

# **Interfirm coopetition: antecedents, tensions, and performance outcomes**

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## **List of abbreviations**

$\alpha$	Cronbach's alpha
$\beta$	Unstandardised regression coefficient
AMOS	Structural Equation Modelling Software
AVE	Average Variance Extracted
CABS	Chartered Association of Business Schools
CEO	Chief Executive Officer
CFA	Confirmatory Factor Analysis
CFI	Comparative Fit Index
CI	Confidence Interval
CR	Composite Reliability
DSI	Decision Sciences Institute
EDSI	European Decision Sciences Institute
EFA	Exploratory Factor Analysis
EO	Entrepreneurial Orientation
EU	European Union
EUR	Euro
ICT	Information and Communication Technologies
IFI	Incremental Fit Index
LCD	Liquid Crystal Display
NC	Normed Chi-square
OECD	Organization for Economic Cooperation and Development
OM	Operations Management
PAC	Potential Absorptive Capacity
POMS	Production Operations Management Society
RBV	Resource Based View
RDT	Resource Dependence Theory
RMSEA	Root Mean Square Error of Approximation

SI	Strategic Intent
SPSS	Statistical Product and Service Solutions
SRMR	Standardized Root Mean Square Residual
TCT	Transactional Cost Theories
TLI	Tucker-Lewis Index
UK	United Kingdom
USA	United States of America
USD	United States Dollars

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## Abstract

### **Interfirm coopetition: antecedents, tensions, and performance outcomes**

While the research on the phenomenon of coopetition has increased significantly during the recent years, scholars in the operations management discipline have started to embrace it more swiftly. However, this line of enquiry often embodies loosely connected body of works, underdeveloped concepts, and a little work that could comprehend the significance of (a) interrelationships among antecedents that could lead firms to pursue coopetition, (b) relationships among tensions and tensions management, and (c) complementarity between firm-specific strategic resources and capabilities to generate performance benefits – the three important yet interrelated areas within interfirm coopetition research. To shed light on these knowledge gaps, this thesis is conducted to examine the overarching research question – “*How the interrelationships among antecedents, and tensions, and resources and capabilities influence various outcomes within horizontal interfirm coopetition?*”. The study utilizes survey data collected from 313 firms that engage in horizontal coopetition relationships in the UK, Ireland, Netherlands, the USA, and Canada. The findings of the thesis contributes to existing body of knowledge in operations management as well as strategic alliances. When it comes to *the antecedents*, the research findings reveal the importance of interplay between key variables of strategic intent, knowledge sharing, and ambidextrous managers for firms in their pursuit of coopetition relationships. It forwards that when complemented with knowledge sharing routines, a firm’s strategic intent could better guide the firm’s ambidextrous managers to pursue a successful coopetition. As for *the tensions*, the findings demonstrate that engaging in coopetition relationships alone will not directly lead to partner’s opportunism. However, firms’ interdependence positively mediates the relationship between coopetition and opportunism when formalization simultaneously moderates the relationships involving coopetition and interdependence as well as coopetition and opportunism. When it comes to the *performance outcomes*, findings reveal that a firm’s use of entrepreneurial orientation as a strategic resource, and potential absorptive capacity and strategic intent as strategic capabilities lead to innovation and operational performance benefits for the firm from its engagement in coopetition. However, these capabilities moderate the relationship between entrepreneurial orientation on performance outcomes differently. Overall, while addressing various knowledge gaps in extant literature, the thesis findings make significant contributions to extant coopetition research.

## **Declaration**

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institutes of learning.

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## **Dedication**

This thesis is dedicated to my parents and extended family

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## **Chapter 1. Introduction to coopetition**

This chapter starts with deliberations pertaining to the nature of coopetition, importance of pursuing coopetition, and how coopetition could materialize in the real world. Following which, it introduces the three key areas of coopetition - antecedents, tensions, and performance outcomes. This chapter ends with the positioning of the research that include the three papers that form the thesis, their results, and key contributions.

Relationships between firms evolved from being purely competitors to cooperators and on to collaborators. However, the recent two decades have noticed an increasing trend in the formation of a new type of relationships in the face of highly competitive business environments. The premise for these relationships embodies simultaneous cooperation and competition between firms, which is termed as ‘coopetition’. The term ‘coopetition’ was first coined by Mr. Raymond John Noorda, CEO of the American multinational software company ‘Novell’, that talked about relationships involving simultaneous cooperation and competition within the business environments in the 1980s and 1990s (Luo et al., 2006, Zhang and Frazier, 2011, Bouncken et al., 2015). Nevertheless, coopetition as a research topic of interest has become increasingly popular ever since the publication of a best-selling book ‘Co-opetition’ by Brandenburger and Nalebuff (1996), and the seminal works carried out by Lado et al. (1997), Dowling et al. (1996), Bengtsson and Kock (1999), and Bengtsson and Kock (2000). These seminal works paved the way for scholars to expand on the breadth and the width of coopetition research. Consequently, the research on coopetition has been consistently adapted and discussed across a wide range of disciplines which include management (Afuah, 2000, Ritala, 2012, Gnyawali and Charleton, 2018, Hoffmann et al., 2018, Bicen et al., 2021), marketing (Luo et al., 2006, Ho and Ganesan, 2013, Bengtsson and Raza-Ullah, 2016, Santos, 2021), operations management (Wilhelm, 2011, Wilhelm and Sydow, 2018, Schiffing et al., 2020, Sodhi and Tang, 2021) and

innovation management (Gnyawali and Park, 2011, Ritala and Hurmelinna-Laukkanen, 2013, Walter et al., 2015, Chiambaretto et al., 2019).

Traditionally, cooperation and competition are viewed as separate relational strategies for firms to embrace (M'Chirgui, 2005, Bouncken et al., 2015, Hoffmann et al., 2018) depending on the environmental conditions within which they operate. The core of competition is driven by the divergent interests of firms in that one firm aims to benefit at the cost of other firm's loss, whereas the core of cooperation is driven by the convergent interests of two or more firms to create joint value or to achieve collective goals (Padula and Dagnino, 2007). However, both the cooperation and competition perspectives have been criticised for their own limitations (Bouncken et al., 2015, Chou and Zolkiewski, 2018). For instance, strong competition obstructs potential interdependencies between firms which in turn would limit possible performance benefits; whereas strong cooperation underestimates competitive dynamics in relationships and allows space for knowledge spillovers and triggers learning races among the partners (Padula and Dagnino, 2007, Bouncken et al., 2015, Deng et al., 2019, Deng et al., 2021). Scholars argue that despite of firms being in cooperation, the competitive dynamics within that relationship give impetus to cooperating firms to exhibit competitive behaviours such as opportunism (Khanna et al., 1998, Hoffmann et al., 2018). However, when it comes to alliances between rival firms, competitive pressures force them to partner with each other due to foreclosed partnering opportunities with other firms outside their core sectors, and the potential complementary benefits which rivals could offer to each other. Additionally, engaging in cooperation could significantly improve competitor firms chances to overcome the limitations associated with traditional cooperation or competition only alliances (Brandenburger and Nalebuff, 1996, Hoffmann et al., 2018).

### **1.1. The nature of coopetition and how it materializes**

The manifestation of contradictory logics of cooperation and competition within the same relationship makes coopetition a paradoxical relationship (Bengtsson and Kock, 2014, Bengtsson et al., 2016b, Raza-Ullah, 2018, Schiffing et al., 2020). The paradoxical nature of the relationship tends to deal with hostilities on one hand due to conflicting interests, i.e., competition, and maintain friendliness due to common interests on the other hand, i.e., cooperation (Bengtsson and Kock, 2000). However, the integration of cooperative and competitive elements within coopetition likely offer flexibility for firms to overcome the limitations of traditional cooperation and competition perspectives (Bengtsson and Kock, 2000, Bouncken et al., 2015). The nature of coopetition makes it more suitable for firms that involve in high technology and knowledge intensive industries such as information and communication technologies (ICT), pharmaceuticals, and research and development (R&D) (Luo, 2007a, Ritala and Hurmelinna-Laukkanen, 2009, Gnyawali and Park, 2011, Ritala and Hurmelinna-Laukkanen, 2013, Raza-Ullah et al., 2014, Chiambaretto et al., 2019, Liu et al., 2020). The technology and knowledge-intensive industries tend to operate in complex environmental conditions that deal with, for instance, shorter product life-cycles, spiralling R&D costs, multiple technologies convergence, and to maintain robust technological standards (Gnyawali and Park, 2009, Gnyawali and Park, 2011, Hoffmann et al., 2018, Devece et al., 2019, Liu et al., 2020). The technology and knowledge intensive industries strive to consistently generate innovations to deal with higher rate of market and customer uncertainties and dynamics (Gnyawali and Park, 2011, Ritala, 2012, Ritala and Hurmelinna-Laukkanen, 2013, Bouncken et al., 2018b). The logic of collaborating with competitors offers a common ground for firms to exchange and use their existing capabilities, technologies, and knowledge over product markets in the innovation development process (Ritala and Hurmelinna-Laukkanen, 2009, Bouncken et al., 2015, Navío-Marco et al., 2019, Yu, 2019, Lascaux, 2020).



