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Why firms implement Coopetitive-Project Teams?

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Abstract

Coopetition strategies are driven by the share of the risks and costs of innovation. However, to implement their strategy, coopetitors can rely on two separated projects teams or on a single Coopetitive Project Team (CPT). By pooling their resources in a CPT, coopetitors face a higher level of imitation and spoliation. The question becomes why coopetitors create a CPT and face higher levels of risks when they have other alternatives? Following the literature about risk management in strategic alliances, unilateral contract-based alliances are preferred to minimize relational risks while bilateral contract-based alliances are appropriate to minimize performance risks. We assume that coopetitors create CPT when the performance risks of the project are high. To illustrate our framework, we study the project portfolios of Astrium and TAS in the space industry. Our findings confirm that coopetitors accept higher levels of relational risks and create CPT when the performance risks of the project are high. On the contrary, coopetitors rely on two separated project teams and assume low relational risks when the performance risks of the project are low.

Keywords: coopetition, relational risk, performance risk, Coopetitive Project Team, case study, space industry

Why firms implement Coopetitive-Project Teams?

Introduction

Innovation appears as a key driver of coopetition strategies (Gnyawali & Park, 2009; 2011). Coopetition strategies allow firms to deal with environment's complexity (Carayannis & Alexander, 1999), technological progress (Von Hippel, 1987) and to divide the risks and the costs of their innovations (Jorde & Teece, 1990; Ritala, 2012). To innovate together coopetitors have to create common working groups in which the innovation occurs. These working groups could be joint-ventures, as in the case of Samsung-Sony coopetition in TV industry (Gnyawali &Park, 2011), or Coopetitive Project Teams – CPT – (Fernandez et al., 2014; Le Roy & Fernandez, 2015).

The design of coopetitive project teams for innovation is underexplored. Because of their legal entity, joint-ventures are easily identifiable. On the contrary, CPT are more difficult to identify. They represent internal structures without any legal entity. Coopetitors do not communicate about the existence of these teams. CPT appear as discreet organizational designs. Indeed, past researches on CPT are scarce and provide very little knowledge about this particular coopetition implementation for innovation (Fernandez et al., 2014; Le Roy & Fernandez, 2015). The research aims to contribute to provide insights on the CPT and more precisely, this research focuses on this question: Why do coopetitors create CPT?

To answer this question we build on alliance literature. Previous alliance scholars made a distinction between equity alliances and non-equity alliances (Osborn & Baughn, 1990; Tallman & Shenkar, 1990; Gulati, 1995). Equity alliances include mainly minority equity alliances and joint ventures (Yoshino & Rangan, 1995). Non-equity alliances can be unilateral contract-based or bilateral contract-based (Mowery et al., 1996). In unilateral contracts, the level of integration is very low. Transfers of property rights are well defined and firms carry out their obligations independently of others (Das & Teng, 2000). On the other hand, in bilateral alliances, partners are tighter integrated. They need to put in resources and work together throughout the alliance (Mowery et al., 1996; Das & Teng, 2000).

We applied the same reasoning to coopetition strategies. Equity forms of coopetition are investigated throughout joint ventures (Luo, 2005; Luo et al., 2006, 2007; Gnyawali & Park, 2009; 2011; Galvagno & Garraffo, 2010) and licensing (Zineldin, 2004). Non-equity forms of coopetition can rely on unilateral contract-based coopetition, i.e. two separated

project teams (Ritala & Hurmelinna-Laukkanen, 2009; Bouncken, 2011; Pellegrin et al., 2013; Yami & Nemeh, 2014) or on a bilateral contract-based coopetition, i.e a common Coopetitive Project Team (CPT) (Enberg, 2012; Fernandez et al., 2014; Le Roy & Fernandez, 2015).

We focus here on non-equity forms of coopetition. We investigate how coopetitors choose between these two non-equity forms of coopetition: unilateral and bilateral contract-based coopetition. In particular, we wonder why coopetitors adopt the riskiest non-equity form of coopetition, i.e., bilateral contract-based coopetition (CPT). In this form of coopetition, coopetitors pool strategic resources together in order to achieve a common goal. Team members from competing companies work together on a daily basis. Risks of imitation and spoliation are inherent to coopetition strategies (Hamel et al., 1989; Hamel, 1991; Baumard, 2010; Fernandez et al., 2014). However, coopetitors face higher levels of risks with a CPT than with two separated project teams. Thus the question becomes why coopetitors would take higher risks and create a CPT when they have other alternatives?

To explore this question, we build on the literature about the risk management in strategic alliances (Das & Teng, 1996, 1998, 2000, 2001; Delerue, 2004, 2005). Previous studies identified two types of risks: relational risks and performance risks (Das & Teng, 2001). Relational risks refer to opportunistic behaviors that are oriented to the individual firm's benefit rather than to the good of the alliance (Das & Teng, 2004; Baumard, 2010). Performance risks are due to the factors that may impede achieving alliance objectives (Das & Teng, 1996, 1998). According to previous scholars, equity alliances are adopted to control relational risks while non-equity alliances are rather chosen to minimize performance risks (Das & Teng, 2001).

The literature review leads us to accept that equity forms of coopetition should be adopted to control relational risks while non-equity forms of coopetition would be preferred to control performance risks. However, some arguments are missing to explain how coopetitors choose among non-equity forms of coopetition, between unilateral contract-based coopetition (separated project team) and bilateral contract-based coopetition (CPT). We assume that coopetitors adopt separated project teams when the relational risks are higher than the performance risks of the project; and they adopt CPT when the performance risks of the project are higher than the relational risks.

To illustrate our framework, we conducted a qualitative case study of the projects portfolios of two major competitors in the telecommunications satellite sector: Astrium (EADS group) and Thales Alenia Space (Thales). This analysis evidenced the drivers of bilateral contract-based coopetition i.e. the drivers of CPT.

First, our findings confirm that the risks and the costs sharing of the innovation are key drivers of coopetition strategies. When the features of the projects are standards, firms try to develop them alone, in a competitive way. When the projects are risky and challenging, firms look for some competitors to collaborate with. Second, our results show that companies manage simultaneously a portfolio of multiple projects. Among them, some projects correspond to a unilateral contract-based coopetition (Arabsat) and other ones to a bilateral contract-based coopetition (Yahsat & Alphabus). The analysis of the features of these projects leads us to some conclusions. Coopetitors rely on unilateral contract-based coopetition – separated project teams – when the performance risks of the project are low. Because the probability of failure is low, there is no reason to assume higher level of relational risks. On the contrary, coopetitors rely on bilateral contract-based coopetition – CPT – when the performance risks of the project are high. Coopetitors will thus accept to deal with high levels of relational risks to limit the risk of failure. CPT will thus be preferred when performance risks of the project are higher than relational risks due to coopetition.

