

See discussions, stats, and author profiles for this publication at: <http://www.researchgate.net/publication/259505433>

# Sources and management of tension in co-competition case evidence from telecommunications satellites manufacturing in Europe

ARTICLE *in* INDUSTRIAL MARKETING MANAGEMENT · JANUARY 2013

Impact Factor: 1.93 · DOI: 10.1016/j.indmarman.2013.11.004

---

CITATIONS

8

---

READS

207

## 3 AUTHORS:



[Anne-Sophie Fernandez](#)

Université de Montpellier

7 PUBLICATIONS 13 CITATIONS

SEE PROFILE



[Frédéric Le Roy](#)

Université de Montpellier

60 PUBLICATIONS 97 CITATIONS

SEE PROFILE



[Devi R. Gnyawali](#)

Virginia Polytechnic Institute and State Uni...

43 PUBLICATIONS 1,347 CITATIONS

SEE PROFILE



## Sources and management of tension in co-opetition case evidence from telecommunications satellites manufacturing in Europe



Anne-Sophie Fernandez <sup>a,\*</sup>, Frédéric Le Roy <sup>a,1</sup>, Devi R. Gnyawali <sup>b,2</sup>

<sup>a</sup> University of Montpellier 1, Montpellier Research in Management, Espace Richter, Bâtiment B, Rue Vendémiaire CS 19519, 34960 Montpellier Cedex, France

<sup>b</sup> Department of Management, 2011 Pamplin Hall, Virginia Polytechnic Institute and State University (Virginia Tech), Blacksburg, VA 24061, United States

### ARTICLE INFO

#### Article history:

Received 30 March 2013

Received in revised form 26 July 2013

Accepted 10 September 2013

Available online 6 December 2013

#### Keywords:

Co-opetition

Tension

Separation

Integration

Space industry

### ABSTRACT

Co-opetition is filled with tension due to inherent contradictory and opposing forces. In this research, we develop a multi-level conceptual framework that helps to understand key drivers of tension in co-opetition and key approaches to managing the tension. We combine literature-based conceptual arguments and insights from in-depth study of one exemplar case of co-opetition between Astrium (EADS group) and Thales Alenia Space (Thales group) within the sector of telecommunications satellites manufacturing in Europe. Our findings highlight multiple sources of co-opetitive tension at different levels. Further, our research shows that a mixed organization based on both separation and integration of competition and cooperation is helpful to understand and effectively manage tension in co-opetition. This paper offers case-based rich insights on the sources and management of tension and has important implications for the design and conduct of future empirical research.

© 2013 Elsevier Inc. All rights reserved.

### 1. Introduction

Co-opetition strategy, defined as the simultaneous pursuit of cooperation and competition among firms, is suggested by scholars as being critical for firm performance (Bengtsson & Kock, 1999; Gnyawali, He, & Madhavan, 2008; Pellegrin-Boucher, Le Roy, & Gurau, 2013; Teece, 1992; Yami, Castaldo, Dagnino, & Le Roy, 2010). While the pursuit co-opetition strategy has the potential to create competitive advantages, it is quite challenging to pursue due to very high levels of tension involved in co-opetition (Gnyawali, Madhavan, He, & Bengtsson, 2012; Lewis, Welsh, Dehler, & Green, 2002) as it embodies opposing forces of competition and collaboration and the need to work together to generate higher common value and the need to compete with each other to get a large portion of the value (Bengtsson & Kock, 2000; Gnyawali & Park, 2011; Walley, 2007). These tensions can be very strong and could jeopardize effective pursuit of co-opetition (Bonel & Rocco, 2007).

Despite the surge of scholarly interest on co-opetition and its management practice, less attention has been paid to the sources and management of tension associated to co-opetition. While the literature has stressed the existence of tension and has begun to uncover the causes and nature of tension in co-opetition, our understanding of this

important phenomenon is clearly lacking. Examination of the sources of tension and ways of managing tension thus is critical to develop a theory of co-opetition (Chen, 2008; Gnyawali & Park, 2011; Walley, 2007). Previous research on these questions has been mainly theoretical (Chen, 2008; Clarke-Hill, Li, & Davies, 2003; Das & Teng, 2000; De Rond & Bouchikhi, 2004; Gnyawali et al., 2008). Empirical studies are very rare (Bengtsson & Kock, 2000). This paper aims to address this critical gap by focusing on two questions: (a) what are the sources of tension in co-opetition? (b) How do firms manage tension in their co-opetitive relationships?

Researchers generally propose two opposite principles to manage co-opetition: separation and integration. In the separation principle, Bengtsson and Kock (2000) recommend a functional or a product-market separation of the management of cooperation and competition. Separation could also be achieved by a third actor entrusted to manage the cooperation (Castaldo, Möellering, Grosso, & Zerbini, 2010). Internal tensions are likely to be low when competition and cooperation are separated. However, other scholars express an opposite point of view in which collaboration and competition should not be separated but integrated. The integration principle underscores the importance of viewing competition and collaboration as simultaneous forces and the need to adopt more holistic and integrative mechanisms (Chen, 2008; Gnyawali et al., 2008). While these approaches appear meaningful conceptually, we know little about whether and to what extent these approaches work and help in managing tension in co-opetition. Research evidence is needed to better understand whether one approach could be better than the other and how firms manage these approaches.

We address these questions by first providing a conceptual discussion of tension in co-opetition. Conceptual insights developed in the

\* Corresponding author. Tel.: +33 434432102.

E-mail addresses: annesophiefernandez@hotmail.fr (A.-S. Fernandez),

frederic.le\_roy@univ-montp1.fr (F. Le Roy), devi@vt.edu (D.R. Gnyawali).

<sup>1</sup> Tel.: +33 434432114.

<sup>2</sup> Tel.: +1 540 231 5021.

first part of the paper are used to deeply investigate co-opetition, tension in co-opetition, and management of tension using an exemplar business case of co-opetition. The case is between two European manufacturers of telecommunication satellites — Astrium (EADS group) and TAS (Thales group) in the European space industry. Our case study examines three levels—inter-organizational, intra-organizational and inter-individual—in order to develop a richer understanding of the multi-level nature and sources of tension.

We contribute to the co-opetition literature in several ways. First, we develop literature-based and case-based insights to understand the nature and sources of tension in co-opetition. Scholars have recognized that co-opetition entails tension (Gnyawali & Park, 2011), but have rarely explored the sources and the dimensions of such tensions. Our results reveal various dimensions and multiple sources of co-opetitive tensions at the inter-organizational, intra-organizational, and inter-individual levels. Second, we develop insights on how firms could manage tension and generate beneficial outcomes from co-opetition. Most of previous scholars insist on the importance of managing co-opetition tension (Gnyawali & Park, 2011; Walley, 2007) but do not explain how to manage it. Insights from our multilevel case study help to understand how various managerial approaches could be useful to deal co-opetitive tension at various levels. Our findings suggest critical role of ordering parties, project teams, and project managers in dealing with tension at multiple levels. Moreover, our results suggest that a combination of both separation and integration principles is to be achieved in effectively dealing with co-opetition. Third, our paper based on rich conceptual development and in-depth case study provides a solid basis for the design and conduct of large-scale empirical research, which is very critical in order to advance our understanding of co-opetition and its implications. Finally, our findings illuminate the role of cognitive and behavioral factors in understanding co-opetitive situations and in managing tension from co-opetition. We show that tension in co-opetition seems to stem mainly from cognitive factors whereas behavioral factors seem critical in the management of tension.

## 2. Theoretical framework

### 2.1. Nature and sources of tension in co-opetition

#### 2.1.1. Co-opetition: A relationship full of tension

Brandenburger and Nalebuff (1996) have defined co-opetition quite broadly, such as a value-net involving the focal firm's interplay with customers, suppliers, complementors, and competitors. Gnyawali and Park (2011) and Bengtsson and Kock (2000) define co-opetition more narrowly with a focus on dyadic interplay between two firms that compete and cooperate with each other simultaneously. Since a narrow definition allows a better understanding of the concept and its implications (Bengtsson & Kock, 1999), we adopt a narrow definition as offered in the literature: “co-opetition is a simultaneous pursuit of collaboration and competition between a pair of firms” (Gnyawali & Park, 2011, p. 51).

Researchers suggest that dyadic co-opetition is quite intriguing, but tensions are also likely to be very high when two close competitors collaborate (Bengtsson & Kock, 2000; Gnyawali & Park, 2011; Gnyawali et al., 2008). Co-opetition entails multiple opposing elements and dualities (Clarke-Hill et al., 2003) and tensions arise from the combination of two opposite dimensions of cooperation and competition. Tensions explain why alliances between competitors are more unstable than alliances between non-competitors (Das & Teng, 2000; Park & Russo, 1996). High levels of both competition and cooperation lead to more complex and intense tensions (Clarke-Hill et al., 2003).

Tension appears to be a threat for companies as high tension could turn a common project into failure. At the same time, researchers also suggest that the reason why co-opetition could lead to beneficial outcomes is because simultaneity of the elements of both competition and cooperation would make firms realize benefits from both of them.

While reduction of one of the elements, especially competition, in a relationship could reduce tension, any attempt to reduce tension by reducing one dimension could hinder realization of gains. So, the critical issue is not to minimize tension, but manage it (Bengtsson & Kock, 2000; Gnyawali et al., 2008, 2012; Luo, Slotegraaf, & Pan, 2006) so that beneficial outcomes could be realized. The strategic issue is not to choose between competition and cooperation but to manage the tensions between both (Clarke-Hill et al., 2003) or to maintain and balance them (Chen, 2008).

Tension is often multi-dimensional and multi-level, and dealing with tension requires recognition and management of the inherent contradictions implicitly (Murnighan & Conlon, 1991). Considering tensions at different levels of the organization seems critical for organizations to understand what kind of management approaches are needed in order to deal with each level of tension. We propose to distinguish three levels of co-opetitive tension: inter-organizational level (De Rond & Bouchikhi, 2004), intra-organizational level (Luo et al., 2006) and inter-individual level (Tsai, 2002). Different sources of tensions appear within each level.

#### 2.1.2. Inter-organizational co-opetitive tensions

Several inter-organizational co-opetitive tensions can be identified in literature. The first tension arises from the dilemma between creation of common value and appropriation of private value (Gnyawali et al., 2012). Collaboration helps to create common benefits, such as new technologies and innovations (Oliver, 2004; Quintana-Garcia & Benavides-Velasco, 2004). The greater the strength of competition, i.e., to realize greater private gain from the created value, the greater the tension between the parties. Distribution of the created value becomes highly critical because partners have the same competitive goals on the markets. Each firm collaborates but its de facto position encourages the firm to win more than its partner. A partner who increases its stock of resources and competences more than its co-opetitor will get competitive advantage in future competition. After the phase of knowledge creation, tensions would arise between distributive and integrative elements of knowledge appropriation (Oliver, 2004). In other words, tensions would appear when each partner will try to capture the value previously created (Cassiman, Di Guardo, & Valentini, 2009).

