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The evolution of coopetitive and collaborative alliances in an alliance portfolio: The Air France case

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Highlights

- This research studies the evolution of the composition of an alliance portfolio from a coopetition perspective
- We build on the coopetition and alliance portfolio literature to explore the composition of an alliance portfolio and its evolution over time
- We show that when market uncertainty is high, firms do not increase their number of agreements but change the composition of their portfolio
- To address high levels of market uncertainty, firms rely more on coopetitive alliances than on collaborative alliances.
- Firms use more horizontal than vertical interactions when market uncertainty is high.

Biographies

Dr. Paul Chiambaretto is Assistant Professor of Strategy and Marketing at Montpellier Business School and Associate Researcher at Ecole Polytechnique. His main research topics are inter-organizational relationships (such as alliances, alliance portfolios and coopetition) and branding strategies. He has developed a strong expertise on air and rail transportation industries. His research has been published in ranked journals such as *Industrial Marketing Management, International Studies of Management and Organization, M@n@gement, Management International, Annals of Regional Science, Journal of Air Transport Management,* etc.

Dr. Anne-Sophie Fernandez is Assistant Professor in Strategic Management at the University of Montpellier 1) and a member of the *Montpellier Research in Management* research team. Her research focused on how firms effectively manage coopetition 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 in journals such as *Industrial Marketing Management, British Journal of Management,* etc.

Abstract and key words

Abstract: This research studies the evolution of the composition of an alliance portfolio from a coopetition perspective. Building on resource dependence theory, market uncertainty appears to be a driver of alliance portfolio formation and evolution. Scholars have previously neglected key dimensions in analyzing the composition of firms' alliance portfolios: the partner type (pure partner or competitor) and partner interactions (horizontal, vertical or mixed). We build on the coopetition and alliance portfolio literature to explore (1) the composition of an alliance portfolio and (2) its evolution over time. We illustrate our theoretical framework with a longitudinal single-case study of Air France's alliance portfolio. First, we show that when market uncertainty is high, firms do not increase their reliance on collective strategies, but they do modify the composition of their portfolio. Second, to address high levels of market uncertainty, firms rely more on coopetitive alliances than on collaborative alliances. Third, firms use more horizontal than vertical interactions when market uncertainty is high.

Key words: Coopetitive alliances; Collaborative alliances; Alliance portfolio composition, Alliance portfolio evolution, Market uncertainty; Resource dependence theory

1. Introduction

Because firms simultaneously engage in multiple alliances, the composition of a firm's alliance portfolio appears to be a key driver of its performance (Castro and Roldan, 2015; Lavie and Miller, 2008). Although alliance portfolios have been investigated through different theoretical lenses (Wassmer, 2010), the resource dependence theory (RDT) represents an interesting perspective from which to study the evolution of a firm's alliance portfolio within the context of its environment (Bae and Gargiulo, 2004; Cui, 2013; Ozcan and Eisenhardt, 2009). According to the RDT, market uncertainty affects firms at not only the dyadic level but also the alliance portfolio level (Hoffmann, 2007; Lavie and Singh, 2011). Thus, we build on the RDT to shed light on how market uncertainty drives the evolution of the composition of an alliance portfolio over time.

Different dimensions have been considered in studies of the composition and evolution of an alliance portfolio, including nationality (Goerzen and Beamish, 2005; Lavie and Miller, 2008), tie strength (Rowley et al., 2000) and exploration/exploitation goals (Dittrich et al., 2007; Lavie et al., 2011). However, previous studies have neglected key dimensions such as the partner type (pure partner or competitor) and partner interactions (horizontal, vertical or mixed).

At the portfolio level, the composition of a firm's alliance portfolio may be based on exclusively coopetitive or collaborative alliances or on a combination of both. According to the coopetition literature, coopetitive alliances perform better than collaborative alliances under specific environmental conditions (Le Roy et al., 2016; Ritala, 2012; Wu, 2014). However, we may wonder whether a portfolio has an optimal share of coopetitive alliances under specific circumstances (Park et al., 2014a). Furthermore, an alliance is motivated by various goals. A firm adapts its interactions with its partners – horizontal, vertical or mixed – to achieve its goals (Dussauge et al., 2000; Lavie, 2007). Because a firm simultaneously

pursues different goals, it seems crucial to consider different types of partner interactions in the analysis of an alliance portfolio.

Considering these two key dimensions – partner type (competitor or otherwise) and partner interaction (horizontal, vertical or mixed) – this research aims to explore (1) the composition of an alliance portfolio and (2) its evolution over time. We build a theoretical framework and formulate three theoretical propositions that are discussed with respect to the results of a longitudinal single-case study of Air France from 2000 to 2011.

Our research provides multiple insights. First, we show that the number of alliances in Air France's alliance portfolio is quite stable. Variations in market uncertainty do not influence the total number of partners of Air France. Second, under conditions of high market uncertainty, we note a substitution between different types of alliances – specifically, collaborative alliances are replaced with coopetitive alliances. Third, horizontal interactions are preferred when market uncertainty is high, whereas vertical interactions are preferred when market uncertainty is low. Thus, in an unstable environment, accessing new markets appears to be less important than securing current markets.

Finally, our findings contribute to both the coopetition and alliance portfolio literature. First, our study suggests the need to consider the portfolio level in studying coopetition strategies and to understand substitution effects with collaborative alliances. Second, we contribute to the literature on the drivers of coopetition by identifying the role of market uncertainty as a driver of coopetition strategies. Finally, we also highlight that coopetitive alliances are often second-best solutions found by firms that desperately need to collaborate with another firm because of extreme environmental conditions. From an alliance portfolio perspective, our research emphasizes the importance of considering the partner type (competitor or pure partner) for scholars to describe and understand the evolution of an alliance portfolio and for managers to proactively manage their portfolios.

2. Theoretical background

2.1.Market uncertainty as a driver of alliance portfolio formation

According to the RDT literature, firms are highly interdependent entities that access resources (Hillman et al., 2009; Pfeffer and Salancik, 1978). This interdependence generates uncertainty because a firm's strategy relies on the actions of other firms and on variations in its environment. To reduce this resource dependency, a firm can absorb scarce resources through mergers or alliances (Drees and Heugens, 2013; Haleblian *et al.*, 2009). RDT emphasizes the link between environmental and/or market uncertainty and firms' collaborative strategies. Market uncertainty can be understood as uncertainty regarding the dynamics of customer demand, competition, and technologies in a particular market (Beckman et al., 2004; Ritala, 2012). Managers should prefer collaborative strategies when there is a high level of market uncertainty (Gulati and Sytch, 2007; Haleblian et al., 2009; Hillman et al., 2009). Alliances with partners can be used to reduce a firm's vulnerability in both domestic and international environments (Elg, 2000; Goes and Park, 1997; Park and Mezias, 2005).

