Long Range Planning xxx (xxxx) xxx-xxx

Contents lists available at ScienceDirect



# Long Range Planning



journal homepage: www.elsevier.com/locate/lrp

# Small and large firms' trade-off between benefits and risks when choosing a coopetitor for innovation

Paul Chiambaretto<sup>a,\*</sup>, Maria Bengtsson<sup>b</sup>, Anne-Sophie Fernandez<sup>c</sup>, Malin H. Näsholm<sup>b</sup>

<sup>a</sup> Montpellier Business School / i3-CRG, Ecole Polytechnique, France

<sup>b</sup> Umeå School of Business and Economics, Umeå University, Sweden

<sup>c</sup> University of Montpellier, France

### ARTICLE INFO

Keywords: Coopetition Innovation Benefits and risks Conjoint analysis Small and large firms Trade-off

### ABSTRACT

This research investigates the extent to which small and large firms differ when assessing the benefits and risks provided by competitors as partners in innovation. Scholars have shown that coopetition can provide both significant benefits and risks for participating firms. The risks associated with firm competition and the trade-off firms make between the risks and benefits that can be obtained through coopetition must be considered when choosing a partnering firm. In addition, we argue that the firm size could affect the evaluation of benefits and the willingness to take risks such that small and large firms differ in their decision making. Therefore, we address the following questions: First, when choosing a coopetitor with which to innovate, to what extent do small and large firms differ in their evaluation of the benefits and risks associated to coopetition? Second, how does this evaluation influence firms' willingness to coopete? We draw on research on coopetition to hypothesize that small and large firms differ in their evaluation of the six most important benefits of coopetition. To test our hypotheses, we rely on an experimental research design based on a choice-based conjoint (CBC) analysis applied to a sample of innovative Swedish firms. Our results confirm that small and large firms value the benefits and risks associated with coopetitors differently. We show that small firms are less reluctant to coopete than large firms, especially if coopetition allows them to reduce their costs and learn from their coopetitor. In contrast, we show that large firms agree to coopete if coopetition enables them to reduce their time-to-market.

### Introduction

Innovation has been identified as one of the key drivers of coopetition, i.e., alliance between competitors (Bengtsson and Kock, 2000; Brandenburger and Nalebuff, 1996). As coopetition makes possible the combination of complementary and compatible resources and at the same time provides a competitive pressure to be alert and improve, it is expected to generate more value and innovation outcomes than other relational modes such as alliances with non-competitors or pure competition (Gnyawali and Park, 2011; Quintana-García and Benavides-Velasco, 2004). However, coopetitive relationships are particularly challenging to manage, and many fail to reach the expected outcomes.

While there are many reasons for coopetition to fail to reach expected outcomes, one important cause is the partner selection

\* Corresponding author.

https://doi.org/10.1016/j.lrp.2019.03.002

Received 12 February 2018; Received in revised form 1 March 2019; Accepted 3 March 2019 0024-6301/ @ 2019 Elsevier Ltd. All rights reserved.

*E-mail addresses*: p.chiambaretto@montpellier-bs.com (P. Chiambaretto), maria.bengtsson@umu.se (M. Bengtsson), anne-sophie.fernandez@umontpellier.fr (A.-S. Fernandez), malin.nasholm@umu.se (M.H. Näsholm).

#### P. Chiambaretto, et al.

process. The decision of which firm to partner with and why are critical for the outcome of all alliances (Kale and Singh, 2009), but Le Roy, Robert and Lasch (2016) argue that partner selection is even more important when firms ally with competitors to innovate. However, only a few studies have addressed questions related to partner selection in coopetition (Akdogan et al., 2015; Alves and Meneses, 2015; Kraus et al., 2018). More precisely, the understanding of the important and complex decision-making process in the selection of a competitor as a partner and how this decision is affected by the additional risks of opportunistic behavior have not been explored. Therefore, the understanding of coopetition partner selection must be further developed for three main reasons.

First, although risk factors are to some extent subsumed within the criteria suggested, the prior partner selection research has neglected the risk that arises from the interdependent nature of alliances (Cummings and Holmberg, 2012). These factors are crucial for coopetition partner selection as benefits can be gained from coopetition (Khanna et al., 1998; Ritala and Tidström, 2014), but the focal firm also faces the risk that the partner will act opportunistically and appropriate most of the value that has been jointly created (Oxley and Sampson, 2004). These tendencies and the rivalry between coopeting firms creates a competitive pressure that is needed to stimulate firms to improve and remain alert; however, if the pressure becomes too strong, the outcome of the alliance can become negative. Consequently, coopetition strategies can be both beneficial and risky, especially in an innovation context (Bouncken and Kraus, 2013; Fernandez et al., 2018a, b). The risks related to competition among partners must be accounted for in the partner selection process, as rivalry that is too intense can jeopardize the outcome of the relationship.

Second, the research has primarily focused on different sets of criteria without considering them in relation to one another. However, Sobrero and Roberts (2001) show that firms' different motives to collaborate in innovation can conflict, and therefore, the authors argue that the trade-off between the partners' characteristics must be considered. Understanding the trade-off between the additional risks and the potential benefits associated with a higher degree of competition is especially critical when firms ally with a competitor. However, such trade-offs have not been studied in previous research investigating partner selection in coopetition, and the benefit and risk dimensions have been studied independently (Akdogan et al., 2015; Alves and Meneses, 2015; Kraus et al., 2018). Indeed, existing research related to coopetition has addressed the fact that the intensity of coopetition exposes a firm to higher levels of risk and tensions (Fernandez et al., 2018a, b; Raza-Ullah, 2017). Simultaneously, cooperating with a competitor presenting a higher degree of competition can also generate stronger benefits (Chiambaretto et al., 2016). Accordingly, it is crucial to explore how firms make a trade-off between benefits and risks in selecting a competitor as a partner to innovate.

Third, our knowledge regarding how small firms determine the trade-off between benefits and risks and how they differ from large firms in this regard is limited. Prior research investigating coopetition has mainly focused on large firms, and only a limited number of contributions have investigated small firms (Bengtsson and Johansson, 2014; Gnyawali and Park, 2009; Morris et al., 2007). We argue that small firms differ from large firms for two main reasons. One reason is the specific dilemma faced by small firms in their partner selection due to liabilities related to their size and relative youth (Hannan and Freeman, 1984; Aldrich and Auster, 1986; Stinchcombe, 1965). Such liabilities imply that small firms lack resources and skills and are in urgent need of external knowledge and resources, which makes them likely to join forces even with competing firms to innovate (Baum et al., 2000; Haeussler et al., 2012). Simultaneously, small firms are particularly exposed to the risks of coopetition (Bouncken and Kraus, 2013; Kuhn and Galloway, 2015) as they lack the advantages of large firms such as experience and organizational innovation capabilities that can be used to absorb a failure (Rosenbusch et al., 2011). Thus, in contrast to large firms, small firms face an existential risk when deciding whether to ally with a competitor. This dilemma can affect small firms' partner selection process and make it different from that of large firms. A second reason is that decision-making processes differ between small and large firms. Managers within small entrepreneurial firms rely more on heuristics and to a larger extent choose the first option that meets their aspiration level as uncertainty and the demand for quick decisions often results in a lack of adequate information (Busenitz and Barney, 1997; Gigerenzer, 2008). They are also to a larger extent than managers of large established firms overly optimistic and tend to neglect threats in the competitive environment (Shepherd et al., 2015). In contrast, large firms have more established, formalized evaluation processes through which they monitor and evaluate potential alliance partners (Kale and Singh, 2009). Therefore, the partner selection process and outcomes may differ depending on the firm size, and identifying the similarities and differences between small and large firms can provide additional insight into the specific nature of partner selection in coopetition based on firm size (Granata et al., 2018; Näsholm et al., 2018).

Our research aims to answer the following research questions: First, to what extent do small and large firms differ in their evaluation of the benefits and risks associated with intensity of competition? Second, how does this evaluation influence their willingness to coopete? To address these questions, we build on the recent literature reviews on coopetition to identify the six most important benefits associated with coopetition strategies (Bengtsson and Kock, 2014; Bengtsson et al., 2016a, b; Bouncken et al., 2015; Czakon et al., 2014; Dorn et al., 2016): (1) reduction of time-to-market; (2) cost reduction; (3) risk sharing; (4) innovation radicalness; (5) learning opportunities; and (6) access to strategic resources. Then, we formulate hypotheses to test the extent to which small and large firms may value these benefits differently and the degree to which they are willing to accept a higher intensity of competition to obtain these benefits.

To test our hypotheses, we use an experimental research design based on a choice-based conjoint (CBC) analysis. CBC analysis is a within-subject experimental research design that allows the effect of competition between alternative options to be tested (Hsu et al., 2017; Kraus et al., 2015; Mensching et al., 2016). Using a sample of innovative Swedish firms, we collect data of 1220 observations of decisions made by 61 managers/entrepreneurs. We divide this sample into two subsamples to investigate the 820 partner selection decisions made by small firms and the 400 partner selection decisions made by large firms. This design allows us to study the similarities and differences (between small and large firms) in the assessment of the benefits and risks provided by a coopetitor for innovation.

Overall, we show that small firms are usually less reluctant to coopete than large firms. Furthermore, we highlight the fact that

## P. Chiambaretto, et al.

small and large firms present different profiles in terms of their willingness to cooperate with a competitor. We show that small firms are willing to collaborate with a competitor if it allows them to reduce their costs or to learn from their partner. With respect to large firms, while the most important benefit is the ability to reduce the time-to-market, they also value the potential cost reduction and the learning opportunities created by the coopetitive relationship. Comparing small and large firms, we show that small firms value coopetitors' that offer strong risk-sharing and learning opportunities more than large firms. In contrast, large firms value competitors that offer shorter time-to-market, significant cost reduction, and innovation radicalness opportunities more than small firms.

Our findings make several contributions to the literature. First, we contribute to the literature on partner selection for coopetition and innovation by identifying and ranking the expected benefits sought by firms when they cooperate with a competitor for the purpose of innovation (Kraus et al., 2018). Second, we contribute to the previous research on partner selection, which has neglected the risks involved when partners are also competitors. The CBC analysis highlights the evaluation and trade-off between the expected benefits and additional risks faced by small and large firms. This study thus adds both to the partner selection literature and the coopetition literature by explaining the role played by risks related to competition when firms select a partner. Third, our results contribute to the understanding of the importance of firm size in coopetition, and they extend the literature on coopetition and small firms (Bengtsson and Johansson, 2014; Gnyawali and Park, 2009; Morris et al., 2007). Our study highlights the similarities and differences in how small and large firms value the benefits coopetition and the similarities and differences in their willingness to coopete. Finally, from a methodological perspective, our research contributes to the emerging and developing research stream in strategic management that uses conjoint analysis (CA) (Patzelt and Shepherd, 2008; Van Gils and Zwart, 2009; Kraus et al., 2016a). In particular, CBC analysis is rarely employed in the coopetition research, and we show the relevance of this method in facilitating the understanding of the partner selection process in coopetition.

### Theoretical background

### Coopetition for innovation: a double-edged sword

Firms rely on coopetition strategies to enhance their innovation processes (Bouncken et al., 2018; Ritala, 2012) as such strategies allow firms to combine the benefits obtained from both cooperation and competition (Bengtsson and Kock, 2000; Fernandez et al., 2018a, b). Cassiman et al. (2009, p. 216) argue that "balancing co-operative and competitive forces in the innovation process to co-create value and to capture part of this value has become crucial to profit from innovation".

Through cooperation, firms can co-create common value and collectively improve their innovativeness. These benefits can be explained by competitors' complementarity and similarity. Competitors' resource complementarity increases the potential for synergy from cooperation as the new skills and different knowledge provided to the firm by the other party enable the creation of value that could not have been possible alone (Das & Teng, 2000a, 2000b; Khanna et al., 1998; Silverman and Baum, 2002). Resource similarity also makes coordination easier as the partners have similar resources and routines (Darr and Kurtzberg, 2000; Mitsuhashi and Greve, 2009). For instance, cultural similarity and goal compatibility decrease the risk of misunderstandings during the course of the relationship (Czakon and Czernek, 2016; Das & Teng, 2000a, 2000b).

Complementarity and similarity simultaneously create advantages related to competition. Because coopeting firms share only partially convergent interests (Gnyawali et al., 2016; Padula and Dagnino, 2007; Rai, 2016), the risk of opportunism and appropriation is high. Coopeting partners have a strong incentive to capture a higher share of the value that is jointly created (Ritala and Hurmelinna-Laukkanen, 2009; 2018). The complementarity and similarity facilitate the immediate use of the knowledge and resources of the partner as close competitors are exceptionally well qualified to identify, assimilate, and apply each other's knowledge in their own business activities (Wu, 2014). By combining the shared resources with partners' own resources, private benefits can be developed (Bouncken and Fredrich, 2016; Fernandez and Chiambaretto, 2016). The risks for such opportunistic behavior create a competitive pressure to further enhance their capability to innovate and thereby enhance their competitive advantages.

However, coopetition is a double-edged sword. Simultaneous cooperation and competition are not always a source of potential benefits as strong tensions that can be difficult to manage could emerge (Fernandez et al., 2014; Raza-Ullah et al., 2014; Tidström, 2014). If the intensity of competition becomes too high, the partners will most likely become less willing to commit new resources, knowledge, and skills, which will reduce the potential benefits from cooperation (Khanna et al., 1998; Padula and Dagnino, 2007). Similarly, if the competition becomes too low, the firms might lose their vigilance. Without sufficient pressure from competition, the likelihood for group-think and over-embeddedness increase, which might decrease managers' attention to potential risks (Raza-Ullah, 2017). Empirical studies have shown that a balanced coopetition relationship is most beneficial for innovation; however, if co-operation, competition, or both become too intense, the benefits decrease (Park et al., 2014; Raza-Ullah et al., 2018). To achieve positive innovation outcomes, it is important to select a partner that enables such a balance, and therefore, it is of interest to further explore how firms make the trade-off between risks related to the intensity of competition and the different benefits related to cooperation.

### Trade-off between benefits and risks when selecting a competitor as partner

The partner selection literature has acknowledged that conflicts and opportunistic behavior are present in alliances (Das and He, 2006; Cummings and Holmberg, 2012); however, the mainstream alliance research views competition as a threat that can be harmful for alliance success (Gimeno, 2004; Park and Russo, 1996). Partner selection research has mainly focused on the success factors critical for firms to effectively cooperate, including task-related criteria linked to the motives to form an alliance (Geringer, 1991),

#### P. Chiambaretto, et al.

partner-related considerations to minimize conflict and competition and create favorable conditions for cooperation (Glaister, 1996; Bierly and Gallagher, 2007; Das & Kumar, 2009) and learning-related criteria (Kumar and Nti, 1998; Bresman et al., 1999).

However, the coopetition research has suggested that a different perspective is needed to understand the benefits that can be gained from coopetition. As discussed above, simultaneity and balance between competition and cooperation is needed to reap the benefits from the combination of the two (Bengtsson and Kock, 2000; Fernandez et al., 2018a, b). It is therefore valuable to determine how the trade-off between competition and cooperation is made. Along these lines, Cummings and Holmberg (2012) argued that a more dynamic perspective on the partner selection process is needed that enables us to understand the trade-off between different partner selection criteria. However, few studies have studied the trade-off, and calls have been made to further explore the role of trade-offs in entrepreneurial decision making in general (Shepherd et al., 2015), and in partner selection models in particular (Wu and Barnes, 2011). For example, Van der Rhee et al. (2009) examined the trade-off between cost, flexibility, delivery and service features in the supplier selection process, and Drover et al. (2014) examined the trade-off between the benefits that a Venture Capitalist (VC) can provide, and the disadvantages and cost related to a VC's reputation for questionable ethical behavior. We believe that similar trade-offs are made between the benefits related to cooperation and the competitive pressure related to the risks and opportunities involved when allying with a competitor; however, this trade-off has not been studied.