1. THEORETICAL BACKGROUND

1.1. COOPETITION: A HIGH-RISK STRATEGY

Coopetition has been defined broadly as the interplays in a 'value net' between a focal firm, its customer, its suppliers and its complementors (Brandenburger & Nalebuff, 1996). More narrowly, coopetition is defined as 'dyadic and paradoxical relationship that emerges when two firms cooperate in some activities, and at the same time compete with each other in other activities' (Bengtsson & Kock, 2000, p. 412). A narrow approach offers a better understanding of coopetition and its implications (Gnyawali & Park, 2011). Thus, building on Le Roy and Fernandez (2015) we define coopetition as a dyadic relationship that simultaneously combines two contrary dimensions, i.e. collaboration and competition. Firms adopt coopetition strategies to benefit from competition while collaborating to achieve a higher level of performance (Peng *et al.*, 2012; Ritala, 2012).

The adoption of coopetition strategies allows companies to benefit from both competition and collaboration that encourage to surpass themselves by constantly improving their offer – and cooperation that allows them to access new resources. In coopetition, firms have no intent to lower competition in order to increase cooperation or to increase competition in order to lower cooperation, but rather to increase competition and cooperation with the same partner-opponent (Fernandez et al., 2014; Yami et al., 2010; Czakon et al., 2014).

Coopetition is a relevant strategy strategies in both complex and dynamic environments (Carayannis & Alexander, 1999). Von Hippel (1987) argued that managers decide to collaborate with competitors when their primary goal is to stimulate technological progress. Product innovation, particularly radical product innovation, is a major factor explaining the adoption of coopetition strategies (Tether, 2002; Belderbos et al., 2004; Quintana-García & Benavides-Velasco, 2004; Neyens et al., 2010; Bouncken & Kraus, 2013; Ritala & Sainio, 2014; Le Roy et al., 2016; Tomlinson, 2010). Competitors decide to innovate jointly to divide the risks of innovation (Tether, 2002; Rijamampianina & Carmichael, 2005), to support the creation of standards and to reinforce their power within the industry (Gnyawali et al., 2006).

If coopetition strategies are potentially fruitful, they expose the firm to new risks. In particular, firms are exposed to imitation risks. At the beginning of the process, the risk of imitation can be managed. Competitive firms are, by nature, firms with unique and hard-to-imitate resources. Their relative positions are due to their capacity to create and increase barriers to their resources mobility (Mahoney & Pandian, 1992). But when the companies follow the collaboration path, these barriers strongly established before tend to weaken or even to disappear during the interfaces and meetings between partners.

Adopting coopetition strategies forces firms to face a dilemma (Hamel, 1991; Pellegrin-Boucher et al., 2013; Fernandez et al., 2014; Le Roy et al., 2016). Firms need to share their strategic resources with their competitor to create new ones. The more open is the firm to share its strategic resources with its partner, the more it will benefit from the coopetition. But the openness exposed the firm at a high risk of imitation and spoliation. In coopetition, while firms are sharing resources, they simultaneously have to protect their strategic resources from the competitor imitation. The competitor could use the imitated resources to compete with its partner on another market. Each firm strategy is driven by an

agenda, to protect its own resources while trying to imitate the competitor's (Hamel, 1991). On the opposite, too much protection will make the collaboration fail.

Paradoxically, firms adopting coopetition strategies can expect high levels of benefits but they also have to deal with high levels of risks. The risk can be a driver of coopetition. According to its "hidden agenda", a firm would collaborate with its competitor only to imitate its resources and learn from its expertise (Hamel, 1991). If each coopetitor had the same "hidden agenda", the coopetition would turn into a zero-sum game. In coopetition firms intend to benefit from the partner's expertise, while protecting its own expertise from the partner's learning. However, firms cannot completely protect themselves from the opportunism of their coopetitor (Pellegrin-Boucher et al., 2013; Fernandez et al., 2014; Le Roy et al., 2016). So the question is to know how to manage these risks? Which form of organization firms must adopt to implement successfully coopetition for innovation?

1.2. Forms of coopetition strategies

To identify the relevant form to implement coopetition strategies we build on alliances literature. Alliance scholars proposed various typologies of strategic alliances (Oliver, 1990; Lorange et al., 1992; Dussauge & Garrette, 1997). Regarding the alliance structural choice, most of previous studies have been focused on the dichotomy of equity alliance vs non-equity alliances (Osborn & Baughn, 1990; Tallman & Shenkar, 1990; Gulati, 1995). Equity alliances include mainly minority equity alliances and joint ventures (Yoshino & Rangan, 1995). On the contrary, non-equity alliances can be unilateral contract-based or bilateral contract-based (Mowery et al., 1996).

Non-equity alliances accept two main forms: unilateral contracts and bilateral contracts. In unilateral contracts, the level of integration is very low. Transfers of property rights are well defined and firms carry out their obligations independently of others (Das & Teng, 2000). On the other hand, in bilateral alliances, partners are tighter integrated. They need to put in resources and work together throughout the alliance (Mowery et al., 1996; Das & Teng, 2000).

The same distinction between equity and non-equity alliances can also be applied to coopetition strategies i.e. alliances between competitors. Some scholars have studied equity coopetition throughout joint ventures (Luo, 2005; Luo et al., 2006, 2007; Gnyawali & Park, 2009; 2011; Galvagno & Garraffo, 2010) and licensing (Zineldin, 2004). Other scholars have investigated non-equity forms of coopetition. Two types of non-equity coopetition have been

previously identified. First, competitors develop common project but create two separate project team in each parent firm (Ritala & Hurmelinna-Laukkanen, 2009; Bouncken, 2011; Pellegrin et al., 2013; Yami & Nemeh, 2014). Second, competitors build a unique coopetitive projects-team to deal with their common project (Enberg, 2012; Fernandez et al., 2014; Le Roy & Fernandez, 2015).

Separate project teams in each parent firm rely on tasks division and punctual coordination during interfaces (Ritala & Hurmelinna-Laukkanen, 2009; Bouncken, 2011; Pellegrin et al., 2013; Yami & Nemeh, 2014). Partners carry out their obligations independently. They build separated project teams who only meet during the interfaces. Since the level of integration is low, this type of coopetition can be considered as a unilateral contract-based form of coopetition.