More recently, several contributions have observed that market uncertainty has affected firms not only at the dyadic level but also at the level of the entire alliance portfolio (Hoffmann, 2007; Lavie and Singh, 2011). Lavie (2007) defines an alliance portfolio as a firm's collection of direct alliances with partners. To sustain growth, firms must accumulate resources (Barney, 1991; Miller and Friesen, 1984), meaning that they must structure (i.e., acquire, accumulate and divest) their resource stock to attain optimal performance (Lippman and Rumelt, 2003; Sirmon et al., 2011). When firms cannot access a resource or a market directly, they use collective strategies, such as collaborative alliances (Das and Teng, 2000; Eisenhardt and Schoonhoven, 1996) or coopetitive alliances (Bengtsson and Kock, 2000; Gnyawali and Park, 2009, 2011). As firms expand in size, they often accumulate

interorganizational relationships and engage in several alliances simultaneously to access wider ranges of resources and markets (Wassmer, 2010).

2.2.Alliance portfolio composition and evolution

Alliance portfolio composition has been studied along a variety of dimensions, including differences in terms of nationality (Goerzen and Beamish, 2005; Lavie and Miller, 2008), tie strength (Rowley et al., 2000) and exploration/exploitation goals (Dittrich et al., 2007; Lavie et al., 2011). The relationship between the diversity of alliances and performance is complex and presents an inverted U-shape (Bruyaka and Durand, 2012; Duysters et al., 2012). For initial alliances, greater diversity provides access to new resources and to new markets that combine in positive ways (Mouri et al., 2012; Srivastava and Gnyawali, 2011). However, as diversity increases, managerial challenges and complexity also increase, which may lead to conflicts (Duysters and Lokshin, 2011; Goerzen and Beamish, 2005). This inverted U-shape not only invites us to consider an optimal level of diversity but also raises issues concerning the ideal portfolio composition to maximize a firm's performance (Lin et al., 2007; Sirmon et al., 2011).

Most contributions focusing on alliance portfolio composition have adopted a dynamic approach and have investigated the evolution of alliance portfolios (Wassmer, 2010). One stream of research has examined how alliances are created or terminated by focusing on the interplay between a focal firm's existing stock of resources and its position in a network of ties (Eisenhardt and Schoonhoven, 1996; Gulati and Gargiulo, 1999; Min and Mitsuhashi, 2012). A second stream of research highlights the links between a firm's strategy, its environment, and the evolution of firm alliances over time (Dittrich et *al.*, 2007; Hoffmann, 2007; Lavie and Singh, 2011; Ozcan and Eisenhardt, 2009). From this perspective, a firm's alliance portfolio co-evolves with its strategy to reduce the effects of environmental

uncertainty and change. Finally, a third stream has linked alliance portfolio evolution to firm growth, highlighting how the needs of a firm inform the evolution of its alliances during the firm's life cycle (Hite and Hesterly, 2001; Maurer and Ebers, 2006; Rindova et *al.*, 2012).

Previous scholars have emphasized that firms can pro-actively change the composition of their alliance portfolios (Bengtsson et al., 2014; Bengtsson and Johansson, 2014; Castro and Roldan, 2015; Greve et al., 2014; Hoffmann, 2007; Wassmer and Dussauge, 2011, 2012). Moreover, external industry-level events may strongly influence a firm's alliance strategy (Koka et al., 2006; Lavie and Singh, 2011; Madhavan et al., 1998). Thus, firms can add, substitute or remove different types of partners in their alliance portfolios to achieve strategic objectives (Greve et al., 2014; Lin et al., 2007). However, to access certain specific resources or markets, the best partner for a firm might also be its closest competitor (Gnyawali and Park, 2009).

2.3.Alliance portfolios and coopetition

With the exception of Park and colleagues (2014a), most alliance portfolio studies have not considered alliances with competitors as a specific type of agreement. This type of alliance can be analyzed from a coopetition perspective. Coopetition is described as "a paradoxical relationship between two or more actors simultaneously involved in cooperative and competitive interactions, regardless of whether their relationship is horizontal or vertical" (Bengtsson and Kock, 2014, p. 182).

Firms adopting coopetition strategies expect to combine the benefits of collaboration and competition (Bengtsson and Kock, 2000; Brandenburger and Nalebuff, 1996; Lado et al., 1997). Collaboration allows firms to access key resources or technologies to launch new products or access new markets. Parallel competition is essential to avoid complacency and to maintain the creative tension between organizations (Park et al., 2014b; Quintana-Garcia and

Benavides-Velasco, 2004; Raza-Ullah et al., 2014). Thus, coopetition can produce greater results than purely collaborative agreements (Ritala, 2012; Le Roy et al., 2016; Wu, 2014). Coopetition can foster innovation (Gnyawali and Park, 2011), market performance (Le Roy and Sanou, 2014) and financial performance (Luo et al., 2007; Wu et al., 2015), and it may be considered an attractive strategy by many firms.

However, the simultaneity of these two opposing dimensions can contribute to the emergence of tensions at different levels (Bengtsson and Kock, 2000; Fernandez et al., 2014; Fernandez and Chiambaretto, in press; Luo et al., 2006; Padula and Dagnino, 2007). Tension between cooperation and competition is typically driven by the conflict between generating shared benefits and capturing private benefits (Czakon, 2010; Ritala and Tidström, 2014). In light of the potential tensions generated by coopetition, firms might avoid engaging in coopetition and instead choose to collaborate with pure partners.

The composition of an alliance portfolio and its evolution have not previously been investigated from a coopetition perspective. However, this dimension is essential to understanding strategic decisions made by firms and the manner in which firms' initial choices are reconsidered. Do firms engage simultaneously in both collaborative and coopetitive alliances? Why and under what circumstances do firms decide to engage in coopetitive alliances rather than in pure collaborative alliances (or vice versa)? Do firms switch from collaborative to coopetitive alliances (or vice versa)? Do they blend both types of alliances simultaneously in their portfolio? To provide insights into these questions, we rely on the alliance portfolio and coopetition literature to build a theoretical framework and propositions.

2.4.Theoretical framework

Whatever the dimensions considered in previous studies of the composition of alliance portfolios, alliances may be signed with a competitor or with a pure partner. At the portfolio level, a firm may thus adopt different alliance portfolio compositions (exclusively with competitors, exclusively with pure partners or a combination of both). Further investigation is required to determine whether a portfolio has an optimal combination of different partner types (Park et al., 2014a). Thus, the partner type (pure partner or competitor) seems to be a critical dimension in the composition of a firm's alliance portfolio.

