. This was a big issue because the American market is the world's largest market for pharmaceuticals.

The optimization of revenue required efficient and experienced sales all over the world, especially in the US. One top manager of Plavix relates how the alliance was perceived when she began to work in the alliance as an operational doctor in charge of the clinical test:

“We heard the following about BMS alliance, it's a caricature, but it's that I've learned. BMS at the time it was the big American pharma. [...] we did a deal on the following basis: for Clopidogrel so future Plavix, we needed a "footprint" in the United States... of someone very strong, very well established to launch [it].”

For optimizing the revenue, an interactive knowledge process was needed. They split the world in two depending on their competitive advantage (Sanofi mainly Europe and BMS mainly the US). And for the commercialization too there was interactive knowledge exchange. For example, one interviewee spoke about the comparison of the list of doctors they needed to convince. Having a competitor is a way to challenge the diffusion process. Interviews spoke about benchmarking they process. For example, one of the learning that

Sanofi developed due to its interaction with BMS was “*to be more aggressive in the communication*” (one project chief).

3.2. FOSTER NEW LAYER OF KNOWLEDGE WITH A MIRROR ORGANIZATION

To create these new layers of knowledge, Sanofi and BMS decided to create multiple levels of interactions between employees from Sanofi and BMS. In this section, we call these multiple levels of interaction between employees as a “mirror organization.” We highlight that this organization fosters cocreation of knowledge and simultaneously monitors the reciprocal knowledge contribution of the BMS.

The mirror organization fosters cocreation of knowledge

Even if each employee stayed located in the parent company, like a mirror they doubled every employee from Sanofi’s project team by a BMS counterpart (cf. figure 4). Thus, each domain from toxicology to marketing had two employees: one from each company working on the Plavix project. That means that at least 25 peoples from each company were in contact with one employee of BMS at the project team level. Depending on the phases of the project, they were requested to work full or part time on Plavix’s project.

The contacts were not only at the project team but also between the alliance managers and the decisional committees. In each committee, the directors of each company needed to take a decision together (cf. the green lines in figure 4).

In the project team, the goal was not to split the tasks but to create a real interaction and co-construction of solutions and decisions together. They looked for synergies. An interviewee highlighted that they were looking for synergies:

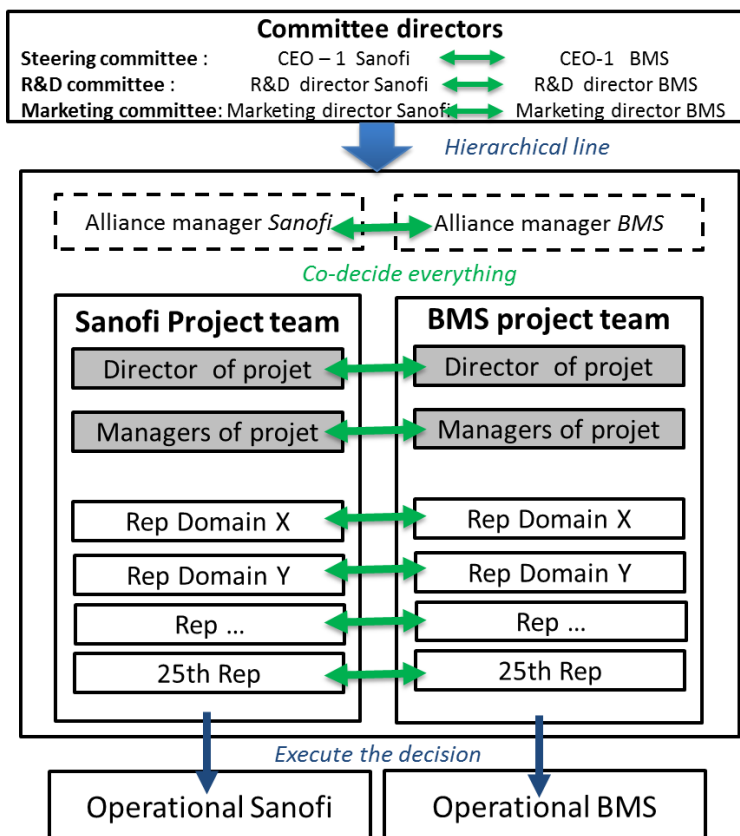
“Everyone in his domain of competencies needs to bring something. After, there is a value added generated from the fact that we work together, again it is not just an addition of what we bring, we are looking for synergies.”

