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# Walking the tight rope of coopetition: Impact of competition and cooperation intensities and balance on firm innovation performance

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ABSTRACT

This study empirically investigates an important question in the coopetition literature: to what extent does coopetition impact a firm's innovation performance? With a focus on the intensity of competition and intensity of cooperation of a focal firm with its alliance partners, our theory proposes that a moderate level of competition with alliance partners is more beneficial than a very high or a very low level of competition. We further develop the concept of "balance" in coopetition and examine how the interplay of competition and cooperation and the balance between the two matter for innovation performance. Results from our empirical study using data from the semiconductor industry show that competition and cooperation intensities have non-monotonic positive relationship with firm's coopetition-based innovation performance. Further, balanced coopetition (i.e., when competition is moderately high and cooperation is high) has a positive effect on innovation performance. A key contribution of this paper is the conceptualization and empirical demonstration of the effects of various aspects of coopetition such as competition dominant, cooperation dominant, and balanced coopetition on innovation performance.



## 1. Introduction

In the dynamic, complex, and global business world, firms increasingly engage in simultaneous pursuit of cooperation and competition—coopetition—(Bengtsson, Eriksson, & Wincent, 2010a; Bengtsson & Kock, 2000; Brandenburger & Nalebuff, 1996; Gnyawali, He, & Madhavan, 2008; Luo, 2007) to gain competitive advantage. A firm's ability to innovate in a sustained manner plays a critical role in gaining and sustaining competitive advantage (McGrath, Tsai, Venkataraman, & MacMillan, 1996). Researchers also suggest that coopetition is important for innovation particularly in high-technology industries (Carayannis & Alexander, 1999; Gnyawali et al., 2008; Quintana-García & Benavides-Velasco, 2004). However, despite the growing popularity of coopetition in both the academic and business arenas, empirical studies on the effects of coopetition on firm innovation performance are rare (Bengtsson et al., 2010a; Walley, 2007; Yami, Castaldo, Dagnino, & Le Roy, 2010).

Moreover, while some studies (Gnyawali et al., 2008) suggest that interfirm relationship simultaneously involving high intensities of competition and cooperation is the most intriguing form of coopetition and is likely to enhance firm innovation performance, some other studies suggest (e.g., Bengtsson, Eriksson, & Wincent, 2010b) the contrary that innovation performance may suffer due to the intensified tension resulting from the strong contradictions and dualities inherent in such relationships (Gnyawali, Madhavan, He, & Bengtsson, 2012). Thus, there is a clear need to examine whether and to what extent high intensities of competition and cooperation would be beneficial for firms in their pursuit of innovation. Further, while the simultaneity of cooperation and competition is a defining characteristic of coopetitive relationships, very few studies have systematically examined the effects of the interplay between these defining elements of coopetition. The purpose of this paper is to address these gaps by developing and testing a theory of how firms' pursuit of competition dominant, cooperation dominant, and balanced coopetition (Bengtsson et al., 2010b) impacts their success in generating technological innovations. We focus on innovation as the outcome variable as prior coopetition research suggests that coopetition is likely to be beneficial for innovation especially in high technology contexts (e.g., Gnyawali & Park, 2011).

Coopetition challenges include the duality of value creation and value appropriation (Brandenburger & Nalebuff, 1996; Lavie, 2007) and the critical need to create common benefits and private benefits (Khanna, Gulati, & Nohria, 1998). Our study focuses on this core issue. We suggest that examination of the focal firm's coopetition based innovation performance needs to consider three primary mechanisms: co-development of knowledge with the partners in a focal alliance, acquisition of partners' knowledge and leveraging the knowledge on projects outside the focal alliance, and enhancement of the level and effectiveness of internal

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knowledge generating efforts. While the first relates to value creation or creation of common benefits and happens within the focal alliance boundaries, the other two types happen beyond those boundaries and relate to private benefits. We argue that the focal firm leverages the potential of its coopetitive relationship most when there is a strong balance between the cooperative intensity and the competitive intensity so that the joint sum of common benefits and private benefits is maximized.

We test our hypotheses using a longitudinal dataset of semiconductor firms. We find that intensity of market competition has a somewhat inverted U-shaped relationship with innovation while intensity of cooperation has a positive effect, but benefits come at a decreasing rate beyond a certain level. Further, the empirical evidence suggests that when competition and cooperation are considered together, balance between competition and cooperation increases the firm's likelihood of generating higher innovation performance from coopetition.

## 2. Theory and hypotheses

### 2.1. Theory

#### 2.1.1. Challenges in the pursuit of coopetition strategy

Much of coopetition research illustrates challenges arising from coopetition, but little research examines how challenging coopetitive situations could be handled and turned into gains for firm innovation. Some of the key challenges highlighted by prior research are conflicting demands of the need to work together in order to create value and the temptation to be opportunistic in order to appropriate a greater share of the created value (Gnyawali et al., 2012; Gnyawali & Park, 2009; Lavie, 2007; Ritala & Hurmelinna-Laukkanen, 2009). Research suggests that tension in interorganizational relationships could manifest in the form of rivalry, hostility, conflicts and uncertainty between the partnering firms (Chen, Su, & Tsai, 2007; Williamson, 1985). Such tension is likely to be very high in coopetitive relationships. Tensions arise due to behavioral uncertainty of the partnering firms (Williamson, 1985), employees' role conflicts (Bengtsson & Kock, 2001) and differences in attitudes and perception of partners toward competition and cooperation (Das & Teng, 2000). More fundamentally, as Gnyawali et al. (2012) suggest, tension arises due to contradictory demands from competition and cooperation and inherent dualities (such as value creation and appropriation) in coopetition. A firm's ability to manage this tension could be fundamental to realizing high payoffs from coopetitive relationships (Gnyawali & Park, 2011).