However, consideration of the partner type is insufficient for studying the composition of a firm's alliance portfolio. Regardless of whether a firm cooperates with competitors, alliances may be motivated by various goals. Firms have different interactions with their partners – horizontal, vertical or mixed – based on these goals (Dussauge et al., 2000; Lavie, 2007). Because firms simultaneously pursue different goals, it seems crucial to investigate the composition of a firm's alliance portfolio and its evolution in terms of partner interactions (horizontal, vertical or mixed).

2.4.1. Partner type

The focal firm frequently accesses the most desirable resources from its competitors (Gnyawali and Park, 2011; Inkpen and Tsang, 2005). Thus, firms can be engaged in collaborative and/or coopetitive alliances (Park et al., 2014a; Wu, 2014). An important stream of research attempts to identify key factors that justify the selection of a coopetitive rather than a purely cooperative partner (Chen, 1996; Gnyawali and Park, 2009; Quintana-García and Benavides-Velasco, 2004). Based on these contributions, we can assume that firms voluntarily blend collaborative and coopetitive alliances in their alliance portfolios.

However, recent contributions emphasize the dark side of coopetition and the risks inherent in collaborating with competitors (Fernandez et al., 2014; Pressey et al., 2014).

Several scholars have indicated that firms do not always want to engage in coopetition strategies (Kylänen and Rusko, 2011; Mariani, 2007) but nonetheless choose to collaborate with competitors because there are no other firms with which to partner. Thus, firms must frequently accept a second- or third-best partner (Gimeno, 2004). Contrary to commonly held views, we assume that some firms may have chosen coopetition in a fit of pique.

To understand this strategic decision, we build on RDT and emphasize the role of market uncertainty in the creation of collaborative or coopetitive alliances. When market uncertainty is high, firms reduce this uncertainty by relying to a greater extent on partners, either in alliances or through coopetition (Hillman et al., 2009). Market uncertainty prompts firms to find partners to solve problems, such as excess resource capacity, and requires firms to screen their environment for potential partners. A firm that is screening for potential partners will assess the potential benefits and risks associated with each possibility (Greve et al., 2014). Thus, the firm ranks the potential partners according to their attractiveness and enters into negotiations with the most attractive partner. However, the most attractive partner (i.e., the first choice) may be unavailable or uninterested in collaborating with the focal firm (Gimeno, 2004). In these circumstances, if the focal firm must find a partner to address market uncertainty, the firm may consider its list of options until it finds a partner willing to collaborate—even if this partner is a competitor (Kylänen and Rusko, 2011; Mariani, 2007).

Based on our reasoning, we formulate the following propositions:

> *Proposition 1: Firms engage in collective strategies to a greater extent when market uncertainty is high than when it is low*
>
> *Proposition 2: The share of coopetitive alliances in a firm's alliance portfolio is larger when market uncertainty is high.*

Figure 1 underlines the role of market uncertainty in the composition of a firm's alliance portfolio in terms of its share of coopetitive alliances.

[Insert Figure 1 about here]

2.4.2 Partner interaction

Partner interaction (i.e., interactions between partners that can be vertical, horizontal or mixed) has been investigated for both collaborative alliances (Lavie and Rosenkopf, 2006; Lavie et al., 2011) and coopetitive alliances (Chiambaretto and Dumez, 2016; Pellegrin-Boucher et al., 2013). These studies show that firms have different partner interactions according to their goals. First, horizontal interactions involve scale alliances in which partners combine similar resources in the same market to generate gains in efficiency and to reduce excess resource capacity by sharing activities (Das and Teng, 2000; Dussauge et al., 2000; Duysters and De Man, 2003). Second, vertical interactions often embody link alliances in which partners bring together complementary resources and thereby enable new product-market combinations (Chung et al., 2000; Dussauge et al., 2000). Finally, mixed interactions combine the objectives of both horizontal and vertical interactions, generating increased efficiency in certain activities/markets while combining complementary resources in other activities/markets (Chiambaretto and Dumez, 2016; Pellegrin-Boucher et al., 2013).

From an interaction perspective, we previously linked different types of agreements (scale-focused, link-focused and balanced) with different types of partner interaction (horizontal, vertical and mixed). However, to date, we have not attempted to connect market uncertainty and partner interactions. Our previous analysis suggests that market uncertainty generates a greater need for dealing with excess resources than for accessing complementary resources (Duysters and De Man, 2003). Thus, we should observe more horizontal (scale-focused) or mixed (balanced) agreements during periods characterized by high levels of market uncertainty. In contrast, during periods of less market uncertainty, firms will primarily use alliances to access complementary resources through vertical (link-focused) interactions. This reasoning leads us to the following proposition:

Proposition 3: The share of horizontal and mixed partner interactions in a firm's alliance portfolio is larger when market uncertainty is high.

Figure 2 demonstrates the role of market uncertainty in the composition of a firm's alliance portfolio in terms of partner interactions.

[Insert Figure 2 about here]

3. Methods and empirical setting

3.1. Research design

In this article, we draw from Hoffmann (2007)'s approach and illustrate our theoretical propositions through an in-depth and explanatory case study (Yin, 2009). This approach does not aim to test the external validity of our framework but rather to test its usefulness in shedding light on coopetition and alliance portfolio evolution. This approach is less conventional than the grounded theory-based inductive approach used in certain previous alliance portfolio and coopetition studies (Gnyawali and Park, 2011; Lavie and Singh, 2011). Nevertheless, several authors have noted the usefulness of case studies to illustrate and discuss theoretical insights (Bogenrieder and Noteboom, 2004; Chiambaretto, 2015; De Rond and Bouchikhi, 2004; Hoffmann, 2007; Vaara and Monin, 2010). As explained by Hoffmann (2007), the case study research strategy has several advantages relative to other methods. First, compared with inductive approaches, theory development in case studies is better grounded in the previous literature and less dependent on the specific case studied. Second, unlike large empirical studies that test hypotheses with large samples, this research method allows the in-depth investigation of a phenomenon by considering the context of a firm. Finally, with a pre-existing theoretical framework, the case selection and data collection in a case study are more relevant to the research question than those in a pure inductive study.