These people were explicitly asked by the top management to work in a transparent way together. By transparent, they were told that any knowledge or experience which could help the development of the project had to be shared (only data from another project due to confidentiality reasons could not be shared). One interviewee from Sanofi told us:

“They told me, from now on, you are going to work with a BMS college; you will have to work hand in hand with him.”

Figure 4: The mirror organization: multiple interactions at multiple levels between Sanofi and BMS

(the green lines are the interactions and Rep means representative)



Source : the authors

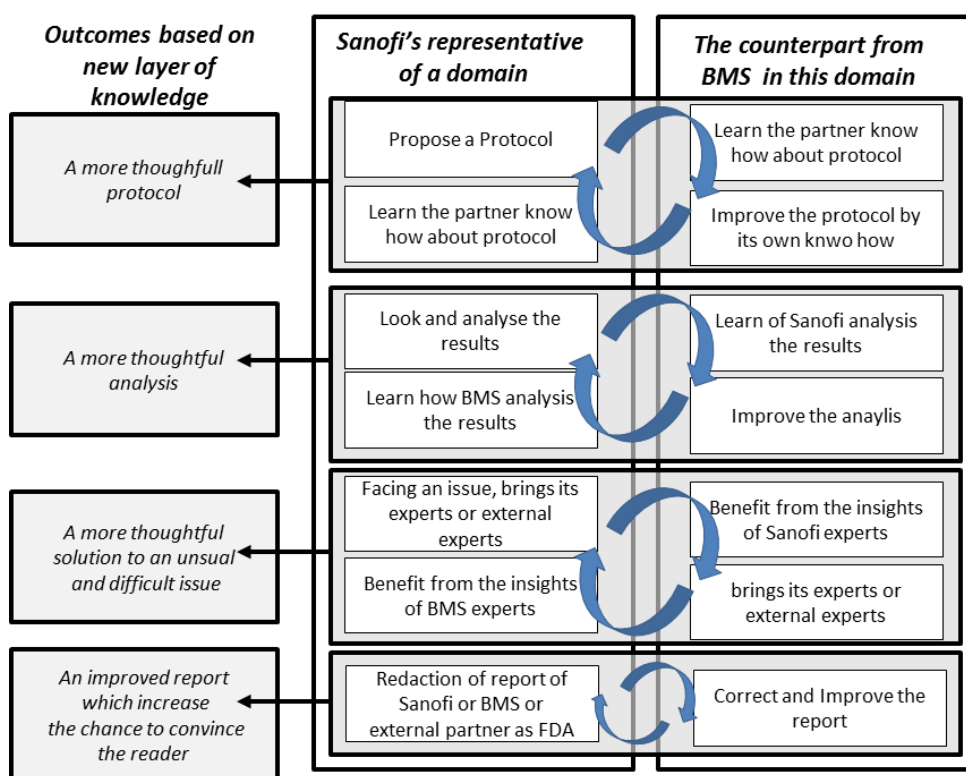
Moreover, in front of the decisional committee, they had to speak in a single voice, and it was because they represented Sanofi's and BMS's shared vision of the solutions or issue of a specific domain that they benefit from credibility and legitimacy. The top management considered that, even if this organization took more time, it was a guarantee of a thoughtful decision. Every action before been executed needed to be challenged by the counterpart who had similar but different and complementary experiences (cf. figure 5). For instance, one interviewee illustrates the creation of a new layer of knowledge for a more efficient clinical plan:

"[...] That's for example if they put together a clinical plan, and then one party says, ok we know much better about this area, and you should not design the clinical study this way, you have to design it that way. Or we know that it's difficult to get the approval if you do it that way, and you'll need these experiments, you'll need these fire marks or whatever, so you give this input. So, you're trying to shape the clinical plans."

And another interviewee illustrates it for the quality of the final report that they give to the FDA to ask for commercialization authorization in the US:

“and even for the study report, It is shared. Before finalizing it, both parties [Sanofi and BMS] read it. Because we always have a different perspective, it allows to take a step back from and ask questions. For the one writing, it, it seems logic but not for the one reading it. [...] by exchanging and the double reading we are sure that all is optimal. We are all engaged in the same boat, and we need to reach the same goal.”