The nature of cooperation is entangled in terms of network level and dyadic level. Network level involves different actors including suppliers, complementors, competitors, customers and the interdependencies that exist between them (Afuah, 2000, Durach et al., 2020). These players together create value and then compete for a maximum share of value in that the focal firm cooperates with some firms and simultaneously competes with others within the same network (Bengtsson and Raza-Ullah, 2016). For dyadic and inter-firm context, firms engage in a direct one to one engagement to cooperate and compete simultaneously. Nevertheless, the manifestation of cooperation varies from one level to that of other level when they were to compare with each other (Bengtsson and Raza-Ullah, 2016). Among these different levels, cooperation at inter-firm level is said to be the ideal level to capture the insights of how cooperation relationships emerge, manifest, and are managed (Gnyawali et al., 2016). This belief is attributed to potential opportunities that cooperation at dyad level offers when it comes to observing both the partners' behaviours as well as the activities of where they cooperate and compete simultaneously (Gnyawali and Park, 2011, Pathak et al., 2014). Generally, firms in interfirm cooperation chose to cooperate in certain areas/functions such as Research and Development (R&D) to create a product market together and compete simultaneously in the market for a bigger share from what they create together (Gnyawali and Park, 2011). This division allows dyad level cooperation to make better observations as well as control over the processes as well as management of activities that are involved in respective cooperating and competing areas within their relationship. Further, cooperation at the dyadic level is argued to be more intense as well as intellectually intriguing than it is in other types (Gnyawali and Park, 2011). It is due to the effectiveness and ease that a dyad offers when it comes to studying the inherent simultaneous cooperative and competitive processes more closely when compared to network level wherein the involvement of multiple firms make it rather difficult and ineffective to make close observations of the simultaneous activities of all the

firms involved in the network (Pathak et al., 2014, Wilhelm, 2011, Gnyawali et al., 2008, Gnyawali and Park, 2011). However, firms that cooperate with one firm and compete with another, or cooperating and competing at different time intervals do not qualify a relationship to be interfirm cooperation but the simultaneity of cooperation and competition between two firms has to happen at the same time in order to be called a coopetition relationship (Luo, 2007b, Bengtsson and Raza-Ullah, 2016). As much as the nature of coopetition could combine the best of both the worlds of cooperation and competition as part of its strategy implementation; the inherent paradox embedded in combining the contradictions of cooperation and competition tends to create tensions (Bouncken et al., 2015, Raza-Ullah, 2018). These tensions include interdependence (Tidström, 2014, Hoffmann et al., 2018, Chou and Zolkiewski, 2018), opportunism (Tidström, 2014, Raza-Ullah et al., 2014, Bengtsson et al., 2016b, Yu, 2019), knowledge sharing vs knowledge protection (Bengtsson et al., 2016b, Fernandez and Chiambaretto, 2016, Chiambaretto et al., 2019), and value creation vs value appropriation (Tidström, 2014, Ritala and Tidström, 2014, Bouncken et al., 2018a, Santos, 2021).

The materialization of coopetition is exhibited using several examples in extant literature to emphasize its relevance to not only academia but also in practice. For coopetition to operationalize, firms decide upon separating the areas in that they intend to cooperate and compete particularly at interfirm level. Coopetition does not occur in cases where cooperation takes place during one period while competition takes place during a different period. This temporal concurrence distinguishes coopetition from the other traditional forms of relationships (Luo, 2007a). One of the prominent examples of coopetition is the relationship between Sony and Samsung that was established in 2004 (Ritala and Hurmelinna-Laukkanen, 2009, Gnyawali and Park, 2011, Ritala et al., 2014, Raza-Ullah et al., 2014, Bengtsson and Raza-Ullah, 2016). The consumer electronics industry was very competitive in early 2000 with top players including Toshiba, Panasonic,

and LG electronics were being able to produce technology breakthroughs to maintain their competitive advantage. Meanwhile Sony was struggling to maintain a hold on to flat-screen TV market after a massive loss in 2003 what was termed as 'Sony Shock'. Sony quickly realised the need to maintain a stable supply of LCD panels to catch-up the market demand. Evidently, Samsung was one of the strongest producers of LCDS panels by that time and Samsung also needed to secure a large partner like Sony to achieve its economies of scale and to advance technological standards and markets reach (Gnyawali and Park, 2011). Anticipating respective potential vulnerabilities in changing industry, technology, and market dynamics prompted Sony and Samsung to join hands despite of them being strong rivals in the same market. Both the firms setup the leadership team, agreed upon initial resource commitments of USD 1 billion each, and ensured governance arrangements in place to begin with their joint venture. Towards the end of 2007, both the firms turned their bottom-line fortunes with their venture's success which further prompted to triple their investments in their venture to develop 8<sup>th</sup> generation technologies (Gnyawali and Park, 2011). Similarly other successful coepetition stories include collaborations between Volkswagen and Ford which was set up to expand their market basis in Latin America (Park and Ungson, 2001), and the relationship between Volkswagen and Suzuki to enable the former to gain access to the Indian market while the latter benefits from former's expertise in vehicle technologies (Kumar, 2014, Bengtsson and Raza-Ullah, 2016). Apart from these examples to be an indication of the motives and the benefits that firms could gain by engaging in coepetition, these examples also reflect on the widely acknowledged fact that coepetition occurs mostly at inter-firm level and the dynamics of coepetition are better observable at inter-firm/dyad level (Fernandez et al., 2014, Bengtsson and Raza-Ullah, 2016).

## **1.2. Why is coopetition important**

The growing importance of coopetition is linked to not only today's complex business environment of rapid technology/market changes and resource requirements within which firms are operating, but also the persistent need for firms to maintain their competitive advantage within such environments (Dowling et al., 1996, Luo, 2007a, Gnyawali and Park, 2009, Dorn et al., 2016, Bengtsson and Raza-Ullah, 2016, Hoffmann et al., 2018). The uncertainties associated to dynamic changes in industry and industry structure (Bengtsson and Kock, 2000, Ritala, 2012, Bengtsson and Raza-Ullah, 2016), increased market demand volatility (Bengtsson and Kock, 2000, Bengtsson and Raza-Ullah, 2016, Hoffmann et al., 2018), institutional conditions (Mariani, 2007, Luo, 2007a), and technology uncertainties attract firms to engage in coooperative relationships (Gnyawali and Park, 2011, Ritala and Sainio, 2014, Bengtsson and Raza-Ullah, 2016). Coooperation assists firms to overcome market dynamism of varied customer and market demands using the commonalities of target market and product offering of the firms (Bengtsson and Kock, 2000). Similarly, coooperation is regarded to be much useful strategy to address major technological breakthroughs due to the similar nature of technological resources that the firms maintain; wherein integrating their technological capabilities enhances their technological diversity and prowess (Quintana-García and Benavides-Velasco, 2004), and importantly assists the firms to overcome diverse range of technological challenges (Gnyawali and Park, 2011, Ritala and Sainio, 2014). When it comes to institutional challenges, the regulatory hindrances that firms face both domestically and non-domestically motivate firms with similar business interests to come together to develop bargaining power, harmonious voice, and collective power to negotiate the institutional hazards (Luo, 2007a, Mariani, 2007, Bengtsson and Raza-Ullah, 2016).

As much as coooperation is widely conversed as a solution to address diverse range of challenges for firms with mutual interests, it is also used as a source for firms to improve

on their performance benefits and to subsequently improve competitive advantage. The multifaceted concept of cooptition is envisioned to offer higher benefits for the firms compared to that of pure cooperation or pure competition relationships (Bengtsson and Kock, 2000). These higher benefits are attributed to the result of combined benefits of both cooperation and competition that cooptition involves (Park et al., 2014b). These benefits are further explained in terms of value creation and value appropriation. The cooperation part of cooptition represents creation of common benefits or value creation while the competition part represents firm-level/value-appropriation benefits that firms aim to gain from what has been created (Brandenburger and Nalebuff, 1996, Khanna et al., 1998, Ritala and Hurmelinna-Laukkanen, 2009, Bengtsson and Kock, 2014, Gnyawali and Park, 2011, Bouncken et al., 2018b). Value creation is the total sum of value that has been created in the course of activities that lead to an outcome such as, for instance, generating innovation; whereas value appropriation is the individual or a firm's share of innovation that a firm wants to utilise to make profits for itself (Ritala and Hurmelinna-Laukkanen, 2009, Ritala and Tidström, 2014, Bouncken et al., 2018b). Although value creation and appropriation are common processes among all types of collaborations, the value distribution process of cooptition varies from traditional collaborations to competitor collaborations. For instance, non-competitor collaborators build their innovation/value created jointly, and distribution/appropriation of their benefits follow as per the underlined formal or information contractual or governance arrangements (Hurmelinna-Laukkanen et al., 2008, Ritala and Hurmelinna-Laukkanen, 2009). However, for competitor-collaborations, the creation of joint value largely remains similar to that of traditional collaborations, but the appropriation of value is more competitive in that one competes over the other to achieve better share of benefits (Ritala and Hurmelinna-Laukkanen, 2009), such as competing in the market place for higher market share. Extant literature suggests diverse range of benefits associated to cooptition which include innovation, market performance,

operational performance, financial or economic performance (Bengtsson and Kock, 2000, Luo, 2007a, Ritala and Hurmelinna-Laukkanen, 2009, Gnyawali and Park, 2011, Gnyawali and Park, 2009, Park et al., 2014b, Ritala and Hurmelinna-Laukkanen, 2013, Ritala et al., 2014, Bengtsson and Raza-Ullah, 2016, Czakon et al., 2019, Luo et al., 2006, Gnyawali et al., 2006).