Our choice of a longitudinal single-case study approach (Eisenhardt, 1989; Yin, 2009) to illustrate and discuss our theoretical framework is also grounded in the suitability of this approach for studying evolutionary processes (Gersick, 1994; Koza and Lewin, 1999). Finally, Wassmer (2010) notes that longitudinal research designs are best suited to the examination of alliance portfolio evolution because longitudinal research considers both alliance formation and termination.

3.2.Industry and case selection

To study the evolution of an alliance portfolio, it was essential to consider an industry with the following characteristics: (a) a significant level of alliance activity (creation and termination); (b) a large number of firms; (c) firms with different levels of links (at the dyadic, network level); (d) different competing multilateral alliances; and (e) firms with various coopetitive agreements. One industry that meets all of these criteria is the airline industry. Based on membership in the International Air Transport Association (IATA), there are more than 240 airlines throughout the world (IATA, 2012) and more than 800 alliances that link these firms with one another (Mills, 2011). Typically, airlines must manage an alliance portfolio (Wassmer and Dussauge, 2012) comprising both pure allies and competitors. Therefore, coopetition is pervasive in the airline industry. Moreover, the airline industry is characterized by the presence of three multilateral alliances that compete with one another. The airline industry is widely known as a network industry (Belobaba et al., 2009; Vasigh et al., 2013) characterized by very high fixed costs, low marginal costs and strong network effects in terms of commercial presence (Shaw, 2011). Airlines thus have a strong incentive to increase their size throughout the world but remain constrained by powerful economic and legal constraints (Iatrou and Oretti, 2007; Odoni, 2009). Consequently, most airlines have implemented collective strategies to bypass these constraints and have developed

collaborative alliances (Gimeno, 2004; Lazzarini, 2007) and coopetitive alliances (Chiambaretto and Dumez, 2016; Czakon and Dana, 2013) and find themselves at the head of alliance portfolios (Wassmer and Dussauge, 2011, 2012).

For our case study, we needed access to all firm alliances over a long period with sufficient details regarding partner interactions (horizontal, vertical or mixed) and partner type (exclusively cooperative or coopetitive) of the agreement. Given our access to specific data, we studied the alliance strategy of Air France from 2000 to 2011, a period that included up to 36 simultaneous alliances. We began our analysis in 2000, when Air France became a founding member of Skyteam to address membership issues that may have been generated by global airline alliances (GAAs), such as Star Alliance, Skyteam and Oneworld. Because we reveal the name of the studied firm (Gibbert et al., 2008), we were asked by Air France managers to halt the analysis in 2011 for confidentiality reasons. Nevertheless, consistent with previous contributions (Dittrich et al., 2007; Lavie and Singh, 2011; Rindova et al., 2012), we believe that this 12-year span provides us with sufficient insight into the evolution of alliance portfolios.

3.3. Empirical setting

According to Oum and colleagues (2000), a strategic airline alliance is "a long-term partnership of two or more firms who attempt to enhance advantages collectively vis-à-vis their competitors by sharing scarce resources, such as brand assets and market access capabilities, and by enhancing service quality, thereby improving profitability." This broad definition encompasses various forms of alliances.

Several factors explain the development of airline alliances. From an exogenous perspective, the literature often suggests that the lack of resources (Park, 1997) and the restrictions on traffic and property rights (Gudmundsson and Rhoades, 2001; Odoni, 2009)

are relevant factors. However, these alliances need not be regarded exclusively as a means of bypassing constraints; rather, they can also be presented as opportunities to share capacities and consequently increase revenues (by improving the load factor) and reduce costs (by sharing expenses) (Bissessur and Alamdari, 1998). From a more endogenous perspective, airline alliances can be partially explained by strategic reactions. Thus, several authors have emphasized the evolution of the nature of competition in the airline industry, such that there has been a shift from competition between airlines to competition between alliances (Bilotkach, 2005; Bilotkach and Hüschelrath, 2011; Reitzes and Moss, 2008). Consequently, airline alliances can be analyzed as strategic responses to other alliances (Gimeno, 2004).

We detail the different forms of airline alliances below (Iatrou and Oretti, 2007). We also explain the difference between code-share agreements and GAAs. First, airlines can sign a "code-share agreement" for certain routes. The International Civil Aviation Organization (ICAO) defines code-sharing as a practice in which one carrier *i* permits another carrier *j* to use its airline designator code on a particular flight of *i* or in which the two carriers share the same designator code on a particular flight (ICAO Circular 296-AT/110, 1997). These agreements can be reciprocal or not, and they are typically implemented on a limited number of routes. Thus, we distinguish parallel code-shares that are implemented on overlapping routes of two airlines from behind-and-beyond code-shares that aim to connect non-overlapping routes.

Parallel code-share agreements aim to reduce excess resource capacity by improving the capacity utilization (i.e., the load factor) of a particular flight without extending the airline's route network. This type of agreement is embodied in the code-share agreement between Air France and Alitalia for the Paris–Rome route, which allows Air France and Alitalia to independently sell one another's seats in order to offer more flights to their respective passengers. Importantly, when two airlines code-share on overlapping routes, they

are not allowed (by regulators) to jointly fix their prices; thus, a certain level of competition remains between them. Such parallel code-share agreements are generally categorized as scale-focused alliances or horizontal interactions because both airlines have historically served this route (Brueckner, 2001; Oum et al., 2004).

By contrast, behind-and-beyond code-share agreements link partners' route networks by allowing a firm to place its code on flights to destinations that it does not serve, thereby increasing the presence of an airline by placing its airline code on more cities (for instance, the code-share agreement between Air France and Delta Airlines in the US allows Air France to claim that they serve more than 50 cities in the US despite actually flying to fewer than 10 US cities). Consequently, such behind-and-beyond agreements are frequently referred to as link-focused alliances or vertical interactions (Brueckner, 2001; Chen and Gayle, 2007).

Beyond these dyadic agreements, airlines created GAAs in the late 1990s (O'Toole, 2000; Czakon and Dana, 2013). There are currently three GAAs: Star Alliance, Skyteam and Oneworld. To date, these three global alliances encompass more than 60 airlines (Star Alliance: 28; Skyteam: 20; and Oneworld: 15). Each global alliance aims to cover the globe with its network of members, each of which must meet certain standards to belong to the alliance. In exchange, when an airline becomes a member, it can benefit from the partner network and take advantage of shared facilities in airports around the world (e.g., common check-in and lounges, shared aircraft maintenance). These GAAs clearly compete with each other, particularly for corporate customers that prefer global travel contracts. The competitive tensions among global alliances also affect members at the individual level. When joining a global alliance, an airline must sign an "exclusivity agreement" in which it agrees to avoid signing agreements with members of a competing global alliance.