Another kind of co-opetitive tension is due to the risks of transfer of confidential information and the risks of technological imitation. Partners pool strategic resources to achieve their goals (Gnyawali & Park, 2009) but at the same time they need to protect their core competencies because they remain strong competitors. Thus, inter-organizational knowledge sharing and learning are sources of potential tensions that affect the dynamics of the partnership (Inkpen, 2000; Khanna, Gulati, & Nohria, 1998; Walley, 2007).

Tensions could also arise due to differences, both explicit and implicit, in the strategies and goals of each partner towards the relationship. Partners could have genuinely different strategic priorities for the partnership and such differences could lead to disagreements on resource allocations. Further, partners could have different strategic intents and hidden priorities, such as imitating the partner's know-how and outlearning each other (Hamel, 1991). Differences in such explicit and implicit strategic priorities could be lead to different mindsets and behaviors of managers, which need to be addressed.

#### 2.1.3. Intra-organizational co-opetitive tensions

Two main sources of co-opetitive tension are likely to exist at the intra-organizational level. The first is between the different business units (Luo et al., 2006). Resource limitations lead to strong competition among various units. Through the resource allocation process, firms decide to give more or less priority to activities inside the organization or to activities set up with competitors (co-opetitive activities). Managers involved in internal activities would compete with colleagues involved in co-opetitive activities to obtain human, technological, and financial resources from the parent firm (Tsai, 2002).

The second source of tensions concern employees involved in activities developed with competitors. These employees face tension when a current competitor becomes a partner or when a current partner becomes a competitor. If employees for a long time were treating someone as a partner, they will have to change their mindset and practices when that partner becomes a competitor. Reciprocally, employees from two companies competing for a long time would face difficulties to perceive each other as partners. [Gnyawali and Park \(2011\)](#) suggest that managers from Sony and Samsung who perceived each other as competitors for a long time have had difficulties to accept each other as partner. This cognitive tension felt by managers inside the organization could lead to ineffective interactions.

#### 2.1.4. Inter-individual co-opetitive tensions

Current literature suggests that co-opetitive tensions could appear for a variety of reasons in inter-individual relationships in a co-opetitive context. Generally, in their daily work, individuals compete to defend their own interests while knowing that their welfare depends on their capacity to collaborate ([Loch, Galunic, & Schneider, 2006](#)). Individuals face a dilemma that consists in choosing between an individual strategy and collaboration. This dilemma is even stronger when the individual decision-making process is not only based on rational economical considerations ([Axelrod, 1984](#)) but also on emotional considerations ([Loch et al., 2006](#)). Social interactions depend on individuals' objectives and individuals' perceptions of each other ([Deutsch, 1973](#)). Contribution of each team-member is difficult to evaluate. Each individual could betray the others or could be mistaken about the others. Free riding could be a strong temptation for individuals. Tensions arising as these conditions are stronger in a co-opetitive context because each individual would defend his/her parent firm. The belongingness to competing firms would a priori reinforce competing behaviors among team members. Individuals from competing firms will find it difficult to set aside their deep-rooted competitive beliefs about each other's company.

Another source of intra-individual tension is due to collective identity. In a pure collaborative project, common identity is gradually created as individuals from different companies work together over time. In co-opetition, two firms' identities are mixed without being merged. They need to coexist until the end of the project. Individuals would work with others with different values and cultures. The psychological equilibrium of the individuals would be disturbed. As pointed out by [Gnyawali et al. \(2008\)](#), the cognitive dissonance is an important source of psycho-cognitive stress for individuals involved in co-opetition.

We have thus far highlighted, based on prior literature, why and how tensions are likely to be high in co-opetitive relationships. We also suggested that tension in co-opetition arise at various levels: inter-organizational, intra-organizational, and inter-individual. We highlight next some ways of managing such tensions.

## 2.2. Managing co-opetitive tensions

It is quite challenging to balance and manage competition and collaboration and the inherent contradictions between them. [Gnyawali and Park \(2009\)](#) suggest that “managers will confront higher level of tension in managing co-opetitive relationship due to high competitive tension, high risks of knowledge loss, and potential of partners to become stronger competitor”. Managers should avoid that tensions turning into conflicts. Instead, they should turn them as a source of competitive advantage. The question then is how to manage co-opetitive tensions?

Contractual governance offers interesting insights to manage cooperative and competitive forces in strategic projects ([Cassiman et al., 2009](#)). However, a legal framework offers little help as the relationships are evolving over time and have multiple dimensions. We discuss below two approaches to manage competition and collaboration and potential

tension stemming from it: separation of competition and collaboration and integration of the two.

### 2.2.1. The separation principle

Paradoxes can be effectively solved by temporal or spatial separation ([Poole & Van de Ven, 1989](#)). In co-opetition, [Bengtsson and Kock \(2000\)](#) recommend a division or separation between the management of competition and the management of collaboration. According to [Bengtsson and Kock \(2000\)](#), this principle of division can take different shapes. First, the separation can be functional. Since individuals can only act according to one logic at a time, either the cooperation or the competition, it seems necessary to create a specific team dedicated to collaboration and another one fully dedicated to competition. Thus, most of the time, companies will collaborate in upstream activities, for example in R&D, and compete in downstream activities such as marketing of the products. In this case, the R&D director will be in charge of the collaboration while the marketing director will handle competition. Second, the separation can be spatial. Division could be achieved thanks to product–market separation. Two companies could collaborate on one market and compete on another one. Likewise, they could collaborate for a new product development while competing on their existing products.

As [Bengtsson and Kock \(2000\)](#) suggest, the application of the division principle inside the company is not always possible. One way to deal with it is to separate the management of competition and the management of collaboration by entrusting the management of the collaboration to a third party. A union could be in charge of the coordination of activities between two co-opetitors ([Bengtsson & Kock, 2000](#)). Following the same approach, [Castaldo et al. \(2010\)](#) and [Depeyre and Dumez \(2010\)](#) consider that a third party could be the client or the ordering party. The third party acts thus as a broker in a strategic network helping partners to manage co-opetition tensions ([Madhavan, Gnyawali, & He, 2004](#)).

As [Bengtsson and Kock \(2000\)](#) stress, individuals find it very difficult to integrate the co-opetitive paradox on their own. Individuals can manage a single dimension, competition or cooperation, but will have great difficulty managing both simultaneously. This suggests that co-opetition cannot be internalized within the organization by individuals and therefore the separation principle is important.

### 2.2.2. The integration principle

For other scholars, the separation principle is insufficient ([Chen, 2008](#); [Das & Teng, 2000](#); [Oshri & Weber, 2006](#)) and integration needs to be pursued. The application of the separation principle tends to create strong tensions within the organization. For example, the R&D director in charge of the collaboration and the marketing director in charge of the competition could face a strong internal conflict situation. To avoid strong tensions within the organization, it seems reasonable to expect individuals to personally integrate the co-opetitive logic. Individuals should develop a co-opetitive mindset to allow an efficient management of the paradoxical nature of co-opetition ([Chen, 2008](#); [Das & Teng, 2000](#); [Gnyawali & Park, 2011](#); [Oshri & Weber, 2006](#)).

The creation of such mindsets can be fostered by organizational learning and global experience associated with co-opetition ([Luo, 2007](#)). A common experience in managing complexity or in successful conflict resolution strengthens mutual understanding and trust ([Ploetner & Ehret, 2006](#)). Development of trust and long-term commitment appears to a critical key factor for success of co-opetitive strategies ([Chin, Chan, & Lam, 2008](#)). Global executives involved in co-opetition should also develop a corporate culture that embraces yin–yang philosophy ([Chen, 2008](#); [Luo, 2007](#)). Individuals with a co-opetition mindset would be better prepared to integrate the paradox and manage simultaneity of competition and collaboration ([Oshri & Weber, 2006](#)). Another way to achieve integration would be establishing and maintaining over time a balance between cooperation and competition ([Park, Srivastava, & Gnyawali, 2012](#); [Teece, 1992](#)). The balancing strategy suggests that as

the intensity of competition grows, a corresponding increase in the intensity of cooperation is necessary in order to keep the relationship in control and to realize greater gains offered by strong competition and cooperation (Park et al., 2012).

These issues associated with the separation principle and the necessity of integration of collaboration and competition have not been explored in scholarly research. This is one of the key aims of this study.

While the separation and integration are likely to be both helpful on their own, we suggest that an approach combining both the separation and the integration principles would allow more effective management of co-opetitive tensions. Little research shows how these two principles are implemented to manage co-opetitive tensions. Until now, the question of the organization of the collaboration between two competitors has been neglected. How do they share their strategic human resources? How do they pool their core competences? How do they protect them? Less attention has been paid to the organizational level and to the individual level as well. It is also critical to consider the source of tension and their management at both corporate and operational levels.

Our review of the literature presented above suggests the following tentative theoretical framework (Fig. Fig. 1) that can be used for further exploration. We use this framework to perform our in-depth case study, which is described next.

### 3. Method

#### 3.1. In-depth case study

Bengtsson, Eriksson, and Wincent (2010) recommend a case study to better understand co-opetition challenges. Case-based exploratory methods seem very appropriate to understand a phenomenon that is poorly understood (Eisenhardt, 1989) and that has multiple and complex elements (Dodgson, Mathews, Kastle, & Hu, 2008) which evolve over time (Langley, 1999). In-depth study explores and details a multi-faceted and paradoxical phenomenon of co-opetition (Gnyawali & Park, 2011). Accordingly, we conducted in-depth study of an exemplar case of co-opetition in order to develop insights about the phenomenon and tensions arising from it (Yin, 1994).

#### 3.2. Research design and case selection

We designed this research as an exploratory study to generate insights about the sources and the management of tensions stemming from dyadic co-opetitive relationships. Manufacturing of telecommunication satellites represents one of the most competitive segments of the space aircraft industry. The worldwide market is divided between five major manufacturers, three American—Boeing Space System, Lockheed Martin, Space Systems Loral—and two European — Astrium (EADS group) and TAS — (Franco-Italian joint venture between Thales — 67% and Finmeccanica — 33%). All of them compete on commercial markets to respond to bids from telecommunication operators. While competition is the dominant strategy between manufacturers,

collaborative relationships tend to be developed between the two European manufacturers of telecommunications satellites located in the same area within the city of Toulouse in Southern France.