In this article we raise the question about the extent to which firms are willing to increase their risks and competitive pressure to gain access to more benefits through cooperation. Analyzing this trade-off is very important as it will provide insights into firms' real motivations to rely on coopetition and how much competitive pressure they can accept and must accordingly manage to gain the benefits provided by competition. Furthermore, we argue that firm size influences this trade-off as coopetition, and its management, have been shown to be different for small and large firms (Näsholm et al., 2018).

### Specificities of coopetition strategies for small and large firms

Small and large firms both rely on coopetition strategies to innovate, although their motives are different. Small firms lack resources and skills because of their liabilities of smallness and newness (Aldrich and Auster, 1986; Hannan and Freeman, 1984; Stinchcombe, 1965). These factors make it difficult for them to obtain resources, capital, patents or a foothold in the market (Blackburn, 2003). Coopetition allows small firms to develop new products by gaining access to their partner's knowledge in design, prototyping, testing, development, and commercialization (George et al., 2001; Shu et al., 2014). While large firms may have the resources and capabilities to develop innovations alone, coopetition can also be an attractive strategy for them. Industry dynamics and technology trends are key drivers of coopetition with regard to large firms, especially in high-tech industries (Gnyawali and Park, 2011). In addition, because large firms have superior resources and capabilities with respect to other potential partners, they can be attractive partners, leading other firms to offer them good cooperation opportunities (Ahuja, 2000).

Das and He (2006) argue that small entrepreneurial firms must use additional partner selection criteria to account for the risk based on their liabilities. Small firms may be more vulnerable to the risks of coopetition, especially when interacting with larger firms (Bae and Gargiulo, 2004; Vandaie and Zaheer, 2014; Yang et al., 2014). This imbalance generates the risk of losing control over the relationship or becoming overly dependent on the partner (Chiambaretto, 2015; Gnyawali and Park, 2009). Established firms might just want to absorb small firms' innovation and expertise that makes them less attractive and more vulnerable to premature acquisition or termination, and they therefore must account for such risks in their partner selection (Das and He, 2006). Finally, because coopetition strategies require dedicated management (Bengtsson et al., 2016a, b; Le Roy and Czakon, 2016; Le Roy et al., 2018), small firms do not always have sufficient resources to address the extra time and additional costs needed to manage their coopetitive relationships (Granata et al., 2018; Morris et al., 2007). Instead, small firms instead must rely on heuristics and make quick decisions, often with a lack of adequate information (Busenitz and Barney, 1997; Gigerenzer, 2008; Shepherd et al., 2015). Due to their more extensive resources, experience, and capabilities, large firms can make more systematic evaluations and more informed decisions, and they are better able to survive a potential failure. Although we have some knowledge regarding the benefits and risks associated with the intensity of competition.

### Trade-off between benefits and risks provided by coopetitors for innovation: size matters

In this section, we discuss how the literature suggests that small and large firms would evaluate the benefits and risks of coopeting for innovation purposes. We start by addressing the risks related to the intensity of competition in coopetition strategies. Then, building on several recent literature reviews of coopetition strategies (Bengtsson and Kock, 2014; Bengtsson et al., 2016a, b; Bouncken et al., 2015; Czakon et al., 2014; Dorn et al., 2016), we identify six benefits as the most important incentives to adopt coopetition strategies. For each of these benefits, we first explain why coopetition strategies can be particularly relevant to achieving them, and then we suggest why these benefits can be more or less important for small or large firms, respectively. Furthermore, we suggest that this would make small and large firms more or less willing to accept a higher intensity of competition from their coopetitor to gain access to these benefits.

### Intensity of competition

As described above, coopetition involves risks that can stem from the competitive side of the relationship becoming too strong. Coopetition for the purpose of innovation involves the risk of potential opportunistic behavior, knowledge leakage, imitation, and loss of competitive advantage (Fernandez et al., 2018a, b; Gnyawali and Park, 2009; Ritala and Hurmelinna-Laukkanen, 2009). These

### P. Chiambaretto, et al.

risks create a healthy competitive pressure that can stimulate firms to strive and improve; however, if the intensity of competition becomes too strong, such risks might diminish the benefits that could be gained from the cooperation aspect of the relationship (Chiambaretto et al., 2016; Ritala and Tidström, 2014). Therefore, we argue that for a given level of benefit provided, small and large firms will accept some level of competition but avoid too excessive competition from a coopetitor, as the consequences of opportunistic behavior will be more severe.

However, it has been shown that small firms tend to have a more entrepreneurial profile and are generally less reluctant to take risks than large firms (Covin and Slevin, 1989; Naldi et al., 2007). Furthermore, because small firms are more vulnerable to product failures or to market uncertainty, they are more willing to rely on risky strategies such as coopetition to survive in a hostile environment (Bonel and Rocco, 2007; Lee et al., 2012; Thomason et al., 2013). Small firms are also more flexible and agile, which can enhance their ability to navigate and manage the risks involved (Bengtsson and Johansson, 2014). Therefore, while we expect both small and large firms to negatively value a high intensity of competition, we suggest that small firms will value this risk less negatively than large firms and therefore are more willing to accept higher coopetition pressure. Our first hypothesis is as follows:

Hypothesis 1. Small firms are less reluctant than large firms to accept higher levels of competition to gain benefits from the collaboration with a competitor.

### Reduction in time-to-market

One important benefit that can be a motive for firms to coopete is a reduction in time-to-market (Dussauge et al., 2000; Morris et al., 2007; Yami and Nemeh, 2014). Shortening product lifecycles forces companies to reduce time-to-market to launch their products at the right time to earn reasonable profits during the useful lifetime of the product (Gnyawali and Park, 2009, 2011). Coopetition might provide the benefit of reducing time-to-market through earlier access to technology and information (Castañer et al., 2014; Nemeh, 2018; Robert et al., 2018). Furthermore, by reducing the risk of failure in the development process, coopetition allows competing partners to decrease the number of failed attempts in the development process such that they can develop new products more quickly (Bouncken et al., 2018). In a nutshell, Yami and Nemeh (2014) demonstrated that vertical coopetition improved product quality and accelerated time-to-market.

Being able to develop and sell a product first is essential for any firm, and the time-to-market benefit is critical when selecting a coopetitor for both small and large firms (Lieberman and Montgomery, 1988). Nevertheless, because small firms have fewer dedicated resources with which to innovate, they must reach their break-even point more rapidly than large firms (Clausen and Korneliussen, 2012; Lee et al., 2010). In addition, as small firms can dedicate fewer resources to obtain large market shares in markets where they face larger competitors, it is even more important for them to be the first to launch a product and benefit from a temporary monopoly (Deeds and Hill, 1996). Accordingly, we suggest that small firms will value a coopetitor that will provide them with a short time-to-market and thus a reduced time to reach break-even more than large firms. Consequently, small firms will be more willing to accept a higher intensity of competition with their coopetitor to reduce their time-to-market. Thus, we propose the following hypothesis:

Hypothesis 2. Small firms are more likely than large firms to cooperate with a competitor that provides a faster time-to-market.

### Cost reduction

A second important benefit is the possibility of reducing costs. Coopetition improves the efficiency of resource utilization (Chiambaretto and Fernandez, 2016; Garrette et al., 2009), allowing firms to realize economies of scale, which in turn reduces the focal firm's overall costs (Dussauge et al., 2000). In parallel, coopetition can be used to reduce research and development costs for new product development (Bouncken et al., 2018; Gnyawali and Park, 2011; Ritala, 2012). Finally, recent contributions have highlighted that coopetition strategies can be implemented to reduce distribution and marketing costs (Chiambaretto et al., 2016; Robert et al., 2018). Cost reduction is probably important for both small and large firms as R&D costs have increased significantly over the years (Fernandez et al., 2018a, b). However, when large companies do not have the resources to finance their innovation process, they can use their bargaining power and reputation to convince external investors or financial institutions to support them. This use of informal power is more difficult for small firms as they are less influent than large firms (Baum et al., 2000). Thus, small firms more than large firms must rely on partners (including competitors) to finance their innovations. Along the same lines, Gnyawali and Park (2009) argue that R&D costs are one of the most important drivers of small firms' involvement in coopetition. Because small firms have limited financial resources and experience difficulties in obtaining external funding, the possibility of reducing costs is assumed to be an important driver of their reliance on coopetition strategies (Chin et al., 2008; Morris et al., 2007). Cost reduction is crucial for small firms as it allows them to reallocate their limited resources to other projects and products (Bumgardner et al., 2011; Gomes-Casseres, 1997). Furthermore, because of their smaller size, small firms must minimize the financial investments associated with the development of an innovation such that they strongly value partners that offer strong cost-reduction opportunities (Näsholm et al., 2018). Accordingly, even if both small and large firms value coopetitors that offer high cost-reduction potential, we expect this benefit to be more important for small firms than for large firms, mainly due to their limited financial resources. As a consequence, small firms will be more willing to accept a higher intensity of competition with their coopetitor to reduce their costs. We thus offer the following hypothesis:

Hypothesis 3. Small firms are more likely than large firms to cooperate with a competitor that provides high cost-reduction opportunities.

## P. Chiambaretto, et al.

### Risk sharing

A third possible motive for coopetition is the ability to share the risks involved in innovation projects between coopetitors (Chin et al., 2008; Ritala, 2012). Competitors collaborate on innovation projects to share both the risks and costs involved (Fernandez et al., 2018a, b; Gnyawali and Park, 2011). On large projects, bearing the financial or technological risks alone is a hazardous bet for firms that may go bankrupt if the project fails (Das and Teng, 1998; Fernandez et al., 2014; Ritala & Saino, 2014). Sharing risk is even more critical for radical innovation projects in which no single firm has the knowledge and skills to develop the new product alone and for which potential sales are uncertain (Bouncken et al., 2018; Fernandez et al., 2018a, b).

At the same time, large firms have significant internal resources and capabilities, which makes it easier for them to buffer themselves against the consequences of project failure (Agarwal and Gort, 2002). In comparison, because of their lower stock of internal resources, small firms are more vulnerable to project failure (which can actually ruin a small firm), and coopetition gives these firms an opportunity to divide the risks in the event of failure (Freeman et al., 1983; Gomes-Casseres, 1997; Yang et al., 2014). Considering the size of small firms, a given project will appear larger and more complex to them than to large firms. Additionally, because of their younger age, small firms have been shown to have on-average less experience in developing innovations than large firms such that they place greater value on the external experience offered by a coopetitor to reduce the risks of failure (Hoang & Rothaermel, 2010). Accordingly, independent of the complexity and size of an innovation project jointly developed with a competitor, we suggest that small firms will value the ability to share risks with a coopetitor more than large firms. Thus, small firms will be more willing to accept a higher intensity of competition with their coopetitor to be able to share risk. Therefore, we develop the following hypothesis:

Hypothesis 4. Small firms are more likely than large firms to cooperate with a competitor that provides high risk-sharing opportunities.

### Innovation radicalness

A fourth benefit associated with coopetition is the ability to develop an innovation by combining a firm's knowledge and technology with those of its coopetitor (Ahuja, 2000; Gomes-Casseres, 1997; Rindova et al., 2012). It is important to distinguish between the benefits related to radical and incremental innovations (Oerlemans et al., 2013). Despite the absence of consensus on the impact of coopetition on incremental and radical innovation (Bouncken and Kraus, 2013; Ritala and Hurmelinna-Laukkanen, 2009), Fernandez et al. (2018a, b) have recently revealed that coopetition can be used to develop both incremental and radical innovation but requires different organizational structures to manage the related coopetitive tensions. Such organizational structures are costly and complex to implement, thus, we argue that only large firms can adequately manage coopetition to develop radical innovations with competitors (Le Roy and Fernandez, 2015; Fernandez et al., 2018a, b). In contrast, smaller firms do not have sufficient resources to develop the coopetition capabilities necessary to manage coopetitive radical innovations (Bengtsson et al., 2016, in press). Furthermore, radical innovations tend to be more risky than incremental ones such that a failure has a greater chance of leading a small firm to bankruptcy than it will a large firm (Lee et al., 2012). Therefore, while we expect small and large firms to positively value the potential for increased innovation radicalness provided by a competitor, we suggest that small firms will value this benefit less than large firms, because small firms are more vulnerable to failures and because they do not have sufficient resources to develop the capabilities necessary to manage radical innovation projects in coopetition (Granata et al., 2018; Le Roy and Czakon, 2016). This makes small firms less willing to accept a higher intensity of competition with their coopetitor to develop more radical innovations. We thus state the following hypothesis:

Hypothesis 5. Small firms are less likely than large firms to cooperate with a competitor that provides increased innovation radicalness.

### Learning opportunities

A fifth potential benefit is the learning opportunities provided by coopetition for innovation. Learning opportunities are particularly achievable in coopetition because partners' resources and knowledge are simultaneously similar (possible to understand) and complementary (providing new knowledge) (Baumard, 2010; Fernandez and Chiambaretto, 2016; Dussauge et al., 2000). Thus, when a firm decides to collaborate with a competitor, it will also consider the learning opportunities offered by that competitor, especially if the focal firm has developed its absorptive capacity (Chiambaretto et al., 2019; Ritala and Hurmelinna-Laukkanen, 2013).

However small and large firms value these learning opportunities differently. First, because small firms have fewer resources and abilities to develop new knowledge internally than large firms, they rely extensively on their collaborations to absorb new knowledge from their partners (Balestrin et al., 2008; Howard et al., 2016; Lee et al., 2010). By contrast, large firms can use their financial and human resources to develop new knowledge internally more easily and depend less on external knowledge (Grigoriou and Rothaermel, 2017; Wuyts and Dutta, 2014). Second, because small firms are usually less experienced than large firms, it is more difficult for them to build upon their own experience to develop innovations and enter new markets (Hoang & Rothaermel, 2010; Chiambaretto and Wassmer, 2019), thus, they try to learn as much as they can from their partnerships to compensate for their liability of newness (Rindova et al., 2012). Consequently, we argue that learning opportunities are more valued by small firms than by large firms. Accordingly, we expect that small firms will be more willing to accept a higher intensity of competition with their coopetitor to gain access to more learning opportunities. We thus propose the following hypothesis:

Hypothesis 6. Small firms are more likely than large firms to cooperate with a competitor that provides high learning opportunities.

## P. Chiambaretto, et al.

### Access to strategic resources

The final benefit to discuss is that in a coopetitive partnership, firms can gain access to resources of strategic importance through their coopetitor. Firms can use coopetition to gain access to resources they do not own internally (Bengtsson and Kock, 2000; Chiambaretto and Dumez, 2016). These external resources are essential for firms' value creation and growth (Chiambaretto and Wassmer, 2019; Gulati, 2007; Srivastava and Gnyawali, 2011). Among various potential partners, direct competitors are more likely to offer resources that are similar and that can be easily combined to develop innovations (Das & Teng, 2000a, 2000b; Mitsuhashi and Greve, 2009). As a consequence, for both small and large firms, coopetition represents a relevant option to gain access to strategic resources, especially in an innovation context.