3.4.Data collection

Data were collected from primary and secondary sources. The primary data were obtained from 15 semi-structured interviews. Five interviews were conducted with Air France alliance managers, and six interviews were conducted with alliance managers from partners of Air France. We also interviewed four industry experts to obtain a more neutral perspective on Air France's alliance strategy. Semi-structured interviews (Merton et al., 1990) with two different types of questions were conducted. The main questions were designed to put the elements in perspective, and the follow-up questions were intended to yield detailed explanations of the partner selection process (Rubin and Rubin, 2012). The duration of the semi-structured interviews ranged from 40 to 95 minutes (with an average of 75 minutes). We explained to the respondents that these interviews would remain confidential and anonymous. Upon request, most interviews were not recorded; rather, notes were taken manually.

We also used various other sources to collect our secondary data. First, we used the *Airline Business Magazine*'s alliance database to obtain an exhaustive list of Air France's alliances from 2000 to 2011. This database is considered to be the most relevant database for studying airline alliances and has been used in several prior studies (Gimeno, 2004; Lazzarini, 2007; Wassmer and Dussauge, 2012). The alliance database provides a great deal of information concerning the structure and nature of executed alliance agreements. In the event this information was incomplete, we sought further details in *Factiva* and other databases.

3.5.Data analysis

Based on the data collected, the primary data were coded according to the recommendations of Miles and Huberman (1994). The selected method is abductive; accordingly, the phases of the empirical investigation were alternated with theoretical reviews. Two stages can be differentiated within the analytical process. An initial round of coding followed the literature to identify collaborative and coopetitive alliances within the industry, the drivers of these

relationships and the partner selection process. This round was essentially deductive. Then, an inductive round of coding was undertaken to reveal the drivers of partner selection and their implications for the composition of the firm's alliance portfolio. This second round was inspired by the method proposed by Corley and Gioia (2004) and Gioia et al. (2013).

Regarding secondary data, we were able to code each alliance for each year (399 observations) according to the partner type and kind of interaction. In addition, we considered GAA membership to determine potential indirect competitive effects. We first categorized alliances according to their partner type (competitor or not) and then coded alliances according to the type of partner interaction (horizontal, vertical or mixed). Once this coding process was complete, we were able to observe and analyze the reconfiguration of Air France's alliance portfolio over a 12-year period according to these two dimensions.

4. Findings

4.1.The influence of market uncertainty on Air France's alliance portfolio

To investigate the influence of market uncertainty on Air France's alliance portfolio, it was necessary to select a time-frame in which the industry displayed different levels of market uncertainty. As noted above, the 2000-2011 period is interesting for several reasons. For example, Air France was already a Skyteam member and 12 years is a reasonable length of time for analyzing the evolution of its alliance portfolio. In addition, this period encompasses a major event that affected the airline industry: the 9/11 attacks in 2001. This event clearly stymied the growth of international airlines and reduced demand. As a consequence, most airlines reduced the offered capacity (number of flights/seats), delayed the delivery of new aircrafts, reduced program investments, and implemented considerable workforce reductions. For instance, US carriers announced the elimination of 100,000 jobs – representing one in six people working in the airline industry – in less than two weeks.

The effect on the load factor of planes was enormous, with an average decrease of 10 points. In the specific case of Air France, the average load factor decreased from 85% in 2000 to 69% in 2001. Air France's operating results shrank by more than 60% in the months following the attacks. It took more than five years for Air France to recover; the company did not reach its pre-9/11 load factor level until 2006/2007. We can reasonably state that these attacks increased the level of market uncertainty for several years by reducing demand and/or creating uncertainty regarding demand. Thus, this external shock can be used to understand how market uncertainty affects the composition of an alliance portfolio.

One approach to assess the influence of market uncertainty on an alliance portfolio is to observe the evolution of the total number of partners in the portfolio. Figure 3 depicts the total number of partners in Air France's portfolio and shows the division between collaborative and coopetitive alliances.

[Insert Figure 3 about here]

Our case allows us to identify three phases related to market uncertainty: a first phase in which market uncertainty is low (before 2001), a second phrase in which market uncertainty is high (2001 to 2006) and a third phase in which market uncertainty is back to its normal level (after 2006). Nevertheless, Figure 3 shows no significant evolution of the total number of partners during the entire time frame. Whatever the level of market uncertainty, the number of partners seems to remain constant. However, a closer look at Figure 3 shows that although the size of the alliance portfolio remained constant, its composition evolved over time.

4.2. Substitution between collaborative and coopetitive alliances in the alliance portfolio

Whereas the total number of partners in Air France's alliance portfolio remained constant, Figure 3 shows that Air France's reliance on coopetitive alliances varied during the 2000-2011 period. With a constant number of partners, an increase (or decrease) in the number of

coopetitive alliances must occur at the expense (or to the benefit) of collaborative alliances. These substitutions between coopetitive and collaborative alliances must be investigated.

However, we must first understand why Air France relies on collective strategies to develop its network. One of Air France's vice presidents explained how alliances are integrated into the company's development strategy:

> *"Our natural market is France and Europe. We thus want to be the leaders on the routes between France and the rest of the world. […] When there is enough demand on a given route, we operate alone. However, when that is not the case, we implement a code-share agreement."*

In these code-share agreements, airline A is allowed to sell seats and to place its code on airline B's flights. Code-share agreements can clearly be regarded as strategic alliances designed to expand the network or address over-capacity issues. Collective strategies such as alliances are visible means of adjusting to market uncertainty. However, to enter into such an agreement, an airline must find the appropriate partner. One of Air France's partners explained the details of this partner selection process:

> *"Of course, we prefer to sign an alliance with a partner with whom we are not in competition. But when there is no alternative and when we really need an alliance to deal with our over-capacity, we are ready to sign a code-share agreement with a competitor."*

Air France blends both strategies, depending on the availability of partners in various markets. Working with a competitor is thus the last (but sometimes necessary) choice when confronting over-capacity issues. In other words, choosing coopetitors appears to be a second-best solution when the focal firm must have a partner to continue its operations. Consequently, a high level of market uncertainty appears to be a crucial driver of coopetition in this industry characterized by high fixed costs.

To investigate this assumption, we analyze Air France's alliance portfolio composition over time through the lens of collaborative versus coopetitive alliances. Figure 4 measures the

evolution of the share of coopetitive alliances in the portfolio. At first glance, our analysis reveals that the share of coopetitive alliances is not constant but rather evolves over the period of analysis. Coopetitive alliances represent between 56% and 79% of all agreements, depending on the year. Contrary to expectations, the share of coopetitive alliances in the alliance portfolio does not constantly increase. Rather, the share of coopetitive alliances presents an inverted U shape.