A related, but rather unexplored, issue in coopetition research is how benefits from coopetition could be realized. A lack of clear articulation of the mechanisms through which benefits could occur limits the advancement of coopetition research. To address this issue, we identify three primary mechanisms based on prior research (Park, 2011; Srivastava, Bruyaka, & Gnyawali, 2012) through which firms generate innovation related benefits from coopetition: i) co-development with partners ii) acquisition of partners' resources, and iii) enhancement of internal innovation efforts through external/partners' resources. First, the firm benefits through co-development mechanism (Srivastava et al., 2012) as it collaborates with its coopetitive partner in joint research projects and problem solving. The coopetitive firms together combine their rather complementary resources and capabilities to enhance their joint innovation performance (Khanna et al., 1998). Second, the focal firm also benefits through acquisition of partners' resources (Srivastava et al., 2012), and the benefits of resource acquisition could extend beyond the scope of a particular relationship (Khanna et al., 1998). As the firm engages in both quasi-internalization and internalization (Dunning, 1995; Luo, 2007) of its coopetitive partners' resources, it enhances its innovation performance by leveraging those resources. Third, due to the presence of competitive elements in its coopetitive alliance, the firm is more motivated to enhance its internal efforts. The enhanced motivation acts as an important catalyst for innovation (Gnyawali & Srivastava, 2013).

#### 2.1.2. Competition and technological innovation

Innovation is considered one of very fundamental activities contributing toward growth, profitability (Roberts, 1999), and survival of firms (Greve, 2003). Due to fast changing environments and increasing technological complexities, firms' internal abilities to innovate on a sustained basis are rather limited. Firms therefore reach out to external sources of knowledge, especially knowledge of their strategic alliance partners because alliances are a very important reservoir of external resources (Ahuja, 2000; Lavie, 2007; Srivastava & Gnyawali, 2011). Further, competitors often have the most relevant and valuable resources because they face similar environmental and competitive challenges (Gnyawali & Park, 2009).

Although prior research generally suggests that strategic alliances help enhance firm innovation performance, scholars have also identified the negative effects of strategic alliances which may hurt a firm's innovation outcomes. Such negative effects include opportunistic behaviors by partners (Das & Teng, 2000), learning race between partners (Hamel, 1991), and knowledge leakage to the partners (Kale, Singh, & Perlmutter, 2000). Such negative effects of strategic alliances would likely be salient when the alliance partners are competitors. It is important to note that prior empirical work examining the impact of coopetition on innovation provides inconsistent findings. For example, while Quintana-García and Benavides-Velasco (2004) report positive effects of coopetition on innovation, Nieto and Santamaría (2007) report a negative relationship between alliances with competitors (i.e., coopetition) and innovation performance, and Knudsen (2007) finds no evidence that coopetition leads to an increase in innovation performance. Huang and Yu (2011) showed that competitive R&D collaborations have a positive moderating effect on the relationship between a firm's internal R&D activities and firm innovation.

We believe that our research provides important conceptual insights about the relationship between coopetition and innovation and helps to understand these inconsistent findings. Specifically, we propose three critical points: (a) since the very basis of coopetition is the intensity of competition and the intensity of cooperation, it is important to examine each of them and their effects before delving into the effects of the simultaneous pursuit of competition and cooperation; (b) the effects of coopetition on innovation are likely to vary depending on the extent or degree of competition and cooperation in the interplay. A mix of very intense competition and very weak cooperation (or vice versa) could make the relationship unstable and generate suboptimal benefits; and by extension (c) a balance of competition and cooperation is important in realizing greater innovation benefits in coopetition.

### 2.2. Hypotheses

Competition is central to coopetition, so most previous studies of coopetition focus on competition as the starting point. When a researcher attempts to examine coopetition among a given set of cooperative partners, a natural starting point is to examine the intensity of competition among the cooperating partners. So our theorization begins with a discussion of the role of the intensity of competition on innovation then moves on to examine the effect of the intensity of cooperation, and then to the issue of balance between competition and cooperation.

#### 2.2.1. Intensity of competition between partners and innovation performance

Research suggests that intense competition is a driving element in pressuring and stimulating firms to innovate and upgrade their competitive advantage (Bengtsson & Kock, 2000). Most previous studies focus on either market competition at the industry level (e.g., Wu, 2012) or a simple distinction between non-competitive (i.e., cooperation with universities) and competitive (i.e., cooperation with companies) collaboration (e.g., Huang & Yu, 2011). Little research, however, specifically focuses on the effects of competition between partners on firm innovation. In this paper, thus, we focus on the relationship between the intensities of competition between partners and firm innovation.