Nevertheless, because small firms have more limited internal resources than large firms, their development and growth require more regular access to external strategic resources (Baum et al., 2000; Gomes-Casseres, 1997; Rindova et al., 2012). More precisely, small firms can use the strategic resources of their competitors to complement their own limited stock of resources and develop innovations (Lechner et al., 2016; Morris et al., 2007; Näsholm et al., 2018). In contrast, large firms will tend to rely more on their own resources to maintain their competitive advantage and will be less dependent upon a coopetitor's resources (Chiambaretto and Wassmer, 2019; Sirmon et al., 2011). Consequently, we argue that access to a coopetitor's strategic resources is more crucial for small firms than for large firms, which can rely more on their own resources to sustain their growth. We suggest that small firms will value a coopetitor that provides access to strategically important resources more than large firms and that small firms will be willing to accept a higher intensity of competition with their coopetitor to gain access to such resources. We thus establish the following hypothesis:

Hypothesis 7. Small firms are more likely than large firms to cooperate with a competitor that provides access to important strategic resources.

To investigate the similarities and differences between small and large firms' evaluation of the risk and benefits of coopetitive partnerships and to test our hypotheses, we apply an experimental research design based on a CBC analysis.

## Method

### An experimental research design based on a choice-based conjoint analysis

In recent years, an increasing number of contributions have relied on experimental methods in strategic management and in the entrepreneurship literature to understand firms' decisions (Chatterji et al., 2016; Kraus et al., 2016b, 2018; Hsu et al., 2017). The purpose of these studies is not to study real or actual choices but the preferences or intentions of firms that are revealed by the experiment.<sup>1</sup> Building on Gnyawali and Song's (2016) call for more rigorous methods (such as experiments) to investigate coopetition strategies, we implement an experimental research design—more specifically, a conjoint analysis (CA)—to answer our research question.

CA accounts for approximately half of the experimental methods used in entrepreneurship and strategic management (Hsu et al., 2017; Lohrke et al., 2010). CA is a within-subject design in which the same individual responds to all treatments and serves as his own control (such that a control group with a random assignment is not needed). CA can be classified as a "decompositional" method as it aims to partition the participants' decisions into underlying preference structures and decision rules (Lohrke et al., 2010). Experiments, particularly those using CA, collect data on managers' assessments and preferences as they are being made (Shepherd and Zacharakis, 2000).

Various types of CA have been used in the entrepreneurship and strategic management field; however, metric CA is the most common method. The participants in these analyses face a given profile or situation with different attributes and are asked to rank or grade these attributes using a Likert scale. However, this method has some drawbacks, and several recent contributions (Eggers et al., 2016; Kraus et al., 2015, 2016b; Mensching et al., 2016) in the field have highlighted that CBC and adaptive conjoint analysis (ACA) are more relevant for capturing managers' decision-making processes. Eggers et al. (2016) explain that analyzing choices made among different profiles instead of rating different attributes within the profiles is more relevant because managers actually make choices, thereby revealing their preferences for different attributes. Furthermore, by using choice tasks with different alternatives from which to choose, CBC analysis adequately considers the effect of competition between alternative options. This requires the participants to consider trade-offs to actually decide which partner to choose, whereas this choice is not required when participants rate options within one alternative separately from other alternatives (Mensching et al., 2016). By using a CBC experiment, we account for the fact that partner selection can be seen as a multidimensional decision process that requires a joint assessment of multiple criteria (in our case, the benefits and risks associated with a coopetitor for innovation).

<sup>&</sup>lt;sup>1</sup> These contributions are in line with the previous research that argues that intentions can be used as a proxy for behavior. For example, studies on the so-called "intention-behavior gap" have shown that half of the people who intended to perform a certain behavior actually performed the behavior, while the other half did not for reasons such as lack of control over the behavior (Sheeran, 2002). However, despite the limitations stemming from this intention-behavior gap, the predictive ability of intention has been shown to be higher than many other indicators.

### P. Chiambaretto, et al.

### Table 1

Attributes and	levels	describing	potential	partners	for th	e conjoint	analysis.
			-	-			

Attributes	Levels	Text shown to the participants
Intensity of competition with the partner	Low Medium High	The intensity of competition with the partner means that the higher the level of competition, the greater the potential opportunism risks related to cooperation. If the intensity of competition with the partner is <b>high</b> , this means that you are largely selling the same products, are active in the same market and are competing for the same customers, which means that there is a risk of opportunism and that the partner can use the benefits of cooperation to compete with you. The situation is reversed if the intensity of competition with the partner is <b>low</b> . If the level of competition is <b>medium</b> , then you are partly in the same markets, selling the same products and feel that there is a moderate risk that your partner will act opportuniscially.
Time-to-market provided by the partner	Slow Normal Fast	Depending on your selected partner, it will take more or less time for you to bring the result of the cooperation to market. The time frame should be related to the time it would usually take to launch new products/services in your markets. This option is called <b>normal</b> . <b>Slow</b> means that it takes longer than usual, while <b>fast</b> means it takes less time than usual.
Degree of innovation novelty reached with this partner	Incremental Radical	A <b>radical</b> innovation refers to a product/service that is new to the market or uses completely new technology. An <b>incremental</b> innovation refers to an existing product or service that has been further developed or improved.
Level of risk assumed by the partner	Less than half Half More than half	The way in which the risk of a possible failure of the development of innovation is divided between your company and the partner may vary. If you share the risk equally, it is <b>half</b> . If your partner takes on over 50% of the project's risk, it is <b>more than half</b> , and if your firm takes on more of the risk, the partner will take <b>less than half</b> .
Cost reduction allowed by the partner	Low Medium High	If the collaboration means that your costs for the innovation are greatly reduced, the cost reduction is <b>high</b> . If the level of cost reduction cannot be considered strong but is still significant, it is regarded as <b>medium</b> . If the costs of innovation do not decrease significantly as a result of the collaboration, the cost reduction is <b>low</b> .
Learning opportunities from the partner	Low Medium High	By working with a partner, your company can learn things that you may find useful in other contexts. This opportunity to develop new useful knowledge and skills from cooperating with a partner can be <b>low</b> , <b>medium</b> or <b>high</b> .
Strategic importance of resources accessed through the partner	Low Medium High	One reason to work with a partner on an innovation project is to gain access to the partner's resources (such as technological expertise, market knowledge or equipment) for the innovation. If you need substantial resources and they are difficult to develop by yourself, the strategic importance of these resources can be categorized as <b>high</b> . If you need somewhat substantial resources and they are relatively difficult to develop, the strategic importance is <b>medium</b> . If the resources are something you can easily develop or replace, the resource's strategic importance is <b>low</b> .

### Attributes and coopetitor profiles

In CBC analyses, full profiles must be displayed, including all attributes. For example, a product or service is described by a set of attribute levels, and the participants are asked about their interest in these "complete" products or services (McCullough, 2002). The results are based on the trade-off between the chosen attributes that can be detected from a respondent's choices of one alternative over another. Selecting the right attributes is thus essential, as presenting more than six or seven attributes is not recommended (Green and Srinivasan, 1990; McCullough, 2002). Attributes should be selected based on the likelihood that they affect a respondent's choice; therefore, we chose attributes that have been identified in the previous research. The levels assigned to each attribute should reflect the different situations that the participants might expect to face in real life (Van Gils and Zwart, 2009).

Accordingly, to analyze partner selection related to coopetition for innovation, we had to characterize potential coopetitors using a set of attributes that were relevant to that type of situation and describe them in terms of levels. The following seven attributes were identified based on the above-described research investigating the benefits and risks of cooperating with competitors: (1) intensity of competition with the partner, (2) time-to-market provided by the partner, (3) degree of innovation novelty reached in collaboration with the partner, (4) level of risk assumed by the partner, (5) cost reduction allowed by the partner, (6) learning opportunities from the partner, and (7) strategic importance of resources accessed through the partner. Table 1 describes these different attributes and each of their levels; it also displays the text provided to the managers for the experiment. Finally, it is important to note that choice-based CA does not integrate control variables in the estimated models (Hsu et al., 2017).

## Decision situation and experimental design

Considering the total number of attributes and attribute levels, 1458 different potential coopetitor profiles must be compared. Comparing pairs of coopetitors, these 1458 profiles would require asking each manager to make 1,062,153 choices. This task would have been impossible for the participants to complete, and, therefore, we used XLStat to generate a simpler design that is D-optimal. D-optimal designs are the result of an optimization that consists of maximizing the determinant of the information matrix. Thus, this algorithm aims to maximize the quantity of information that can be extracted from the experiment. Several iterations are made by the algorithm until the highest Log(Determinant) is obtained. We used this design is our experiment/data collection. In our case, the D-

### P. Chiambaretto, et al.

### Table 2

Example of choice faced by a manager in the experiment.

	Partner alternative 1	Partner alternative 2
Intensity of competition with the partner	Low	High
Time-to-market provided by the partner	Slow	Normal
Degree of innovation novelty reached with the partner	Radical	Radical
Level of risk assumed by the partner	Half	More than half
Cost reduction allowed by the partner	Low	Low
Learning opportunities from the partner	Low	High
Strategic importance of resources accessed through the partner	High	Medium

optimal design yielded 15 profiles and 20 choices to be made (each choice being between 2 profiles).<sup>2</sup>

To participate in this experimental research design, the participants were first provided with a short description of the decision situation and the different attributes. The instructions asked the participants to imagine that their firm had decided to cooperate with a competitor to develop a new product or service. We then explained that they had not yet chosen a competitor with which to ally and that the experiment would be about understanding their choice of competitor-partner. The following text was then provided: *"The circumstances of your firm and the industry are the same as your current situation. The innovation project concerns the development of a product or service that would be relevant to your firm."* Subsequently, the managers were presented with coopetitor profiles, each representing a choice of coopetitor for the innovation project. An example of a choice is provided in Table 2. All managers were offered the same 20 choices (each choice was to be made between 2 profiles drawn among the 15 profiles generated by the D-optimal design). These choices were then used for the analysis.

## Analysis and estimations

To assess the relative importance of the different attributes (and levels) in partner selection using a CBC analysis design, we relied on a multinomial logit (MNL) model (Islam et al., 2007; Louviere et al., 2000). In this case, our dependent variable was the coopetitor chosen, while the independent variables were the coopetitor's attributes. The CBC analysis was structured around the idea that the coopetitor chosen by the focal firm would be the one that provides the highest level of utility. In a general choice context, we assumed that the overall utility V is a linear combination of the part-worth (or partial) utilities  $\beta$  of the attribute X and other product attributes Y (Eggers et al., 2016). The estimated part-worth utilities  $\beta$  indicate the attribute's effect (for a given level) on the utility associated with a coopetitor with these characteristics and, consequently, how this utility affects the probability of choosing this type of coopetitor. For each attribute, one of the levels was set as a "reference level" such that its utility was set at 0. For this attribute, the remaining estimated part-worth utilities  $\beta$  were thus comparisons with the "reference level," which allowed us to assess the additional utility provided by a change from one reference level to another reference level. To estimate the coefficients, we relied on the Maximum Likelihood Estimation, which is particularly relevant for investigating decisions at the individual level (Frischknecht et al., 2014). More precisely, we used the Newton-Raphson iterative method to estimate the parameters. After each iteration, the loglikelihood is calculated such that the iterations are continued until the maximum number of iterations is reached or the log-likelihood no longer increases. Once the part-worth utilities were estimated, two additional analyses were required.

First, we needed to assess the weight of a specific attribute in the decision process. In other words, we sought to measure the relative contribution of a given attribute in the decision process (Kraus et al., 2015). We evaluated the importance of an attribute by dividing the maximum difference of partial utility of the variable by the sum of maximum differences of the partial utilities for every variable. Second, we converted the relative utilities of two levels of the same attribute into another variable to highlight a potential trade-off (Chiambaretto et al., 2013). Because we focused our attention on the willingness to coopete, we converted the partial utilities of "intensity of competition with the partner." The goal of this conversion was to be able to state the following: "For attribute A, to switch from level a1 to level a2, I am willing to change the intensity of competition of my coopetitor by X points."

### Sample selection and data collection

Following the recommendations of Kraus et al. (2016) and Hsu et al. (2017) regarding sample selection, we wanted our respondents to be representative of the population studied as follows: entrepreneurs and managers working at firms involved in innovative activities. Thus, our dataset was constructed based on a list of 786 innovative Swedish firms with between 50 and 1000 employees and with patents. These firms were extracted from the Amadeus database edited by Bureau Van Dijk. Using the contact information from the database, the firms were contacted by telephone, and the purpose of the study was explained. Of the phone

<sup>&</sup>lt;sup>2</sup> D-optimal designs are relevant as they consider potential constraints (such as forbidden pairs or forbidden factor combinations) while minimizing the number of trials or resources to collect information. As a consequence, D-optimal designs are increasingly used in conjoint analyses (Kessels et al., 2006; Vermeulen et al., 2008; Goos et al., 2010). Simultaneously, the criteria of balance, orthogonality and minimum overlap are not always met in D-optimal designs. However, it appears that these criteria are far less important because the D-optimal design aims to extract as much information as possible from the experiment (and thus, the goals targeted by the criteria of balance, orthogonality and minimum overlap are already encompassed in its design).

#### P. Chiambaretto, et al.

## Long Range Planning xxx (xxxx) xxx-xxx

numbers on the list, 47 were invalid and an additional 92 firms could not be reached. We asked to speak to someone with insight into the firm's innovation or research work; then, to minimize the lack of external validity of our data collection, we asked how partners were selected and how alliances were made (Choi and Shepherd, 2004). The most frequent participants were R&D managers. There were also some CEOs, marketing directors, and other managers, including business unit managers and technical, administrative and sales/purchasing managers. Out of the 647 firms contacted, 206 (31%) declined to participate, usually due to a lack of time or the principle of not participating in studies. More than half of the firms that declined to participate or felt that they were not qualified to answer stated that they did not have any innovation/R&D activities, their innovation competencies were located abroad, or they did not cooperate to achieve innovation. We asked those that responded in the affirmative to participate in the study and sent them an email with information about the study, a guide describing the experiment and an explanation of the attributes, along with a link to the experiment. In total, 441 agreed to receive the email. However, of the emails sent, 39 bounced, which means that 402 had the opportunity to answer. We were able to collect responses from 70 managers/entrepreneurs, nine of which were incomplete. Ultimately, the study resulted in responses from 61 mangers/entrepreneurs, representing a 9.4% response rate (in terms of firms initially contacted) and a 15.2% response rate (in terms of firms that had the opportunity to complete the experiment). Considering that each manager had to make 20 choices, we were able to collect data based on 1220 partner selection decisions. These decisions are our unit of analysis in our investigation. With 1220 decisions investigated (made by 61 participants), our sample size is similar to that in other studies using CA (Choi and Shepherd, 2004; Drover et al., 2014; Eggers et al., 2016; Kraus et al., 2015; Lohrke et al., 2010; Wood & Williams, 2014).<sup>3</sup> We divided our sample into two subsamples, i.e., one subsample with decisions made by "small firms" and one subsample with decisions made by "large firms," as we sought to highlight the specificities of the benefits and risks valued by small and large firms coopeting for innovation. Based on traditional indicators such as the number of employees, we categorized firms with fewer than 250 employees as small firms, whereas the remaining firms were considered large (Ahire and Golhar, 1996; Ayyagari et al., 2007; McAdam and Reid, 2001). In our entire sample, 41 firms (67.2% of the respondents) had fewer than 250 employees and were classified as small firms, while the remaining 20 firms (32.8% of the respondents) were categorized as large firms. Accordingly, we obtained the following two subsamples: the first subsample included 820 partner selection decisions made by small firms (n = 820), while the second subsample encompasses 400 partner selection decisions made by large firms (n = 400). To ensure that these two subsamples are large enough, we calculated their statistical power (associated with our research design). We find a statistical power larger than 0.98 for the subsample of decisions made by small firms, and power equal to 0.79 for the subsample of decisions made by large firms, which is consistent with the standards required in research articles (Faul et al., 2009).