[Insert Figure 4 about here]

Considering the share of coopetitive alliances in the alliance portfolio against the background of the three previously identified phases of market uncertainty (low before 2001; high between 2001 and 2006; and low after 2006), a pattern appears. Figure 4 shows that Air France has relied extensively on coopetitive alliances during those periods in which it faced a high level of market uncertainty. However, as soon as its load factor reached its pre-9/11 level (in 2006-2007), the company reduced the level of coopetitive alliances in its portfolio.

This pattern appears to present coopetitive alliances as a temporary strategy used by the focal firm during periods in which market uncertainty is high. An airline industry expert detailed the drivers of alliances with competitors:

> *"One must understand the reasoning behind these alliances. At the beginning, we create an alliance and cooperate with the partner to increase the load factor of these international routes. If traffic increases considerably and revenues can be enhanced, then we decide to serve the market directly, without the partner."*

A former airline executive also referenced the temporary dimension of alliances with competitors:

> *"The main issue with alliances with competitors is their instability. These agreements are highly reversible. Alliances with competitors are like 'Spanish Inns' in which you bring whatever you want, you look for whatever you need, you stay with whoever you want, but in the end you can stop everything whenever you want."*

Coopetitive alliances thus appear to be a "temporary fix" to help firms to cope with low demand and high market uncertainty. As soon as demand increases, the focal firm eliminates its competitor partnerships and reduces the share of coopetitive alliances in its alliance portfolio.

4.3. Evolution of partner interactions

As previously explained, another approach to study the evolution of the composition of an alliance portfolio is to consider the different interactions with partners. Depending on the type of partner interaction, an agreement will be classified as horizontal, vertical or mixed. In fact, these different forms of alliances appear to serve different goals for the focal firm. An airline industry expert confirmed that airline alliances do not all share the same objectives:

> *"Parallel [horizontal] alliances aim to deal with over-capacity issues and increase the load factor of the plane on a given route. On the contrary, complementary [vertical] alliances aim to increase the network of the airline by giving access to routes beyond the partner's hub."*

Clearly, the goals of these two types of partner interactions are different. Horizontal interactions are executed to increase the load factor on a given route by sharing capacities and creating commercial synergies with an airline. However, horizontal alliances present also a dark side, as one industry expert explained:

> *"Horizontal alliances are not that profitable. There are not so many economies of scale realized by the partnering airlines. Actually, these alliances are much more about eliminating the competition (either by making a new friend or by killing him)."*

Conversely, vertical interactions facilitate access to more resources or routes. Mixed alliances tend to combine both needs with the same partner. Hence, Figure 5 plots the different alliances according to partner interactions from 2000 to 2011.

[Insert Figure 5 about here]

Considering all of the agreements in Air France's alliance portfolio, we observe some variations in the share of horizontal interactions over time. More precisely, we observe a bell-shaped curve in which the share of horizontal interactions increased from 28% to 42% by 2006 before decreasing to its "business-as-usual" level of approximately 28% by 2011. Between 22% and 31% of the alliances are mixed alliances, which combine horizontal and vertical interactions. However, there is no clear trend over time. Finally, the share of vertical interactions in Air France's alliance portfolio presents a U-shaped relationship, decreasing from 47% to 30% by 2006 before reaching its traditional level of approximately 44% in 2011.

Recall that three different phases of market uncertainty were identified during the 2000-2011 period: a low level of market uncertainty before 2001, a high level of market uncertainty from 2001 to 2006, and a lower level of uncertainty after 2006. Linking the evolution of partner interactions in the portfolio with the different levels of market uncertainty, we find that during periods of high market uncertainty, Air France relied heavily on horizontal interactions. Such horizontal agreements are particularly useful to address over-capacity issues and consequently to reduce market uncertainty. Logically, with a constant share of mixed interactions, the share of vertical interactions decreases during periods of high market uncertainty because in that environment, it seems more important to secure current markets than to obtain access to new markets.

Thus, Air France appears to have used modifications to the composition of its alliance portfolio as a means of addressing its evolving needs according to the level of market uncertainty.

5. Discussion

5.1.Market uncertainty, alliance formation and coopetition

Building on our insights from the case study, we discuss the various propositions elaborated in our theoretical framework. More precisely, we investigate the links among market uncertainty, alliance formation and choice of collaboration with competitors.

According to RDT, during periods of high market uncertainty, we should expect firms to rely to a greater degree on collective strategies (e.g., alliances, joint ventures, mergers) to internalize this uncertainty (Haleblian et al., 2009; Hillman et al., 2009; Park and Mezias, 2005). However, in Figure 3, we do not observe any significant change in the number of partners working with Air France despite strong variation in the level of market uncertainty (due to the 9/11 attacks). This surprising result does not illustrate Proposition 1 and contrasts with most RDT conclusions. We suggest that this contradiction occurs because the conclusions of RDT have never been discussed in terms of the composition of the alliance portfolio. Indeed, RDT clearly associates an increased need to enter into alliances with an increased number of partners. However, firms may prefer to alter the composition of their alliance portfolios while keeping the number of partners constant rather than adding new partners to their portfolios (Dittrich et al., 2007; Lavie and Singh, 2011). Examining the composition of the Air France alliance portfolio should shed light on how firms adapt their alliance portfolios to address variations in market uncertainty.

Figures 3 and 4 provide more information about the share of coopetitive alliances in Air France's alliance portfolio. The figures clearly show that as market uncertainty increased after 2001, the alliance strategy of Air France relied significantly more on coopetition. In addition, the results show that coopetitive alliances were used extensively until 2006, when Air France reached its pre-9/11 load factor level. Following 2006, the share of coopetitive alliances in the portfolio diminished to its initial level. This result clearly shows the existence of a relationship between market uncertainty and the use of coopetition. Indeed, Ritala (2012)

shows that a higher degree of market uncertainty leads to better performance by coopetitive alliances than by collaborative ones. As one of the industry experts explained, when airlines are confronted with a high level of market uncertainty and experience over-capacity issues, they desperately need to partner with another firm, even a competing firm. In other words, airlines are more willing to compromise on their choice of partner when facing substantial difficulties. This observation explains why airlines rely on coopetition more during periods of uncertainty than during quieter periods.