Figure 5: The new layer of knowledge due to daily interaction between Sanofi’s domain representative and its counterpart



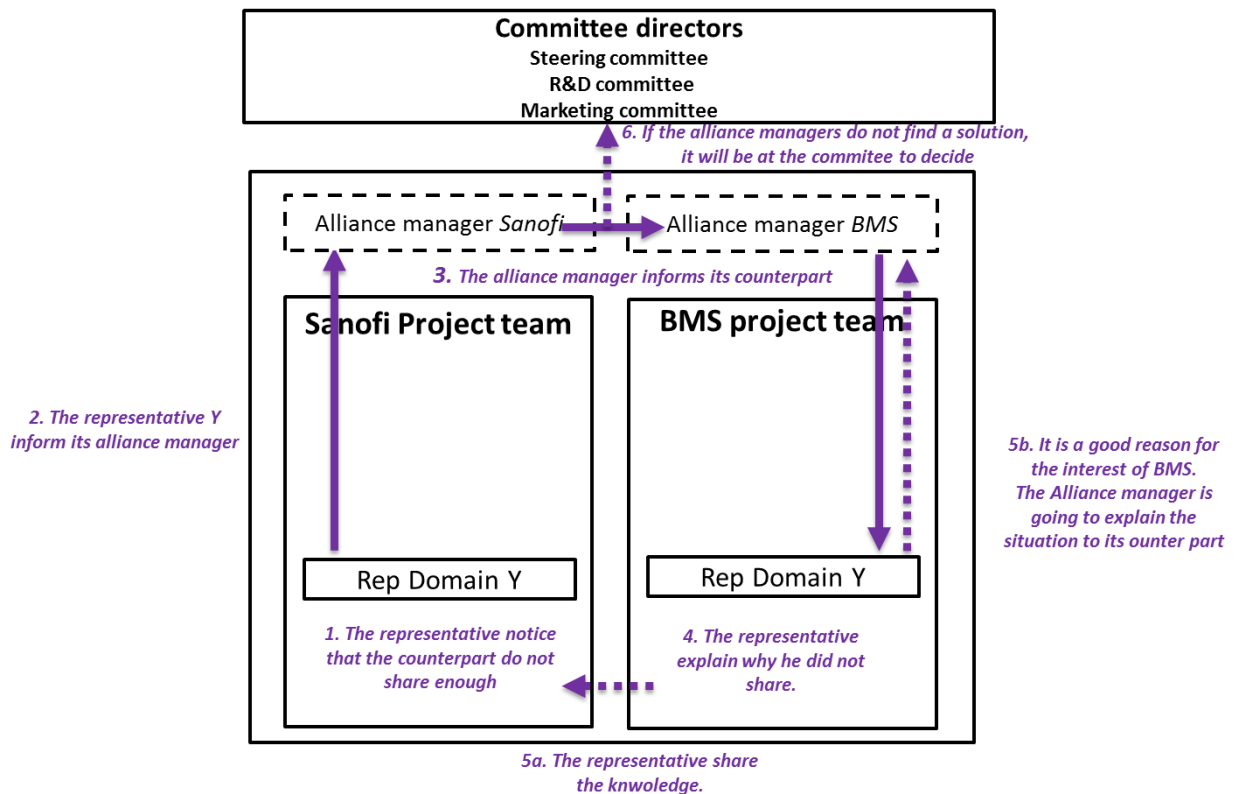
Thus, these close interactions at multiple levels and in each domain of the project team is a guarantee to an efficient decision based on a larger portfolio of resources and experiences. It allows knowledge transfers and knowledge co-creation. Some employee even considered that this organization put them in a kind of bubble separated from the rest of the company and even from the firms’ issues. One representative of toxicology in the Plavix case argues:

“We were disconnected from... from the firm objectives. We do not think about money; we just think about finding the best solution to this scientific issue.”

The mirror organization monitors the reciprocal knowledge contribution

The mirror organization is also a way to monitor BMS, and reciprocally for BMS to monitor Sanofi. As the two counterparts have a similar specific domain of competencies (i.e. toxicology, pharmacovigilance, marketing...), they could evaluate the level of implication of their counterpart and its contribution to the success of the project in their domain. Thus, these close interactions were a way to monitor the partner. If the partner failed to contribute enough, they needed to report it to the alliance manager who was going to inform the other alliance manager and thus it will be managed internally by BMS. Thus, by a mirror organization, Sanofi could guarantee BMS contribution to the project and reciprocally (figure 6).

Figure 6: The management of conflict due to a representative who did not share enough transparent



If the representative of BMS had good reasons to not share some specific knowledge, the alliance manager of BMS and Sanofi were negotiating between them to find a solution. And if even at this level they did not find a solution, the conflict was reported to the decisional committee who had to address the issue and inform the representation how to behave.