#### 3.3. Alphas: an exemplar case of co-opetition

The Alphas program conducted jointly by TAS and Astrium is an exemplar case of co-opetition for several reasons. First, the case is unique because it represents a situation where several firms engage in co-opetition and deep insights could be generated by going inside the organizations and their relationships. Second, the common project team set up by TAS and Astrium and between two institutions to conduct the program represents a unique case to investigate in-depth co-opetitive tensions. In the space industry, companies are used to the mode of organization by projects. A *Project Management Office* (PMO) governs each program. When TAS and Astrium decided to collaborate on Alphas, they used the same organizational logic. Both companies pooled human, financial, and technological resources in a team governed by a mixed PMO.

In early 2000, a new top-of-the-range market segment appeared in the telecommunications market for massive satellites. The current European ranges of products i.e. Eurostar (Astrium) and Spacebus (TAS) were too limited to compete in this market segment. American manufacturers such Boeing Space had already developed new products to lead the new market segment, leaving Europeans manufacturers in a follower position. Missing market opportunities, Astrium and TAS decided to develop a new range of products but they lacked of financial capacity to sustain their innovation. Astrium and TAS needed institutional investments from the French institution CNES (*Centre National des Etudes Spatiales – National Center of Space Studies*) and from the European institution ESA (*European Space Agency*). Because the institutional support was limited, CNES and ESA forced Astrium and TAS to pool their human, technological, and financial resources to develop together a common new range of satellites. In 2001, Astrium and TAS, supported by ESA, implemented a program called Alphas to design and build a new European orbital platform able to support very powerful telecommunications satellites and compete with American manufacturers on the top-of-the-range market segment. The objective of CNES and ESA was to stimulate European innovation to improve European competitiveness against the American leadership. Alphas is the case studied.

#### 3.4. Data collection and analysis

We intentionally carried out a qualitative case study method, as this method would enable us to avoid the constraints of a preliminary choice of tools or types of data to be used (Yin, 2003), making it possible to access heterogeneous data collected from a variety of sources (Langley & Royer, 2006). Moreover, this method makes it possible to analyze a phenomenon at several levels (Eisenhardt, 1989). Following the recommendations of Bengtsson et al. (2010), we investigate co-opetition tensions across organizational level and team level. Following the criteria for qualitative analysis (Eisenhardt, 1989; Eisenhardt &

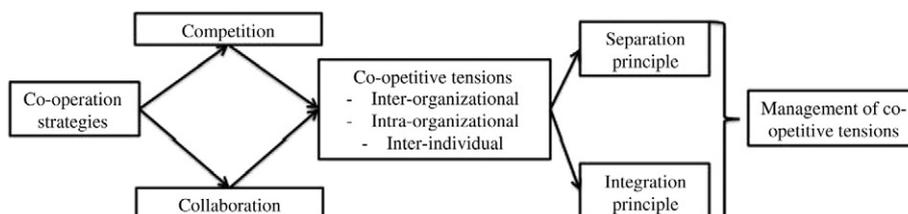


Fig. 1. Theoretical framework of managing co-opetitive tensions.

Graebner, 2007; Yin, 1994) we began our case study analysis by interviewing top managers in both companies Astrium and TAS. The individuals were chosen because they were key decision makers in the organizations. The first round of interviews began with semi-structured interviews keeping in mind the general research questions regarding co-opetition but allowing constructs to surface freely regarding the nature of the phenomenon for the partners (Glaser & Straus, 1967). Based on this first round of interviews, we were able to better understand the different current programs of telecommunications and to identify the individuals involved in them. The second round of interviews was conducted with project managers and team members of the co-opetitive program (i.e. Alphabus) and of non-collaborative programs.

In total, forty semi-structured interviews lasting about 60 min each were conducted face-to-face (except for five conference calls) individually, recorded and then transcribed as soon as possible to preserve the quality of information. All the interviews were conducted in France. Seven were conducted in Paris offices, one in Cannes, and all others in Toulouse. Two were performed in English and the rest of them in French. Table 1 details the distribution of interviewed participants.

Data collected from the interviews were evaluated by verifying them with collected secondary data, which was gathered from multiple sources. We strived for the highest level of rigor in terms of internal and construct validity (Gibbert, Ruigrok, & Wicki, 2008).

Internal secondary data came from extracts of contracts, presentations at meetings, and managerial reports. External secondary data were collected from national reports, experts' analysis, and press articles. Data gathered from the interviews were analyzed using NVivo 8 Software. Interviews were coded in two rounds. The first round of coding was based on a descriptive logic (Miles & Huberman, 1994). Based on the literature review, the first objective was to identify co-opetition strategies among multiple inter-organizational relationships i.e. competition, collaboration, or co-opetition. The second aim of the descriptive logic was to identify drivers, features, and outcomes of co-opetition strategies. The second round of "interpretive" coding enabled us to go beyond the descriptive first coding round (Miles & Huberman, 1994). The coding was focused on the multiple sources and dimensions of co-opetitive tensions at different levels and also on the management of such tensions.

The discussion below is based on the information collected from the primary and secondary data sources. We provide detailed tables with exact quotes in the tables. We draw on these quotes and related information in developing our insights. We refer to the quotes whenever appropriate, and invite the reader to look at the tables for detailed information.

## 4. Sources of co-opetitive tensions

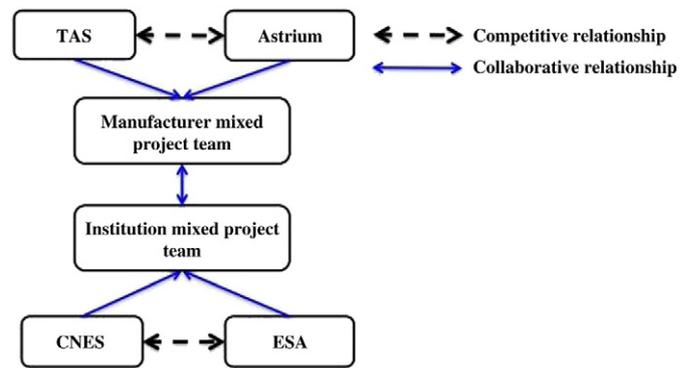
### 4.1. Sources of inter-organizational co-opetitive tensions

#### 4.1.1. Tensions due to the ordering party

After having decided to develop a common platform, Astrium and TAS had to set up an appropriate organization to support the

**Table 1**  
The distribution of the interviewees.

Company	Number of Interviews	Functions	Number of interviews
Astrium	15	Co-opetitive space programs	23
Thales	16	• Alphabus-Alphasat (15)	
ESA	3	• Yahsat (8)	
CNES	3	Competitive space programs	4
Others (sub contractors, clients etc.)	3	Top managers	13
Total	40	Total	40



**Fig. 2.** The organization of Alphabus.

collaboration. Two-mixed project teams between competing organizations had to collaborate intimately (as illustrated in Fig. 2).

The two ordering parties, CNES and ESA, constituted the first team. The two manufacturers, Astrium and TAS, constituted the second team. Our interviews suggested that tensions arose within both teams and between them, and thus underscored the appropriateness of the Alphabus organization in order to investigate the co-opetitive tensions and their management.

A first kind of tension appeared because of the nature of the project and because of the involvement of two institutions. CNES and ESA had similar missions and objectives in promoting the European space industry on the worldwide market. But CNES was more focused on the French industry and thus was opposed to ESA (quote 1, Table 2). Thus, it was possible to consider some competition between CNES and ESA. Each manufacturer tried to take advantage from the situation accusing its partner in front of the institutions. Each manufacturer tried to push them forward in front of the institutions. Astrium and TAS tried to manipulate the institutional team to defend their own interest at the expense of Alphabus. Since a firm realized the manipulation intended by its partner, high tensions arose and threatened the continuation of the project. Tensions between ordering parties encouraged manufacturers to adopt opportunistic behaviors. High level of co-opetitive tensions resulted from the further of competitive behaviors against collaborative ones.

#### 4.1.2. Tensions due to the commercialization of Alphabus

A second kind of tension appeared at the organizational level related with the marketing of Alphabus (quote 2, Table 2). The development of the new range of satellites based on Alphabus technology was competing with the current range Eurostar (Astrium) and Spacebus (TAS) for demands around 12 kW. The collaborative agreement allowed Astrium and TAS to bid any demand up to 12 kW with Alphabus. In this range, Alphabus was heavier and more powerful and more expensive than Eurostar and Spacebus and suffered from a lack of competitiveness (quote 2, Table 2). Alphabus would be more competitive for more powerful payloads up to 14 kW. However, the demand for this top-of-the-range product was still very rare.

In addition of the complex positioning of Alphabus, manufacturers would rather bid with their own range and develop them than trying to bid with Alphabus. Tensions arose between the partners due to possible cannibalization of the three ranges of products: Eurostar, Spacebus and Alphabus (quote 3, Table 2).

Moreover, Alphabus was based on a new orbital technology not tested yet. Since its orbit reliability was not confirmed, clients had less trust in Alphabus. Consequently, it was easier for Astrium or TAS to bid in the worldwide market with a well-known and more reliable product. The range of satellites of Astrium benefitted from a technological advantage compared to TAS. Eurostar satellites could support payloads from 14 kW to 16 kW. Conscious of the critical situation, TAS reproached to Astrium for not giving the priority to Alphabus. In TAS mind, Astrium

was just involved in Alphasbus to benefit from the financial support offered by the institutions to improve its own range of products and its own competitiveness. Thus, new tensions arose between Astrium and TAS.

#### 4.1.3. Tensions due to the governance of the program

A third source of co-opetitive tension was due to the industrial governance of the program. From the beginning, partners had decided to jointly build the Alphasbus platform. The question of the leadership during the commercialization of Alphasbus was critical. Tensions emerged between TAS and Astrium about who would build the payload and who would be the prime contractor for a whole satellite based on Alphasbus technology. Astrium and TAS agreed to entrust the project ownership to the manufacturer responsible for the payload construction. Partners competed to demonstrate their supremacy in building payloads to become prime contractor (quote 4, Table 2). Even though the prime contractor assumed a higher level of risks than its partners, it benefitted a privileged interface with the client. Directly negotiating and interacting with the client, the manufacturer could manage the relationship to develop the client's trust, to improve its brand image and its reputation. By being a prime contractor, the manufacturer's objective was to optimize its chances to win future bids with the same client.