### **1.3. Three key areas of inter-firm coopetition: antecedents, tensions, and outcomes**

Extant research indicates that the important areas of coopetition can be explained in three key areas – antecedents; processes, i.e., tensions in our case; and outcomes (Padula and Dagnino, 2007, Ritala et al., 2014, Bouncken et al., 2015, Bengtsson et al., 2016a, Bengtsson and Raza-Ullah, 2016, Klimas, 2016, Strese et al., 2016a, Dorn et al., 2016, Czakon et al., 2019). **One**, the antecedents or the drivers – these are the motivations for competitor firms to engage in coopetition (Ritala, 2012, Ritala et al., 2014, Bengtsson and Raza-Ullah, 2016, Dorn et al., 2016, Hoffmann et al., 2018). **Two**, the tensions - these represent the some of the outcomes of the dynamics associated to coopetition. The complex nature of the interplay of cooperation and competition is associated to causing tensions (Raza-Ullah et al., 2014, Bouncken et al., 2015, Dorn et al., 2016, Bengtsson and Raza-Ullah, 2016, Fernandez and Chiambaretto, 2016, Hoffmann et al., 2018). **Three**, the outcomes, these are associated to performance outcomes such as innovation, economic, market, operational benefits (Bouncken et al., 2015, Bengtsson and Raza-Ullah, 2016, Dorn et al., 2016, Hoffmann et al., 2018). These three areas together forms the rationale for our overarching research question – “*How the interrelationships among antecedents, and tensions, and resources and capabilities influence various outcomes within interfirm horizontal coopetition?*”.

### 1.3.1. Antecedents to coopetition

Extant literature dissuades several antecedents as motivating factors for rival firms to engage in collaborations with each other. These antecedent are categorised in terms of internal, relational, and external antecedents (Ritala et al., 2014, Bengtsson and Raza-Ullah, 2016, Chiambaretto et al., 2019), and the nature of these antecedents are attributed to economic, social, and structural conditions (Gnyawali and Park, 2011, Dahl et al., 2016). *Internal antecedents* refers to a firm's internal environment that represents a firm internal goals, resources, personal motives such as exploiting new market opportunities, reducing costs and risks, move up in value chain order, improving the competitive capability through integrating own resources with that of partners, and eventually improve on overall performance (Luo, 2007a, Gnyawali and Park, 2009, Ritala et al., 2014, Bengtsson and Raza-Ullah, 2016, Adame-Sánchez et al., 2018). *External antecedents* reflect upon a firm's external environment that represents industrial characteristics such as market uncertainty, growth structure, technological demands such as technological convergence to build new platforms, and institutional forces such as governments, policy makers, and regulatory bodies' that drive the firms to pursue cooperative relationships (Luo, 2004, Walley et al., 2007, Barretta, 2008, Ritala, 2012, Bengtsson and Raza-Ullah, 2016, Zhang et al., 2017, Xu et al., 2019). *Relational antecedents* refer to the distinct and complementary resources of partners, investing in relational assets, setting up effective governance mechanisms, ensuring resource and knowledge sharing routines to enable the rival firms to pursue coopetition (Zineldin, 2004, Bonel and Rocco, 2009, Luo, 2007a, Gnyawali and Park, 2011, Bengtsson and Raza-Ullah, 2016, Bicen et al., 2021).

The following Table 1.1 illustrates the commonly acknowledged antecedents for firms to pursue cooperative relationships from across management studies.

Table 1.1: Coopetition antecedents literature

Antecedents	Major studies
<b>Internal antecedents</b>	
Strategic intent	<p>Strategic intent measures a firm’s strategic aggressiveness and ambitions and offer direction for firms to pursue different forms of strategic relationships such as coopetition.</p> <p>(Gnyawali et al., 2006); (Luo, 2007a); (Gnyawali and Park, 2009); (Yami et al., 2010) (Ritala, 2012); (Ritala and Tidström, 2014); (Gnyawali and Charleton, 2018); (Pattinson et al., 2018); (Bacon et al., 2019); (Estrada and Dong, 2019)</p>
Managers role	<p>Use of managerial ambidextrous skills assist exploration of collaborating opportunities and exploiting competing areas simultaneously to achieve cooperation and competition objectives within coopetition.</p> <p>(Luo, 2007a); (Bonel and Rocco, 2009); (Fernandez and Chiambaretto, 2016); (Strese et al., 2016a); (Bengtsson et al., 2016b); (Galkina and Lundgren-Henriksson, 2017); (Pattinson et al., 2018); (Bengtsson et al., 2018)</p>
<b>External antecedents</b>	
Industry structure	<p>The uncertainties, instability, growth potential and structure of an industry encourage rival firms to engage in coopetition.</p> <p>(Luo, 2004); (Möller and Rajala, 2007); (Gnyawali and Park, 2011); (Ritala, 2012); (Bengtsson and Johansson, 2014); (Klimas, 2016); (Le Roy and Czakon, 2016); (Bengtsson et al., 2016a); (Czakon et al., 2019)</p>
Market conditions	<p>Varied customer expectations and dynamic market demands over various product categories trigger firms that serve similar markets to collaborate so as to manage market dynamism.</p> <p>(Morris et al., 2007); (Luo, 2007a); (Ritala, 2012); (Bouncken et al., 2015); (Galkina and Lundgren-Henriksson, 2017); (Bouncken et al., 2018b); (Fredrich et al., 2019); (Bouncken et al., 2020a); (Klein et al., 2020)</p>



Technology conditions	<p>Accessing and integrating competitors' technological capabilities tend to enable coopetitors to overcome technological challenges besides being able to enhance their technological diversity and rate of new product developments.</p> <p>(Quintana-García and Benavides-Velasco, 2004); (Luo, 2007a); (Gnyawali and Park, 2009); (Gnyawali and Park, 2011); (Raza-Ullah et al., 2014); (Gnyawali and Song, 2016); (Estrada et al., 2016); (Bouncken et al., 2018b); (Estrada and Dong, 2019); (Bacon et al., 2019); (Liu et al., 2020)</p>
Institutional environment	<p>Regulatory hindrances, both domestically or regionally, motivate rivals to come together as being united with firms that have similar interests assist to develop a collective bargaining power, harmonious voice, and power to deal with institutional hazards.</p> <p>(Bengtsson and Kock, 2000); (Luo, 2004); (Luo, 2007a); (Mariani, 2007); (Barretta, 2008); (Rusko, 2011); (Yami and Nemeh, 2014); (Tidström, 2014); (Dahl et al., 2016); (Bouncken et al., 2018a)</p>
<b>Relational antecedents</b>	
Investments in relational assets	<p>Investments in relational assets is a major determinant for firms in coopeition as such investments could potentially lead to relational rents, asset interconnectedness, and mitigate the risks associated to high-level investments.</p> <p>(Zineldin, 2004); (Padula and Dagnino, 2007); (Dagnino and Rocco, 2009); (Gnyawali and Park, 2009); (Nair et al., 2011); (Gnyawali and Park, 2011); (Ritala, 2012); (Ritala et al., 2014); (Estrada and Dong, 2019)</p>
Complementary resources	<p>Complementary resources create higher value for alliances when such resources are used in combination rather than when they are used separately. Complementaries also bring stability to the relationships.</p> <p>(Luo, 2007a); (Ritala and Hurmelinna-Laukkanen, 2009); (Gnyawali and Park, 2009); (Gnyawali and Park, 2011); (Ritala, 2012); (Bouncken and Kraus, 2013); (Ritala et al., 2014);</p>

	(Bouncken et al., 2016a); (Estrada et al., 2016); (Fredrich et al., 2019)
Knowledge sharing	<p>Knowledge sharing is a key source of competitive advantage for coopetitors as gaining access to knowledge resources of the partners through cooperation allows to realise common objectives, while unintended spillovers and imitation assist to gain personal benefits.</p> <p>(Carayannis and Alexander, 1999); (Levy et al., 2003); (Quintana-García and Benavides-Velasco, 2004); (Padula and Dagnino, 2007); (Gnyawali and Park, 2011); (Ritala and Hurmelinna-Laukkanen, 2013); (Bouncken and Kraus, 2013); (Estrada et al., 2016); (Chiambaretto et al., 2019); (Bacon et al., 2019); (Chen et al., 2020); (Zhu et al., 2020)</p>
Governance mechanism	<p>Well-functioning governance mechanisms are important for coopetition's success. Governance mechanisms ensure to enhance trust, direct managerial contact channels, joint problem solving, shared decision making, and prescribe clear rules for the actions and behaviours in a given relationship.</p> <p>(Luo, 2007a); (Andersen and Drejer, 2009); (Cassiman et al., 2009); (Yami et al., 2010); (Gnyawali and Park, 2011); (Ritala and Hurmelinna-Laukkanen, 2013); (Estrada et al., 2016); (Bouncken et al., 2016a); (Dorn et al., 2016); (Devece et al., 2019); (Bicen et al., 2021)</p>

Various antecedents play different roles in influencing firms cooperative engagements. For instance, relational antecedents such as governance mechanisms complement knowledge sharing routines to protect coopetitors' interests (Ritala and Hurmelinna-Laukkanen, 2013, Bouncken et al., 2016a, Dorn et al., 2016, de Resende et al., 2018, Durach et al., 2020). However, our understanding pertained to what antecedents trigger firms to pursue cooperation and the underlying complementarity between various antecedents to materialize cooperation is very much limited. It is important to explicate this conundrum given that extant literature argues that firms decision to engage in cooperation

likely to take place within a firm (Luo, 2007a), but it lacks clarity when it comes to further explaining potential complementary variables that enable firms successful coopetition engagements. Engaging in coopetition is a firm-specific decision taken at a firm level (Dowling et al., 1996, Luo, 2007a, Velu, 2016) in that 'strategic intent' is attributed to be a key antecedent that drives firms to engage in different levels of coopetition such as intrafirm, interfirm, or network (Luo, 2007a). However, it is unknown how the process of a firm's strategic intent to engage in coopetition unfolds and whether it is a straightforward process or there are any intermediary antecedents/variables that may accommodate the intent to pursue coopetition. This underlines the need to further investigate the significance of the antecedents that not only trigger firms decision to pursue coopetition and but also potentially complement the strategic intent to materialise the relationship between strategic intent and engaging in coopetition.