Finally, regarding the firms' alliance experiences, the average number of alliances managed was 6.35 (s.d. = 10.38). In total, 22 firms (36.1% of the respondents) declared that they spent less than 2.5% of their budget on R&D, 34 firms (55.8% of the respondents) invested between 2.5% and 7% of their budget in R&D, and 5 firms (8.1% of the respondents) invested more than 7% of their budget in R&D. However, our total sample was dominated by small firms, whose R&D activities could be difficult to identify as they are often conducted informally or outside dedicated units (Muscio, 2007).

## Analysis

## Analysis of partial utilities

The partial (or part-worth) utilities associated with each attribute and level are detailed in Table 3. As we explained earlier, the coefficient  $\beta$  indicates the attribute's effect on the utility associated with a coopetitor having these characteristics and thus how this utility affects the probability of choosing this type of coopetitor. For each attribute, we set the value of the coefficient  $\beta$  to 0 for one of the levels. For a given level, if the coefficient  $\beta$  is positive, it means that this specific level increases the likelihood of selecting a coopetitor with this level (compared to a coopetitor having the reference level for this attribute). In contrast, if the coefficient  $\beta$  is negative, a coopetitor that has this level for this given attribute has a lower chance of being selected (compared to a coopetitor that has the reference level for this attribute). Finally, the last two columns of Table 3 indicate the value of the Welsch-t statistic and the p-value for comparison of the coefficients of decisions made by small and large firms. In addition to Table 3, Fig. 1 provides a graphical illustration of the similarities and differences between small and large firms' decisions regarding each attribute.

In Table 3, we first consider the attribute "Intensity of competition with the partner." The reference level is set at "Low." Focusing on small firms, we note that the coefficient for the level "High" is negative and significantly different from zero ( $\beta = -1.168$ , p < 0.001). This result indicates that when coopeting, small firms are more likely to prefer a coopetitor with a lower intensity of competition. Regarding large firms, we show that the coefficient for the level "High" is negative and significantly different from zero ( $\beta = -1.396$ , p < 0.001). Comparing small and large firms, we show that the difference between the two values is positive and significantly different from zero ( $\beta = -1.396$ , p < 0.001). Comparing small and large firms, we show that the difference between the two values is positive and significantly different from zero (Welsch-t = 20.324, p < 0.001). This means that smaller firms, when selecting a competitor as a partner, are less negatively affected by a high level of competition with that coopetitor than large firms. This provides support for Hypothesis 1.

Then, we consider the coefficients for the attribute "Time-to-market provided by the partner." The reference level is set at "Slow." For small firms, we note that the coefficient for the level "Fast" is positive and significantly different from zero ( $\beta = 0.815$ , p = 0.002). This result confirms that when coopeting, small firms are more likely to cooperate with a coopetitor that provides faster

<sup>&</sup>lt;sup>3</sup> Most studies published in top-tier journals using CA with respondents that are managers or entrepreneurs have a sample size with the following characteristics: number of respondents between 50 and 120 and number of decisions between 330 and 1800.

### P. Chiambaretto, et al.

### Table 3

Partial utilities of partner selection decisions made by small and large firms.

Dependent variable	Partner se	lected								
	Decisions made by small firms			Decisions made by large firms			Small versus large firms			
Attributes and levels	β		Standard error	$\Pr > Khi^2$	β		Standard error	$\Pr > Khi^2$	Welsch-t	P-value
Intensity of competition w	with the part	tner								
Low	0				0					
Medium	-0.186		0.155	0.229	-0.661	***	0.224	0.003	38.181	< 0.001
High	-1.168	***	0.138	< 0.001	-1.396	***	0.202	< 0.0001	20.324	< 0.001
Time-to-market provided	by the partr	ner								
Slow	0				0					
Medium	0.564	***	0.154	< 0.001	0.648	***	0.218	0.003	-6.895	< 0.001
Fast	0.815	***	0.265	0.002	1.075	***	0.385	0.005	-12.170	< 0.001
Degree of innovation nov	elty reached	l with	this partner							
Incremental	0				0					
Radical	0.214		0.159	0.179	0.461	**	0.226	0.041	-19.60	< 0.001
Level of risk assumed by	the partner									
Less than half	0				0					
Half	0.313	*	0.185	0.091	0.452	*	0.260	0.082	-9.594	< 0.001
More than half	0.564	***	0.154	< 0.001	0.509	**	0.220	0.021	4.553	< 0.001
Cost reduction allowed by	y the partne	r								
Low	0				0					
Medium	0.639	***	0.208	0.002	0.750	**	0.311	0.016	-6.505	< 0.001
High	0.888	***	0.199	< 0.001	0.927	***	0.277	0.001	-2.534	0.011
Learning opportunities fro	om the partr	ner								
Low	0				0					
Medium	0.126		0.197	0.523	0.100		0.278	0.720	1.707	0.088
High	0.866	***	0.166	< 0.001	0.819	***	0.236	0.001	3.567	< 0.001
Strategic importance of resources accessed through the partner										
Low	0				0					
Medium	-0.046		0.165	0.781	0.031		0.250	0.901	-5.578	< 0.001
High	-0.484	*	0.287	0.092	-0.067		0.426	0.874	-17.668	< 0.001
Number of observations	820				400					
R <sup>2</sup> (Nagelkerke)	0.175				0.177					

p < 0.1; \*p < 0.05; \*\*p < 0.01.

time-to-market. For large firms, we observe that the coefficient for the level "Fast" is also positive and significantly different from zero ( $\beta = 1.075$ , p < 0.001). Therefore, large firms also prefer a coopetitor that provides a faster time-to-market. Finally, when comparing the values of the coefficients for small and large firms, we note that the difference between the two values is significantly different from zero (Welsch-t = -12.170, p < 0.001); however, contrary to our expectation, it is negative. This means that large firms place greater value on a coopetitor that provides faster time-to-market than smaller firms. We therefore reject Hypothesis 2.

Continuing with the attribute "Cost reduction allowed by the partner," the reference level is set at "Low." For small firms, we reveal that the coefficient for the level "High" is positive and significantly different from zero ( $\beta = 0.888$ , p < 0.001). This result suggests that when coopeting, small firms are more likely to cooperate with a coopetitor that provides higher cost-reduction opportunities. For large firms, we show that the coefficient for the level "High" is positive and significantly different from zero ( $\beta = 0.927$ , p = 0.001). Regarding the comparison between small and large firms, we note that the difference between the two values is not only significantly different from zero (Welsch-t = -2.534, p = 0.011) but also negative. This result means that large firms value coopetitors that provide high cost-reduction opportunities more than smaller firms. We therefore reject Hypothesis 3.

Regarding the attribute "Level of risk assumed by the partner," the reference level is set at "Less than half." For small firms, we show that the coefficient for the level "More than half" is positive and significantly different from zero ( $\beta = 0.564$ , p < 0.001). We can thus conclude that when coopeting, small firms are more likely to cooperate with a coopetitor that provides higher risk-sharing opportunities. With respect to large firms, we also note that the coefficient for the level "More than half" is positive and significantly different from zero ( $\beta = 0.509$ , p = 0.021), confirming the same preferences for large firms. Comparing small and large firms, we note that the difference between the two values is positive and significantly different from zero (Welsch-t = 4.553, p < 0.001). This result means that smaller firms value risk-sharing opportunities more than large firms, which provides support for Hypothesis 4.

Concerning the attribute "Degree of innovation novelty reached with this partner," the reference level is set at "Incremental." For small firms, we observe that the coefficient for the level "Radical" is positive but not significantly different from zero ( $\beta = 0.214$ ,

### P. Chiambaretto, et al.

Long Range Planning xxx (xxxx) xxx-xxx



Fig. 1. Partial utilities associated with different coopetitors' attributes for small and large firms.

p = 0.179). Consequently, we cannot say that small firms are more likely to cooperate with a coopetitor that provides higher innovation radicalness opportunities. In contrast, for large firms, we note that the coefficient for the level "Radical" is positive and significantly different from zero ( $\beta = 0.461$ , p = 0.041). Accordingly, we can confirm that large firms prefer coopetitors that provide higher innovation radicalness opportunities. Comparing small and large firms, we show that the difference between the two values is negative and significantly different from zero (Welsch-t = -19.60, p < 0.001). This means that small firms value a coopetitor that provides high innovation radicalness opportunities less than large firms, which provides support for Hypothesis 5.

Shifting to the attribute "Learning opportunities provided by the partner," the reference level is set at "Low." Focusing on small firms, we note that the coefficient for the level "High" is positive and significantly different from zero ( $\beta = 0.866$ , p < 0.001). We can therefore say that when coopeting, small firms are more likely to cooperate with a coopetitor that provides more learning opportunities. In parallel, for large firms, we note that the coefficient for the level "High" is positive and significantly different from zero ( $\beta = 0.819$ , p < 0.041), suggesting that the same preference is observed for large firms. Analyzing potential differences between small and large firms, we show that the difference between the two values is positive and significantly different from zero (Welsch-t = 3.567, p < 0.001). This means that smaller firms value a coopetitor that provides significant learning opportunities more than large firms. We therefore find support for Hypothesis 6.

Concerning the attribute "Strategic importance of resources accessed through the partner," the reference level is set at "Low." Focusing on small firms, we note that the coefficient for the level "High" is negative and significantly different from zero ( $\beta = -0.484$ , p = 0.092). This surprising result suggests that when coopeting, small firms prefer cooperating with a competitor whose resources are not too strategic. For large firms, the results are also indeterminate because the coefficient for the level "High" is not significantly different from zero ( $\beta = -0.067$ , p = 0.874). Comparing small and large firms, we show that the difference between the two values is negative and significantly different from zero (Welsch-t = -17.668, p < 0.001). This means that smaller firms value a coopetitor that provides access to highly strategic resources less than large firms. We therefore reject Hypothesis 7.

### The relative importance of coopetitor attributes

We also want to measure the relative contribution of the different attributes to the partner selection process. To do so, we divide the maximum difference of the partial utility of a variable by the sum of the maximum differences of the partial utilities for every variable. The relative importance of an attribute is always a positive number such that even for an attribute that contributes negatively to the attractiveness of a potential coopetitor (i.e., it reduces the likelihood of choosing this coopetitor), its value will still be positive. This operation yields the information presented in Table 4 and in Fig. 2. The pie charts in Fig. 2 represent the weight of each attribute in the partner selection decision.

First, the attribute *intensity of competition with the partner* is the most important attribute in the partner selection process for both small and large firms. This attribute accounts for more than 26% of the utility variation in partner selection for large firms and more than 23% for small firms, indicating that small firms are less reluctant than large firms to coopete. The strong importance of this attribute for both small and large firms can be explained by the fact that it is the only attribute in our experimental design that measures the risks provided by a coopetitor. However, small and large firms differ significantly with respect to the rest of the attributes.

### P. Chiambaretto, et al.

## Table 4

Relative importance of partner's attributes in the partner selection decisions made by small and large firms.

Attributes	Importance	Importance		
	Small firms	Large firms		
Intensity of competition with the partner	23.367%	26.411%		
Time-to-market provided by the partner	16.298%	20.342%		
Degree of innovation novelty reached with this partner	4.287%	8.719%		
Level of risk assumed by the partner	11.289%	9.263%		
Cost reduction allowed by the partner	17.765%	17.547%		
Learning opportunities from the partner	17.319%	15.494%		
Strategic importance of resources accessed through the partner	9.674%	1.864%		
Total	100%	100%		



Fig. 2. Relative importance of coopetitors' attributes in the partner selection decision for small and large firms.

For small firms, we observe three attributes that make very similar contributions to the decision process: *Cost reduction allowed by the partner* (17.77%), *Learning opportunities from the partner* (17.32%) and *Time-to-market provided by the partner* (16.30%). In the previous empirical studies, these three attributes are quite common motives for selecting a coopetitor with which to innovate. Together, these three attributes account for more than 50% of the utility variation in the partner selection process. The following two additional attributes have a higher level of importance of close to 10%: *Level of risk assumed by the partner* (11.30%) and *Strategic importance of resources accessed through the partner* (9.67%). Finally, the remaining attribute is the *Degree of innovation novelty reached with this partner* (5.31%).

For large firms, the importance of the attributes is very different and reveals their priorities. A key attribute for them appears to be *Time-to-market provided by the partner*, which accounts for 20.34% of the utility variation. The two following attributes have values close to 15%: *Cost reduction allowed by the partner* (17.55%) and *Learning opportunities from the partner* (15.49%). Another set of three attributes with values close to 10% are to be taken into account: *Level of risk assumed by the partner* (9.26%) and *Degree of innovation novelty reached with the partner* (8.72%). Finally, the following attribute makes a marginal contribution to the partner selection process: *Strategic importance of resources accessed through the partner* (1.86%).

## Measurement of willingness to coopete

One of the benefits of the CBC analysis is its ability to highlight the trade-off between the various attributes that characterize the coopetitor (Lohrke et al., 2010; Mensching et al., 2016). By converting the relative utilities of two levels of the same attribute into another variable, we can investigate the trade-off between the additional risks created by a higher intensity of competition with a given coopetitor and the benefits that can be obtained through the agreement with that specific coopetitor. We focus our attention on the willingness to coopete and convert our partial utilities into "intensity of competition with the partner." To do so, we follow the

### P. Chiambaretto, et al.

### Table 5

Measurement of the willingness to coopete to access additional benefits for small and large firms.

Attribute and level variation	Number of additional points on the "intensity of competition" scale accepted by the focal firm to change the level of the attribute			
	For small firms	For large firms		
Time-to-market provided by the partner (from slow to fast)	+69.04	+91.09		
Degree of innovation novelty reached with this partner (from incremental to radical)	+18.16	+ 39.04		
Level of risk assumed by the partner (from less than half to more than half)	+ 47.82	+ 43.09		
Cost reduction allowed by the partner (from low to high)	+75.25	+78.58		
Learning opportunities from the partner (from low to high)	+73.36	+69.38		
Strategic importance of resources accessed through the partner (from low to high)	- 40.98	-5.71		

steps below for the two samples of small and large firms (we use the sample of small firms as our example when describing the steps).