#### 4.1.4. Tensions due to the activity division

A fourth source of inter-organizational co-opetitive tension came from the division of the activity between TAS and Astrium (quotes 5, 6 and 7, Table 2). It was one of the most complex and critical stages at the beginning of the project (quote 5, Table 2). Both, Astrium and TAS, held resources and competences to build their own satellites. However, they developed complementary expertise: Astrium in platform conception and TAS in payload conception. Astrium and TAS used to vertically collaborate following this logic of complementary competencies. Such a vertical division was impossible in Alphasbus. The platform could not be split into two complementary work packages and then integrated together.

The development of Alphasbus required a combination of technologies, resources, and competencies of both Astrium and TAS. The first challenge consisted in defining the new components to develop. Partners needed to agree on which components from Eurostar and from Spacebus they wish to reuse and which components they had to create (quote 6, Table 2). This decision was expected to be based on their anticipation of the future technological evolution and on the expected technological obsolescence.

In order to preserve the partnership equity, Astrium and TAS must equally share new developments. Partners strategically thought about the choice of the new developments. Even though they agreed to innovate, the new developments had to benefit their own range of products. However, the choice of the new development revealed the firm's weaknesses to the partner, which was highly risky taking into consideration the future competition (quote 7, Table 2). Alphasbus was supposed to be based on the pooling of the best technologies of Astrium and TAS. But apparently, firms were not pooling their strengths but their weaknesses. Astrium just as TAS participated in Alphasbus to improve their competitiveness. Through Alphasbus, Astrium and TAS expected to develop synergies between Alphasbus and Eurostar on the one hand, and between Alphasbus and Spacebus on the other hand (quotes 8, 9 and 10, Table 2).

Through new developments, Alphasbus contributed to the modernization of the European space industry. Astrium and TAS were thus involved in a win-win relationship. The sharing of new development should be equal in volume and in value. Each firm tried to enhance its competitiveness while avoiding partner's reinforcement. Alphasbus was a way to "best fight the other in the competition" (quote 10,

Table 2). New tensions emerged (quote 8, Table 2) creating a paradoxical situation (quote 9, Table 2).

#### 4.2. Sources of intra-organizational co-opetitive tensions

To develop Alphasbus, Astrium and TAS pooled technological, human, and financial resources within a mixed project team. Tensions arose within this team.

##### 4.2.1. Tensions due to differences between industrial processes

First, tension arose due to the differences between industrial processes of TAS and Astrium. Team members did not operate with the same processes or with the same methods. Within the team, organizational routines and standards from Astrium were competing with those from TAS. Eurostar and Spacebus were built on radically different processes and software. The combination and the sharing of distinct frameworks induced high level of tensions within the team and specifically during interfaces. For example, team members from TAS used the acronym REX for the return of experience whereas people from Astrium talked about "Lesson Learned". The lack of understanding between team members created misunderstandings and potential conflicts particularly during the engineering interfaces (quote 11, Table 2).

##### 4.2.2. Tensions due to the dilemma between protection and sharing strategic information

A second source of tensions came from the dilemma between the protection and the sharing of strategic information. The pooling stimulated learning dynamics between partners. Through collaboration, team members had the opportunity to learn new processes but they simultaneously faced the risk of imitation of their best practices (quote 12, Table 2). Astrium and TAS were above all, competitors. Even if Alphasbus was a new development, partners protected their industrial secrets. At the beginning of the program, Astrium and TAS refused to share knowledge judged as confidential. This over protection was an obstacle for the development of Alphasbus (quote 13, Table 2).

##### 4.2.3. Tensions due to the involvement of the ordering parties

The third source of intra-organizational co-opetitive tensions was due to the involvement of the ordering parties in the program (quote 14, Table 2). When a technical difficulty occurred, ordering parties asked Astrium and TAS for additional details. If the difficulty came from Astrium, the firm would only communicate the documents to the ordering parties but not to TAS and reciprocally. But the ordering party could transfer the information to TAS. Astrium faced a risk of transfer through the ordering parties.

Moreover, the technical solution proposed was discussed between Astrium and the ordering parties regardless without TAS. TAS was not invited to the meeting. Consequently, TAS would necessarily find the decision unfair and unequal. Ordering parties adopted opportunistic behaviors. They benefited from tensions between manufacturers. Ordering parties' decisions and actions increased asymmetries between partners (quote 14, Table 2).

#### 4.3. Sources of co-opetitive tensions at inter-individual level

The complexity of the program and the paradox of the context induced tensions between team members within the industrial mixed-team and within the institutional mixed-team.

##### 4.3.1. Tensions due to individuals' reluctances regarding the project

A first source of inter-individual co-opetitive tensions came from TAS and Astrium employees' reluctances. These reluctances created tensions among team members and among individuals from the same company (quotes 15, 16 and 17, Table 2). Most of individuals did not understand the evolution of the market trends or the challenges of the

**Table 2**  
Quotes summary from interviews on nature and sources of co-opetitive tensions.

No.	Source	Quote	Source of tension	Level
1	ESA Alphas project manager	"Organizations change. At the time when we were doing the program, CNES was having difficulties because the overall emphasis of CNES was to reduce the project teams and to <b>increase the amount of expert lines of work</b> . And at the time this created difficulties because it meant that the line managers from the technical lines of CNES <b>were getting a stronger say in the program</b> . And that gave <b>more difficulties for the project manager to make claim</b> . So the programs were not linked so much to the problems of, the people working directly on the project, more to the environment around the project. And I could give you a similar case at ESA. We also had these problems that <b>people were trying to undermine the program</b> because they have difficulties to accept the French domination of the telecom market."	The ordering party	Inter-organizational
2	TAS Alphas marketing manager	"What I realize today is that it is <b>badly like because it is a compromise</b> . There is a famous British saying "what's a camel, it is a horse drawn by a committee". It is exactly that. <b>Alphas is not very well positioned</b> in the range of products needed today. It is big, heavy, and very powerful actually perhaps too powerful for number of markets. And on the markets where we can sell it, Alphas is a little cumbersome"	The commercialization of Alphas	
3	TAS sales manager	"There is a <b>more or less official will of Astrium to develop their product ranges</b> and they are nibbling the Alphas range by bottom. Alphas should go from 14 to 20 kW and Astrium is going today until 14 kW even 16 kW, <b>and perhaps we have been too naïve saying "but wait, there is Alphas for this range"</b> .		
4	Astrium Alphas project manager	"Thus, <b>the prime contractor benefits from being primed</b> . It assumes the risks. It is the one making the maintenance of the satellite when it is in its orbital position, so of course he benefits from it".	The governance	
5	TAS Alphas project manager	"And that was a commercial agreement but that went fairly smooth, what was much more difficult was the...the commercial agreement was for the future, what was much more <b>difficult in the beginning was the industrial work sharing between the two parties for the building of Alphas itself</b> . That took a reasonable amount of time."	Activity division	
6	TAS Alphas industrial manager	"In 2001, it was necessary to already start preparing the future, because we could not keep using electronic components becoming obsolescent, which would not be any more manufactured, i.e. our suppliers will not keep producing them just for us, because we do not use any enough. Thus it is necessary <b>to prepare the future while identifying which are the components that will replace the components that one uses</b> ."		
7	Astrium Alphas industrial manager	"Because our pawns are not advanced. Our pawns are not advanced because we don't want people to know. <b>When people want such product for the Spacebus range, they will not say why they need such performance</b> . Thus our pawns are not advanced. This is <b>hard</b> ."		
8	Astrium Alphas project manager	"(...) as opposed to what we believed, <b>each company wanted to be reinforced in its weakest part</b> . Nobody will say it because <b>no manufacturer will give his weaknesses</b> . But approximately, it is necessary it to recognize, there are not big secrets. Eurostar is with 50 volts; we want to pass to 100 volts. Nobody... finally it a manufacturer has not the financial capacity to do, so it told "I am ok. I make Alphas which will help me to develop the 100 volts and which will help Eurostar to pass to 100 volts. Clearly. Done". Spacebus they must have the same approach. I do not know the details or I know the details but it is not my business to say it. But, it is almost that. Thus <b>we did not put together the best part of the two companies</b> even if we wrote it in the advertising plates."		
9	TAS Alphas engineering system manager	"But at the beginning, the aim of these developments was, apart from making a new line of products up to the two current ranges of products, <b>the aim was to share significant developments financings</b> . There was also the <b>objective to benefit quickly from at least for half of the financings for the current range of products</b> without speaking of range extension."		
10	ESA Alphas marketing manager	"It is almost <b>perverse</b> because <b>they must work together for the new Alphas</b> project but what do they do? <b>They reinforce their weak points to best fight the other in the competition</b> ."		
11	TAS Alphas technical manager	"Just the montage of these supports it's not the same from TAS and from TAS. Yes! It could be <b>strange but since all our processes are certified, validated, it's not the same</b> . So, when we ask Astrium to stick something on a structure coming from Thales, it's a <b>problem</b> . So, we have a lot of details to solve."	Differences between industrial processes	Intra-organizational
12	Astrium Alphas industrial manager	"Nevertheless, we have seen some stuffs in their... <b>how they worked, their operating processes</b> which are not so bad finally. They are more rigorous. The equivalent of their plant in Cannes for us it is Stevenage, so the British it is more 'it works'. We do not know much about how or why it works. Whereas they are more rigorous and more industrial. Thus, <b>we learn tricks</b> . I cannot say we don't learn from each other. But <b>they also learn from us</b> ".	Dilemma between protection and sharing strategic information	
13	Astrium sales manager	"There are <b>things which are not divided</b> . There are things which are <b>not shown</b> . This situation creates some <b>issues</b> sometimes."		
14	Astrium Alphas technical manager	"Even the client feels sometimes uncomfortable because it is not his job to give them (i.e. confidential information) to us. There were very precise examples. <b>It is very touchy</b> . When we, the prime, <b>we were not present at meetings about anomalies whereas the client, our customer and Thales are together</b> . <b>It is rather delicate to manage</b> . Because after the meeting, we have to believe the partner when he tells us the problem has been solved. So, if the client says "ok. I am happy. What they present to me is appropriate. It convinced me. It is solved", then it is ok for us too. But, well... the satellite is still guaranteed by us. So <b>for us it is risky</b> ".	The involvement of ordering parties	
15	Astrium Alphas industrial manager	"Because it is their enemy (TAS members). <b>They are their competitors</b> . They (Astrium employees) are much more <b>reticent</b> . But we (Astrium team members) the way we work, it is human. After all, we work together; we have our product to make it progressing. We have to oil the process. <b>We think they are paranoiac on some points</b> ".	Individuals' reluctances regarding the project	Inter-individual
16	ESA Alphas project manager	"There were many – it went through all organizations, ESA and CNES, Astrium and Alcatel at the time, so there were <b>pros and cons in both camps</b> and in both organizations, all four of them."		
17	ESA Alphas marketing manager	"There was, within all organization, Thales and Astrium or in our institution ESA or in CNES, there were <b>resistances</b> . There were people who said 'yes, <b>you are doing that for a market which does not exist yet</b> '. The manufacturers <b>are not serious</b> . They say they to collaborate but the actually use Alphas to finance new developments for their current platform, for their current range of products. <b>They will never work together</b> ".		