### **1.3.2. Tensions**

Coopetition is a tension filled relationship due to the interactions between inherently contradictory logics of cooperation and competition within the same relationship (Gnyawali and Park, 2011, Fernandez et al., 2014, Hoffmann et al., 2018, Chou and Zolkiewski, 2018, Chiambaretto et al., 2019). Such interactions tend to give rise to tensions as they consist of two co-existing paradoxical logics with conflicting goals (Bengtsson and Raza-Ullah, 2016, Bengtsson et al., 2016b, Yan et al., 2019). The nature of tensions in coopetition maintain a clear and consistent distinction with that of the tensions generally occur in non-coopetition relationships. For instance, in non-competitor alliances, losing a firm's key customer or a key supplier to its partner tend to provoke negative feelings, which is referred to as competitive tensions (Bengtsson et al., 2016b). However, the tensions in coopetition originates from the paradoxicality in that the use of cooperation to build trust and efforts to maintain the trust while pursuing competition simultaneously could cause tensions (Raza-Ullah et al., 2014, Schiffing et al., 2020).

As much as interfirm cooperation allows to better observe underlying cooperation processes such as value creation and value appropriation, it also offers an opportunity to better observe the tensions between both the partners (Bengtsson and Kock, 2000, Chiambaretto et al., 2019, Santos, 2021). A plausible way to comprehend the tensions in interfirm cooperation is to observe the simultaneous cooperation processes that create value in certain areas (Ex – R&D and production) and appropriate value in other areas (Ex – marketplace) (Bengtsson et al., 2016a, Bengtsson and Raza-Ullah, 2016). Similarly, competitors are expected to share the resources and knowledge on one hand and protect the resource leakages and knowledge spillovers on the other hand (Ho and Ganesan, 2013). Observing these simultaneously pursued paradoxical processes within interfirm cooperation relationships offers better comprehensions over the potentially underlying tensions. Extant literature debates different types of tensions that can possibly occur in interfirm cooperation relationships. The following Table 1.2 lists the tensions associated to interfirm cooperation.

Table 1.2: Cooperation tensions literature

<b>Tensions</b>	<b>Major studies</b>
Dependence	<p>Dependence refers to one party to exercise its resources and size as tools to make other party to be dependent within a given relationship.</p> <p>(Luo, 2004); (Luo, 2005); (Padula and Dagnino, 2007); (Wilhelm, 2011); (Bouncken and Fredrick, 2012); (Tidström, 2014); (Dahl, 2014); (Fernandez and Chiambaretto, 2016); (Fredrich et al., 2019); (Chai et al., 2019); (Jakobsen, 2020); (Bouncken et al., 2020a); (Vlachos and Dyra, 2020)</p>
Power asymmetry	<p>Refers to the influence and decisions going in the direction desired by one party that has the dominant bargaining power in a given relationship.</p>

	(Luo, 2004); (Wilhelm, 2011); (Raza-Ullah et al., 2014); (Tidström, 2014); (Czakoń et al., 2014); (Akpınar and Vincze, 2016); (Le Roy and Czakoń, 2016); (Chou and Zolkiewski, 2018); (Bendig et al., 2018); (Tidström et al., 2018)
Opportunism	Refers to one party exploiting the interests of the other party while sharing resources and activities due to the varying circumstances surrounding their transactions.  (Lado et al., 1997); (Khanna et al., 1998); (Osarenkhoe, 2010); (Tidström, 2014); (Park et al., 2014b); (Fernandez and Chiambaretto, 2016); (Bouncken et al., 2016a); (Bouncken and Fredrich, 2016); (Estrada et al., 2016); (Bouncken et al., 2018b); (Chai et al., 2019); (Yu, 2019); (Fredrich et al., 2019); (Jakobsen, 2020)
Role tensions	Refers to the tensions that stem from the cooperative and competitive oriented activities that firms share and execute as part of the cooperation arrangements.  (Dowling et al., 1996); (Bengtsson and Kock, 2000); (Bengtsson and Kock, 2014); (Tidström, 2014); (Velu, 2016); (Bouncken et al., 2016a); (Gnyawali et al., 2016); (Bengtsson et al., 2016b); (Chai et al., 2020); (Yan et al., 2019)
Value creation vs Value appropriation	Refers to the tensions between the overall value that firms create together and capturing their own share of benefits from the value created.  (Quintana-García and Benavides-Velasco, 2004); (Lacoste, 2012); (Tidström, 2014); (Yami and Nemeh, 2014); (Fernandez et al., 2014); (Raza-Ullah et al., 2014); (Bouncken et al., 2015); (Fernandez and Chiambaretto, 2016); (Estrada et al., 2016); (Le Roy and Czakoń, 2016); (Bouncken et al., 2018a); (Chou and Zolkiewski, 2018); (Chiambaretto et al., 2019); (Jakobsen, 2020); (Santos, 2021)

These tensions can sometimes grow stronger based on the environment surrounding the relationship as environmental conditions such as resource, relational, or external conditions could jeopardize the effectiveness of the firms pursuit of coopetition (Bonel and Rocco, 2007, Fernandez et al., 2014). Alternatively, several scholars blame the competition dimension for the potential tensions in coopetition and argue for it to be reduced or eliminated to effectively reduce tensions. However, attempts to eliminate or reduce competition from the relationship could possibly reduce the benefits that coopetition as a whole could offer. Therefore, the key is to manage the tensions than eliminating competition from coopetition altogether (Bengtsson and Kock, 2000, Fernandez et al., 2014). Extant literature argues that high failure rates of paradoxical collaborations are attributed to firms failure to have required capabilities to manage the tensions (Raza-Ullah et al., 2014, Bengtsson et al., 2016b). Accordingly, the importance of use of various governance mechanisms, such as various contractual and relational governance as well as formal and informal protection mechanisms, is debated to deal with coopetition tensions (Ritala and Hurmelinna-Laukkanen, 2013, Bouncken et al., 2016a, de Resende et al., 2018). Although extant literature discusses the importance of investigating various coopetition tensions as well as the use of various mechanisms to mitigate tensions (Tidström, 2014, Bouncken et al., 2016a, Hoffmann et al., 2018); they appear to have overlooked at (1) possible underlying interconnections between different types of coopetition tensions themselves (2) how formal rule-based mechanisms, which are rather argued to be tension mitigators in generic alliances (i.e., non-coopetition alliances), could affect the coopetition tensions. Extant coopetition literature views coopetition tensions, described in Table 1.2, to be independent and they do not appear to have any plausible linkages between themselves. However, several non-coopetition studies argue in favour of an underlying association between different types of tensions in alliances. To add to this uncertainty, coopetition scholars reckon a substantial lack of understanding over what underlies the

tensions and how certain variables oscillate the tensions (Raza-Ullah et al., 2014, Hoffmann et al., 2018). Therefore, it would be interesting to investigate the underlying associations between the coepetition tensions and how formal rule-based mechanisms can affect these tensions.