In Coopetitive Project Teams competitors pool technological, financial and human resources (Enberg, 2012; Fernandez et al., 2014; Le Roy & Fernandez, 2015). Individuals from competing are integrated in the same structure and work together on a daily basis (Le Roy & Fernandez, 2015). This type of coopetition can be considered as a bilateral contract-based form of coopetition.

When firms enter in coopetition strategies, they have to decide first between equity or non-equity coopetition. Second, when they choose equity coopetition they have to decide between licensing and joint-ventures and when they choose non-equity coopetition they have to decide between unilateral contract-based or bilateral contract-based coopetition. Table 1 summarizes the different forms of coopetition.

Table 1. Forms of coopetition strategies

Structure of coopetition	**Licensing**	**Joint Ventures**	**Separated project teams in each parent firm**	**Coopetitive projects-teams**
References	(Zineldin, 2004)	(Luo, 2005; Luo et al., 2006; 2007; Galvagno & Garraffo, 2010; Gnyawali & Park, 2009; 2011)	(Ritala & Hurmelinna-Laukkanen, 2009; Bouncken, 2011; Pellegrin et al., 2013; Yami & Nemeh, 2014)	(Enberg, 2012; Fernandez et al., 2014; Le Roy & Fernandez, 2015)
Form of coopetition	**Equity coopetition**		**Non-equity coopetition**	
			Unilateral contract-based coopetition	**Bilateral contract-based coopetition**

1.3. THEORETICAL FRAMEWORK

This research focuses on the choice between different forms of non-equity coopetition. This question remains unexplored by previous studies. When coopetitors create a Coopetitive

Project Team, employees work together and share information. Coopetitors accept to face a higher risk of technological transfer than in other forms of coopetition (Fernandez et al., 2014; Hamel, 1991; Pellegrin-Boucher et al., 2013; Le Roy et al., 2016). Thus, the question is why would coopetitors take the risk to build a CPT when they could have different options? To answer this question, we build a theoretical framework on risk management theory.

As previously pointed out, risks could be considered as a driver of coopetition strategies or as a consequence of them. To clarify this confusion about the relationship between risk and coopetition, a deeper investigation on the types of risks is necessary. In alliance literature, two types of risk have been identified: relational risks and performance risks (Das & Teng, 2001). Relational risk relates to cooperation among alliance partners, while performance risk has to do with the hazards of not achieving the performance objectives of an alliance, given cooperation (Das & Teng, 1996, 1998).

Relational risk refers to opportunistic behaviors that are oriented to the individual firm's benefit rather than to the good of the alliance (Das & Teng, 2004; Baumard, 2010). Relational risk is a perceived and multidimensional risk that denotes decision makers' concerns regarding the level of cooperation between partners (Delerue, 2004; 2005). Relational risk is influenced by how each partner allocates and manages the resources and by how it commits to an alliance (Das & Teng, 1998).

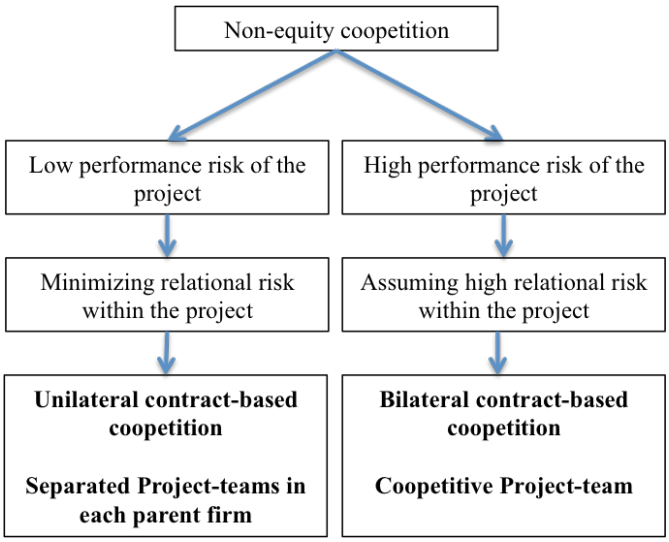
On the contrary, performance risks are due to the factors that may impede achieving alliance objectives (Das & Teng, 1996, 1998). Performance risk is grounded in the interactions of alliance partners with the external environment.

Previous studies have shown that equity alliances are adopted to control relational risks while non-equity alliances are rather chosen to minimize performance risks (Das & Teng, 2001). The same reasoning can be applied to alliances with competitors, i.e. to coopetition strategies. Equity forms of coopetition would be adopted to control relational risks while non-equity forms of coopetition would be adopted to control performance risks.

However, as highlighted in Table 1, two forms of non-equity coopetition have been previously identified: separated project teams - unilateral contract-based coopetition (Ritala & Hurmelinna-Laukkanen, 2009; Bouncken, 2011; Pellegrin et al., 2013; Yami & Nemeh, 2014) and coopetitive project teams - bilateral contract-based coopetition (Enberg, 2012; Fernandez et al., 2014; Le Roy & Fernandez, 2015). There is a gap in the literature about the reasons why firms adopt unilateral or bilateral contract-bases coopetition.

The dilemma between relational and performances risk represents an interesting approach to better understand coopetitors' choice. As a general rule, firms form alliances to gain access to partner firm's valuable resources while keeping one's own resources intact (Das & Teng, 1999). This assumption is even truer in coopetition. When they collaborate, competitors share strategic resources to create new ones. Openness allows the firms to expect high levels of benefits but expose them to a high relational risk i.e. risking imitation and spoliation (Hamel, 1991). This relational risk seems higher in bilateral contract-based coopetition than in unilateral contract-based coopetition. Thus, firms should adopt highest relational risk only if performance risk of the common project is higher. So, we assume that coopetitors will adopt bilateral contract-based coopetition to minimize performance risk at the project-level. On the contrary, if the performance risk is lower than the relation risk at the project level, coopetitors will adopt unilateral contract-based coopetition. Consequently, we coopetitors will take the relational risk of the CPT only if performance risk of the project is higher. Figure 1 presents our theoretical framework that will be further illustrated.