Table 2 (continued)

No.	Source	Quote	Source of tension	Level
18	ESA Alphasbus marketing manager	"Thus this is creating <b>weird situations</b> or that creates <b>people who are a little bit schizophrenic in the program</b> because, at the same time <b>they share the challenges, they have the same objectives</b> than their competitors and at the same time <b>they know things that their colleagues in their company do not know</b> . And at the same time they do not have the right to communicate what they know, <b>they do not have the right to use the information because it is confidential</b> "	The individual integration of paradoxes	
19	Astrium Alphasbus industrial manager	"So, when we come to visit people working on Eurostar 3000, they say to us " <b>people working on Spacebus are jerks</b> ". And if you go on the other side, I think it's the same".		

top-of-the-range market segment (quote 16, Table 2). They just perceived the risks and the difficulties due to the collaboration with a competitor. In each company, just few individuals were convinced of the potential of Alphasbus and faced many reluctances from several other individuals.

#### 4.3.2. Tensions due to the individual integration of paradoxes

A second source of inter-individual co-opetitive tensions resulted from individual schizophrenic behaviors (quote 18, Table 2). Alphasbus was a confidential program. Within the team, individuals perceived each other as colleagues. This situation created intense tensions between individuals, and schizophrenic behaviors among team members appeared. They developed a common partnership culture reducing tensions among team-members but enhanced tensions between team-members and individuals from their parent firms. The more the individuals are far from the team, the more the inter-individual tensions were high. On the contrary, when individuals were members of the same team, inter-individual tensions were generally low.

Most of Alphasbus team members were expert engineers proud of their know-how and proud of their company. They would compete against each other to demonstrate their superiority. In their mind, the partner was always the one to blame. Expert engineers worked simultaneously on Alphasbus and on other internal programs for their parent firm. However, their involvement depended on the program. They had to define priorities, which created tensions. Inter-individual co-opetitive tensions were higher between engineers than between managers (quote 19, Table 2). While managers developed mindsets to deal with the dual and paradoxical context, engineers perceived each other as competitors. Managers also integrated the collaborative dimension of the relationship. For engineers, the competition represented the major source of tensions. On the contrary, for managers the major source of tensions was the duality.

## 5. Managing co-opetitive tensions

### 5.1. The key role of ordering parties in managing inter-organizational co-opetitive tensions

Alphasbus governance was shared between four organizations: CNES and ESA on one hand – the institutional common team, and on the other hand, TAS and Astrium, the industrial organization. The constitution of a common institutional was an essential dimension of the project cohesion and of the collaboration within the project. The legitimacy of CNES and ESA to be involved in the project, beyond financial considerations, was reinforced. CNES and ESA played a clear role in the organization and in the co-ordination of the program. Through this common institutional team, both institutions contributed together to the management of tensions between TAS and Astrium.

First, ESA and CNES adopted a common powerful client position vis-à-vis their suppliers (quote 1, Table 3). Because they were institutions, CNES and ESA were more flexible with the manufacturers than a private client. When Astrium and TAS were late, institutions would not penalize them as a private client. On the contrary, they would try to understand

why Astrium and TAS were late and consequently, they would try to help them to find technical or financial solutions. The mission of CNES and ESA was to defend Alphasbus' interests on the worldwide market. They were simultaneously clients. When the suppliers did not respect their agreements, CNES and ESA acted like any private telecommunication operator. Astrium and TAS faced difficulties to accept the dual role of these space agencies. Thus, tensions emerged within Alphasbus governance team.

Second, as the institutions' mission is aimed at promoting the European Space industry, they arbitrated conflicts between manufacturers to secure Alphasbus' progress (quotes 2 and 3, Table 3). Institutions were in charge of the technical reporting of the program. Based on an evaluation of the industrial propositions regarding costs and risks, the institutions would express their opinion. Even if the manufacturers were to take the final decision, space agencies were influencing the decision making process by formulating technical recommendations. Thus, CNES and ESA directed technical choices. CNES and ESA were financially supporting the program. As such, they controlled the program through budgets. They checked if the financial support were actually invested in Alphasbus and not in other developments. Astrium and TAS tended to ignore Alphasbus to use the institutional money to improve their own range of satellites. Financial and technical institutional involvement reduced the partners' opportunistic tendency. When the progress of the program was blocked, the institutional team recommended more information sharing (quote 2, Table 3). Even if companies were reluctant, this information sharing was essential for the program. Institutions' actions had to respect the confidentiality of each partner. No information about Eurostar or Spacebus ranges should be transferred to the competitor through the institutional team.

Third, the institutions contributed to the management of commercialization tensions between TAS and Astrium. Alphasbus was a new platform based on an untested new technology. Since private telecommunication operators refused to be the first to test the technology, space agencies were looking for a way to demonstrate the reliability of the product. ESA and CNES could not afford to buy together a satellite (payload and platform). New tensions therefore emerged between space agencies.

Finally, CNES and ESA agreed on a common commercial offer. Thanks to CNES support, ESA offered the first Alphasbus platform to any private telecommunications operator who accepted to buy the payload. A bidding procedure was planned in the worldwide market. The telecommunications operator interested in the technology would get the platform for free and would just have to invest in the payload. The telecommunications operator Inmarsat won the bid. The whole satellite contract called Alphasat. Thanks to a close collaboration, institutions were efficiently involved in the management of tensions due to the commercialization of the new technology. With Alphasat, ESA became the client of a consortium of suppliers: TAS and Astrium. The contract was driven by a public–private partnership on the client side, and by a co-opetition relationship on the supplier side. This layout was completely new in the space industry. The question which partner would be the prime contractor arose between the parties. In order

**Table 3**  
Quotes summary from interviews on management of co-opetitive tensions.

No.	Source	Quote	Dimension	Level
1	ESA Alphasat project manager	"So we were fortunate first of all that at the customer level between ESA and CNES, <b>we had a very good arrangement at project level</b> . So the cooperation between ESA and CNES having a <b>combined objective</b> in the Alphasat program, setting up a <b>combined team</b> was already important because that meant <b>there was one customer interface for the industry</b> ."	The key role of ordering parties	Inter-organizational co-opetitive tensions
2	ESA Alphasat industrial project manager	"There was a case on the level subcontractor where we <b>arbitrated</b> . But really arbitrated between the companies because they did not want to work together anymore and then <b>we succeeded in keeping them working together</b> . It was <b>very positive</b> . But in my opinion it should be avoided"		
3	ESA Alphasat project manager	"We also had an agreement with industry to have something like a steering board. So in the steering board the high level management of ESA, CNES, Astrium and Alcatel were represented. So these were not the project managers but were actually <b>the bosses and that turned out also to be a very useful way of dealing with difficulties</b> . And in fact it <b>helped a lot also to let's say whitewash problems that there were between Astrium and Alcatel because there was always a sort of third party</b> who could mitigate or mediate between the two. <b>And likewise straight away when there were issues between ESA and CNES they could sometimes effectively have industry in the steering board who would help</b> ."		
4	TAS Alphasat–Alphasat project manager	"An Inmarsat satellite with L bandwidth, it is rather Astrium, it is obvious. Eutelsat satellite with L bandwidth it is rather Thales. <b>It depends on the customer, on the type of payload, and on the knowledge we have of the market</b> or of the customer. We know some customers better than other ones. So the marketing committee will decide."		
5	TAS Alphasat–Alphasat project manager	"Since you are more <b>in the dynamics to make to project progressing</b> , since you are not indebted for your faults to the partner i.e. <b>each one assumes the consequences</b> , the decision is easier i.e. <b>we try to take jointly the best decisions</b> , when it is wedging, because it is really wedging sometimes, we have an authority that can help us to solve the conflict."		
6	TAS Alphasat manager	"Thus it is out of the question Thales management could be done by Astrium. First of all, for a question of <b>financial confidentiality</b> , and <b>because someone from TAS is more able to manage the Thales part than someone from Astrium</b> . And someone from Astrium is more able to manage Astrium part than someone from TAS. This is why we have <b>duplicated the managerial responsibilities at the team level</b> . But it is just for the key functions".	The key role of project team and project managers	Intra-organizational co-opetitive tensions
7	TAS Alphasat technical manager	All this kind of information which we could regard as strategic or not, we can actually do it at the time. Sometimes we can be mistaken because there are things we don't give it after two or three weeks or two or three months later, we finally say <b>'I will give it to you because this is it'</b> and on the contrary it has already happened to us to say <b>'we gave that we shouldn't have to'</b> ."		
8	Astrium Alphasat technical manager	"We put some <b>clear boundaries</b> . In their side, Thales does the same. <b>We don't make espionage</b> . Me, I am not paid to spy on what the other do. I am glad when they tell me 'we have manufactured such satellite with such mass and it works well'".		
9	Astrium Alphasat technical manager	"Well <b>some information can be told but not provided</b> . For example I can say to my colleague we have had such problem, this is it. I will not tell you how or I will tell you just a little how we solved it but I will not provide you the document or I will just show it to him. I can do that. We do that. After all, it is the human side. So, <b>it is in our interests to have good relationships with people</b> ".		
10	Astrium Alphasat technical manager	"I have clearly said to my counterpart <b>I cannot reveal it</b> . It is like that. Sometimes, you don't like hearing that. <b>They do not have access to all the data</b> . I know there are some things, well, some documents have been provided with pages in less. They haven't liked it so much and vice versa. It could have been Astrium or Thales. It is like that and it is not questioned."		
11	TAS Alphasat–Alphasat project manager	"We have tried to put all the mechanisms which force <b>to be proactive to improve the product</b> not to kill it. Like we know things, we don't want to share them with you because we don't want you to profit from them on Eurostar. But <b>if this behavior is penalizing of Alphasat, it is not possible</b> ."		
12	TAS Alphasat engineering system manager	"There is <b>much information we exchange</b> . That mostly <b>depends on the people</b> . Well, there are some people with whom that blocked quickly because the person would not give any, and then, when someone starts to release some, finally I saw that historically on the program. When I arrived, the technical managers were very hermetic, and then progressively, <b>perhaps because of practice to work together, today the technical managers exchange so much more</b> , I think."		
13	TAS Alphasat project manager	"Ok, but <b>all alone we could not have done anything we have made</b> . Therefore we have done it together. Put a handkerchief on your frustrations. <b>Look what we are doing and look at your work plan</b> . Because it is true, you do not do the AIT, it doesn't seem like, ok. Fine. But we do all of that. And on the other side, it is the same".		
14	TAS Alphasat engineering system manager	"If, the troops tear each other to pieces between them and above <b>them there are mediators to say: enough</b> . Now you do this, you do that. It is very also <b>related to the project manager's behaviors</b> . The troops do not obey. Well, they do not take initiative by themselves. If we give them instructions of cooperation and open book or things like that, I think they end up doing it. It depends <b>on the spirit</b> above".	The key role of project team and project managers	Inter-individual co-opetitive tensions
15	ESA Alphasat project manager	"The situation requires <b>a certain kind of person capable to work in this kind of context</b> . There are <b>open-minded and understanding</b> people. They are diplomats. They precisely understand, they are <b>sensitive</b> to the critical issues of the context."		
16	TAS Alphasat project manager	"The implementation of teams depends much on <b>the team members</b> you picked. Sometime it is necessary to transfer people because <b>they can't stand the pressures coming from their management</b> . I have had this case. I have said to its chief end up. Medical repatriation. She could not make it. She was coming with stomachache and crying. I said ok fine. If you can't make it, it's not a big deal. We will replace you. And the day she left, she felt so much better. She hasn't have stomachache anymore. But it really depends on the people. She was from Toulouse and her chief in Cannes did not understand what was going on and he badgered her."		