### **1.3.3. Performance outcomes**

Extant literature allude various potential performance benefits for firms at both firm level and relational level as a result of their involvement in coepetitive relationships (Bengtsson and Kock, 2000, Ritala and Hurmelinna - Laukkanen, 2013, Bengtsson and Raza-Ullah, 2016, Bouncken et al., 2018b, Hoffmann et al., 2018, Czakon et al., 2020). Among the benefits, innovation, operational outcomes, and other relational performance benefits have received more attention as they appear to be the commonly discussed performance outcomes. Innovation outcomes are attributed to knowledge routines as well as knowledge exchanges between firms as part of the cooperative arrangements of coepetition while the competition part of coepetition is said to exert pressure on the firms to continuously innovate (Park et al., 2014a, Bengtsson and Raza-Ullah, 2016, Navío-Marco et al., 2019, Chen et al., 2020). The innovation outcomes are further discussed in terms of incremental and radical innovations. These innovation types are also associated to coepetitors abilities to utilize their capabilities to internalize the knowledge and to protect the unintended leakages. For instance, a firm's ability to maintain high levels of knowledge protection regimes tend to increase the firm's chances to generate radical innovations (Ritala and Hurmelinna-Laukkanen, 2013). Also, firms ability to enhance their research and development (R&D) capabilities potentially lead to radical innovations (Fredrich et al., 2019). Similarly, firms ability to utilize their absorptive capacities to access and utilize external knowledge for own benefits can generate both the incremental (Ritala and Hurmelinna-Laukkanen, 2013) and radical innovations (Fredrich et al., 2019). However, these outcomes are also dependent on characteristics such as operating in technology-

intensive or knowledge-driven industries wherein coepetitors tend to operate (Ritala and Hurmelinna-Laukkanen, 2013, Liu et al., 2020); and the knowledge received from partner must have sufficient substance to generate novel innovations (Bouncken and Fredrick, 2012, Bengtsson and Raza-Ullah, 2016). Besides the innovation, coepetition is also argued to offer traditional performance benefits that include both operational performance as well as economic performance. Coepetition is necessitated by the firms' mutual need for collaboration in specific areas so as to improve efficiencies by consummating their collective operational infrastructure in target markets (Luo, 2007a, Luo, 2005). For instance, Nokia competes rigorously with Ericsson in China for market share, whereas alternatively Nokia and Ericsson work together for greater access where they together build equipment clusters to enhance their efficiencies and service effectiveness (Luo, 2007a). Cooperation between competitors also come with the benefits of reducing costs, risks, and uncertainties (Le Roy and Sanou, 2014, Bengtsson and Raza-Ullah, 2016, Christ et al., 2017, Devece et al., 2019). For some firms, partnering with a competitor is the best strategic decision due to the similarities in their expertise and to achieve common market interests in a given scheduled time intervals. Coepetition offers to be an effective opportunity for such firms to quickly improve their production efficiencies, flexibility, and quality controls together to enhance the overall strength of their operations (Luo, 2007a, Wilhelm, 2011, Devece et al., 2019, Bengtsson et al., 2016b). Such a coepetition driven benefits potentially lead to fulfilment of greater customer needs and higher market share, and eventually greater financial performance (Lado et al., 1997, Tsai, 2002, Luo et al., 2006, Bendig et al., 2018). Accordingly, extant literature indicate coepetition performance benefits to result in increased economic and profitability performance benefits (Luo et al., 2006, Wilhelm, 2011, Baruch and Lin, 2012, Bouncken et al., 2015, Strese et al., 2016a, Bendig et al., 2018, Pekovic et al., 2020).



Table 1.3: Coopetition performance outcomes literature

Performance outcomes	Major studies
Innovation (Incremental and radical)	(Bengtsson and Kock, 2000); (Luo, 2007a); (Ritala and Hurmelinna-Laukkanen, 2009); (Gnyawali and Park, 2009); (Ritala, 2012); (Bouncken and Kraus, 2013); (Ritala and Hurmelinna-Laukkanen, 2013); (Park et al., 2014a); (Park et al., 2014b); (Ritala and Sainio, 2014); (Bouncken et al., 2016a); (Estrada et al., 2016); (Bouncken et al., 2018b); (Bacon et al., 2019)
Operational performance (Cost, efficiencies, quality, flexibility, and reliability etc.)	(Luo, 2007a); (Mariani, 2007); (Morris et al., 2007); (Dagnino and Rocco, 2009); (Bouncken et al., 2015); (Bengtsson and Raza-Ullah, 2016); (Bengtsson et al., 2016b); (Christ et al., 2017); (Devece et al., 2019)
Relational performance (Financial performance, meeting alliance objectives, and alliance overall performance etc.)	(Luo, 2004); (Luo, 2007a); (Dagnino and Rocco, 2009); (Baruch and Lin, 2012); (Le Roy and Sanou, 2014); (Bengtsson and Kock, 2014); (Bouncken et al., 2015); (Strese et al., 2016b); (Bengtsson and Raza-Ullah, 2016); (Klimas, 2016); (Bendig et al., 2018); (Klimas and Czakon, 2018); (Crick, 2019); (Fredrich et al., 2019); (Manzhynski and Figge, 2020); (Pekovic et al., 2020)

Although extant literature allude coopetition to offer various performance benefits, it lacks clarity when it comes to the resources and capabilities that coopetitors tend to utilize to gain these performance benefits at both the firm level and at alliance level. Studies suggest number of combinations of resources, capabilities, and mechanisms to enable coopetitors to generate both the firm and alliance level performance outcomes (Luo, 2004, Luo, 2005, Morris et al., 2007, Luo, 2007a, Ritala and Hurmelinna-Laukkanen, 2009, Ritala, 2012, Ritala and Hurmelinna-Laukkanen, 2013, Ritala and Sainio, 2014, Park et al., 2014a, Park et al., 2014b, Ritala et al., 2014, Estrada et al., 2016, Le Roy and Czakon, 2016, Vanyushyn et al., 2018, Bendig et al., 2018). However, coopetitors in general are highly entrepreneurial which tend to use their firm level resources and capabilities in the

first place to generate performance benefits before utilizing the resources that come from outside firm boundaries (Kreiser, 2011). Scholars have put forward several combinations of internal resource and capabilities to explain how internal capabilities potentially help generating performance outcomes such as innovation (Estrada et al., 2016); but these neither particularly explain the role of firm-level resources and capabilities in generating various performance outcomes for the firm nor discuss from the perspective of inter-firm cooperation context to capture the true magnitude of the effects of firm-level resource and capabilities. It is important to investigate the internal side of a firm in cooperation as (1) literature argues that the firm-level resource and capability combinations complement each other to enhance the firm's performance outcomes in interfirm relationships, (2) firms are said to generate multiple performance benefits simultaneously utilizing their firm-level resources and capabilities. Therefore, it indicates a need to investigate the potential performance benefits of competitor's resources and capabilities at the firm-level in interfirm cooperation relationships.

#### **1.4. Overview of the research**

To address the overarching research question – *“How the interrelationships among antecedents, and tensions, and resources and capabilities influence various outcomes within interfirm horizontal cooperation?”*, three different yet interrelated research papers have been developed which collectively form the basis for the thesis. The positioning of the overarching research question, ‘Sub-Research Questions’ (SRQ) and the ‘Objectives’ (OB) of each of the research questions are depicted in the Figure 1.1. Research paper – I, by addressing the objectives OB1a, OB1b, OB1c, and OB1d of the sub-research question one (SRQ1), investigates how a firm's strategic intent could lead the firm to pursue cooperation utilizing the intervening channels of the firm's manager's ambidexterity and knowledge sharing routines. Research paper – II, by addressing the objectives OB2a, OB2b, OB2c, and OB2d associated to the sub-research question two (SRQ2), it investigates

the relationships between cooperation and two different tensions of interdependence and opportunism; additionally, it studies the effects of formalization on the relationships involving cooperation and interdependence as well as cooperation and opportunism. Therefore, research papers I and II address the antecedents and tensions part of the overarching research question. Research paper – III, through OB3a and OB3b associated to the sub-research question three (SRQ3), investigates the significance of the internal resource and capabilities for a firm/cooperator to generate innovation performance as well as operational performance outcomes from the firm's engagement in cooperation relationships. Accordingly, research paper – III addresses performance outcomes (utilizing resources and capabilities) part of the overarching research question. Together, research papers I, II, and III aim to address the overarching research question of the thesis, i.e., 'Investigate the antecedents, tensions, and performance outcomes within interfirm horizontal cooperation relationships'. Figure 1.1 illustrates the positioning of the three research papers and the key constructs that underlie each of the papers. Later below, a brief outline of each of the three research papers is provided.



Figure 1.1: Positioning of the three research papers

### **1.4.1. Research Paper-I**

Research paper one is attributed to the first sub-research question of this thesis.

**SRQ1:** How does the interplay of key antecedents enable firms to pursue successful coopetition relationships?

**Title:** *The architecture of competition: Strategic intent, ambidextrous managers, and knowledge sharing*

#### **Objectives:**

- **OB1a:** Investigate the potential relationship between a firm's 'strategic intent' and its 'manager's ambidexterity', and how 'knowledge sharing' could moderate the relationship.
- **OB1b:** Investigate the potential relationship between a firm's 'strategic intent' and 'coopetition', and how 'knowledge sharing' could moderate the relationship.
- **OB1c:** Study the relationship between manager's ambidexterity and coopetition.
- **OB1d:** Study the moderated mediation effect of knowledge sharing and ambidexterity between strategic intent and coopetition.

#### **Results**

- The effect of strategic intent on manager's ambidexterity is found to be negative and rather significant. The knowledge sharing routines could positively moderate the negative effect between strategic intent and manager's ambidexterity.
- The effect of strategic intent on coopetition is found to be negative and insignificant. The use of knowledge sharing routines could positively moderate this relationship.

- The relationship between manager's ambidexterity on cooperation is found to be positive and significant.
- The mediation effect of manager's ambidexterity on the relationship between strategic intent and cooperation is positive and significant when knowledge sharing concurrently moderates the relationship between strategic intent and manager's ambidexterity.