Figure 1. Theoretical Framework



2. RESEARCH METHODS

2.1. A CASE STUDY

While equity forms of coopetition are easily observable, non-equity coopetition are difficult to identify. This research aims to explain why firms choose Coopetitive Project Teams (bilateral contract-based coopetition) instead of Separated Project Teams (unilateral contract-based

coopetition). Because we aim to describe and understand a new phenomenon (rather than to test propositions), an exploratory research design is appropriate (Miles & Huberman, 2013). In line with Bengtsson and colleagues (2010) recommendations, we conducted a case study of to understand the emergence of different forms of non-equity coopetition (Yin, 2013). Case-based exploratory methods are appropriate for understanding poorly understood phenomenon (Eisenhardt, 1989) with multiple and complex elements (Dodgson et al., 2008) that evolve over time (Langley, 1999). In-depth studies are the best way to explore a multi-faceted and paradoxical phenomenon such as emergence of multiple forms of coopetition strategies (Dowling et al., 1996; Gnyawali & Park, 2011).

2.2. Empirical settings

Coopetition is frequently observed in high-tech industries (Gnyawali et al., 2006). In order to understand why companies, use different forms of non-equity coopetition it was relevant to study an industry organized by projects. Accordingly, we conducted our research within the space industry (Dussauge & Garrette, 1997).

The space industry includes all activities leading to the production of aircraft, missiles and spacecraft that require diverse and sophisticated technologies to answer the demands of both private and public clients. Europe is currently the world's second space power in budgetary terms. Like NASA in the US, European space agencies such as the European Space Agency (ESA) and the National Centre for Space Studies (CNES) are actively involved in the structuring of industrial activity through the development and coordination of space programmes.

This study focused on the most competitive segment of the space industry, the telecommunications satellite manufacturing. The world market is divided among five major manufacturers, including three Americans—Boeing Space Systems, Lockheed Martin Space Systems and Loral Space & Communications—and two Europeans—Astrium,[1] EADS and Thales Alenia Space, a French-Italian joint venture between Thales (67%) and Finmeccanica (33%). In addition, potential competitors from emerging countries (China, India, Brazil, and Russia) lead their local markets and threaten international markets from a long-term perspective. They do not yet have the capacity to compete with American or European manufacturers in the international markets, but they have mastered the technologies. In the

[1] Since January 2, 2014, Astrium has been known as Airbus Defense and Space.

future, manufacturers from emerging countries could become strong competitors in worldwide markets.

Manufacturers compete to respond to tenders from space agencies in institutional markets and from telecom operators in local and international markets. These telecom operators are international (Intelsat and Inmarsat) or regional (Eutelsat and Arabsat) companies with high financial capacities. They employ a fleet of satellites and sell services to TV channels, Internet service companies, etc. Private telecom operators capture the highest share of the value created in the chain, and are thus considered as highly profitable companies.

A telecommunications satellite is composed of two parts: the platform and the payload. The payload includes the receiving antennas, the repeaters and the transmitting antennas. The platform is the vehicle responsible for the smooth launching of the satellite and the maintenance of the satellite in the space environment. The platform is relatively standardized for a range of products, whereas the payload is adapted to the requirements of each client.

In this research, we analyze the different strategies used by Astrium and TAS. Both companies manage a large portfolio of space programmes, enabling us to investigate different projects simultaneously.

2.3. Data Collection

Primary and secondary data were collected to enable the use of triangulation techniques (Lincoln & Guba, 1985; Eisenhardt, 1989; Gibbert *et al.*, 2008). Primary data was gathered through 51 semi-structured interviews conducted with CEOs, department heads, project managers and team members[2]. The interviews were recorded and then transcribed as soon as possible to preserve the quality of the data (Gibbert et al., 2008). Following Gioia et al. (2013), we assured the interviewees that their names would not be used. Secondary data were obtained from various sources, including internal documents (e.g., contracts, presentations, meetings and reports) and external documents (e.g., news articles and industry reports). The combination of primary and secondary sources allowed us to triangulate the collected information by crosschecking facts and dates to avoid potential interpretation biases.

[2] The duration of interviews ranged from 43 to 154 minutes. The average duration was 77 minutes. With the exception of five conference calls, all interviews were conducted face to face.

2.4. DATA ANALYSIS

The empirical material (primary and secondary data) was coded according to the recommendations of Miles and Huberman (2013). Two stages can be differentiated within the analytical process.

A first round of coding followed the literature to identify projects corresponding to different strategies: competition, collaboration, equity-coopetition, non-equity coopetition, unilateral contract-based coopetition (Separated Project Teams) and bilateral contract-based coopetition (Coopetitive Project Teams). This round was essentially deductive and allowed us to ensure that our chosen case was relevant to illustrate our framework.

Then, a second inductive round of coding was undertaken to understand the drivers and the features of each project. This second round was inspired by the method proposed by Corley and Gioia (2004) and Gioia et al. (2013) and entailed coding our material in different steps. We began by identifying first-order categories, which allowed us to label the interviews. Then, we attempted to arrange the first-order categories within second-order themes to link the first-order categories with the existing literature and to identify potential nascent concepts or mismatches. Finally, we attempted to combine the second-order themes into aggregate dimensions to study the relationships between them. To implement the different steps in the inductive round, we used NVivo 9 software to conduct the content analysis and to design arborescence.

3. SINGLE PROJECT TEAM, TWO SEPARATED PROJECT TEAMS OR A COMMON COOPETITIVE PROJECT TEAM?

Space agencies (institutional markets) and private telecom operators (local and international markets) formulate and published tenders so that all manufacturers are aware of the potential markets. After publication of the tender, each manufacturer must decide whether to respond to it. Then, the manufacturer should decide how responding to the bid and would explore different strategic options: alone, with a partner or with a partner-competitor. The manufacturer would compare the benefits, risks and costs for each option. We studied the projects portfolios of Astrium and TAS to understand their strategic choice to compete or to coopete. Then, firms can choose between different organizational designs: a single project team, two separated project teams or a common coopetitive project team. Our study aims to understand the drivers of their choice.

Our findings highlighted some projects developed in coopetition. However, the coopetition strategy implemented for these projects does not correspond to an equity coopetition but rather to a non-equity coopetition. The task division is clear and the risks are shared by the partners. The research revealed two organizational design corresponding to this strategy. Partners have two options: two separated project teams or one common coopetitive project team i.e. unilateral or bilateral contract-based coopetition. Our findings contribute to understand the drivers of this choice.

3.1. A SINGLE PROJECT TEAM

On commercial markets (emergent or international), competition is the dominant strategy between manufacturers and concerns half of European space projects.