Table 3 (continued)

No.	Source	Quote	Dimension	Level
17	TAS Alphasus technical manager	"So, in the space industry, we work rather by challenges. We are not interested so much in doing the same thing that we've done before. And here, <b>it is about challenges</b> . It is not so much the development because it is almost behind us, but it is to ensure <b>the end, the success while working with Astrium</b> . Because the developments, they have been made by each partner on its side, supervised by both but now we are in the phase where we have to really work together. <b>This was the challenge for me. It was the interest of the program</b> . And obviously we are not beginners in this kind of job. This is helping too".		
18	TAS Alphasus technical manager	" <b>Each one is capable to build a satellite</b> . I do not claim to learn at Thales how to work. It is necessary <b>to be respected</b> . And we are aware that each one among us is able to build a satellite alone."		

to manage these tensions, CNES and ESA created a marketing committee composed of employees from ESA, CNES, Astrium, and TAS. Space agencies decided to take into account two criteria – the type of the mission required by the client and the existence of previous commercial relationships between the client and the supplier. Based on these two criteria, Astrium was designated as the prime contractor (quote 4, Table 3). Astrium and TAS were co-prime contractors for the platform construction. For the payload, TAS became Astrium's main subcontractor. On the contrary to a classical vertical partnership, TAS would assume jointly all the risks, for the whole satellite, with Astrium (quote 5, Table 3). This risk sharing agreement pointed out the collaboration and reduced opportunistic tendencies.

### 5.2. The key role of the project team and project managers to manage intra-organizational co-opetitive tensions

The mixed-team set up by Astrium and TAS managed part of the co-opetitive tensions.

First, the project team participated to the management of tensions due to the governance and the leadership of the program. To reflect the risk sharing and the co-governance partners decided to duplicate key managerial functions within the team (quote 6, Table 3). Two project managers governed Alphasus project team one from each company, without any hierarchical relationship between them. Each industrial segment was also governed by a duo of managers, one from each company. This managerial duplication could be considered a waste of resources, but it was essential to preserve the confidentiality of the financial data and to manage human resources. "Someone from TAS is more able to manage the TAS part than someone from Astrium" (quote 6, Table 3). The duplication at the project level guaranteed an equal decision power to each partner. Decisions were to be taken by the consensus of the two project managers. Both had to approve the decision. This double-checking process also helped to minimize the mistakes.

Second, project managers were responsible for the operational management of the strategic information within the team, between the team and the parent firms, and between the team and the client (quotes 7 to 12, Table 3). Project managers decided what information had to be shared and what information had to be protected depending on the context. At the beginning of the program, they could decide to protect some information and then to decide to share it (quote 7, Table 3). Project managers were individually responsible for the risks of transfers. Their ethics prevented economic intelligence processes. They put "clear boundaries" and did not "make espionage" (quote 8, Table 3). When it was required for Alphasus, project managers allowed a limited sharing of confidential data. They accepted information exchanges without providing the related documentation (quote 9, Table 3). For example, team members shared the results obtained for the power of the platform without sharing the calculation method. Team members were allowed to control the calculation without taking notes or pictures. "They do not have access to all the data (...) it is like that and it is not questioned" (quote 10, Table 3).

Thus, industrial secrets were protected, even during interfaces. Project managers protected confidential information while encouraging the information sharing for Alphasus. Their objective remained the

platform development. "Behavior penalizing Alphasus is not possible" (quote 11, Table 3). An individual aware of a technical problem on its range of product was forced to share if it represented for Alphasus. Even though these tacit rules, unwanted transfers occurred during informal inter-individual interactions such as coffee breaks. Project managers were in charge of the management of these transfers. To do so, project managers had to trust each other and to spread this climate of mutual trust to team members (quote 12, Table 3).

### 5.3. The key role of the project team and project managers to manage inter-individual co-opetitive tensions

Project managers were in charge of the management of inter-individual tensions within the team (quotes 13 to 19, Table 3). They managed individuals' frustrations after the industrial division (quote 13, Table 3). Project managers acted like mediators (quote 14, Table 3). Team members conformed to project managers. The management of tensions within the team depended mostly on the project manager's behavior. The expertise of project managers was essential. They must have previously developed specific capacities and mindsets to integrate the duality and to manage tensions. Relational capabilities should be combined with technical skills. In a co-opetitive context, project managers should be "open-minded", "understanding", "diplomatic", and "sensitive" (quote 15, Table 3).

Project managers were in charge of the composition of their team. They selected individuals who were able to work in a tensed context and able to understand the challenges of such situation. Team member's expertise was essential. At the beginning, creativity and invention were more important than other abilities. As the engineering phases started, authority and determination were the most important factors. Project managers replaced team members when they "can't stand the pressures coming from their management" (quote 16, Table 3). Alphasus was built in an extremely tensed context. Project managers could expect to face difficulties to convince people to be part of it. But the involvement in Alphasus was not taken into account in individual's career plans. The challenging and interesting nature of the program attracted people (quote 17, Table 3) and the engineers were proud to participate to the development of a new technology such as Alphasus. The individuals' involvement came from personal incentives. Alphasus was considered as a technological challenge and a major innovation in the industry. Individuals were professionally and emotionally involved in the program. Project managers communicated about a common objective i.e. the development of a new platform. They created a common team spirit among team members. Team members felt to belong first to Alphasus and then to their parent firms. The common spirit team implemented by project managers helped to reduce tensions among team members. To manage tensions between engineers, project managers developed an internal communication based on modesty (quote 18, Table 3). Project managers recommended mutual competence recognition. Both TAS and Astrium had the qualifications to build and sell a satellite. Project managers encouraged mutual respect between engineers. Through a daily internal communication, project managers stimulated collaboration and learning processes and ensured that the program progressed well.

**Table 4**  
Sources of tension at multiple levels.

Level	Source of co-opetitive tensions
Inter-organizational	Tensions due to the ordering parties Tensions due to the commercialization of the program Tensions due to the program governance Tensions due to the activity division
Intra-organizational	Tensions due to the differences between industrial processes Tensions due to the dilemma between protection and sharing of strategic information
Inter-individual	Tensions due to the involvement of ordering parties Tensions due to individuals' reluctances regarding the project Tensions due to the individual integration of paradoxes

## 6. Discussion

This research aimed at answering two important questions: (a) what are the sources of tensions in co-opetition? (b) How do the firms manage tensions arising from co-opetition? We investigated these questions by first developing key conceptual insights related to the sources and management of tensions and then by conducting an in-depth case study to illuminate important findings. Finding from the case study enabled us to better understand and illustrate multiple sources of co-opetitive tension at different levels and to understand how these tensions are managed.

### 6.1. Sources of co-opetitive tensions

The case study highlighted multiple sources of co-opetitive tensions at three levels: inter-organizational, intra-organizational and inter-individual. These multi-dimensional and multi-levels co-opetition tensions are presented in Table 4.

At the inter-organizational level, four sources of co-opetitive tensions appeared: tensions due to the ordering parties, tensions due to the commercialization of Alphabus, tensions due to the program governance, and tensions due to the activity division. Strong and intense tensions arose from the dilemma between value creation and value appropriation. This is in line with prior research (Cassiman et al., 2009; Oliver, 2004) that suggests that the capture of the value jointly created by both partners is a source of conflict, especially during the activity division and during the commercialization of the product. Actions of ordering parties reinforced co-opetitive tensions. The impact of the third party seems to be different from the role identified in previous scholars. Bengtsson and Kock (2000) and Castaldo et al. (2010) found that the third party contributes to reduce co-opetitive tensions. Our findings suggest the critical role of the third actor as a manager of co-opetitive tension, at the same time, we also find evidence that the third actor can be an important source of tension. On one hand, ordering parties encouraged the collaboration between competing manufacturers. On other hand, manufacturers benefitted from the conflict between ordering parties to compete against each other and to gain an upper hand over the other side.

Three sources of intra-organizational tension are highlighted: differences between industrial processes, dilemma between protection and sharing of strategic information, and involvement of ordering parties. Within the project team, high level of tension emerged because of the combination of two distinct industrial approaches. This insight goes further than tension between different units of the same company (Luo et al., 2006). Moreover, within the team, a major dilemma appeared with respect to the sharing and the protection of strategic information. This result is consistent with previous scholars (Gnyawali et al., 2008; Inkpen, 2000; Khanna et al., 1998; Walley, 2007).

Finally, inter-individual co-opetitive tensions arise due to individuals' reluctance regarding the project and to the individual integration of paradoxes. Consistent with Loch et al. (2006), we found that tension appeared between individuals within the Alphabus project-team because as the members came from competing companies, members had difficulties seeing each other as a partner.