### **Key contributions**

- The findings clarify the contradictory assumptions posited in extant literature on the potential linkage between strategic intent and cooperation (Luo, 2007a, Nielsen, 2010, Yami et al., 2010, Estrada and Dong, 2019). The results suggest that a firm's strategic intent to pursue cooperation is not straightforward as some scholars argued, but indicates the need for potential intervening variables, in our case knowledge sharing and manager's ambidexterity, to materialize the relationship between strategic intent and cooperation.
- The results empirically validate the importance of ambidextrous managers for firms to pursue cooperation relationships. This finding contributes to the calls that seek (1) clarity on the managerial characteristics in ambidextrous relationships (Felício et al., 2019) and (2) empirical investigation into the nature of managers involved in cooperative relationships (Czakon et al., 2019). The findings propose that managers' ambidextrous skills consist of a combination of exploration and exploitation skills and they are essential to pursue cooperation. Our finding is the first to establish an empirical connection between manager's ambidexterity and cooperation.
- The results forward an underlying positive mediation effect of manager's ambidexterity on the relationship between strategic intent and cooperation when knowledge concurrently moderates the relationship between the strategic intent

and manager's ambidexterity. This result advocates that knowledge sharing could complement a firm's strategic intent to align it with that of the partner firm to maintain congruence between the partners, in that the knowledge complemented strategic intent could better guide the firm's ambidextrous managers to pursue cooperation.

#### **1.4.2. Research Paper-II**

Research paper two is attributed to the second sub-research question of this thesis.

**SRQ2:** How does cooperation lead to different tensions and what role formalized routines play in managing the tensions?

**Title:** *Key tensions in cooperative relationships: The contingent role of formalization*

#### **Objectives:**

- **OB2a:** Study the effects between 'cooperation and interdependence', 'cooperation and opportunism', and 'interdependence and opportunism'.
- **OB2b:** Study the moderating effect of 'formalization' on the relationships involving 'cooperation and interdependence' as well as 'cooperation and opportunism'.
- **OB2c:** Investigate the mediating role of interdependence between cooperation and opportunism.
- **OB2d:** Investigate the moderated mediation effect of formalization and interdependence between cooperation and opportunism.

#### **Results**

- The effect of cooperation on firms' interdependence is negative and rather significant. Formalization is found to positively moderate this negative effect between cooperation and interdependence.

- The effect of cooptation on partner firm's opportunism is found to be insignificant. Formalization could positively moderate the effect between cooptation and partner's opportunism.
- The effect of cooptitors' interdependence on partner firm's opportunism is positive and significant.
- The mediation effect of interdependence on the relationship between cooptation and opportunism is insignificant. However, interdependence is found to positively mediate the relationship between cooptation and opportunism when formalization could concurrently moderate the relationships between cooptation and interdependence as well as cooptation and opportunism.

### **Key contributions**

- The results respond to the calls that (a) seek more investigations with regards to inherent tensions in cooptitive relationships (Peng et al., 2012, Hoffmann et al., 2018, Chou and Zolkiewski, 2018), and (b) examine the relationships between interdependence and other potential variables that affect the cooptitive tensions in general and opportunism in particular (Hoffmann et al., 2018, Gnyawali and Charleton, 2018, Tidström, 2014). Our findings add to the literature about various outcomes with regards to the relationships between 'cooptation and interdependence', 'cooptation and opportunism', and 'interdependence and opportunism'.
- Our findings add to the calls that criticize the general understanding over partner's opportunism in strategic alliances to be largely fragmented and inadequate (Das, 2006, Das and Rahman, 2010). The results contribute to this dilemma by showing that cooptation leads to partner's opportunism through interdependence when formalization could simultaneously moderate the



relationships involving coopetition and interdependence as well as coopetition and opportunism.

- The results clarify the ambiguity and misinterpretations surrounding the effects of formalization on tensions in interfirm relationships (Luo, 2007c, Walter et al., 2015, Paswan et al., 2017). Within the coopetition context, our results forward formalization to have differential effects. These findings may also remain relevant to other forms of interfirm alliances as well.

### **1.4.3. Research Paper-III**

Research paper three is attributed to the third sub-research question of this thesis.

**SRQ3:** How do firm-specific resources and capabilities affect a firm's performance within coopetition relationship?

**Title:** *Performance effects of organizational resources and capabilities within horizontal cooperative relationships*

#### **Objectives:**

- **OB3a:** Study the effects of a firm's entrepreneurial orientation (EO), potential absorptive capacity (PAC) and strategic intent (SI) on the firm's innovation and operational performance within coopetition relationships?
- **OB3b:** Investigate the moderating effect of PAC and SI between the EO and performance relationship.

#### **Results**

- The effects of entrepreneurial orientation (EO), strategic intent (SI), and potential absorptive capacity (PAC) on both the incremental and radical innovations, as well as on operational performance is found to be positive and significant.

- SI is found to be negatively moderating the effect between EO and operational performance while the effect of PAC on EO and operational performance relationship is found to be insignificant.
- Moderation effect of SI on the relationship between EO and incremental innovation is negative and significant whereas the effect of PAC on EO and incremental innovation is found to be insignificant.
- Moderation effects of both the SI and PAC on the relationship between EO and radical innovation is found to be insignificant.

### **Key contributions**

- This study, to the best of our knowledge, is the first to investigate the effects of a firm's EO and SI on the firm's innovation and operational performance within the context of horizontal cooperative relationships.
- Our results suggest EO to lead to both the innovation as well as operational performance benefits. These results clarify the mixed arguments from extant literature in that some suggest high-levels of EO to lead to better organisational performance (Wiklund and Shepherd, 2003, Martin and Javalgi, 2016, Wiklund, 1999, Zahra and Covin, 1995, Lumpkin and Dess, 2001, Li et al., 2009) while others do not support such a conjecture (George et al., 2001, Walter et al., 2006).
- The results of the independent as well as moderating effects of PAC and SI on the EO and performance relationship contribute to the calls that seek to investigate (1) firm-level capabilities that could assist competitors to be successful (Bouncken et al., 2015, Bouncken and Fredrich, 2016) and (2) the use of interactive capabilities in relationships (Covin et al., 2006, Raddats et al., 2017). The independent effects of both SI and PAC suggest that they could lead to performance benefits. However, the moderating effects suggest that use of

the multiple capabilities might not lead EO to generate improved performance benefits but it could rather be counterproductive for performance benefits.

- The findings make direct contributions to OM calls that seek cross-disciplinary research between OM and entrepreneurship (Kickul et al., 2011, Sahi et al., 2019) as well as OM and strategic management concepts (Hitt, 2011, Weele and Raaij, 2014). Besides, the contributions also add to OM studies that seek to explore inherent organizational capabilities of coopetitors (Wilhelm and Sydow, 2018), and their interaction effects (Li et al., 2011). Specifically, our results combine EO (entrepreneurship literature), SI and PAC (strategic management concepts) with innovation and operational performance and add the contributions to extant literature.

#### **1.4.4. Structure of the thesis**

This thesis is organized in the following order. Chapter 2 explains the context in which the research is carried out that include interfirm context and the industry and geography selection. Later, it discusses the philosophical paradigm and the researcher's approach behind choosing quantitative methods to pursue this research. Following which, this chapter explains the data collection and the tools used to collect the primary data. Later, Chapter 3, Chapter 4, and Chapter 5 represent the researcher papers 1, 2, and 3 respectively. Chapter 6 explains the conclusions that include a summary of findings all three research papers, research implications, and future research direction.

### **Chapter 2: Research context and methodology**

This chapter begins with the explanations pertained to the context in which the study is carried out that include reasons for choosing the technology and knowledge-intensive sectors background. It further explains the research approach and philosophical considerations, and the methodological approaches employed for the thesis.

The motivation for choosing interfirm cooperation context is attributed to the deliberations made in extant literature which suggest that researchers must narrowly define cooperation in order to capture and develop a deep understanding of not only how cooperation evolves but also its implications (Bengtsson and Kock, 1999, Gnyawali and Park, 2011, Rai, 2016, Bouncken et al., 2020a). Extant research further asserts that cooperation at the interfirm level is the most intellectually intriguing and managerially challenging (Gnyawali and Park, 2011). Similarly, others suggest that the processes involved in cooperation can be effectively observed and managed at the interfirm level than other levels of cooperation (Ritala and Hurmelinna-Laukkanen, 2009, Bengtsson and Kock, 2014, Dorn et al., 2016). Researchers also argue that it is important to study cooperation at the interfirm level to understand the underlying dynamic processes related to simultaneous cooperation and competition and how that can lead to potential breakthrough outcomes such as innovations and value creation (Bengtsson and Kock, 2014, Rai, 2016). Reckoning the importance attached to interfirm cooperation research, about 80 percent of cooperation studies between the years 2004 and 2014 carried out within interfirm cooperation context whereas 12 percent studies addressed within network context and over 5 percent of studies pursued in intrafirm context (Dorn et al., 2016).