Astrium and TAS evaluate a tender from a telecom operator separately without communicating or sharing information. Firms do not know against which firm they will compete, competition is confidential. Each competitor elaborates its best offer to the client based on its core competencies and on its best technology (Eurostar for Astrium and Spacebus for TAS). The client receives different responses from different competitors and proceeds to a selection based on two criteria: product reliability and cost.

For telecom operators, product reliability is a key criterion. They pay specific attention to the technological section of the offer. Once in orbit, it is almost impossible to repair or conduct maintenance on a satellite. Telecom operators are very timorous regarding first-try innovations. They would rather buy tested technologies than test new ones. They compare Spacebus to Eurostar, evaluating all of the equipment and would choose the most reliable product for their mission.

Cost is the second key driver of telecom operators' choices. As private companies, telecom operators seek to increase their margins and profits. Of two competing offers, the client will choose the less-expensive one.

Therefore, based on both criteria (product reliability and cost) the client selects a supplier and ends the competition. For Astrium and TAS, it is a win-lose game. If Astrium wins, TAS loses and *vice versa*. Then, the winning firm and its subsidiaries perform all of the manufacturing and the final assembly, and operate the satellite. Thus, only the winning firm benefits from the programme and assumes all of the risk and costs of the manufacturing.

Competition occurs primarily when Astrium and TAS each consider their individual capacities strong enough to win alone in the market. When a firm holds enough internal

strategic resources, it will compete to win the market. Competition leads the manufacturers to the creation of one single team fully responsible for the project.

3.2. TWO SEPARATED PROJECT TEAMS

Our research revealed two situations of unilateral contract-based coopetition i.e. separated project teams: (1) when Astrium or TAS decided to collaborate with a local partner in emerging markets (2) when Astrium and TAS decided to collaborate together. We detail both situations.

First, to answer a tender from an emergent country, European manufacturers were constrained to vertically collaborate with a local firm. Astrium adopted this strategy with Antrix in the Indian market and TAS with ChinaSatcom in the Chinese market and with Gazprom in the Russian market.

Local firms lacked of the necessary expertise and reliability to compete with Astrium or TAS in international markets. However, the collaboration with mature firms allowed local firms to develop core competencies and expertise. Local firms from emerging countries can be expected to become strong competitors in the future. The strategy implemented between a European manufacturer and a local firm can thus be considered as a coopetition strategy.

The coopetition strategy implemented corresponded to a unilateral contract-based coopetition. The European manufacturer was leading the contract i.e. the prime contractor to ensure the quality and the reliability of the global offer. The manufacturing of the satellite was divided between both partners. The local firm was considered as the main subcontractor. It manufactured the platform for half of the typical cost, allowing the prime contractor to formulate a more price-competitive offer. Because local firms do not have the expertise to manufacture a payload, Astrium or TAS remained responsible for the payload design and manufacture. This strategy involved a division of the costs and the risks between the prime and the local partner up to its contracted share. Each firm committed for its own share of the satellite. Benefits were also divided according to the industrial division between both partners.

Each firm created a project team dedicated to its activity, in its own company. Both project teams were geographically separated without any interaction. Project managers were meeting a few times to coordinate the who le project and deliver a common offer to the client.

Second, Astrium and TAS can decide to collaborate together in some markets such as the Saudi market. Arabsat[3] was an exemplar case of unilateral contract-based coopetition implemented by Astrium and TAS. In 1985, TAS was Arabsat main supplier. TAS built the first generation of satellites (Arabsat 1) and met with the client's expectations. TAS was thus entrusted for the next generation of satellites. The platform of the next generation faced multiple technical issues that ended the relationship between TAS and Arabsat. The client initiated a new competition between Astrium, TAS and Boeing. The mission of Arabsat 4-a was specific and required specialized technologies. Astrium and TAS decided to pool the best of their companies in a single offer. Because TAS was suffering from a bad reputation, the formulation of a common offer was impossible. Thus, Astrium answered the bid as prime contractor and appointed TAS as the main manufacturer.

In this configuration, Astrium was the prime contractor and TAS would be presented as a regular subcontractor. An Astrium project team was responsible for the platform manufacturing while another team in TAS was in charge of the payload. Both teams worked remained located in their parent firms. They did not have any interaction or contact during the project. Their work was assembled and coordinated by project managers. The risks and the costs of the project were divided between both partners according to the industrial division. The client was receiving a single offer from Astrium. TAS was relegated to a first-tier subcontractor and was not involved in the governance of the project or in financial negotiations.

3.3. Single Coopetitive Project team

Our findings revealed two space projects that corresponded to a bilateral contract-based coopetition: Yahsat and Alphabus. First, Astrium and TAS used bilateral contract-based coopetition to win against Boeing Space on the Emirati market, for the client Yahsat. Second, the same strategy appeared on the European institutional market for the Alphabus project. The objective was to develop a new top-of the-range platform and to design a new range of products based on this technology.

For both projects, Yahsat and Astrium, Astrium and TAS created a coopetitive project team in which they pooled strategic resources and core competencies. The coopetitive project team was governed by a Project Management Office (PMO). Responsibilities and liabilities of the PMO were equally divided between both partners. The client received a single offer

[3] Arabsat was the name of the Saudi global private telecom operator client.

signed jointly by Astrium and TAS. The offer expressly mentioned the double project governance, the dual management and the equal risk sharing. Partners were committed to a full risk sharing on no-fault basis. Both firms assumed all the financial, technological and commercial risks regardless of whether they came from Astrium or TAS. The co-governance of the project encouraged Astrium and TAS to pool their best resources and competencies in the project. Coopetitors decided to pool financial, technological and human resources in a common team fully dedicated to the project. Employees from both parent firms became team members a coopetitive project team. The pooling of each firm's strengths ensured that the client received the best and most reliable offer.

3.3.1. Yahsat

In August 2007, Al Yah Satellite Communications Company (Yahsat), a subsidiary of Mubadala, signed a contract with Astrium and TAS for the manufacture of a dual system of satellite communications.

With a total value of approximately 1.8 billion euros, Yahsat was one of the most important projects in the entire space industry. Usually, a telecommunications satellite programme represents between 200 and 300 million euros. Yahsat represented six to seven times the average value of a regular project. In 2007, the turnovers of Astrium and TAS on their spatial activities were respectively about 4.6 billion euros and 2.6 billion dollars. Yahsat represented almost half of the turnover of Astrium and almost the entire turnover of TAS in the space industry. This analysis explained the high level of financial risks assumed by Astrium and TAS.