The existing literature on alliances and coopetition views coopetitive and collaborative alliances as two exclusive modes of cooperation by comparing their respective performances. By contrast, we show that such alliances can actually complement one another and be substituted for one another according to the level of market uncertainty. In fact, it appears that coopetition can be implemented as a temporary strategy to address market uncertainty. Firms are thus willing to cooperate with a competitor despite coopetitive tensions if doing so allows them to reduce the risks and additional costs caused by lower demand. However, when market uncertainty decreases, the focal firm does not need a partner at any cost and thus will exit alliances that generate high levels of tension (i.e., its coopetitive agreements). We thus contribute to the previous literature on coopetition by emphasizing its temporary use to address environmental uncertainty (Dusyters and De Man, 2003). Our findings thus illustrate Proposition 2.

5.2. Market uncertainty, partner interactions and alliance portfolio reconfiguration

As explained above, from a partner interaction perspective, the goal of a horizontal interaction is to benefit from economies of scale, whereas the goal of a vertical interaction is to benefit from the interdependence of complementary resources (Dussauge et al., 2000). Because external events affecting an industry may have a strong effect on a firm's alliance strategy

(Koka et al., 2006; Lavie and Singh, 2011; Madhavan et al., 1998), it is useful to understand how firms modify the composition of their alliance portfolios to address such exogenous shocks (Lin et al., 2007). Because alliances pursue different goals, it is logical to find that different types of partner relations are more or less common during periods of high or low market uncertainty.

Figure 5 categorizes all of the alliances in Air France's portfolio according to the different categories of partner interactions. This figure clearly shows that the share of horizontal interactions in the portfolio presents an inverted U-shape that peaked in 2006. This bell-shaped curve confirms that when market uncertainty generates over-capacity issues, Air France is more willing to enter into scale-focused alliances. Figure 5 also shows that Air France chose to rely less on vertical interactions during the post-9/11 period. The temporary reduction in the share of link-focused alliances in its portfolio composition might be interpreted as an indication that in an unstable environment, it was more important to secure current markets than to gain access to new markets. However, as soon as the level of market uncertainty decreased to its pre-9/11 level, Air France began to enter into link-focused alliances again. The relative abundance of link-focused and vertical interactions during a period of low market uncertainty is in line with Proposition 3.

More broadly, by using different partner types (competitor or not) or different partner interactions (horizontal, vertical and mixed), a firm can change the composition of its alliance portfolio to adapt its strategy to the changing environment (Greve et al., 2014; Koza and Lewin, 1999; Lavie and Singh, 2011).

5.3. Theoretical contributions

This research contributes to both the coopetition and alliance portfolio literature. First, concerning the coopetition literature, our research is one of the first to propose an analysis of

coopetition strategies at the portfolio level. This analysis shows how collaborative and coopetitive alliances can be combined or substituted in an alliance portfolio. More precisely, this research underlines the role of market uncertainty as a driver of coopetition strategies. Our findings suggest that coopetition can be used as a transitory strategy to address current and temporary challenges. Furthermore, we observe that firms can consider coopetition as a second-best choice. This result is in line with recent studies on the management of coopetition that have noted the existence of multiple coopetitive tensions. Indeed, because of the risks and tensions generated by coopetition, this strategy does not appear to be the first option for most firms. However, in cases of extreme market uncertainty, firms seem to have no other choice but to work with a competitor.

Second, concerning the alliance portfolio literature, our findings show that contrary to most RDT conclusions, the alliance portfolio size is not impacted by market uncertainty. However, we show that instead of increasing the number of partners, firms can modify the composition of their alliance portfolio to address market uncertainty. In addition, this research is one of the first to integrate partner type (competitor or pure partner) as a dimension to describe alliance portfolio composition and evolution.

5.4. Managerial implications

Our investigation has several implications for managers. First, our contribution shows that managers must configure their alliance portfolios to adapt to the changing environment. We show that in the presence of an unstable environment, firms need not increase the size of their alliance portfolio by adding new partners; rather, they can alter the composition of their alliance portfolio. When facing increasing market uncertainty, firms should focus their attention on their existing resources and markets instead of attempting to access new markets or new resources through vertical interactions. To protect core markets and resources,

managers should rely more on temporary scale-focused alliances, often with competitors. Once the market uncertainty returns to its business-as-usual level, the firm can reconsider the exploration of new markets or new resources through vertical interactions.

6. Conclusion

This research aimed to explore (1) the composition of an alliance portfolio and (2) the evolution of that composition. Our attention has been focused on two features of the alliances within a portfolio: partner type (competitor or pure partner) and partner interaction (horizontal, vertical or mixed). To provide new insights into these questions, we elaborated a theoretical model and conducted a longitudinal single-case study on the reconfiguration of Air France's alliance portfolio from 2000 to 2011. First, our findings indicate stability in the total number of partners in Air France's alliance portfolio. However, our analysis of the evolution of the composition of the portfolio revealed a substitution between collaborative and coopetitive alliances. Under high levels of market uncertainty, firms replace their collaborative alliances with coopetitive alliances. Finally, with respect to the portfolio composition, we show that the shares of vertical and horizontal interactions in the portfolio evolved according to the level of market uncertainty too.

Our research presents several limitations that may provide directions for future research. First, the RDT lens adopted in our analysis and theoretical framework should be discussed further. Although we justified the use of RDT as a relevant theory to discuss the evolution of alliance portfolios in relation to firms' environments, the use of RDT may also have acted as a constraint, leading to inconclusive propositions. Other theoretical lenses could shed light on several puzzling results, such as the constant number of partners despite different levels of market uncertainty. Studying alliance portfolio evolution through the

resource orchestration perspective (Sirmon et al., 2011) or the exploration/exploitation approach (Stettner and Lavie, 2014) could yield promising results.

Second, the limited external validity generated by a single-case study should be considered. Although our case was used for the purpose of illustrating our theoretical model, more cases would be helpful to assess the conclusions offered by our various propositions. These additional cases could be drawn either from the same industry or, to avoid industry-specific behavior, from different industries. The airline industry is a perfect illustration of a network industry in which over-capacity issues are recurrent and play a central role in firms' strategies. Airlines may consequently rely more on coopetitive alliances to address these issues than firms in other industries. Studying cases in non-network industries could shed light on the dynamics of coopetition- or cooperation-dominant alliance portfolios.

Third, this longitudinal analysis occurred over a 12-year period. At first glance, a 12-year period is consistent with most research on alliance portfolio evolution issues. Nonetheless, our research might be extended to a longer period to highlight and analyze possible cycles. A longer study period could lead to different external shocks, which in turn could lead to different sources of market uncertainty and thus different effects.

Finally, although we attempted to understand the determinants of different alliance portfolio configurations, our approach remained largely analytical. Future studies might adopt a more normative approach to characterize the ideal portfolio configuration in terms of partner types and partner interactions depending on the environment.