More than half of cooperation relationships occur between firms in the same industry (Padula and Dagnino, 2007, Rai, 2016, Bouncken et al., 2020a); firms involved in technology and knowledge-intensive industries in particular are increasingly pursuing cooperative relationships (Padula and Dagnino, 2007, Oshri and Weeber, 2006, Pellegrin-Boucher et al., 2013, Sanou et al., 2016, Niu et al., 2019, Zhu et al., 2020). Collaborations between Sony and Samsung, Apple and Google, Mitsubishi and McDonnell Douglas, Shell and RWE etc (Luo, 2007a, Fernandez et al., 2019) reflect in the fact that cooperation largely occurs between firms in the same industry. Cooperation is more suitable for technology and knowledge intensive industries as firms in these industries tend to experience continuously

changing technology conditions besides that such firms hope to receive greater dividends that technological advancements could offer as a result of pursuing coopetition (Ritala and Hurmelinna-Laukkanen, 2009, Ritala and Hurmelinna-Laukkanen, 2013, Ritala and Sainio, 2014, Niu et al., 2019). Rapid technological advancements and uncertain business environments are a major concern for majority of the firms which force such firms to engage in alliances with their direct competitors within the same industries (Han et al., 2012, Rai, 2016). Alternatively, diversifying the knowledge and technological capabilities to deal with possible uncertainties is another motivation for which firms chose to collaborate with competitors (Quintana-García and Benavides-Velasco, 2004). These uncertainties are particularly attributed to the market expectations to deliver breakthrough advancements so as to create innovations, and to overcome the challenges associated to obsolete technologies and operational inefficiencies (Ritala, 2012, Bouncken and Kraus, 2013, Planko et al., 2019). Given that coopetition is viewed to be highly critical for technological industries (Sanou et al., 2016); the thesis is carried out within the technology and knowledge-intensive industries context. The database of Eurostat (2018) was utilized to identify the appropriate group of technology and knowledge-intensive sectors. Eurostat stands for 'European Statistical Office' which happens to be a directorate-general of the European commission. The key responsibilities of Eurostat include providing statistical information to the institutions of European Union (EU) and member states. The following sectors were identified from the list of technology and knowledge intensive sectors as highlighted in the Eurostat database (Eurostat, 2018). The identified sectors include automotive/automobile, consumer electronics, engineering, information and communication technologies (ICT), machinery, pharmaceuticals, and research and development (R&D). The selection of these sectors were cross verified with extant literature to validate whether these were used in previous studies. Previous studies have also chosen sectors of this kind to signify the importance of these industries for coopetition

research (Luo, 2007a, Ritala and Hurmelinna-Laukkanen, 2009, Dagnino and Rocco, 2009, Gnyawali and Park, 2011, Ritala and Hurmelinna - Laukkanen, 2013, Raza-Ullah et al., 2014, Wu, 2014, Chiambaretto et al., 2019, Chou and Zolkiewski, 2018, Planko et al., 2019).

## **2.1. Philosophical paradigm**

The importance of embedding philosophical paradigms within a research presentation is attributed to three key reasons. *One*, to clarify the design of a research; *Two*, to identify which designs will be appropriate to explain a research; *Three*, to recognize and create designs that may be outside the scope of a researcher's past experience (Easterby-Smith, 2012). Accordingly, explaining philosophical perspective of a research is a significant aspect of management research presentations (Easterby-Smith, 2012, Bryman, 2016). Nonetheless, incorporating philosophical aspects within a research thesis is important as it assists to indicate assumptions made about the nature of ontology and epistemology which are rather regarded to be central to philosophical debates (Easterby-Smith, 2012). Generally, questioning of research philosophies are typically expressed in terms of ontology which is about asking 'what sort of entities is reality constituted of?' (the nature of reality); whereas epistemology is one that questions 'how do you know such entities?' (how to reach that knowledge) (Patterson and Williams, 1998, Haslanger, 2012). These questions and the consequent answers will determine what objects that the theories refer to, i.e., ontology, and the sort of evidence it offers to provide access to the objects, i.e., epistemology. The relationships between ontology and epistemology is often represented in social sciences research that allude to a spectrum of combinations of a realist ontology and a positivist epistemology at one end and anti-realist and interpretivist epistemology at the other end (Cunliffe, 2011). Almost all researchers follow certain methods to validate their research; for instance, qualitative, quantitative, or mixed method approaches, based on an underlying assumption of what actually constitutes a 'valid' research and what

methods are appropriate to explicate the research's objectives. These add to the importance of knowing what constitutes that assumptions (Myers, 1997). This thesis employs quantitative methods to investigate the overarching research question – “*How the interrelationships among antecedents, and tensions, and resources and capabilities influence various outcomes within interfirm horizontal cooperation?*”; and the three sub-research questions – (1) How does the interplay of key antecedents enable firms to pursue successful cooperation relationships? (Research paper – I), (2) How does cooperation lead to different tensions and what role formalized routines play in managing the tensions? (Research paper – II), (3) How do firm-specific resources and capabilities affect a firm's performance within cooperation relationship? (Research paper – III); and the objectives of each of these papers as explained in section 1.4. The section below explains the researcher's epistemological stance following the decision to choose quantitative methods.

### **2.1.1. Epistemological stance**

Epistemological stance is central to a research's position on designing research. It is an important issue given that it can affect the quality of the research work being carried out (Easterby-Smith, 2012, Saunders, 2019). Epistemology is suggested to be the assumptions that researchers hold to view the world behind an adopted method, and to ground for the legitimation to acquire knowledge that will be reflected in the adoption of a research strategy (Crotty, 1998). The issue of epistemological position is related to the acceptability and legitimation of knowledge. Different types of epistemological approaches influence a researcher's decision on research design and the tools and techniques to be used for data collection and analysis that justify the researcher's philosophical position. The widely addressed epistemological stances include positivism, relativism, social construction, feminism, interpretive social science (Easterby-Smith, 2012). However, positivism, interpretive, and social science represent different viewpoints that therefore maintain alternative assumptions about social science research (Neuman, 2000). The central

debating issue in social science studies is that whether it is possible for social science to follow the course of natural science with the adoption of same processes, principles, and ethos. The perspective that argues for social science to imitate methods of natural sciences to study social reality is positivism, and the opposite of that is interpretivism; therefore, it may be possible to imitate the methods of natural sciences in social sciences but at the same time it underlies that the subjects in social reality/science are profoundly distinct from that of natural sciences (Roth and Mehta, 2002). Nonetheless, both the positivism and interpretivism are argued to be frequently taken stances among the researchers in business and management studies (Roth and Mehta, 2002).

#### **2.1.1.1. Interpretivism**

Interpretivism is a contrast to positivism. It views researchers as social actors in a research process. Interpretivism studies meaningful social action with a systematic observation of people in activities to comprehend as well as interpret how people construct meanings or objects in day to day life (Neuman, 2000, Bryman, 2016). Interpretivism underlines a distinction between social research targets (people and their institutions) and physical objects, and further seeks social science researchers to develop the “subjective” meaning of social world (Bryman et al., 2019). This approach holds that people’s interactions with their external world are always already facilitated by cultural and historical contexts. Therefore, people actively and easily make and remake their comprehensions of the external world (Bryman et al., 2019). Consequently, it can create limitations to generalisation, prediction, replicability. Nevertheless, the key goal for interpretivists is to gain an understanding over feelings or the world’s point of view rather than involving in testing behaviours and numerical proofs (Neuman, 2000, Bryman, 2016). To add to that, interpretivists view individuals to be unique and therefore cannot be generalized due to the underlying multiple interpretations that the unique individuals could make with the world



(Cohen, 2017); therefore, interpretivists believe these instances have to be examined through the eyes of the participants instead of other approaches.

#### **2.1.1.2. Positivism**

Central to positivism is that a ‘meaning’ in the social world exists externally; and therefore its properties have to be measured objectively utilizing objective methods rather than inferring subjectivity through sensation, intuition, or reflection (Easterby-Smith, 2012). Positivists believe that reality exists independently upon the knowledge, and which drives the focus of positivists on data rather than individual opinions to generate wide application of the collected data. In support of similar arguments, Bryman et al. (2019) reckon that authentic knowledge occurs from the application of strict scientific methods provided with observable, measurable, and empirical evidence. Positivism also suggests that objects are known to have a previous connotation, and therefore, the researchers are persuaded to discover their meaning by verifying the knowledge by grounding it in empirical data in a specific research contexts (Saunders, 2019). Researchers with positivism approach attempt to test a theory or theories to increase their predictive understanding of a particular phenomenon of interest (Myers, 1997). The positivist epistemology emphasizes on a host of scientific methods that produce numerical and alphanumeric data. However, although the data that positivists have access to are measurable and observable with the help of instruments, the researchers need to remain detached or to be neutral in order to perform research so as to reach confirmation of the data via empirical tests (Neuman, 2000, Saunders, 2019).

#### **2.2. Research approach**

The research approach is broadly discussed dichotomously in extant literature – one being the inductive approach whereas the other is the deductive approach (Alasuutari et al., 2008). However, a third and less known approach is called abductive approach that stems from the insight that the advances to theory developments and sciences neither come as a

result of pure induction or a complete deduction (Taylor et al., 2002, Spens and Kovács, 2006). Inductive approach is generally associated to building new theories and advancing the theory development process that involves observation of specific instances and establish generalization about that phenomena (Eisenhardt, 1989, Spens and Kovács, 2006). Inductive approach involves moving from being particular to general; it involves making observations about a certain phenomenon of interest which can lead to forming theories based on those observations (Locke, 2007). For deductive approach, it is often utilized within a well-established theory or theories wherein researchers utilize empirical entailments of the theory to test and establish the theory (Locke, 2007, Nola, 2014, Woiceshyn and Daellenbach, 2018). Deduction approach necessitates moving from being generic to specific. It starts from choosing a theory of interest, derive hypothesis from the theory, and test the hypothesis to validate or revise the theory (Locke, 2007, Woiceshyn and Daellenbach, 2018). Deductive approach is generally chosen for several important reasons. *One*, deductive approach allows a researcher to sample a part of the population by a probability selection method and generalize the study outcomes to the entire population with a known degree of accuracy (Davis-Sramek and Fugate, 2007). *Two*, deductive approach simplifies the operationalization of complex constructs and enable the establishment of causal links between the selected constructs for a study. *Three*, “if a researcher is using a methodology which is not widely used within a particular academic discipline, it is likely that the research will be misunderstood and subsequently undervalued” (Kitchen, 1999, p.480, Wagner and Kemmerling, 2010). Overall, the ability to scan a particular theory and narrow that down to a particular view from its generalist view to derive logical conclusions makes deductive approach to be a predominant research approach in management sciences in general and operations management in particular (Spens and Kovács, 2006).