Moreover, the client was a new actor in the space industry and Yahsat was its first telecommunications project. The company emerged in the early 2000s as an offshoot of the government of the United Arab Emirates. Astrium and TAS had little information about the client's solvency, its capacity to meet its obligations, or its reliability. This uncertainty represented an added source of financial risk for the manufacturers. If for some reason the client was unable to pay during the three years, manufacturers would be at the verge of bankruptcy. They needed strong insurance from their parent group or from an external insurance company, the COFACE (*La Compagnie Française d'Assurance pour le Commerce Extérieur - The French Insurance Company for Foreign Trade*). However, the 1.8-billion-euro of Yahsat amount was too risky even for the COFACE. Thales and EADS groups refused to insure 100% of the project. Consequently, Astrium and TAS decided to answer the

tender together, dividing the financial risk, allowing EADS and Thales groups to insure a 50% of the project.

The client Yahsat lacked of experience on space activities and preferred a turnkey contract. Astrium and TAS were responsible for the manufacture, the launching and the controlling of two satellites, two ground stations transmitting signals and information and a military telecommunications network[4]. Unlike traditional and common satellite projects, Yahsat did not agree to pay the full price at the order or at the delivery of the product. A 15% of the payment was required at the satellites launching. The rest of the price was spread over three years. Consequently, Astrium and TAS had to assume high levels of financial risks.

Yahsat project went beyond a single satellite and required a complete, turnkey system. When a client buys a satellite, it has two options. First, the client can purchase a satellite in a traditional client-supplier relationship. The client is in charge of the launching of the satellite and of the satellite controlling over its lifetime. The satellite manufacturer assumes technical risks of dysfunctions or breakdowns until the satellite launch. Second, the client can outsource the launching and the controlling to its satellite manufacturer. The manufacturer becomes a provider of a turnkey system and assumes risks of dysfunctions or breakdowns all over the lifetime of the satellite. Because launching and orbital positioning are critical steps, the manufacturer assumes higher levels of technical risks in a turnkey system than in a regular satellite contract. In previous collaborations, Astrium used to be in charge of the platform and TAS of the payload. In Yahsat, the industrial division followed the equity of the financial division. Each manufacturer was in charge of 50% of the manufacturing, about 0.9 billion euros. This division avoided jeopardizing the project's success. However, Astrium and TAS remained competitors and expected to realize the most interesting work packages of the project, corresponding to the highest technological parts of the system.

As explained, Yahsat was characterized by high levels of risks. Risk sharing appeared as a key driver of the coopetition strategy implemented by Astrium and TAS. The rule of *risk sharing on a no-fault basis* committed both partners to assume—jointly and severally—the risks of all stages of the project. To fulfill their commitments partners needed to work closer together, to supervise their work and to manage efficiently the project interfaces. When a technical issue appeared, finding the responsible for it would not matter. Instead, partners needed to deeper collaborate to find the best solution for the project, even if that meant to

[4] Exclusively restricted from civilian use

revise the industrial division and leave the manufacture of a key component to the other partner. Because of its high levels of risks, Yahsat required close collaboration between Astrium and TAS. The high levels of risks associated to the project explained also why partners decided to create a coopetitive project team to do the project.

3.3.2. Alphabus

The evolution of telecommunications services required more powerful satellites with higher capacities. The current range of European products—Eurostar (Astrium) and Spacebus (TAS)—were too limited to follow the evolution of the demand. Boeing Space Systems had developed a new top-of-the range line of products and was leading the market. Astrium and TAS wanted to develop their own platform for heavy and powerful payloads to compete with Boeing.

The new platform development represented considerable R&D investments. According to public data, 400 million euros were initially invested in the project. The real budget, although not public, was more than twice the initial investment. The end of the project was expected in four years but Astrium and TAS took four more years to design and build Alphabus. The four additional years of development had to be funded. The platform was finished in 2012 and the first Alphasat satellite was launched in 2013. Each manufacturer had a maximum cash flow of 15 million euros for all of its R&D in the telecommunications sector, which was not sufficient to develop Alphabus. Public funding became necessary but public institutions could not fund the development of two platforms. Thus, in June 2005, the CNES and the ESA encouraged Astrium and TAS to develop a common platform and a corresponding offer of satellites called Alphasat.

In order to develop such innovation, Astrium and TAS decided to pool their resources and competencies in a coopetitive project team. This decision was driven by several factors. First, the coopetitive project team appeared as the relevant organization to deal with the high level of technological risks of Alphabus. Alphabus was a radical innovation and the platform was designed to become the core technology of the European space industry. It was critical to avoid breakdowns or dysfunctions. It was also essential to push the technologies further, to think of the future and not to limit the technologies with the current capacities. Close collaboration between team members was the only solution to imagine and create the next competitive advantage on the space market. The coopetitive project team encouraged daily interactions between individuals and allowed the exploitation of synergies between Astrium

and TAS core competencies. Alphabus would thus benefit from learning processes between team members. The industrial division followed this complementarity logic. Astrium pooled its competencies on electronic systems and systems for altitude control, and TAS pooled its competencies on mechanical and chemical propulsion. The pooling of the core competencies of both partners allowed the development of innovative components that neither Astrium or TAS could have achieved alone. The close collaboration obtained with the coopetitive project team also allowed partners to develop new technology together, such as avionics.

Second, the implementation of a coopetitive project team helped Astrium and TAS to deal with the high level of commercial risk due to Alphabus. Because solving a technical problem issue when a satellite is in orbit remains almost impossible, clients prefer reliable technologies to new ones. Convincing a client to be the first one to test the technology represented a critical issue for Astrium and TAS. The ESA offered to fund the first Alphabus platform and the integration of the satellite to any client interested in launching the first Alphasat for a telecommunication mission. The client could launch a top-of-the-range satellite for half of the price. However, clients remained doubtful. Astrium and TAS decided to communicate about the strengths of Alphabus. The platform was designed by the best engineers with the core technologies of the two space leaders. The pooling in the coopetitive project team and the close collaboration between team members appeared as a quality label for clients. Thus, several clients decided to respond to the ESA tender. Inmarsat won the market and launched Alphasat XL, the largest telecommunications satellite in July 2013.