- (1) For the variable *intensity of competition with the partner*, we take the maximum and minimum partial utility values. The highest value is reached for "Low" ( $\beta = 0$ ), and the lowest value is reached for "High" ( $\beta = -1.168$ ). Consequently, the range in terms of partial utility variation for the attribute "intensity of competition with the partner" is 1.168 (=0- (-1.168)).
- (2) We state that *intensity of competition with the partner* can be measured on a scale from 1 to 100. A rating of 1 on this scale for a potential coopetitor means that the intensity of competition of this potential coopetitor with the focal firm is very low ( $\beta = 0$ ). In contrast, when a coopetitor is rated 100 on this scale, the intensity of competition of this potential coopetitor with the focal firm is very high ( $\beta = -1.168$ ). Thus, by considering the range in terms of the partial utility variation we calculated above, we can convert partial utilities into points on this scale of competition (from 1 to 100). More precisely, we can say that when a coopetitor sees its "intensity of competition" grade change from N to N+1 (on a scale from 1 to 100), it generates a loss of utility for the focal firm of 0.0118 units (=1.168/(100-1)).
- (3) Knowing this conversion rule (from partial utilities to "intensity of competition"), we can measure the trade-offs between a given benefit and the intensity of competition. For each attribute and level, we have observed partial utility variations. Consequently, we can convert them and measure them on the *intensity of competition* scale. Using the example of the attribute *time-to-market*, a coopetitor offering the possibility of creating a project with a fast time-to-market will be associated with a partial utility  $\beta = 0.815$ . In contrast, a coopetitor offering a slow time-to-market will generate a partial utility  $\beta = 0$ . In other words, all else being equal, switching from a coopetitor that offers a slow time-to-market to a coopetitor that offers a fast time-to-market generates a gain of 0.815 units of utility. To highlight the trade-off between the different attributes, we must analyze coopetitors based on a fixed level of utility. Stated differently, the utility gain in terms of time-to-market must be compensated by the same level of utility loss on another attribute. In our case, the other attribute is the *intensity of competition with the partner*. Because improving time-to-market generates a gain of 0.815 utility units, we must lose 0.815 utility units on the "intensity of competition" attribute. Knowing that a reduction of 1 utility unit implies an increase of 84.75 (=1/0.0118) points on the intensity of competition scale, we can say that to compensate for the gain of 0.815 utility units, the focal firm is willing to cooperate with a firm that is 69.04 (=0.815/0.0118) points higher on the competition scale than initially planned by the focal firm. We can thus state that, *ceteris paribus*, to change the level of time-to-market associated with the coopetitor from slow to fast, the focal firm is willing to increase the intensity of competition of its coopetitor by 69.04 points (on a scale from 1 to 100).
- (4) We then apply the same reasoning to all the other attributes. This yields the results in Table 5 for small and large firms, also illustrated in Fig. 3. The values in Table 5 can be read as follows: *Ceteris paribus*, to change the level of time-to-market associated with the coopetitor from slow to fast, a small firm is willing to increase the intensity of competition of its coopetitor by 69.04 points.

We find that small and large firms present very different profiles in terms of willingness to coopete.<sup>4</sup> We show that small firms are quite willing to coopete if it allows them to either reduce their costs (+75.25 pts) or learn from the coopetitor (+73.36 pts). Developing products faster (+69.04 pts) and sharing risks with a coopetitor (+47.82 pts) are also benefits that make small firms willing to accept higher levels of competition. Furthermore, being able to develop radical innovation with a coopetitor (+18.16 pts) is less valued by small firms. Finally, and paradoxically, having access to strategic resources is a negative point for small firms, which requires a reduction of the level of competition with the target coopetitor (-40.98 pts).

<sup>&</sup>lt;sup>4</sup> The conversion leading to the measure of the "willingness to coopete" was performed using the "intensity of competition" attribute as a reference. Accordingly, in Table 5 and Fig. 3, only the six remaining attributes are listed and converted to be able to measure the number of additional points on the "intensity of competition" scale accepted by the focal firm to change the level of a given attribute (from low to high, for instance). Thus, the "intensity of competition" attribute does not appear in Table 5 and Fig. 3. The order of the remaining attributes remains the same as in Table 4.

### P. Chiambaretto, et al.



Fig. 3. Measurement of the willingness to coopete to access additional benefits for small and large firms.

Focusing on large firms, the most important attribute for them is the ability to reduce the time-to-market (+91.09 pts); however, they also value the cost-reduction potential provided by a coopetitor (+78.58 pts) and the learning opportunities that stem from the coopetitive relationship (+69.38 pts). To a lesser extent, large firms value the ability of a coopetitor to share risks (+43.09 pts) and to develop more radical innovations (+39.04 pts). However, similar to small firms, to access strategic resources, large firms require a reduction (but to a much lower extent than small firms) in the level of competition with the target coopetitor (-5.71 pts).

### Discussion and concluding remarks

### Interpretation of the findings

The valuation and importance of coopetitors' attributes by small and large firms

Our analysis confirms that many of the benefits that have previously been identified in the literature on the drivers of coopetition strategies are highly valued by small firms (Table 3 and Fig. 1). However, in contrast to our expectation, small firms do not value the ability to develop more radical innovations as highly as large firms do, and they even place negative value on gaining access to the strategic resources of a coopetitor. Regarding innovation radicalness, we expected small firms to highly value the benefit, although the necessary management of coopetition to develop radical innovations is complex and costly (Fernandez et al., 2018a, b; Granata et al., 2018; Le Roy and Czakon, 2016). Our results indicate that such joint projects might be too difficult to implement for small firms. Furthermore, small firms evaluate the possibility of gaining access to strategic resources through coopetition as negative for them, although they usually see alliances and coopetition as a way to obtain access to resources through a coopetitor would place them in a vulnerable situation as they can become highly dependent upon a larger coopetitor's resources (Baumard, 2018; Hora et al., 2018) or become locked into the partners' structure (Bengtsson and Johansson, 2014). With regard to the importance placed by small firms on the different attributes (Table 4 and Fig. 2), we show that the most important attribute is intensity of competition, followed by cost reduction and learning opportunities. The ability to develop products more rapidly and the opportunity to share risks with a coopetitor on an innovative project are important to a lesser extent.

In contrast, large firms present a different profile in terms of their valuation of coopetitors' attributes. Starting first with the partial utilities (Table 3 and Fig. 1), large firms value all the attributes listed in the experiment positively except for intensity of competition and access to strategic resources. In line with the literature on coopetition strategies, large firms tend to value coopetitors that provide shorter time-to-market (Yami & Nemeh, 2004), offer cost-reduction opportunities (Dussauge et al., 2000) and provide the possibility of sharing risks (Gnyawali and Park, 2011;Ritala, 2012) and a potential to develop radical innovations (Bouncken and Fredrich, 2012) while offering interesting learning opportunities (Estrada et al., 2016; Fernandez and Chiambaretto, 2016). However, large firms do not value coopetitors that offer access to strategic resources; it seems that this is not a priority for them or a reason to coopete. Table 4 and Fig. 2 provide a comparison of these different attributes, showing their relative importance for large firms. The previous research has shown that these attributes are important; however, our study adds to the understanding by showing the order in which the different attributes are valued. When looking for a coopetitor, a large firm will first consider the risks associated with

## P. Chiambaretto, et al.

coopetition and will then prioritize coopetitors that offer a short time-to-market, can reduce costs and offer learning opportunities. Then, in a second step, it will value coopetitors that are willing to share risks and have the ability to develop radical innovations.

### Similarities and differences between small and large firms' valuation of coopetitors' attributes

We also highlight the similarities and differences between small and large firms when examining the importance of these attributes in the partner selection decision. Starting with intensity of competition, we note that small firms are less reluctant to coopete than large firms, (26.41% versus 23.36%), which validates Hypothesis 1. We see two plausible explanations for this result. First, small firms' size and their must complement their knowledge, and resources might force them choose to be involved in riskier collaborations such as coopetition to a greater extent than large firms. Second, the entrepreneurial orientation of small firms might make them more willing to take the risks associated with uncertain projects (Covin and Slevin, 1989; Naldi et al., 2007). Because small firms are more vulnerable to failures or market uncertainty, they are more willing to rely on risky strategies such as coopetition to survive in hostile environments (Bonel and Rocco, 2007; Lee et al., 2012; Thomason et al., 2013). In contrast, as they grow, large firms tend to become more inward looking and ignorant of external knowledge (Levinthal & March 1993), making them less willing than small firms to assume the risks of coopetition.

Furthermore, we show that small firms value the ability to share risks (11.28% versus 9.26%) and the learning opportunities provided by coopetition (17.31% versus 15.49%) more than large firms. These differences were also tested, leading to the validation of Hypotheses 4 and 6. With respect to risk sharing, we explain these results by the fact that large firms have more internal resources than small firms and can therefore protect themselves from the consequences of project failure, whereas smaller firms remain far more vulnerable (Gomes-Casseres, 1997; Yang et al., 2014). Consequently, small firms will value coopetitors that are willing to share risks more than large firms. With respect to learning opportunities, small firms' limited internal resources and knowledge reduce the potential for innovation. Thus, they rely on coopetition to obtain access to additional knowledge or technologies they cannot develop internally (Balestrin et al., 2008; Gomes-Casseres, 1997; Lee et al., 2010). By contrast, larger firms can use their own financial and human resources to develop new knowledge internally (Grigoriou and Rothaermel, 2017; Wuyts and Dutta, 2014). This explains why small firms value coopetitors that provide significant learning opportunities more than large firms.

In contrast, compared with small firms, large firms place greater value on coopetitors that provide shorter time-to-market, higher cost-reduction opportunities, and more radical innovation potential. Regarding time-to-market and the cost-reduction potential, we actually expected small firms to value coopetitors that provide these benefits more than large firms such that we rejected Hypothesis 2. Regarding time-to-market, even if small firms have a shorter time horizon than large firms, some studies have shown that reducing time-to-market for a new product can also increase the risk of failure (Afonso et al., 2008). Because small firms are more vulnerable to the risk of failure than large firms, this can explain why small firms might not value the time-to-market attribute as much as large firms. Furthermore, even if large firms have the potential to develop innovations alone, they will rely on alliances and coopetition when they do not have sufficient time to develop a given innovation internally; thus, they value the reduction in time-to-market (Castañer et al., 2014; Nemeh, 2018). With respect to cost-reduction opportunities, our test of the differences between coefficients led us to reject Hypothesis 3. We could argue that small firms may have an incentive to seek a coopetitor that provides them with the opportunity to save the limited amount of resources they can invest in a project. However, some scholars have also highlighted that small firms tend to adopt "niche strategies" in which market positioning and the ability to deliver a tailor-made solution is as important as (or even more important) than the cost structure (Qian and Li, 2003; Verhees and Meulenberg, 2004). In parallel, larger organizations have broader ambition because they want to address various customer segments, which leads them to value the costreduction potential of a coopetitor (Gomes et al., 2016). Finally, concerning the degree of innovation, we show that large firms value the innovation radicalness provided by a coopetitor more than small firms, which validates Hypothesis 5. This can be explained through the inherent complexity associated with the development of radical innovations in a coopetition context. Only large firms have sufficient resources to implement the proper management of coopetition for radical innovation (Fernandez et al., 2018a, b; Granata et al., 2018; Le Roy and Fernandez, 2015).

## Small and large firms' willingness to coopete for innovation

Because small and large firms prioritize the attributes of a coopetitor in an innovation project differently, we expect different values in their willingness to coopete. However, it has been suggested that all firms tend to value the main benefits associated with coopetition strategies similarly (Ritala, 2009). In Table 5 and Fig. 2, we observe that small and large firms have quite a similar "willingness to coopete" for several attributes. Small and large firms will agree to coopete if it allows them to reduce costs (+78.58 pts for large firms and +75.25 pts for small firms). Both types of firms value learning opportunities quite similarly (+68.38 pts for large firms and +73.36 pts for small firms) and the ability to share risks (+43.09 pts for large firms and +47.82 pts for small firms).

In contrast, for the three remaining attributes, we observe very important differences between small and large firms. We first highlight that large firms are much more willing than small firms to coopete if it allows them to reduce the time-to-market of their new products (+91.09 pts for large firms and +69.04 pts for small firms). In parallel, we show that large firms seek more radical innovations than small firms and are therefore more willing to coopete to develop radical innovations (+39.04 pts for large firms and +18.16 pts for small firms).

Finally, we expected a positive trade-off between the intensity of competition and the strategic importance of resources accessed through the partner; however, surprisingly our results show the contrary. The strategic importance of resources has a negative trade-off with intensity of competition for all firms but especially for small firms (-5.71 pts for large firms and -40.98 pts for small firms). This suggests that if the resources to which the coopetitor could provide access are strategically important for the firm, the focal firm

P. Chiambaretto, et al.



Fig. 4. Ranking of key attributes in the selection of a coopetitor for innovation: similarities and differences between large firms.

sees that as a risk rather than a benefit. If a coopetitor provides resources that are highly strategic and not easily substitutable, the focal firm becomes more dependent on the coopetitor (Baumard, 2018; Hora et al., 2018). This could be especially dangerous for small firms as they can become overly dependent on- or even locked into that coopetitor's value chain (Baum et al., 2000; Bengtsson and Johansson, 2014; Vandaie and Zaheer, 2014).

Comparing all these elements, we can rank the key attributes that are sought out by small and large firms when looking for a coopetitor for innovation (Fig. 4). We observe that small and large firms present differences regarding the first three attributes. Small firms look for a coopetitor that offers cost-reduction opportunities in priority, while large firms place more value on the reduction in time-to-market provided by the coopetitor. However, the ranking of the remaining attributes (but not necessarily the valuation of these attributes) by small and large firms is quite similar. This result may encourage more discussion between the literature on coopetition in SMEs and the literature on large firms to more deeply investigate not only these firms' differences but also their similarities (Näsholm et al., 2018).

### Contributions to the literature

First, our study contributes to the literature on coopetition and innovation (Ritala, 2012; Bouncken and Kraus, 2013; Le Roy et al., 2016) and, more precisely, the emerging literature regarding the partner selection process for innovation. The previous studies on partner selection in coopetition (Akdogan et al., 2015; Alves and Meneses, 2015; Kraus et al., 2018) have identified some partner- and relationship attributes but have not studied how the benefits and risks are jointly assessed when selecting a coopetitor. We extend their conclusions not only by identifying but also by ranking the expected benefits sought by small and large firms when they cooperate with a competitor.

Second, based on our experimental approach, we have also been able to analyze the trade-off between the additional benefits and risks generated by a higher intensity of coopetition. Although a few studies in the partner selection research have acknowledged the trade-off between different selection criteria that are linked to cooperation such as trust and commitment, no study has examined managers' reasoning regarding the dilemma of the additional risks involved due to competition. Experimental research designs such as the conjoint method are required to reveal the preferences in how decisions are made (Van Gils and Zwart, 2009). Consequently, this research is the first study to clearly show how firms balance the intensity of competition to gain access to specific benefits. Taking the risk into account is a contribution to the research on partner selection, which has neglected this issue and focused on the criteria that facilitate cooperation.

Third, our findings also contribute to the coopetition research as they give an indication of the level of pressure from competition that firms are willing to accept when they ally with a competitor with specific motives. The coopetition research has shown that the combination of high levels of cooperation and competition is most beneficial for performance outcomes but that too high levels of cooperation and competition, or both, is negative (Bengtsson et al., 2016a, b; Park et al., 2014). For example, when firms ally to

### P. Chiambaretto, et al.

reduce the time-to-market to learn from the partner or to reduce costs, they are willing to accept stronger pressure from competition. However, if the level of competition becomes too strong, it may prevent a firm from cooperating with that competitor to gain access to these advantages. It also indicates that it might be even more important to develop a specific coopetition capability to manage the tensions that can be expected in such an alliance (Bengtsson et al., 2016, in press; Gnyawali et al., 2016). In contrast, if the motives are to share risks and to develop radical innovation, the willingness to accept high levels of competition pressure is lower, and it would be interesting to study if the pressure becomes too low in such alliances to realize the full potential of the coopetition.