For instance, the marketing representatives from Sanofi and BMS had issues to share they best practices. The issues were due to the competitive perception of the partner. Thus, the two

alliance managers supported by the decisional committee decided to create common events as team building activities or they try to always organize informal events as a common dinner.

To conclude this section 3.2, these daily and closed interactions had to goal leverage the knowledge in increase the success of the innovation (a process needed because the path to follow was uncertain and risky) and a way to monitor the partner contribution in terms of knowledge and resources. We would like to highlight that this mirror organization was possible only because the partner was a competitor. Finding a counterpart able to challenge every decision in every domain is possible only if the partner does the same job. Thus, only a competitor is suitable for this job.

The mirror-organization: an invitation for opportunism

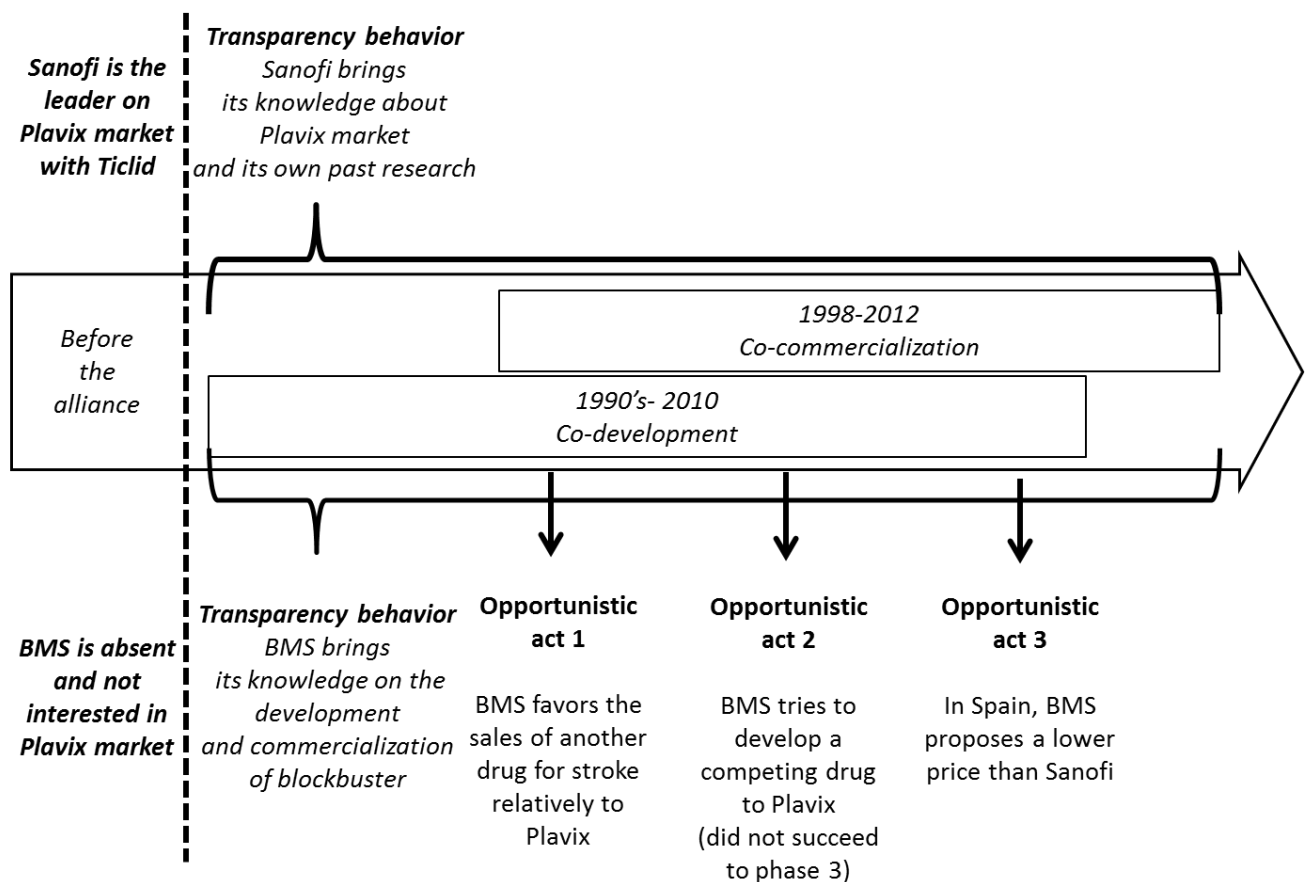
By contrast, this mirror organization which requires the partner firms to engage in close and intense interaction at multiple levels across the cooperative interface gave BMS opportunities to behave opportunistically. All these interactions did not bode well for Sanofi's ability to control the flow of its knowledge about Plavix's past research and about the market opportunities in the cardiovascular market. For instance, BMS used its transparent interactions with Sanofi to perceived a strategic opportunity in the cardiovascular market. BMS decided to develop a competing drug internally. A patent was filed, but luckily for Sanofi, this drug failed in Phase 3, just before the commercialization. If BMS had successes in the commercialization of this drug, Sanofi would have created its own competitor in the cardiovascular market.