Third, Astrium and TAS had to face a high level of market risk when they developed Alphabus. The top-of the-range market represented a new segment in the space industry. The demand was highly uncertain that questioned the profitability of the offer. Heavy and powerful satellites might be too powerful for small telecom operators. They represented interesting opportunities for large telecom operators but at the same time very expensive. The volume of the demand was expected to be low but with a high value. The market niche could have some overlaps with the middle range market. Spacebus and Eurostar could compete with Alphabus for powers about 12kW. To avoid such competition and to promote Alphabus, partners signed a formal agreement that stipulates its priority over Eurostar and Spacebus. Consequently, Airbus and TAS would have to respond a tender for a powerful satellite together with Alphabus. They could not compete against Alphabus with a Eurostar or a Spacebus offer. Cannibalism between the different ranges of products was prohibited.

Partners also formally decided to alternate the leadership of the contracts. Since Astrium was prime contractor for Alphasat XL, TAS would be the prime contractor for the next contract. The coopetitive project team became responsible for the development of Alphasat. Team members (from competing parent firms) were in charge of incremental innovation, the promotion of Alphabus and the future contracts. The maintain of the coopetitive project team was essential to sell an innovation co-developed by two competitors.

4. DISCUSSION

4.1. CONTRIBUTIONS

Cooperation with competitors appears a counterintuitive and risky strategy (Hamel, 1991). Coopetition implies risking being looted by your partner-competitor (Baumard, 2010). However, this strategy is widely used by companies in various industries (Gnyawali and Park, 2011; Pellegrin et al., 2013; Yami and Nemeh, 2014). This empirical observation brings the conclusion that companies are willing to deal with the risks due to coopetition. However, a coopetition strategy can lead to different organizational designs that are more or less risky. Coopetitors can decide to build two separated project teams, independent from each other, with the lowest interaction. By doing so, partners expect to limit the risk of knowledge transfer and the risk of spoliation. This organizational design presents a negative effect. By reducing the interactions among team members, partners also limit the benefits of the collaboration. They do not fully benefit from the synergies between both teams. On the other side, coopetitors can consider that they need the partner's resources and competencies so strongly that they will accept to build a common project team. Partners will accept a high level of risks but with the expectation of a high level of gains.

In the literature, we found a gap to explain why companies assume higher levels of risks in a coopetition strategy. Previous scholars addressed the questions of the drivers of coopetition and their major insight was that competitive firms could collaborate to divide the risks of the innovation process (Belderbos et al., 2004; Bouncken and Kraus, 2013; Carayannis and Alexander, 1999; von Hippel, 1987; Neyens et al., 2010; Quintana-García and Benavides-Velasco, 2004; Ritala and Sainio, 2014; Le Roy et al., 2016; Tether, 2002; Tomlinson, 2010). However, these researches did not explain why coopetition strategies can lead to different designs: two separated project team (Ritala Hurmelinna-Laukkanen, 2009;

Pellegrin et al., 2013; Bouncken, 2011; Yami and Nemeh, 2014) or a common coopetitive project team (Enberg, 2012; Fernandez et al., 2014; Le Roy and Fernandez, 2015).

Our research aims to answer the following research question: why coopetitors will take higher risks by creating a common coopetitive project team instead of creating two independent ones? The study of the projects portfolios in the space industry provides interesting insights on this question.

First, the findings are in line with previous studies about the drivers of coopetition. Indeed, the telecommunications satellite manufacturing sector is characterized by a high degree of complexity and dynamism (Carayannis & Alexander, 1999). Similarly, technological progress (Von Hippel, 1987) and innovation competition (Tether, 2002; Belderbos et al., 2004; Quintana-García & Benavides-Velasco, 2004; Neyens et al., 2010) appeared as key drivers of coopetition strategies in the space industry. As previously explained, Astrium and TAS decided to collaborate together or with a local firm from an emerging country to divide the costs and the risks of the innovation. However, our results encourage us to go beyond previous scholars', to consider other dimensions to partners' decision to build a common coopetitive project team. To understand such decision, the firm level is no longer appropriate. The project level seems the relevant level of analysis.

Second, our findings revealed two forms of non-equity coopetition strategies: two independent separated project and one single coopetitive project teams. These findings are in line with previous studies. These organizational designs have been previously identified. However, previous studies used to focus on one form of coopetition two separated project team (Ritala Hurmelinna-Laukkanen, 2009; Pellegrin et al., 2013; Bouncken, 2011; Yami and Nemeh, 2014) or a common coopetitive project team (Enberg, 2012; Fernandez et al., 2014; Le Roy and Fernandez, 2015). Here, the study of the portfolio aims to understand why companies use one form or the other. The risk seems the major variable to consider.

Third, our findings illustrated the theoretical framework built on alliance literature (Dasn and Teng, 2001). Indeed, the alliance literature differentiates between relational risks and performance risks (Das and Teng, 1996; 1998; 2001). Coopetition strategies seem driven by performance benefits but these strategies are threatened by high levels of relational risks (Baumard, 2010). According to previous studies (Das and Teng, 2001), Astrium and TAS adopted non-equity forms of coopetition to control performance risks. This result is consistent with the literature about the drivers of coopetition strategy (Ritala, 2012). However, our

findings have shown two forms of non-equity coopetition. The first form is used for the Arabsat project. Two separated project teams are implemented and correspond to a unilateral contract based-coopetition. The second form appeared in Yahsat and Alphabus. One common coopetitive project team is implemented that corresponds to a bilateral contract based-coopetition. Thus, in the same portfolio, partners have competitive projects that they do alone; collaborative projects that they share with their competitors (or local partners); and coopetition projects that they do jointly with their competitors. Previous scholars have shown that coopetitive project teams i.e. unilateral contract-based coopetition exposed partners to a high level of relational risks (Fernandez et al., 2014; Le Roy and Fernandez, 2015). Our findings suggest that Astrium and TAS are more willing to assume a high level of relational risks when the performance risks associated with the project are also high. Table 2 summarizes the key features of the project studied.

Table 2. Separated Project Teams vs Coopetitive Project Teams

Project	Arabsat	Yahsat	Alphabus
Innovation degree	Incremental	Incremental	Radical
Coopetition strategy	Non-equity coopetition	Non-equity coopetition	Non-equity coopetition
Performances risks of the project	Low	High	High
Relational risks of the project	Low	High	High
Organizational design	Separated project teams	Coopetitive Project Team	Coopetitive Project Team

Yahsat and Alphabus were the most important space projects in the decade. A failure would have lead the companies to bankruptcy. Thus, partners had no other alternative but to succeed. In order to deal with such high level of performance risks, partners needed the core competencies and the best of each partner. They needed strong interactions among team members in order to stimulate innovation and creativity. Partners were perfectly aware of the high relational risks they were taking. But the performances risks were considered as more important. On the contrary, in a standard space project such as Arabsat, performances risks seem lower. Because there is no technological challenge for the partners and because both partners have a lot of experience in such projects, they can precisely divide the tasks between them. Since the project did not need any co-development, partners did not pool their strategies resources and their core competencies in a common project team. There is no reason for the coopetitors to work together. So, if the performance risks are low, coopetitors will assume a lowest level of relational risks by implementing two separated project teams.