Fourth, we contribute to the growing research on small firms' coopetition strategies by underscoring the specificities of partner selection for coopetition for small and large firms, we extend the limited literature on coopetition and small firms (Näsholm et al., 2018). We reveal that small and large firms present some similarities but also significant differences in terms of preferences when looking for a coopetitor with which to innovate (Morris et al., 2007). Our main conclusion is that small firms are generally less reluctant to coopete than large firms. Comparing small and large firms, we show that small firms value coopetitors that offer strong risk-sharing and learning opportunities more than large firms. In contrast, large firms value competitors that offer shorter time-to-market, significant cost-reduction and innovation radicalness opportunities more than small firms.

Finally, from a methodological standpoint, this research contributes to the emerging and developing research stream that uses CA to investigate different topics in the strategic management and interorganizational research (Patzelt and Shepherd, 2008; Van Gils and Zwart, 2009). More precisely, within this literature, we contribute to the recent research that uses CBC analysis to investigate firms' decision-making process (Lefebvre et al., 2014; Eggers et al., 2016; Mensching et al., 2016). We show that analyzing choices instead of rating different profiles provides relevant knowledge about how firms make decisions and choose between different alternatives by revealing their preferences. Furthermore, we go beyond the contributions in this field by actually assessing the trade-off between the different attributes by calculating a "conversion rate" between the attributes. Based on that conversion rate, our analysis allows us to measure the willingness to coopete depending on the value of the benefits provided by the coopetitor.

### Managerial implications

Our findings have important implications for managers involved in innovation activities in small and large firms. This study highlights the partner selection process in coopetition and contributes to making small and large firms more aware of what is at stake when they select a coopetitor with which to innovate. Our results contribute to guiding managers in making the trade-off between the risks of opportunistic behavior related to intense competition and the possible benefits provided by a coopetitor. The results also highlight the importance of evaluating the risk of increased dependency on the coopetitor. More broadly, by improving the partner selection process, we expect our findings to contribute to improving small and large firms' innovation performance.

## Conclusion

Small and large firms widely rely on coopetition strategies to foster their innovation processes. However, coopetition can be a double-edged sword, not only providing major benefits but also creating numerous additional risks (Bouncken and Kraus, 2013; Ritala and Hurmelinna-Laukkanen, 2013). Although benefits and risks in coopetitive relationships have received significant attention as separate issues (Gnyawali and Park, 2009), we have little knowledge regarding how small and large firms jointly assess the benefits and risks provided by a coopetitor for innovation purposes. Highlighting the similarities and differences between small and large firms provides a clearer vision of the benefits that are sought by these firms and acknowledges why these coopetition agreements must be managed and why they perform differently (Granata et al., 2018; Näsholm et al., 2018).

Our research shows that small and large firms value benefits differently when they decide to innovate with a coopetitor. We show that small firms are usually less reluctant to coopete than large firms, especially if it allows them to reduce their costs and learn from their coopetitors. In contrast, we show that large firms accept a higher intensity of competition if doing so allows them to reduce their time-to-market as a first priority, followed by their costs.

However, this study has limitations that offer interesting perspectives for further studies. Regarding our theoretical approach, although we investigated a partner selection process in coopetition for innovation, we adopted a broad definition of innovation. Depending on the type of innovation targeted by firms (e.g., technical innovation or business model innovation), the drivers and thus the respective attributes might differ (Ritala and Sainio, 2014). Second, because coopetition strategies generate various types of tensions depending on the project's characteristics (Fernandez et al., 2018a, b), it might be relevant to better characterize the risks associated with the coopetitive projects to determine how they affect the partner selection process carried out by small and large firms. Third, dividing firms into two categories (small versus large firms) can be considered slightly simplistic. A more fine-grained division of firms (according to their size or other dimensions) could provide further interesting results regarding the partner selection process. Finally, future studies could investigate how the similarities and differences in preferences highlighted in this research could influence the actual selection of different coopetitors and the management of these coopetitive relationships.

Regarding the method used, there are also limitations, although CBC analysis is closer to a real decision-making process than metric or ranking CA. First, CA requires researchers to know a priori the most important attributes and their levels in terms of how they affect the participants' decisions (Lohrke et al., 2010; Lefebvre et al., 2014). Consequently, the method does not allow researchers to investigate other attributes that might be equally or even more important. Second, the participants are forced to select a coopetitor for innovation based on only a few limited attributes, creating the possible risk that the participants attach importance to attributes that they would not have considered important in a "real-life" situation only because they were presented in the experiment. Third, because the participants in our experiments were managers or entrepreneurs, we were limited by the number of

### P. Chiambaretto, et al.

respondents (61 in total) and decisions analyzed (1220 in total). While we already have a sufficient statistical power, increasing the size of our sample (especially by having more decisions made by large firms) could allow us to confirm and strengthen the validity of our results. Fourth, as explained by Lohrke et al. (2010), research in the field of experimental economics has revealed that when experiments lack true incentives to motivate behavior, the participants may not want to reveal their true judgments, resulting in unreliable data (Smith and Walker, 1993). Fifth, because the CA protocol is quite repetitive, it is often noted that the participants may experience a significant level of fatigue and may not remain focused during the entire length of the experiment (Hsu et al., 2017). To avoid this issue, other CA techniques such as ACA could be used, and some contributions have already shown ACA's relevance to studying managers' decisions (Van Gils and Zwart, 2009; Wuebker et al., 2015). Nevertheless, despite these limitations, our findings have broadened our understanding of the similarities and differences between small and large firms' preferences when looking for a coopetitor with which to innovate.

### References

- Afonso, P., Nunes, M., Paisana, A., Braga, A., 2008. The influence of time-to-market and target costing in the new product development success. Int. J. Prod. Econ. 115 (2), 559–568. https://doi.org/10.1016/j.ijpe.2008.07.003.
- Agarwal, R., Gort, M., 2002. Firm and product life cycles and firm survival. Am. Econ. Rev. 92 (2), 184–190. https://doi.org/10.1257/000282802320189221.
- Ahire, S.L., Golhar, D.Y., 1996. Quality management in large vs small firms. J. Small Bus. Manag. 34 (2), 1.
- Ahuja, G., 2000. The duality of collaboration: inducements and opportunities in the formation of interfirm linkages. Strat. Manag. J. 21 (3), 317–343. 3 < 317::AID-SMJ90 > 3.0.CO;2-B. https://doi.org/10.1002/(SICI)1097-0266(200003)21.
- Akdogan, A.A., Dogan, N.Ö., Cingöz, A., 2015. Coopetition as a business strategy: determining the effective partner selection criteria using fuzzy AHP. Int. Rev. Manag. Bus. Res. 4 (1), 137.
- Aldrich, H., Auster, E., 1986. Even dwarfs started small: liabilities of age and size and their strategic implications. Res. Organ. Behav. 8, 165–198.
- Alves, J., Meneses, R., 2015. Partner selection in co-opetition: a three step model. Res. Mark. Enterpren. 17 (1), 23–35. https://doi.org/10.1108/JRME-10-2014-0026. Ayyagari, M., Beck, T., Demirguc-Kunt, A., 2007. Small and medium enterprises across the globe. Small Bus. Econ. 29 (4), 415–434. https://doi.org/10.1007/s11187-006-9002-5.
- Bae, J., Gargiulo, M., 2004. Partner substitutability, alliance network structure and firm profitability in the telecommunications industry. Acad. Manag. J. 47 (6), 843–859. https://doi.org/urn:nbn:nl:ui:12-148536.

Balestrin, A., Fayard, P., Vargas, L.M., 2008. Knowledge creation in small-firm network. J. Knowl. Manag. 12 (2), 94–106. https://doi.org/10.1108/13673270810859541.

- Baum, J.A.C., Calabrese, T., Silverman, B.S., 2000. Don't go it alone: alliance network composition and startups' performance in Canadian biotechnology. Strat. Manag. J. 21 (3), 267–294. 3 < 267::AID-SMJ89 > 3.0.CO;2-8. https://doi.org/10.1002/(SICI)1097-0266(200003)21.
- Baumard, P., 2010. Learning in coopetitive environments. In: Yami, S., Castaldo, S., Dagnino, G.B., Le Roy, F. (Eds.), Coopetition: Winning Strategies for the 21st Century. Edward Elgar, Cheltenham.
- Baumard, P., 2018. Coopetiting with an irreconcilable asymmetric disadvantage. In: Fernandez, A.-S., Chiambaretto, P., Le Roy, F., Czakon, W. (Eds.), The Routledge Companion to Coopetition Strategies. Routledge, Abingdon.
- Bengtsson, M., Johansson, M., 2014. Managing coopetition to create opportunities for small firms. Int. Small Bus. J. 32 (4), 401–427. https://doi.org/10.1177/ 0266242612461288.
- Bengtsson, M., Kock, S., 2000. Coopetition" in business networks—to cooperate and compete simultaneously. Ind. Mark. Manag. 29 (5), 411–426. https://doi.org/10. 1016/S0019-8501(99)00067-X.
- Bengtsson, M., Kock, S., 2014. Coopetition—quo vadis? Past accomplishments and future challenges. Ind. Mark. Manag. 43 (2), 180–188. https://doi.org/10.1016/j. indmarman.2014.02.015.
- Bengtsson, M., Kock, S., Lundgren-Henriksson, E.-L., Näsholm, M.H., 2016a. Coopetition research in theory and practice: growing new theoretical, empirical, and methodological domains. Ind. Mark. Manag. 57, 4–11. https://doi.org/10.1016/j.indmarman.2016.05.002.
- Bengtsson, M., Raza-Ullah, T., Vanyushyn, V., 2016b. The coopetition paradox and tension: the moderating role of coopetition capability. Ind. Mark. Manag. 53, 19–30. https://doi.org/10.1016/j.indmarman.2015.11.008.
- Bengtsson, M., Raza-Ullah, T. & Srivastava, M.K. (In Press). Looking different vs thinking differently: impact of TMT diversity on coopetition capability. Long. Range Plan., doi:https://doi.org/10.1016/J.LRP.2018.11.001.
- Bierly, P.E., Gallagher, S., 2007. Explaining alliance partner selection: fit, trust and strategic expediency. Long. Range Plan. 40 (2), 134–153. https://doi.org/10.1016/ j.lrp.2007.03.001.

Blackburn, R., 2003. Intellectual Property and Innovation Management in Small Firms. Routledge, New York.

- Bonel, E., Rocco, E., 2007. Coopeting to survive; surviving coopetition. Int. Stud. Manag. Organ. 37 (2), 70–96. https://doi.org/10.2753/IMO0020-8825370204.
- Bouncken, R.B., Fredrich, V., 2012. Coopetition: performance implications and management antecedents. Int. J. Innov. Manag. 16 (05), 1250028. https://doi.org/10. 1142/S1363919612500284.
- Bouncken, R.B., Fredrich, V., 2016. Learning in coopetition: alliance orientation, network size, and firm types. J. Bus. Res. 69 (5), 1753–1758. https://doi.org/10. 1016/j.jbusres.2015.10.050.
- Bouncken, R.B., Kraus, S., 2013. Innovation in knowledge-intensive industries: the double-edged sword of coopetition. J. Bus. Res. 66 (10), 2060–2070. https://doi.org/10.1016/j.jbusres.2013.02.032.
- Bouncken, R.B., Gast, J., Kraus, S., Bogers, M., 2015. Coopetition: a systematic review, synthesis, and future research directions. Rev. Manag. Sci. 9 (3), 577-601. https://doi.org/10.1007/s11846-015-0168-6.
- Bouncken, R.B., Fredrich, V., Ritala, P., Kraus, S., 2018. Coopetition in new product development alliances: advantages and tensions for incremental and radical innovation: coopetition in new product development. Br. J. Manag. 29 (3), 391–410. https://doi.org/10.1111/1467-8551.12213.
- Brandenburger, A.M., Nalebuff, B.J., 1996. Co-Opetition: A Revolutionary Mindset that Redefines Competition and Cooperation, vol. 121 Doubleday, New York. Bresman, H., Birkinshaw, J., Nobel, R., 1999. Knowledge transfer in international acquisitions. J. Int. Bus. Stud. 30 (3), 439–462. https://doi.org/10.1057/palgrave. jibs.8490078.
- Bumgardner, M., Buehlmann, U., Schuler, A., Crissey, J., 2011. Competitive actions of small firms in a declining market. J. Small Bus. Manag. 49 (4), 578–598. https://doi.org/10.1111/j.1540-627X.2011.00337.x.
- Busenitz, L.W., Barney, J.B., 1997. Differences between entrepreneurs and managers in large organizations: biases and heuristics in strategic decision-making. J. Bus. Ventur. 12 (1), 9–30. https://doi.org/10.1016/S0883-9026(96)00003-1.
- Cassiman, B., Di Guardo, M.C., Valentini, G., 2009. Organising R&D projects to profit from innovation: insights from Co-opetition. Long. Range Plan. 42 (2), 216–233. https://doi.org/10.1016/j.lrp.2009.01.001.
- Castañer, X., Mulotte, L., Garrette, B., Dussauge, P., 2014. Governance mode vs. governance fit: performance implications of make-or-ally choices for product innovation in the worldwide aircraft industry, 1942–2000. Strat. Manag. J. 35 (9), 1386–1397. https://doi.org/10.1002/smj.2160.
- Chatterji, A.K., Findley, M., Jensen, N.M., Meier, S., Nielson, D., 2016. Field experiments in strategy research. Strat. Manag. J. 37 (1), 116–132. https://doi.org/10. 1002/smj.2449.
- Chiambaretto, P., 2015. Resource dependence and power-balancing operations in alliances: the role of market redefinition strategies. M@n@gement 18 (3), 205–233.