Moreover, the mirror organization did not hinder opportunistic behavior in the value appropriation phase. First, on the US market, BMS favored the sales on its own cardiovascular drug relatively to the co-developed drug "Plavix". Secondly, in some countries like Spain and due to the legislation constrained, Sanofi and BMS had to sell the same product under two different brands. Thus, they were in direct competition in Spain. For example, in one of the biggest hospital in Madrid, each company had a full-time sale force guy in charge of selling the drug of their company. As the product was the same, for the sale force, it was not possible to differentiate them based on the product characteristic. Thus, BMS decided to lower its price compared to Sanofi's product.

Three main different opportunistic reported above by our interviews (cf. figure 7) generated huge conflict at the decisional committees.

Despite these conflicts at the highest level of the firms, at the project team, the transparency between the two counterparts was not reduced. And most of the times, they did hear about the opportunistically behavior of BMS, but they considered them rumor or as external events in which they were not involved. Thus, they were a kind of virtual separation between the management of the BMS's opportunistically behavior and the project teams who needed to co-create knowledge together

Figure 7 : BMS's opportunistic behaviors



DISCUSSION

This research studied the use of a cooperative strategy for radical innovation, and more precisely we look at the use of transparency at the working group level (i.e. project team) in this specific context.

In the literature addressing competition strategy for radical innovation, a debate appears between two approaches. From *resources and capabilities based view*, competition is widely

and successfully used to achieve innovations in various industries (Gnyawali & Park, 2011; Pellegrin-Boucher, Le Roy, & Gurau, 2013; Yami & Nemeh, 2014). Coopetition allows creating new layers of knowledge with a competitor which has a similar and complementary knowledge portfolio. However, from a *transaction cost theory* perspective, cooperation with competitors remains a counterintuitive and risky strategy (Hamel, 1991). Involved its knowledge in a transparent interaction with competitors are invitations for opportunism, thus the “high reciprocal transparency” is just a fallacy or a transition state because one partner behaves opportunistically (Larsson & Bengtsson, 1998; Loebecke et al., 1999).

Our extreme case study confirmed and went deeper in some perspectives in this debate.

First, we confirm the value creation of the coopetition strategy (Le Roy & Czakon, 2016; Ritala, Golnam, & Wegmann, 2014). We go deeper by highlighting that the value creation is happening through the creation of new and different layers of knowledge through the whole innovation process (i.e. the risk-taking of the development of a radical innovation, the reduction of time to market and the optimization of the revenue). And more important, we highlight that these new layers of knowledge are possible because of the partner’s competitor characteristics. If the partner was not a competitor, they could not be able to double every representative of the project team, and thus they could not be challenged in every decision.

Secondly, this study investigated the use of “high reciprocal transparency.” We confirmed that for radical innovation “high reciprocal transparency” is a mediator variable and thus it is mandatory. Thus, we position ourselves in opposition to the authors that argue that the best solution to manage coopetition is not to reduce the appropriability of the knowledge by the coopetitors (Baumard, 2010; Fernandez & Chiambaretto, 2016). Making any action such as the reduction of transparency to hinder the appropriability is like “shooting itself in the foot.” The reduction of transparency of one partner leads to the destruction of possibility to create a radical innovation

Thirdly, we investigate the opportunism as a barrier for high reciprocal transparency (Nieto and Santamaria, 2007; Santamaria and Surroca, 2011). Our case study revealed counter-intuitive perspective. Firms like Sanofi put up with opportunism when it arises. Sanofi considers opportunism as a punctual conflict and not as a barrier to transparency. We even argue from this case study that erases the risk of opportunism is not a good idea for radical innovation. The risk of opportunism is the proof that the coopetition is creating value and new knowledge.