### 6.2. Management of co-opetitive tensions

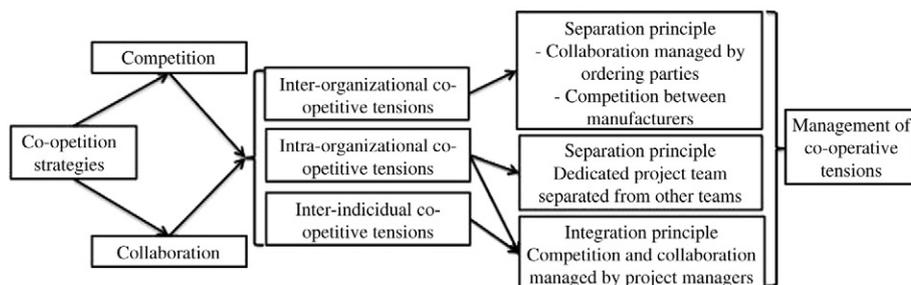
The case study evidenced several approaches managers use in order to manage co-opetitive tensions. The nature of the managerial practices set up depends on the level of tension. Inter-organizational co-opetitive tensions were mainly managed by the space agencies ESA and CNES. At this level, TAS and Astrium remained mostly engaged in competition. Ordering parties forced partners to collaborate when tensions between them were too high. Astrium and TAS outsourced the management of inter-organizational tensions to their ordering parties. Ordering parties provided an unbiased and neutral vision of the situation. They offered rational solutions to partners to manage their tensions.

To build Alphabus, Astrium and TAS created a common project team by pooling employees from both companies. Within the team, project managers were in charge of the management of tensions. They managed intra-organizational and inter-individual tensions. The involvement and the actions undertaken by project managers were essential for the program success. Project managers assumed were decentralized and autonomous to decide between sharing and protecting strategic information.

Thus, a division could be observed in the management of co-opetitive tensions. At a first level, the ordering party directed the competition between manufacturers and forced them to co-ordinate their activities. At a second level, project managers coordinated the activity by simultaneously managing both the competition and the collaboration. Both levels were structured to contribute together to the management of co-opetitive tensions.

Entrusting ordering parties to co-ordinate the inter-organizational dimension allowed companies to focus their attention on competition. The ordering party steered the negotiations and forced the partners to collaborate. Our findings match with the separation principle highlighted by Bengtsson and Kock (2000). The separation was possible as the management of collaboration is outsourced to a third actor, enabling the manufacturers to focus on competition.

However, as Castaldo et al. (2010) pointed out, is the outsourcing of the collaboration management sufficient to conduct common projects



**Fig. 3.** Management of tensions in co-opetition.

between competing firms? Our findings confirm that outsourcing to a third actor is not sufficient to manage co-opetitive tensions. Indeed, by outsourcing the management of the collaboration, partners lose the control of their relationship. The third actor does not guarantee its success in managing tensions and could suffer from the lack of legitimacy to act as a mediator. Such an actor may not have the technical competences and know-how to make good decisions. If the third actor fails, partners would assume alone the financial fees due to the delay. The third actor could also act opportunistically and create new tension between partners, which could make the tensions more complex.

Due the underlying reasons highlighted above, the partners could not entrust the entire task of tension management to the ordering parties. They had to internally manage part of the tensions. Thus, the manufacturers adopted the principle of creating a common project team dedicated to the project. Consistently with the separation principle noted by Bengtsson and Kock (2000), this team was isolated from the rest of the parent firms. Each company pooled human, technical, and financial resources to give the team managerial autonomy.

Within the team, both project managers from each partner were in charge of the management of tensions. They faced the necessity to integrate the co-opetition paradox at the inter-individual level. Following the integration principle, they integrated the duality of co-opetition to deal with co-opetitive tensions within the team. At both the intra-organizational and the inter-individual levels, the management of co-opetitive tensions depended mainly on the project managers. At these levels, partners were, through their project managers, jointly and equally responsible for the management of co-opetitive tensions.

Could the companies apply further the integration principle by integrating the management of inter-organizational co-opetitive tensions? Our findings seemed to highlight that it was not conceivable. Indeed, following the integration perspective, the success of the project relies on how project managers deal with co-opetitive tensions. Making the success dependent on only two individuals was highly risky for the partners. Moreover, encouraging the integration at the inter-organizational level would make the project managers undertake more decisions, but the project managers may not have necessary ability to simultaneously deal with collaboration and competition. Entrusting a third party to manage inter-organizational tension limits the scope of project managers and avoids involving them in a highly complex and unmanageable situation. Even if project managers have an essential role in managing co-opetitive tensions, the whole management of co-opetitive tensions does not rely only on their individual capacity to integrate the paradox.

Finally, the companies seem to take advantage from a combination of both principles of integration and separation to efficiently manage co-opetitive tensions. The principle of separation is applied when they differentiate the management of inter-organizational tensions and the internal management of the project. The management of the inter-organizational collaboration is entrusted to a third party allowing partners to focus their attention on competition. The separation principle is also validated with the creation of the common and dedicated team. The common team is separated from the rest of TAS and Astrium teams, working on other markets and other products in competition against each other. Within the team, employees are supposed to develop a collaborative project. Thus, the principle of integration is applied mostly because co-opetitive tensions reappear at the project-team level. The project manager has to integrate at the inter-individual level the co-opetition paradox.

## 7. Contributions and conclusion

### 7.1. Contributions

With a focus on sources co-opetitive tensions and ways of managing them, this study contributes to co-opetition literature in several

important ways. First, while scholars stressed the existence of tension in co-opetition (Gnyawali & Park, 2011; Gnyawali et al., 2008; Gomes-Casseres, 1994) little is known about the dimensions and sources of co-opetitive tensions. The case study conducted provides insights to fill this important gap in the literature. Our findings highlight three levels of co-opetitive tensions: inter-organizational level, intra-organizational level, and inter-individual level. At each level, multiple sources of tensions have been identified. Co-opetition has been largely investigated at the inter-organizational level (Bengtsson & Kock, 2000; Oliver, 2004) or on dyadic level (Gnyawali & Park, 2011) and limited research exists at the intra-firm level (Luo et al., 2006; Tsai, 2002). Our study underscores the importance of examining tensions at multiple levels and provides concrete illustration of unique sources of tension at each level.

Second, while previous scholars stressed the necessity to manage co-opetitive tensions (Bengtsson & Kock, 2000; Chen, 2008; Das & Teng, 2000; Gnyawali et al., 2008), most of them remain theoretical except one empirical study (Bengtsson & Kock, 2000). Our case study offers interesting insights to understand what managerial tools could be set up by organizations at various levels to deal with co-opetitive tensions. At the inter-organizational level, the management of the collaboration is entrusted to ordering parties and the partners remain in charge of the management of the competition. At the intra-organizational and inter-individual levels, a project-team is created through resource pooling from both companies. This common and dedicated team is separated from the rest of the organization. These two managerial practices provide insights to understand how the separation principle recommended by Bengtsson and Kock (2000) can actually be implemented. At the intra-organizational and at the inter-individual levels, project managers are in charge of the management of co-opetitive tensions. This finding points out how the integration principle (Oshri & Weber, 2006) can be implemented.

Third, our study stresses the importance of pursuing separation, integration, and the balance between the two as being key to realizing gains from co-opetition. While the literature has suggested that co-opetition enhances firms' competitiveness (Bengtsson & Kock, 1999; Gnyawali et al., 2008; Teece, 1992; Yami et al., 2010), little is known about how that occurs. The question is not about choosing between co-opetition, co-operation, or competition but to understand how to effectively manage co-opetition and realize gains. Since co-opetition has become a standard in most of hi-tech industries (Gnyawali et al., 2008), mere adoption of a co-opetition strategy is unlikely to provide a competitive advantage. The competitive advantage comes from an efficient management of the paradox and tensions. Our research shows that effective management of co-opetition is not about choosing between the separation and the integration principles, but it is about being able to effectively combine the two principles. The strategic challenge thus is not about making choices between integration and separation but is about how to do both simultaneously. Finally, we believe that our insights from the blend of prior literature and in-depth case study provide a solid basis for future researchers to design and conduct more systematic empirical research on the nature, sources, and management of tension in co-opetition. The specific quotes and insights from the case study could be used to design survey instruments and conduct large-scale empirical research, which is very critical in order to advance our understanding of tension in co-opetition and its implications.

### 7.2. Directions for future research

We acknowledge a few limitations of our study before suggesting directions for future research. First, this study is based on a single case study of co-opetition within the European space industry. While we believe that this is an exemplar case, our findings from this single case should be interpreted with caution and need to be tested through other cases (in other sectors in the same industry for example) or

large-scale empirical studies. Second, while our case study provides some good foundation to understand ways of managing co-opetition projects, further research is needed to better understand how co-opetitive programs are managed. Our findings suggest that both the integration and separation principles are helpful. But we wonder if several combinations of both principles are possible and if yes how? Future research could dig deeper into these questions. Third, while our findings highlight the critical role played by the third actor, we were not able to examine deeper the various tasks of the third actor and ways in which they could minimize or contribute to tension. On the one hand, the actor appears as a source of tensions since it deliberately encourages competition between the partners. On the other hand, the actor manages the tensions by forcing partners to collaborate. This double ambiguous role remains poorly understood and could be investigated in future research.

A few important directions for future research emerge based on this study. First, our research highlighted a novel organizational configuration: the pooling of human, technological, and financial resources by competitors into a common project-team. The project team questions the “unity of command” principle but at the same time provides an interesting approach to managing co-opetition. In a related manner, our findings underscore the primary role of project managers but little is known about creation and management of such project teams in other co-opetition contexts. Future research could further examine similar approaches and compare and contrast the pros and cons of different organizational configurations in co-opetition. Second, as we have discussed above, our findings show that (as illustrated in Fig. 3) the strategic challenge in co-opetition management is not choosing between the integration and separation principles but it is achieving an effective combination of the two. Our research shows that both integration and separation principles are simultaneously required to manage tensions in co-opetition and these two are interdependent principles. However, simultaneously pursuing both is a challenge. Future researchers could build on our illustration of separation and integration principles and investigate more deeply conditions under which separation and integration will work separately, when combination is necessary, and how to achieve such a combination. Third, our findings suggest that both cognitive and behavioral factors play important roles in dealing with tensions in co-opetition. Tensions seem to stem mainly from cognitive factors whereas behavioral factors seem critical in the management of tension. The cognitive factors are about how managers perceive and understand co-opetition. As the Astrium Alphas technical manager stated (noted in Table 2), perceptions of risk is a critical factor in the relationship. Similarly, being open minded in the relationship and viewing the relationship as an opportunity to create value would be critical in increasing the commitment and minimizing tension. The behavioral steps or actions such as setting up a combined team, making deliberate attempts to understand each other, and duplicating management responsibilities at the team level appeared very instrumental in dealing with the tension. We encourage future researchers to more systematically identify and examine such cognitive and behavioral factors. Finally, while some researchers have suggested that a firm's capability to deal with co-opetition is important in realizing gains (Gnyawali & Park, 2011), little is known about what constitutes such capability. We believe that the cognitive and behavioral factors we have identified in this study as noted above serve as key ingredients of a firm's co-opetition capability and encourage researchers to disentangle the cognitive and behavioral aspects and investigate how firms could develop capabilities to effectively navigate co-opetition relationships and realize greater gains from such relationships.