### P. Chiambaretto, et al.

#### Long Range Planning xxx (xxxx) xxx-xxx

- Chiambaretto, P., Dumez, H., 2016. Toward a typology of coopetition: a multilevel approach. Int. Stud. Manag. Organ. 46 (2–3), 110–129. https://doi.org/10.1080/ 00208825.2015.1093797.
- Chiambaretto, P., Fernandez, A.-S., 2016. The evolution of coopetitive and collaborative alliances in an alliance portfolio: the Air France case. Ind. Mark. Manag. 57, 75–85. https://doi.org/10.1016/j.indmarman.2016.05.005.
- Chiambaretto, P., Wassmer, U., 2019. Resource utilization as an internal driver of alliance portfolio evolution: the Qatar Airways case (1993–2010). Long. Range Plan. 52 (1), 51–71. https://doi.org/10.1016/j.lrp.2018.02.004.
- Chiambaretto, P., Baudelaire, C., Lavril, T., 2013. Measuring the willingness-to-pay of air-rail intermodal passengers. J. Air Transp. Manag. 26, 50–54. https://doi.org/ 10.1016/j.jairtraman.2012.10.003.
- Chiambaretto, P., Gurău, C., Le Roy, F., 2016. Coopetitive branding: definition, typology, benefits and risks. Ind. Mark. Manag. 57, 86–96. https://doi.org/10.1016/j. indmarman.2016.05.009.
- Chiambaretto, P., Massé, D., Mirc, N., 2019. "All for One and One for All?" knowledge broker roles in managing tensions of internal coopetition: the Ubisoft case. Res. Pol. 48 (3), 584–600. https://doi.org/10.1016/j.respol.2018.10.009.
- Chin, K., Chan, B.L., Lam, P., 2008. Identifying and prioritizing critical success factors for coopetition strategy. Ind. Manag. Data Syst. 108 (4), 437–454. https://doi. org/10.1108/02635570810868326.
- Choi, Y.R., Shepherd, D.A., 2004. Entrepreneurs' decisions to exploit opportunities. J. Manag. 30 (3), 377-395. https://doi.org/10.1016/j.jm.2003.04.002.
- Clausen, T., Korneliussen, T., 2012. The relationship between entrepreneurial orientation and speed to the market: the case of incubator firms in Norway.
- Technovation 32 (9), 560-567. https://doi.org/10.1016/j.technovation.2012.05.004.
- Covin, J.G., Slevin, D.P., 1989. Strategic management of small firms in hostile and benign environments. Strat. Manag. J. 10 (1), 75–87. https://doi.org/10.1002/smj. 4250100107.
- Cummings, J.L., Holmberg, S.R., 2012. Best-fit alliance partners: the use of critical success factors in a comprehensive partner selection process. Long. Range Plan. 45 (2–3), 136–159. https://doi.org/10.1016/j.lrp.2012.01.001.
- Czakon, W., Czernek, K., 2016. The role of trust-building mechanisms in entering into network coopetition: the case of tourism networks in Poland. Ind. Mark. Manag. 57, 64–74. https://doi.org/10.1016/j.indmarman.2016.05.010.
- Czakon, W., Mucha-Kuś, K., Rogalski, M., 2014. Coopetition research landscape a systematic literature review 1997-2010. Int. J. Manag. Econ. 17, 122–150.
- Darr, E.D., Kurtzberg, T.R., 2000. An investigation of partner similarity dimensions on knowledge transfer. Organ. Behav. Hum. Decis. Process. 82 (1), 28-44. https://doi.org/10.1006/obhd.2000.2885.
- Das, T.K., He, I.Y., 2006. Entrepreneurial firms in search of established partners: review and recommendations. J. Int. Entrep. Behav. Res. 12 (3), 114–143. https://doi.org/10.1108/13552550610667422.
- Das, T.K., Kumar, R., 2009. Interpartner harmony in strategic alliances: managing commitment and forbearance. Int. J. Strategic Bus. Alliances (IJSBA) 1 (1), 24–52.
- Das, T.K., Teng, B.-S., 1998. Resource and risk management in the strategic alliance making process. J. Manag. 24 (1), 21–42. https://doi.org/10.1177/ 014920639802400103.
- Das, T.K., Teng, B.-S., 2000a. A resource-based theory of strategic alliances. J. Manag. 26 (1), 31–61. https://doi.org/10.1177/014920630002600105.
- Das, T.K., Teng, B.-S., 2000b. Instabilities of strategic alliances: an internal tensions perspective. Organ. Sci. 11 (1), 77–101. https://doi.org/10.1287/orsc.11.1.77. 12570.
- Deeds, D.L., Hill, C.W.L., 1996. Strategic alliances and the rate of new product development: an empirical study of entrepreneurial biotechnology firms. J. Bus. Ventur. 11 (1), 41–55. https://doi.org/10.1016/0883-9026(95)00087-9.
- Dorn, S., Schweiger, B., Albers, S., 2016. Levels, phases and themes of coopetition: a systematic literature review and research agenda. Eur. Manag. J. 34 (5), 484–500.
- Drover, W., Wood, M.S., Fassin, Y., 2014. Take the money or run? Investors' ethical reputation and entrepreneurs' willingness to partner. J. Bus. Ventur. 29 (6), 723–740. https://doi.org/10.1016/j.jbusvent.2013.08.004.
- Dussauge, P., Garrette, B., Mitchell, W., 2000. Learning from competing partners: outcomes and durations of scale and link alliances in Europe, North America and Asia. Strat. Manag. J. 21 (2), 99–126. 2 < 99::AID-SMJ80 > 3.0.CO;2-G. https://doi.org/10.1002/(SICI)1097-0266(200002)21.
- Eggers, F., Eggers, F., Kraus, S., 2016. Entrepreneurial branding: measuring consumer preferences through choice-based conjoint analysis. Int. Entrep. Manag. J. 12 (2), 427–444. https://doi.org/10.1007/s11365-014-0344-1.
- Estrada, I., Faems, D., de Faria, P., 2016. Coopetition and product innovation performance: the role of internal knowledge sharing mechanisms and formal knowledge protection mechanisms. Ind. Mark. Manag. 53, 56–65. https://doi.org/10.1016/j.indmarman.2015.11.013.
- Faul, F., Erdfelder, E., Buchner, A., Lang, A.-G., 2009. Statistical power analyses using G\*Power 3.1: tests for correlation and regression analyses. Behav. Res. Methods 41 (4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149.
- Fernandez, A.-S., Chiambaretto, P., 2016. Managing tensions related to information in coopetition. Ind. Mark. Manag. 53, 66–76. https://doi.org/10.1016/j. indmarman.2015.11.010.
- Fernandez, A.-S., Le Roy, F., Gnyawali, D.R., 2014. Sources and management of tension in co-opetition case evidence from telecommunications satellites manufacturing in Europe. Ind. Mark. Manag. 43 (2), 222–235. https://doi.org/10.1016/j.indmarman.2013.11.004.

Fernandez, A.-S., Chiambaretto, P., Le Roy, F., Czakon, W., 2018a. The Routledge Companion to Coopetition Strategies. Routledge, Abingdon.

- Fernandez, A.-S., Le Roy, F., Chiambaretto, P., 2018b. Implementing the right project structure to achieve coopetitive innovation projects. Long. Range Plan. 51 (2), 384–405. https://doi.org/10.1016/j.lrp.2017.07.009.
- Freeman, J., Carroll, G.R., Hannan, M.T., 1983. The liability of newness: age dependence in organizational death rates. Am. Sociol. Rev. 48 (5), 692–710. https://doi. org/10.2307/2094928.
- Frischknecht, B.D., Eckert, C., Geweke, J., Louviere, J.J., 2014. A simple method for estimating preference parameters for individuals. Int. J. Res. Mark. 31 (1), 35–48. https://doi.org/10.1016/j.ijresmar.2013.07.005.
- Garrette, B., Castañer, X., Dussauge, P., 2009. Horizontal alliances as an alternative to autonomous production: product expansion mode choice in the worldwide aircraft industry 1945-2000. Strat. Manag. J. 30 (8), 885-894. https://doi.org/10.1002/smj.770.
- George, G., Zahra, S.A., Wheatley, K.K., Khan, R., 2001. The effects of alliance portfolio characteristics and absorptive capacity on performance: a study of biotechnology firms. J. High Technol. Manag. Res. 12 (2), 205–226. https://doi.org/10.1016/S1047-8310(01)00037-2.
- Geringer, J.M., 1991. Strategic determinants of partner selection criteria in international joint ventures. J. Int. Bus. Stud. 22 (1), 41-62.
- Gigerenzer, G., 2008. Why heuristics work. Perspect. Psychol. Sci. 3 (1), 20–29. https://doi.org/10.1111/j.1745-6916.2008.00058.x.
- Gimeno, J., 2004. Competition within and between networks: the contingent effect of competitive embeddedness on alliance formation. Acad. Manag. J. 47 (6), 820–842. https://doi.org/10.2307/20159625.
- Glaister, K.W., 1996. UK-western european strategic alliances. J. Euromarketing 5 (4), 5–35. https://doi.org/10.1300/J037v05n04\_02.
- Gnyawali, D.R., Park, B.-J., 2009. Co-opetition and technological innovation in small and medium-sized enterprises: a multilevel conceptual model. J. Small Bus. Manag. 47 (3), 308–330. https://doi.org/10.1111/j.1540-627X.2009.00273.x.
- Gnyawali, D.R., Park, B.-J., 2011. Co-opetition between giants: collaboration with competitors for technological innovation. Res. Pol. 40 (5), 650–663. https://doi.org/ 10.1016/j.respol.2011.01.009.
- Gnyawali, D.R., Song, Y., 2016. Pursuit of rigor in research: illustration from coopetition literature. Ind. Mark. Manag. 57, 12–22. https://doi.org/10.1016/j. indmarman.2016.05.004.
- Gnyawali, D.R., Madhavan, R., He, J., Bengtsson, M., 2016. The competition-cooperation paradox in inter-firm relationships: a conceptual framework. Ind. Mark. Manag. 53, 7–18. https://doi.org/10.1016/j.indmarman.2015.11.014.
- Gomes, E., Barnes, B.R., Mahmood, T., 2016. A 22 year review of strategic alliance research in the leading management journals. Int. Bus. Rev. 25 (1), 15–27. Part A. https://doi.org/10.1016/j.ibusrev.2014.03.005.
- Gomes-Casseres, B.G.-., 1997. Alliance strategies of small firms. Small Bus. Econ. 9 (1), 33–44. https://doi.org/10.1023/A:1007947629435.
- Goos, P., Vermeulen, B., Vandebroek, M., 2010. D-optimal conjoint choice designs with no-choice options for a nested logit model. J. Stat. Plan. Inference 140 (4),

#### P. Chiambaretto, et al.

851-861. https://doi.org/10.1016/j.jspi.2009.09.006.

Granata, J., Lasch, F., Le Roy, F., Dana, L.-P., 2018. How do micro-firms manage coopetition? A study of the wine sector in France. Int. Small Bus. J. 36 (3), 331–355. https://doi.org/10.1177/0266242617740412.

Green, P.E., Srinivasan, V., 1990. Conjoint analysis in marketing: new developments with implications for research and practice. J. Mark. 54 (4), 3–19. https://doi.org/ 10.2307/1251756.

Grigoriou, K., Rothaermel, F.T., 2017. Organizing for knowledge generation: internal knowledge networks and the contingent effect of external knowledge sourcing. Strat. Manag. J. 38 (2), 395–414. https://doi.org/10.1002/smj.2489.

Gulati, R., 2007. Managing Network Resources : Alliances, Affiliations and Other Relational Assets. Oxford University Press, Oxford; New York.

Haeussler, C., Patzelt, H., Zahra, S.A., 2012. Strategic alliances and product development in high technology new firms: the moderating effect of technological capabilities. J. Bus. Ventur. 27 (2), 217–233. https://doi.org/10.1016/j.jbusvent.2010.10.002.

Hannan, M.T., Freeman, J., 1984. Structural inertia and organizational change. Am. Sociol. Rev. 49 (2), 149–164. https://doi.org/10.2307/2095567.

Hoang, H., Rothaermel, F.T., 2000. Leveraging internal and external experience: exploration, exploitation, and R&D project performance. Strategic Management Journal 31 (7), 734–758.

Hora, W., Gast, J., Kailer, N., Rey-Marti, A., Mas-Tur, A., 2018. David and Goliath: causes and effects of coopetition between start-ups and corporates. Rev. Manag. Sci. 12 (2), 411–439. https://doi.org/10.1007/s11846-017-0273-9.

Howard, M., Steensma, H.K., Lyles, M., Dhanaraj, C., 2016. Learning to collaborate through collaboration: how allying with expert firms influences collaborative innovation within novice firms. Strat. Manag. J. 37 (10), 2092–2103. https://doi.org/10.1002/smj.2424.

- Hsu, D.K., Simmons, S.A., Wieland, A.M., 2017. Designing entrepreneurship experiments: a review, typology, and research agenda. Organ. Res. Methods 20 (3), 379–412. https://doi.org/10.1177/1094428116685613.
- Islam, T., Louviere, J.J., Burke, P.F., 2007. Modeling the effects of including/excluding attributes in choice experiments on systematic and random components. Int. J. Res. Mark. 24 (4), 289–300. https://doi.org/10.1016/j.ijresmar.2007.04.002.

Kale, P., Singh, H., 2009. Managing strategic alliances: what do we know now, and where do we go from here? Acad. Manag. Perspect. 23 (3), 45-62.

- Kessels, R., Goos, P., Vandebroek, M., 2006. A comparison of criteria to design efficient choice experiments. J. Mark. Res. 43 (3), 409–419. https://doi.org/10.1509/jmkr.43.3.409.
- Khanna, T., Gulati, R., Nohria, N., 1998. The dynamics of learning alliances: competition, cooperation, and relative scope. Strat. Manag. J. 19 (3), 193–210. 3 < 193::AID-SMJ949 > 3.0.CO:2-C. https://doi.org/10.1002/(SICI)1097-0266(199803)19.

Kraus, S., Ambos, T.C., Eggers, F., Cesinger, B., 2015. Distance and perceptions of risk in internationalization decisions. J. Bus. Res. 68 (7), 1501–1505. https://doi. org/10.1016/j.jbusres.2015.01.041.

Kraus, S., Meier, F., Eggers, F., Bouncken, R.B., Schuessler, F., 2016a. Standardisation vs. adaption: a conjoint experiment on the influence of psychic, cultural and geographical distance on international marketing mix decisions. Eur. J. Int. Manag. 10 (2), 127–156. https://doi.org/10.1504/EJIM.2016.074468.

- Kraus, S., Meier, F., Niemand, T., 2016b. Experimental methods in entrepreneurship research: the status quo. Int. J. Entrepreneurial Behav. Res. 22 (6), 958–983. https://doi.org/10.1108/IJEBR-05-2016-0135.
- Kraus, S., Meier, F., Niemand, T., Bouncken, R.B., Ritala, P., 2018. In search for the ideal coopetition partner: an experimental study. Rev. Manag. Sci. 12 (4), 1025–1053. https://doi.org/10.1007/s11846-017-0237-0.

Kuhn, K.M., Galloway, T.L., 2015. With a little help from my competitors: peer networking among artisan entrepreneurs. Entrep. Theory Pract. 39 (3), 571–600. https://doi.org/10.1111/etap.12053.

Kumar, R., Nti, K.O., 1998. Differential learning and interaction in alliance dynamics: a process and outcome discrepancy model. Organanization Science 9 (3), 356–367. https://doi.org/10.1287/orsc.9.3.356.

- Le Roy, F., Czakon, W., 2016. Managing coopetition: the missing link between strategy and performance. Ind. Mark. Manag. 53, 3–6. https://doi.org/10.1016/j. indmarman.2015.11.005.
- Le Roy, F., Fernandez, A.-S., 2015. Managing coopetitive tensions at the working-group level: the rise of the coopetitive project team. Br. J. Manag. 26 (4), 671–688. https://doi.org/10.1111/1467-8551.12095.

Le Roy, F., Robert, M., Lasch, F., 2016. Choosing the best partner for product innovation: talking to the enemy or to a friend? Int. Stud. Manag. Organ. 46 (2), 136–158. Le Roy, F., Fernandez, A.-S., Chiambaretto, P., 2018. From strategizing coopetition to managing coopetition. In: Fernandez, A.-S., Chiambaretto, P., Le Roy, F., Czakon, W. (Eds.), The Routledge Companion to Coopetition Strategies. Routledge, Abingdon.

Lechner, C., Soppe, B., Dowling, M., 2016. Vertical coopetition and the sales growth of young and small firms. J. Small Bus. Manag. 54 (1), 67–84. https://doi.org/10. 1111/jsbm.12131.

Lee, S., Park, G., Yoon, B., Park, J., 2010. Open innovation in SMEs—an intermediated network model. Res. Pol. 39 (2), 290–300. https://doi.org/10.1016/j.respol. 2009.12.009.