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Figure 1. Alliance portfolio composition and partner type

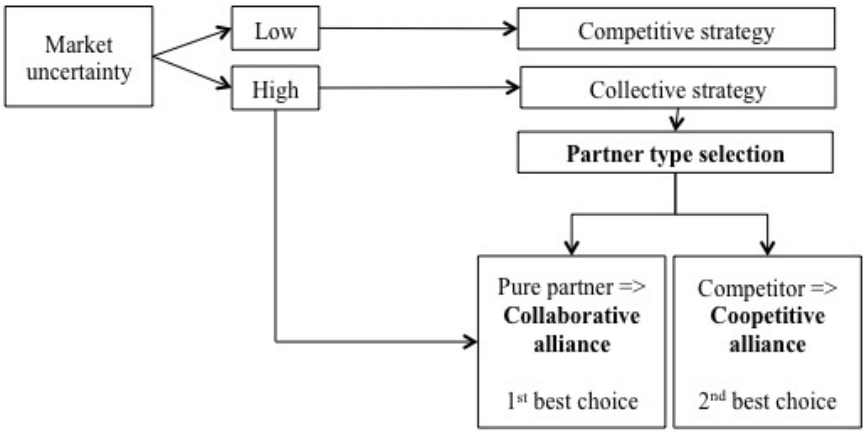

Figure 2. Alliance portfolio composition and partner interaction

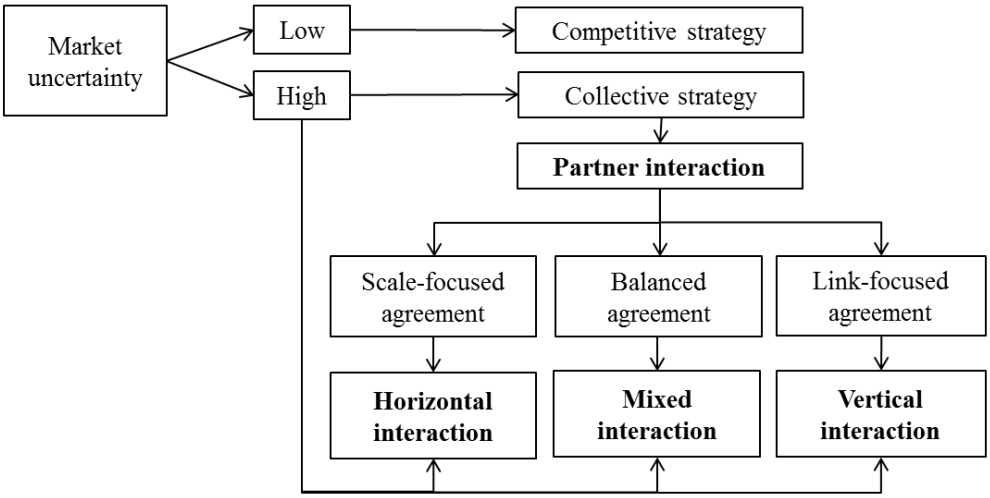

Figure 3. The number and type of Air France's alliances from 2000 to 2011

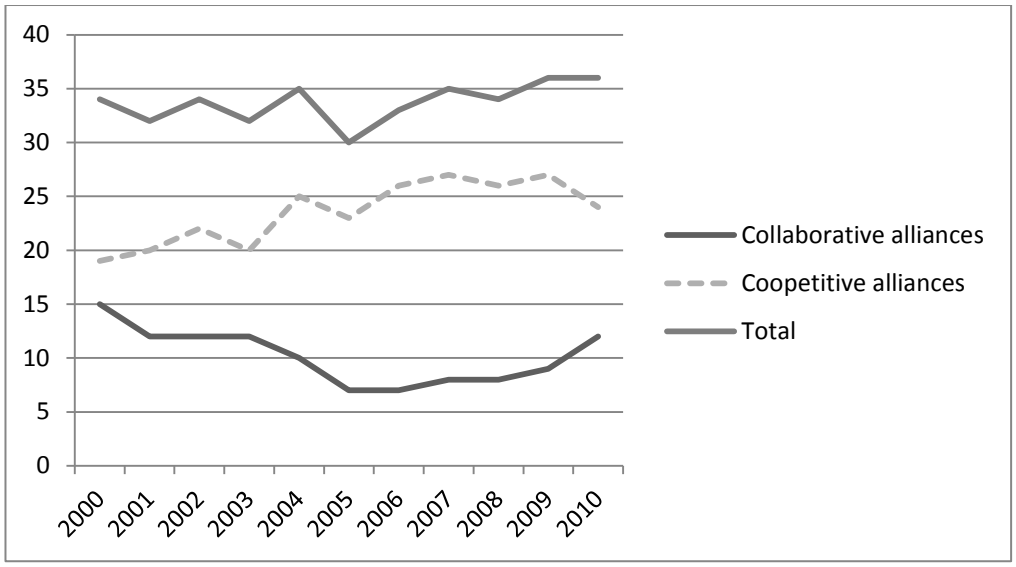

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Figure 4. Evolution of the share of coopetitive alliances from 2000 to 2011

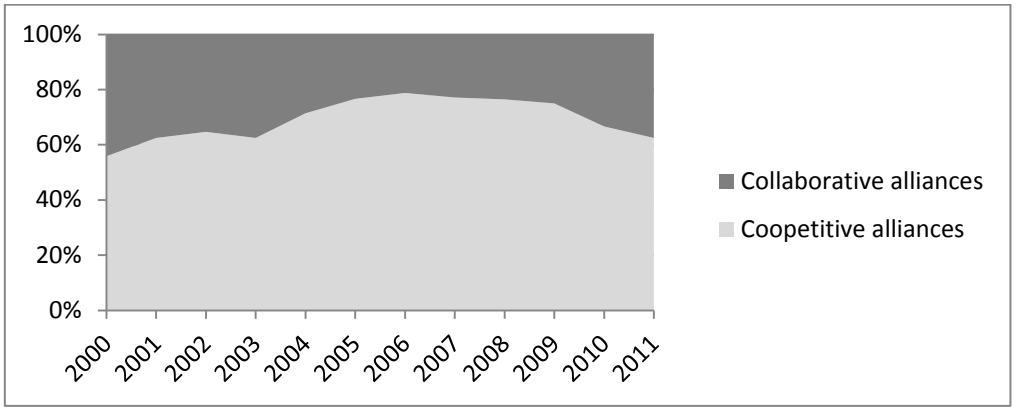

Figure 5. Evolution of partner interactions from 2000 to 2011