Thus, this study brings new insight into the management of coopetition by highlighting a specific organizational design: the mirror organization. This mirror organization is empirical illustration of how firms can engage in close and intense interaction at multiple levels across the coopetition interface in order to be simultaneously transparent and curb opportunism (Kale et al., 2000). What is interesting is that this perfect theoretical organization did not hinder the opportunism. BMS behaved by at least three times opportunistically. Thus, we argue that the management of coopetition is to foster transparency and to minimize the willingness to behave opportunistically. However, the management of coopetition is not about hinder the partner ability to being opportunistic because the key stone of the coopetition success is to co-create value and that increases the risk of opportunism. We also noticed that the opportunistic behavior happened when the product was close to the market. This is consistent with past research that argues that when products are close to market, the opportunistic risk is higher (Bengtsson & Kock, 2000; Yami & Nemeah, 2014)

Our conceptual discussion followed by insights from the extreme case study led us to propose three counter-intuitive propositions:

Proposition 1: *For radical innovation through coopetition, high reciprocal transparency is mandatory*

Proposition 2: *Erase the risk of opportunism is a wrong good idea for radical innovation. The risk of opportunism is the proof that the coopetition is creating value and new knowledge mandatory for radical innovation.*

Proposition 3: *An efficient management of coopetition for radical innovation relies on maintaining high reciprocal transparency between the two competitors even if the partner behaves opportunistically (i.e. be sure that the project still going on). In other words, the coopetitor opportunistic behavior should not stop the project and not hinder transparency.*

Remark: opportunism should be deal as a punctual conflict

4. MANAGERIAL IMPLICATIONS

Our findings might represent interesting guidelines for top managers and for project managers. First, they confirm that coopetition strategies are relevant to addressing the challenges of radical innovation. These strategies allow the creation of new layers of knowledge improving the radical innovation process success. Moreover, only a competitor can challenge every strategic decision in every domain of the innovation process. Thus, we encourage top managers to consider collaborating with even their strongest competitor. Both partners will benefit from the exploitation of their complementarities under the proper circumstances.

Second, our findings provide some directions for an adequate organizational design: the mirror organization (i.e. double each employee in the project team). This organizational design would allow the creation of new layers of knowledge and the monitor of the partner's contributions in terms of knowledge.

Thirdly, opportunism should not be perceived as a barrier of transparency but as an indicator of value creation which needs to be deal as a punctual conflict. To deal with this conflict, firms should separate the conflict management from the project team to not generate a pervasive effect and lead to the reduction of transparency.

LIMITS

This study as some limitations that also offer opportunities for future research.

First, our case study focused on only one extreme case within an industry, and therefore the findings should be interpreted with caution and need to be tested through other cases. For instance, we highlighted from this extreme case study a new mediator variable between coopetition and radical innovation: the transparency and its management. Now, quantitative research is needed to confirm and go deeper into this mediator variable.

Second, while we investigated the opportunities of transparency and highlighted some opportunistic behaviors, the management of opportunistic behavior needs to be investigated in future research.

CONCLUSION

The aim of this investigation is to highlight a new mediator variable between coopetition and radical innovation: the transparency and its management. The contribution of this paper is that this mediator is counter-intuitive and mainly perceived as a fallacy. To provide this counter-intuitive prediction, we conducted an in-depth case study on an extreme case of coopetition in the pharmaceutical industry: the coopetitive project between Sanofi and BMS which generated a radical innovation (i.e. the blockbusters: Plavix). More precisely we considered Sanofi use of transparency during the whole innovation process and when the opportunistic behavior of Sanofi was noticed or expected.

Thus, firms need to fight against the intuitive reaction of reducing transparency when the partner behaves opportunistically. Reducing its transparency inevitably leads to “shooting itself in the foot” because the reduction of transparency of one partner leads to the destruction of any possibility to create a radical innovation.

The complexity revealed by our case study is that firms established organizational design to foster transparency and minimize the willingness to behave opportunistically but do not to hinder the ability of opportunism. Eradicate the ability of opportunism, if it means reduce transparency, is value destructive.

This conclusion confirms the need to treat specifically the literature of alliance and coopetition. Adopting a coopetition point of view means perceiving the opportunistic behavior not as a barrier to collaboration but as an indicator of value creation between competitor. Opportunism is just a punctual conflict which needs to be managed. Opportunism is the downside of the superior benefit of having simultaneously cooperation and competition, and this downside needs to be accepted and put up with when it arrives without reducing transparency.

Finally, we highlight the key role of the organizational design and the existence of a specific design for a coopetitive relationship that minimizes opportunism without hinder the ability of opportunism.

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