Lee, H., Kelley, D., Lee, J., Lee, S., 2012. SME survival: the impact of internationalization, technology resources, and alliances. J. Small Bus. Manag. 50 (1), 1–19. https://doi.org/10.1111/j.1540-627X.2011.00341.x.

Lefebvre, V.M., Raggi, M., Viaggi, D., Sia-Ljungström, C., Minarelli, F., Kühne, B., Gellynck, X., 2014. SMEs' preference for innovation networks: a choice experimental approach. Creativ. Innov. Manag. 23 (4), 415–435. https://doi.org/10.1111/caim.12090.

Levinthal, D.A., March, J.G., 1993. The myopia of learning. Strat. Manag. J. 14 (S2), 95-112. https://doi.org/10.1002/smj.4250141009.

Lieberman, M.B., Montgomery, D.B., 1988. First-mover advantages. Strat. Manag. J. 9 (1), 41–58. https://doi.org/10.1002/smj.4250090706.

Lohrke, F.T., Holloway, B.B., Woolley, T.W., 2010. Conjoint analysis in entrepreneurship research: a review and research agenda. Organ. Res. Methods 13 (1), 16–30. https://doi.org/10.1177/1094428109341992.

Louviere, J.J., Hensher, D., Swait, J., 2000. Stated Choice Methods: Analysis and Applications. Cambridge University Press, Cambridge.

McAdam, R., Reid, R., 2001. SME and large organisation perceptions of knowledge management: comparisons and contrasts. J. Knowl. Manag. 5 (3), 231–241. https://doi.org/10.1108/13673270110400870.

McCullough, D., 2002. A user's guide to conjoint analysis. Res. Market. 14 (2), 18-23.

Mensching, H., Calabrò, A., Eggers, F., Kraus, S., 2016. Internationalisation of family and non-family firms: a conjoint experiment among CEOs. Eur. J. Int. Manag. 10 (5), 581–604. https://doi.org/10.1504/EJIM.2016.078795.

Mitsuhashi, H., Greve, H., 2009. A matching theory of alliance formation and organizational success: complementarity and compatibility. Acad. Manag. J. 52 (5), 975–995.

Morris, M., Koçak, A., Özer, A., 2007. Coopetition as a small business strategy: implications for performance. J. Small Bus. Strat. 19 (1), 35–55.

Muscio, A., 2007. The impact of absorptive capacity on SMEs' collaboration. Econ. Innovat. N. Technol. 16 (8), 653–668. https://doi.org/10.1080/10438590600983994.

Naldi, L., Nordqvist, M., Sjöberg, K., Wiklund, J., 2007. Entrepreneurial orientation, risk taking, and performance in family firms. Fam. Bus. Rev. 20 (1), 33–47. https://doi.org/10.1111/j.1741-6248.2007.00082.x.

Näsholm, M., Bengtsson, M., Johansson, M., 2018. Coopetition for SMEs. In: Fernandez, A.-S., Chiambaretto, P., Le Roy, F., Czakon, W. (Eds.), The Routledge Handbook on Coopetition Strategies. Routledge, Abingdon.

Nemeh, A., 2018. Building a first-mover advantage from coopetition. In: Fernandez, A.-S., Chiambaretto, P., Le Roy, F., Czakon, W. (Eds.), The Routledge Companion to Coopetition Strategies. Routledge, Abingdon.

Oerlemans, L.A.G., Knoben, J., Pretorius, M.W., 2013. Alliance portfolio diversity, radical and incremental innovation: the moderating role of technology management. Technovation 33 (6–7), 234–246. https://doi.org/10.1016/j.technovation.2013.02.004.

Oxley, J.E., Sampson, R.C., 2004. The scope and governance of international R&D alliances. Strat. Manag. J. 25, 723-749.

Padula, G., Dagnino, G., 2007. Untangling the rise of coopetition: the intrusion of competition in a cooperative game structure. Int. Stud. Manag. Organ. 37 (2), 32–52. https://doi.org/10.2753/IMO0020-8825370202.

### Long Range Planning xxx (xxxx) xxx-xxx

#### P. Chiambaretto, et al.

Park, S.H., Russo, M.V., 1996. When competition eclipses cooperation: an event history analysis of joint venture failure. Manag. Sci. 42 (6), 875–890. https://doi.org/ 10.1287/mnsc.42.6.875.

Park, B.-J., Robert), Srivastava, M.K., Gnyawali, D.R., 2014. Walking the tight rope of coopetition: impact of competition and cooperation intensities and balance on firm innovation performance. Ind. Mark. Manag. 43 (2), 210–221. https://doi.org/10.1016/j.indmarman.2013.11.003.

Patzelt, H., Shepherd, D.A., 2008. The decision to persist with underperforming alliances: the role of trust and control. J. Manag. Stud. 45 (7), 1217–1243. https://doi.org/10.1111/j.1467-6486.2008.00791.x.

Qian, G., Li, L., 2003. Profitability of small- and medium-sized enterprises in high-tech industries: the case of the biotechnology industry. Strat. Manag. J. 24 (9), 881–887. https://doi.org/10.1002/smj.344.

Quintana-García, C., Benavides-Velasco, C.A., 2004. Cooperation, competition, and innovative capability: a panel data of European dedicated biotechnology firms. Technovation 24 (12), 927–938. https://doi.org/10.1016/S0166-4972(03)00060-9.

Rai, R.K., 2016. A Co-opetition-Based approach to value creation in interfirm alliances: construction of a measure and examination of its psychometric properties. J. Manag. 42 (6), 1663–1699. https://doi.org/10.1177/0149206313515525.

Raza-Ullah, 2017. A Theory of Experienced Paradoxical Tension in Co-opetitive Alliances. Dissertation at Umeå School of Business Economics and Statistics Studies in Business Administration. Series B, No. 97.

Raza-Ullah, T., Bengtsson, M., Kock, S., 2014. The coopetition paradox and tension in coopetition at multiple levels. Ind. Mark. Manag. 43 (2), 189–198. https://doi.org/10.1016/j.indmarman.2013.11.001.

Raza-Ullah, T., Bengtsson, M., Vanyushyn, V., 2018. Coopetition capability: what is it? In: Fernandez, A.-S., Chiambaretto, P., Le Roy, F., Czakon, W. (Eds.), The Routledge Handbook on Coopetition Strategies. Routledge, Abingdon.

- Rindova, V.P., Yeow, A., Martins, L.L., Faraj, S., 2012. Partnering portfolios, value-creation logics, and growth trajectories: a comparison of Yahoo and Google (1995 to 2007). Strat. J. Entrep. 6 (2), 133–151. https://doi.org/10.1002/sej.1131.
- Ritala, P., 2009. Is cooperition different from cooperation? The impact of market rivalry on value creation in alliances. Int. J. Intellect. Prop. Manag. 3 (1), 39–55. https://doi.org/10.1504/LJIPM.2009.022955.

Ritala, P., 2012. Coopetition strategy – when is it successful? Empirical evidence on innovation and market performance. Br. J. Manag. 23 (3), 307–324. https://doi.org/10.1111/j.1467-8551.2011.00741.x.

Ritala, P., Hurmelinna-Laukkanen, P., 2009. What's in it for me? Creating and appropriating value in innovation-related coopetition. Technovation 29 (12), 819–828. https://doi.org/10.1016/j.technovation.2009.07.002.

Ritala, P., Hurmelinna-Laukkanen, P., 2013. Incremental and radical innovation in coopetition—the role of absorptive capacity and appropriability. J. Prod. Innov. Manag. 30 (1), 154–169. https://doi.org/10.1111/j.1540-5885.2012.00956.x.

Ritala, P., Hurmelinna-Laukkanen, P., 2018. Dynamics of coopetitive value creation and appropriation. In: Fernandez, A.-S., Chiambaretto, P., Le Roy, F., Czakon, W. (Eds.), The Routledge Handbook on Coopetition Strategies. Routledge, Abingdon.

Ritala, P., Sainio, L.-M., 2014. Coopetition for radical innovation: technology, market and business-model perspectives. Technol. Anal. Strat. Manag. 26 (2), 155–169. https://doi.org/10.1080/09537325.2013.850476.

Ritala, P., Tidström, A., 2014. Untangling the value-creation and value-appropriation elements of coopetition strategy: a longitudinal analysis on the firm and relational levels. Scand. J. Manag. 30 (4), 498–515. https://doi.org/10.1016/j.scaman.2014.05.002.

Robert, M., Chiambaretto, P., Mira, B., Le Roy, F., 2018. Better, Faster, Stronger: the impact of market-oriented coopetition on product commercial performance. M@ n@gement 21 (1), 574–610.

Rosenbusch, N., Brinckmann, J., Bausch, A., 2011. Is innovation always beneficial? A meta-analysis of the relationship between innovation and performance in SMEs. J. Bus. Ventur. 26 (4), 441–457. https://doi.org/10.1016/j.jbusvent.2009.12.002.

Shepherd, D.A., Zacharakis, A., 2000. Structuring family business succession: an analysis of the future leader's decision making. Entrep. Theory Pract. 24 (4) 25–25.
Shepherd, D.A., Williams, T.A., Patzelt, H., 2015. Thinking about entrepreneurial decision making: review and research agenda. J. Manag. 41 (1), 11–46. https://doi.org/10.1177/0149206314541153.

Shu, C., Liu, C., Gao, S., Shanley, M., 2014. The knowledge spillover theory of entrepreneurship in alliances. Entrep. Theory Pract. 38 (4), 913–940. https://doi.org/10. 1111/etap.12024.

Silverman, B.S., Baum, J.A.C., 2002. Alliance-based competitive dynamics. Acad. Manag. J. 45 (4), 791-806. https://doi.org/10.2307/3069312.

Sirmon, D.G., Hitt, M.A., Ireland, R.D., Gilbert, B.A., 2011. Resource orchestration to create competitive advantage breadth, depth, and life cycle effects. J. Manag. 37 (5), 1390–1412. https://doi.org/10.1177/0149206310385695.

Smith, V.L., Walker, J.M., 1993. Monetary rewards and decision cost in experimental economics. Econ. Inq. 31 (2), 245–261. https://doi.org/10.1111/j.1465-7295. 1993.tb00881.x.

Sobrero, M., Roberts, E.B., 2001. The trade-off between efficiency and learning in interorganizational relationships for product development. Manag. Sci. 47 (4), 493–511. https://doi.org/10.1287/mnsc.47.4.493.9828.

Srivastava, M.K., Gnyawali, D.R., 2011. When do relational resources matter? Leveraging portfolio technological resources for breakthrough innovation. Acad. Manag. J. 54 (4), 797–810. https://doi.org/10.5465/AMJ.2011.64870140.

Stinchcombe, A., 1965. Social structure and organizations. In: March, J.G. (Ed.), Handbook of Organizations. Rand McNally & Company, Chicago.

Thomason, S.J., Simendinger, E., Kiernan, D., 2013. Several determinants of successful coopetition in small business. J. Small Bus. Entrep. 26 (1), 15–28. https://doi.org/10.1080/08276331.2012.761800.

Tidström, A., 2014. Managing tensions in coopetition. Ind. Mark. Manag. 43 (2), 261–271. https://doi.org/10.1016/j.indmarman.2013.12.001.

Van der Rhee, B., Verma, R., Plaschka, G., 2009. Understanding trade-offs in the supplier selection process: the role of flexibility, delivery, and value-added services/ support. Int. J. Prod. Econ. 120 (1), 30–41. https://doi.org/10.1016/J.IJPE.2008.07.024.

Van Gils, A., Zwart, P.S., 2009. Alliance formation motives in SMEs: an explorative conjoint analysis study. Int. Small Bus. J. 27 (1), 5–37. https://doi.org/10.1177/0266242608098345.

Vandaie, R., Zaheer, A., 2014. Surviving bear hugs: firm capability, large partner alliances, and growth. Strat. Manag. J. 35 (4), 566–577. https://doi.org/10.1002/ smj.2115.

Verhees, F.J.H.M., Meulenberg, M.T.G., 2004. Market orientation, innovativeness, product innovation, and performance in small firms. J. Small Bus. Manag. 42 (2), 134–154. https://doi.org/10.1111/j.1540-627X.2004.00102.x.

Vermeulen, B., Goos, P., Vandebroek, M., 2008. Models and optimal designs for conjoint choice experiments including a no-choice option. Int. J. Res. Mark. 25 (2), 94–103. https://doi.org/10.1016/j.ijresmar.2007.12.004.

Wood, M.S., Williams, D.W., 2014. Opportunity evaluation as rule-based decision making. J. Manag. Stud. 51 (4), 573–602. https://doi.org/10.1111/joms.12018. Wu, J., 2014. Cooperation with competitors and product innovation: moderating effects of technological capability and alliances with universities. Ind. Mark. Manag.

43 (2), 199–209. https://doi.org/10.1016/j.indmarman.2013.11.002.

Wu, C., Barnes, D., 2011. A literature review of decision-making models and approaches for partner selection in agile supply chains. J. Purch. Supply Manag. 17 (4), 256–274. https://doi.org/10.1016/J.PURSUP.2011.09.002.

Wuebker, R., Hampl, N., Wüstenhagen, R., 2015. The strength of strong ties in an emerging industry: experimental evidence of the effects of status hierarchies and personal ties in venture capitalist decision making. Strat. J. Entrep. 9 (2), 167–187. https://doi.org/10.1002/sej.1188.

Wuyts, S., Dutta, S., 2014. Benefiting from alliance portfolio diversity: the role of past internal knowledge creation strategy. J. Manag. 40 (6), 1653–1674. https://doi.org/10.1177/0149206312442339.

Yami, S., Nemeh, A., 2014. Organizing coopetition for innovation: the case of wireless telecommunication sector in Europe. Ind. Mark. Manag. 43 (2), 250–260. https://doi.org/10.1016/j.indmarman.2013.11.006.

Yang, H., Zheng, Y., Zhao, X., 2014. Exploration or exploitation? Small firms' alliance strategies with large firms. Strat. Manag. J. 35 (1), 146–157. https://doi.org/10. 1002/smj.2082.

## P. Chiambaretto, et al.

Paul CHIAMBARETTO, PhD., is a 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 Research Policy, Long Range Planning, Industrial Marketing Management, International Studies of Management and Organization, M@n@gement, Management International, etc. He has been a visiting researcher in several foreign institutions such as University of Oxford, Concordia University and Umea University.

Maria BENGTSSON is a Professor in Entrepreneurship at Umeå School of Business and Economics, Sweden. Her research is mainly focused on coopetition, the dynamics of inter-organizational relationships, and innovation. She has published books and articles in journals such as Industrial Marketing Management, Scandinavian Journal of Management, Regional studies and International Small Business Journal.

Anne-Sophie FERNANDEZ, Ph.D., is Associate Professor of Strategic Management at the University of Montpellier (Montpellier Management Institute) and a member of Montpellier Research in Management (MRM). She focuses on how competitors can achieve successfully common innovation projects. She has worked on both the aerospace industry and the airline industry. She already published several articles in ranked journal (Industrial Marketing Management, British Journal of Management, Long Range Planning) and she has participated to the organization of special tracks on the topic (AIMS, EURAM) and to the coordination of special issues.

Malin H. NÄSHOLM is an Associate Professor in Management at Umeå School of Business and Economics, Sweden. She is currently doing research on coopetition for innovation, the management of coopetition, and the influence of individuals and their experiences. She has published in journals such as Industrial Marketing Management and Journal of Business Environment.