## References

- Axelrod, R. (1984). *The evolution of cooperation*. New York: Basic Books.
- Bengtsson, M., Eriksson, J., & Wincent, L. (2010). New ideas for a new paradigm. In S. Yami, S. Castaldo, G. B. Dagnino, & F. Le Roy (Eds.), *Coopetition: Winning strategies for the 21st century* (pp. 19–39). Cheltenham: Edward Elgar.
- Bengtsson, M., & Kock, S. (1999). Cooperation and competition in relationships between competitors in business networks. *Journal of Business and Industrial Marketing*, 14, 178–190.
- Bengtsson, M., & Kock, S. (2000). Co-opetition in business networks – To cooperate and compete simultaneously. *Industrial Marketing Management*, 29, 411–426.
- Bonel, E., & Rocco, E. (2007). Coopeting to survive; Surviving to coopetition. *International Studies of Management & Organization*, 37, 70–96.
- Brandenburger, A.M., & Nalebuff, B. J. (1996). *Co-opetition*. : Doubleday.
- Cassiman, B., Di Guardo, M. C., & Valentini, V. (2009). Organizing R&D projects to profit from innovation: Insights from co-opetition. *Long Range Planning*, 42, 216–233.
- Castaldo, S., Möellering, G., Grosso, M., & Zerbini, F. (2010). Exploring how third-party organizations facilitate co-opetition management in buyer–seller relationships. In S. Yami, & F. Le Roy (Eds.), *Co-opetition: Winning strategies for the 21st century* (pp. 141–165). UK: Edward Elgar Publications.
- Chen, M. -J. (2008). Reconceptualizing the competition–cooperation relationship: A transparadox perspective. *Journal of Management Inquiry*, 17(4), 288–305.
- Chin, K. -S., Chan, B.L., & Lam, P. -K. (2008). Identifying and prioritizing critical success factors for co-opetition strategy. *Industrial Management and Data Systems*, 108(4), 437–454.
- Clarke-Hill, C., Li, H., & Davies, B. (2003). The paradox of co-operation and competition in strategic alliances: Towards a multi-paradigm approach. *Management Research News*, 26(1), 1–21.
- Das, T. K., & Teng, B.S. (2000). Instabilities of strategic alliances: An internal tensions perspective. *Organization Science*, 11(1), 77–101.
- De Rond, M., & Bouchikhi, H. (2004). On the dialectics of strategic alliances. *Organization Science*, 15(1), 56–69.
- Depeyre, C., & Dumez, H. (2010). The role of architectural players in coopetition: The case of the US defense industry. In S. Yami, & F. Le Roy (Eds.), *Co-opetition: Winning strategies for the 21st century* (pp. 124–141). UK: Edward Elgar Publications.
- Deutsch, M. (1973). *The resolution of conflict*. New Haven, CT: Yale University Press.
- Dodgson, M., Mathews, J., Kastelle, T., & Hu, M. -C. (2008). The evolving nature of Taiwan's national innovation system: The case of biotechnology innovation networks. *Research Policy*, 37, 430–445.
- Eisenhardt, K. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532–550.
- Eisenhardt, K., & Graebner, K. E. (2007). Theory building from case studies: Opportunities and challenges. *Academy of Management Journal*, 50(1), 25–32.
- Gibbert, M., Ruigrok, W., & Wicki, B. (2008). Research notes and commentaries. What passes as a rigorous case study? *Strategic Management Journal*, 29, 1465–1474.
- Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago: Aldine.
- Gnyawali, D. R., He, J., & Madhavan, R. (2008). Co-opetition: Promises and challenges. In C. Wankel (Ed.), *21st century management: A reference handbook* (pp. 386–398). Thousand Oaks, CA: Sage Publications.
- Gnyawali, D. R., Madhavan, R. M., He, J., & Bengtsson, M. (2012). Contradictions, dualities and tensions in cooperation and competition: A capability based framework. *Annual Meeting of the Academy of Management*, Boston, MA.
- Gnyawali, D. R., & Park, B. J. (2009). Co-opetition and technological innovation in small and medium-sized enterprises: A multilevel conceptual model. *Journal of Small Business Management*, 47(3), 308–330.
- Gnyawali, D. R., & Park, B. J. (2011). Co-opetition between giants: Collaboration between competitors for technological innovation. *Research Policy*, 40(5), 650–663.
- Gomes-Casseres, B. (1994). Group versus group: How alliance networks compete. *Harvard Business Review*, 72(4), 62–74.
- Hamel, G. (1991). Competition for competence and inter-partner learning within international strategic alliances. *Strategic Management Journal*, 12(special issue), 83–104.
- Inkpen, A.C. (2000). A note on the dynamics of learning alliances: Competition, cooperation and relative scope. *Strategic Management Journal*, 21(7), 775–780.
- Khanna, T., Gulati, R., & Nohria, N. (1998). The dynamic of learning alliances: Competition, cooperation, and relative scope. *Strategic Management Journal*, 19(3), 193–210.
- Langley, A. (1999). Strategies for theorizing from process data. *Academy of Management Review*, 24(4), 691–710.
- Langley, A., & Royer, I. (2006). Perspectives on doing case study research in organizations. *Management*, 9(3), 73–86.
- Lewis, W. M., Welsh, M.A., Dehler, G. E., & Green, S. G. (2002). Product development tensions: Exploring contrasting styles of project management. *The Academy of Management Journal*, 45(3), 546–564.
- Loch, C. H., Galunic, D. C., & Schneider, S. (2006). Balancing cooperation and competition in human groups: The role of emotional algorithms and evolution. *Managerial and Decision Economics*, 27, 217–233.
- Luo, Y. (2007). A co-opetition perspective of global competition. *Journal of World Business*, 42, 129–144.
- Luo, X., Slotegraaf, R. J., & Pan, X. (2006). Cross-functional co-opetition: The simultaneous role of cooperation and competition within firms. *Journal of Marketing*, 70, 67–80.
- Madhavan, R., Gnyawali, D. R., & He, J. (2004). Two's a company, three's a crowd? Triads in cooperative–competitive networks. *Academy of Management Journal*, 47, 918–927.
- Miles, M. B., & Huberman, A.M. (1994). *Qualitative data analysis: An expanded sourcebook*. Thousand Oaks, CA: Sage.
- Murnighan, J. K., & Conlon, D. E. (1991). The dynamics of intense work groups: A study of British string quartets. *Administrative Science Quarterly*, 36, 165–186.
- Oliver, A. L. (2004). On the duality of competition and collaboration: Network-based knowledge relations in the biotechnology industry. *Scandinavian Journal of Management*, 20, 151–171.
- Oshri, I., & Weber, C. (2006). Cooperation and competition standards-setting activities in the digitization era: The case of wireless information devices. *Technology Analysis & Strategic Management*, 18(2), 265–283.

- Park, S. H., & Russo, M. V. (1996). When competition eclipses cooperation: An event history analysis of joint venture failure. *Management Science*, 42(6), 875–890.
- Park, B. J., Srivastava, M., & Gnyawali, D. R. (2012). Impact of balanced cooperation and competition experience on firm innovation. Presented at the 2012 Workshop on *Coopetition Strategy, Katowice, Poland*.
- Pellegrin-Boucher, E., Le Roy, F., & Gurau, C. (2013). Coopetitive strategies in the ICT sector: Typology and stability. *Technology Analysis & Strategic Management*, 25(1), 71–89.
- Ploetner, O., & Ehret, M. (2006). From relationships to partnerships – New forms of cooperation between buyer and seller. *Industrial Marketing Management*, 35(1), 4–9.
- Poole, M. S., & Van de Ven, A. H. (1989). Using paradox to build management and organization theories. *Academy of Management Review*, 14(4), 562–578.
- Quintana-Garcia, C., & Benavides-Velasco, C. A. (2004). Cooperation, competition, and innovative capability: A panel data of European dedicated biotechnology firm. *Technovation*, 24, 927–938.
- Teece, D. J. (1992). Competition, cooperation and innovation: Organizational arrangements for regimes of rapid technological progress. *Journal of Economic Behavior and Organization*, 18(1), 1–25.
- Tsai, W. (2002). Social structure of 'Co-opetition' within a multiunit organization. *Organization Science*, 13(2), 179–190.
- Walley, K. (2007). Co-opetition: An introduction to the subject and an agenda for research. *International Studies of Management and Organization*, 37(2), 11–31.
- Yami, S., Castaldo, S., Dagnino, G. B., & Le Roy, F. (2010). *Coopetition: winning strategies for the 21st century*. Cheltenham, UK, Northampton, MA, USA: Edward Elgar.
- Yin, R. K. (1994). *Case study research, design and methods* (2nd ed.) Newbury Park, CA: Sage.
- Yin, R. K. (2003). *Case study research, design and methods*. Thousand Oaks, CA: Sage.
- Anne-Sophie Fernandez** is an Assistant Professor in Strategic Management at the University of Montpellier 1 (Institute of Science of Enterprise and Management – ISEM) and a member of the *Montpellier Research in Management* research team. Her research focused on how firms effectively manage co-opetition strategies, which deals with the management of paradoxes and tensions. She is specifically interested in high-tech industries and collaborative innovation. She has already published several articles on these topics.
- Frédéric Le Roy** is a Professor in Strategic Management at the University of Montpellier 1 (Institute of Science of Enterprise and Management – ISEM) and GSCM – Montpellier Business School, France. He is the Dean of Research of ISEM and the Director of the Master Consulting in Management. He published many research articles and several books. His current research relates primarily to co-opetition strategy. Besides, he develops research on entrepreneurship and strategy in high-tech industries.
- Devi R. Gnyawali** (Ph.D. University of Pittsburgh, USA) is the R. B. Pamplin Professor of Management and the Director of Graduate Programs at the Department of Management, Virginia Polytechnic Institute and State University (commonly known as Virginia Tech). His current research focuses on two main areas in strategic management: (a) the role of a firm's internal and relational resources on its ability to generate innovations and achieve competitive advantage, and (b) the drivers, nature, and implications of inter-firm co-opetition. His research has been published in several high quality journals, including *Academy of Management Journal*, *Academy of Management Review*, *Information Systems Research*, *Journal of Management*, and *Journal of Management Studies*.