Our findings allow us to formulate the following proposition:

Proposition. Coopetitors implement Coopetitive Project Teams (resp. separated project teams) and assume high levels of relations risks (resp. low) when the performance risks of the project are high (resp. low).

4.2. Managerial implications

The findings could represent interesting guidelines for top managers and for project managers. First, they confirm that coopetition strategies are relevant strategies to deal with innovation challenges. They allow partners to divide the costs and the risks associated to the innovation. Firms can thus be involved in more innovative projects with the same level of resources. So, top managers should consider collaborating with their competitors for their innovations whether they are incremental or radical. Even more, we encourage top managers to consider their strongest competitor to collaborate with. Both partners will benefit from the exploitation of their complementarities. Second, our findings provide some directions for managers to decide about different organizational forms of coopetition. Creating a common project team with a main competitor could seem irrational because of the obvious relational risks. However, we encourage managers to go beyond this risk and to consider another type of risks: the performance risks. Thus, we recommend top managers and project managers to create CPT rather than separated project teams when performance risks of the project are high; and in spite of the high level of relational risks associated with the CPT.

4.3. Limitations and directions for future research

Our research faces some limitations that offer interesting perspectives for further studies. The main methodological limitation comes from the embeddedness of our findings in a specific industry and period. Assuming that the telecommunications satellite manufacturing is a case representative of high-tech industries, similar findings could be obtained in similar industries. Our assumption needs to be extended to new empirical settings.

Another perspective for further research could be the question of the management. Our findings suggest that performance risks can be considered as a key driver of unilateral contract-based coopetition. But, this form of coopetition forces coopetitors to assume a high level of relational risk. Our research pretends that it worth assuming high levels of risks when performance risks are also high. However, we do not investigate how coopetitors deal with high levels of relational risks at the project level. Thus, it could be interesting to deeper investigate the management of relational risks in a CPT. Le Roy and Fernandez (2015) have

pointed out a co-management principle and some tools to manage the tensions at the project level, but they did not focus their attention on all the dimensions of the relations risks. How do team members perceive each other? What are the risks faces by team members? How could these risks impact the project? Further studies are required to grasp the challenges of the management of relational risks.

The arbitration between performance and relational risks to choose an appropriate organizational design appears as a short-term decision. In the cases studies, partners compare the risks of failure and the risks of spoliation. However, managers' decisions seem driven by a short-term perspective. The project success seems more urgent than the knowledge management. We can wonder what would happen in a long term perspective. We can think about the collaboration between Airbus and China Aviation. This strategy seems highly profitable for Airbus but we can question it in a long term. What about the know-how imitation? Is there any knowledge transfer between both companies? What would happen if China Aviation turned into the strongest competitor of Airbus? It would be interesting to introduce a time dimension in the decision making-process of the forms of coopetition.

Finally, in this research, we paid attention to different forms of non-equity coopetition. Nevertheless, investigating equity forms of coopetition could also be interesting. Building on the literature (Gulati, 1995; Osborn & Baughn, 1990; Tallman & Shenkar, 1990) we can assume that equity forms of coopetition are implemented to minimize relational risks. However, some studies pointed out some tensions in coopetitive joint ventures (Gnyawali and Park, 2009; 2011). It would be interesting to study tensions and risk management in equity forms of coopetition. Are they the same than in non-equity forms of coopetition? What are the differences? Do they require different management strategies?

The risk management offers stimulating perspectives to study coopetition strategies at different levels.

CONCLUSION

Competitors collaborate to foster their innovation process (Belderbos et al., 2004; Quintana-García & Benavides-Velasco, 2004; Ritala & Sainio, 2014; Tether, 2002; Neyens et al., 2010; Tomlinson, 2010; Bouncken & Kraus, 2013; Le Roy et al., 2016). However, when competitors enter in coopetition strategies they face a high level of risk of imitation and spoliation (Hamel, 1991; Gnyawali & Park, 2001; Fernandez et al., 2014). This level of risk

can be more or less intense depending on the form of coopetition. Indeed, coopetition strategies can have different forms: equity (Zineldin, 2004; Luo, 2005; Luo et al., 2006; 2007; Galvagno & Garraffo, 2010; Gnyawali & Park, 2009; 2011) Vs non-equity coopetition. In the case of non-equity coopetition strategies, partners can implement two separated project team (Ritala Hurmelinna-Laukkanen, 2009; Bouncken, 2011; Pellegrin et al., 2013; Yami & Nemeh, 2014) or one common Coopetitive Project Team (CPT) (Enberg, 2012; Fernandez et al., 2014; Le Roy & Fernandez, 2015). The question becomes thus why would coopetitors assume a high level of risk by creating a CPT while they have other alternatives? In order to investigate this issue, we built on the literature about the risks in alliances and more precisely on the distinction between relational and performance risks (Das & Teng, 1996, 19988, 2000, 2001; Delerue, 2004, 2005). In line with our theoretical framework, we assumed that coopetition would accept higher relational risks when the level of performance risks would be higher.

We illustrate our framework with the results of a qualitative study of the project portfolio of space companies: Astrium and TAS. We simultaneously studied various space projects, corresponding to coopetition strategies. Our findings revealed that firms are simultaneously engaged in different projects with their competitors but these projets rely on different organizational designs. The analysis of the features of the projects studies allowed us to provide some new insights on coopetition theory. When coopetitors have to deal with projects with high levels of performance risks, they build a Coopetitive Project Team. Coopetitiors will thus accept high level of relational risks in order to achieve a challenging project. On the contrary, if the project is quite standard, coopetitors will split the project and will build two separated project teams. Coordination and interfaces will be limited.

Our findings present strong contributions to coopetition literature. They contribute to explain the coexistence of multiple forms of coopetition. Coopetition are risky strategies but sometimes they appear as the only solution to deal with other levels of risks. Finally, ours findings suggest to move to the project level to better understand the drivers of the different forms of coopetition.

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