Deductive approach is often made aligned to positivistic research approach (Wagner and Kemmerling, 2010). Deductive approach is chosen for investigating the thesis's principle/overarching research question – “How the interrelationships among antecedents, and tensions, and resources and capabilities influence various outcomes within interfirm horizontal cooperation?” for the following reasons. *One*, the variables utilized to study the three sub-research questions associated to the principle research question maintain a significant amount of theory, discussions, and knowledge in the extant cooperation literature. *Two*, scholars that discuss various theoretical arguments such as the importance of various variables that could lead a firm to pursue cooperation, potential relationships between various cooperative tensions and the importance of various mechanisms to manage the tensions, and performance outcomes of competitor's internal resources and capabilities, seek empirical relevance to validate the theoretical discourse associated to the underlying areas and to forward potential new knowledge associated to those areas (Czakon et al., 2014, Bouncken et al., 2015, Dorn et al., 2016, Bengtsson and Raza-Ullah, 2016, Gnyawali and Song, 2016, Hoffmann et al., 2018, Devece et al., 2019, Zacharia et al., 2019), and 3). *Three*, my personal view as a positivist prompts me to investigate the underlined objectives of thesis utilizing empirical tools and analysis. The key to effective materialization of deductive-positivistic approach involves not only the development of a hypothesis/hypotheses following a specific theory or a combination of them but also to test the hypothesis empirically (Spens and Kovács, 2006). This process involves the use of quantitative methods (Golicic et al., 2005) as quantitative methods originate from the research paradigms of positivists approaches. Quantitative methods focus on the measurement when collecting and analysing the data. These methods lead to a result of objective knowledge that is independent of beliefs and values of the concerned people, firms, or the individuals (Somekh and Lewin, 2005, Babones, 2016). Nevertheless, ultimate goal of those that use quantitative methods is to analyse and measure casual

relationships between variables that are under investigation (Sale et al., 2002). The use of quantitative data and tools likely assist researchers, such as I, to move to a particular result, i.e., deductive, in the form of quantitative data from a theoretical view (Golicic et al., 2005). Different quantitative research methods can be used to implement deductive research process that include surveys, simulation, mathematical modelling, statistical analysis, econometrics, and laboratory experiments etc (Halldórsson and Aastrup, 2003, Myers, 2013). The survey method is identified to be the most popular and effective method for data collection to perform quantitative analysis (Smith, 1985, Forza, 2002, Wagner and Kemmerling, 2010). Surveys assist to obtain data from large group of people or events in a systematic manner, and supports to identify the patterns in the data, and further allows to generalize the data to larger population (Smith, 1985).

### **2.3. Design and methodology**

The study chose to include sample firms that are cooperating and competing simultaneously at a same period of time and based out in developed countries such as the UK, Ireland, Netherlands, USA, and Canada for data collection. The geographical location selection is made based on: (1) high concentration of technology and knowledge-intensive collaborations among the firms in these locations; (2) following the Eurostat's database (Eurostat, 2018) which highlights higher concentration of such firms in Europe; (3) following the highlights of OECD TL3 database (Organization for Economic Cooperation and Development – Territory Level 3) that indicates an increasing trend in collaborations between technology firms in the north America region besides the Europe. Europe happens to be a region for intensive research and development (R&D) collaborations (Aristei et al., 2016), and the advanced nations within the Europe such as UK, Ireland, Netherlands among others are in the forefront of technology and knowledge intensive collaborations (Amoroso et al., 2018). OECD TL3 reveals that together the countries in the EU and US region constitute around 85% of the total number of OECD TL3 regions that engaged in

collaborative innovations between the years 1978 to 2014 (Righetto et al., 2019). Among the Europe and the north America regions, we have identified firms located in the UK, Ireland, Netherlands, USA, and Canada to collect the data mainly due to (a) the industries and sectors where cooperation is prevalent are mainly located in the developed world, (b) previous cooperation studies that have selected similar industrial and sectoral backgrounds have indicated these countries wherein cooperation becoming popular (Luo, 2005, Luo, 2007a, Dagnino and Rocco, 2009, Park et al., 2014b, Chiambaretto and Dumez, 2016, Tippmann et al., 2018, van den Broek et al., 2018), and (c) ease of access to the companies of our context in these countries.

### **2.3.1. Survey**

Surveys are pervasive as they are widely employed to inform decision making in every walk of life (Keusch, 2015, Hulland et al., 2018). Surveys are highly popular in academic research across streams to collect relatively larger amount of data (Cooper, 1995). It is particularly a popular mode of data collection in strategic alliance studies such as cooperation (Gomes et al., 2016). This popularity is attributed to, at least in part, difficulties in asking people the direct questions regarding researching topics of interest rather than observing their behaviours and thoughts through a meticulously manipulated researchers survey questions (Hulland et al., 2018). Survey data can be collected either manually or online using web tools. Manual survey data collection methods involve traditional paper and pen or pencil and such methods tend to be costly and time consuming (Lefever et al., 2007), and sometimes it also comes at a disadvantage of losing out of survey information through misplacements of the collected data documents. To add to this, it often involves making field visits to make sure the data collection is done satisfactorily (Lefever et al., 2007). However, conducting web-surveys or the online surveys could be an useful alternative method to collect the data. Web-surveys enable to collect the data rather in a short timeframe, and they help to save time and costs that involve in data collection

processes. To add to this, web-surveys also assist to extend the reach of target population by reaching out to a larger and diverse global population that in return enhance the size of the data. Correspondingly, the use of web-surveys have consistently emerged as one of the popular mode of data collection (Jiang and Li, 2008, Keusch, 2015).

A highly structured web-based survey questionnaire was utilised to collect the data. I have utilized the services of 'Qualtrics', a popular survey tool and data collection firm, for the data collection purpose. Identifying and approaching the data of firms that engage in interfirm cooperation is found to be extremely difficult in my experience as it took months of time to reach out to only handful number of firms that engage in cooperation relationships. Therefore, I approached 'Qualtrics' due to that (1) they are known for their ability to reach out to large groups of industry contacts across major parts of the world, and (2) Qualtrics is in collaboration with the University of Manchester to offer their webtools as services for the researchers to build surveys as well as utilize their services to collect the data as and when needed. The use of Qualtrics services for data collection is not a new phenomenon in academic research as researchers from across the disciplines use their services for data collection purposes (Abbey and Meloy, 2017, Davis and Bendickson, 2018, McDowell et al., 2018, Jackson et al., 2016, Statsenko and Corral de Zubielqui, 2020, Hartmann et al., 2020). The increased use of Qualtrics services for data collection is attributed to the strength of Qualtrics robust panel data which enables researchers to identify and approach the target respondents at quick time intervals (Abbey and Meloy, 2017, Statsenko and Corral de Zubielqui, 2020).

Prior to approaching the Qualtrics team for their assistance with the data collection, I have created the web-survey by embedding all the survey questions utilizing their webtools. Later, I have verified the structure and readability of the web-survey with several senior academics/experts. After addressing minor issues that were raised by the experts, I have sought an explanatory preamble meeting with the Qualtrics team to explain them

about the specific context in which the study is being conducted. The guidance that I have discussed with the Qualtrics' team mainly include explaining them the contextual matters such as the nature of target interfirm relationships, i.e., horizontal interfirm relationships that cooperate/collaborate and compete at the same time. For better clarity, I have explained them the context with several examples such as Sony and Samsung relationship. The explanatory preamble also include the specific technology and/or knowledge-intensive industries that are to be targeted, specific respondents/job-titles, and the countries to be considered.

### **2.3.2. Data collection and analysis**

The web-survey was built utilising the Qualtrics ready to use webtools in that the questionnaire measures of various variables were embedded. The survey instrument is built utilizing multi-item measures. All the measures for the variables used across the three research papers are adapted from the established studies. A 7-point Likert scale with endpoint of “strongly disagree” to “strongly agree” is incorporated. The target sample includes the firms that are from across the North America, the UK, Ireland, and Netherlands. These firms share industrial backgrounds of automotive/automobile, consumer electronics, engineering, information and communication technologies (ICT), machinery, pharmaceuticals, and research and development (R&D) as these sectors are related to high-tech and knowledge-intensive industries (Eurostat, 2018) besides they are being often addressed by the scholars in coopetition studies that focused on technology and knowledge-intensive industries (Luo, 2007a, Ritala and Hurmelinna-Laukkanen, 2009, Dagnino and Rocco, 2009, Gnyawali and Park, 2011, Ritala and Hurmelinna-Laukkanen, 2013, Raza-Ullah et al., 2014, Wu, 2014, Chiambaretto et al., 2019). A screening question was included at the beginning of the survey to prevent non-suitable and non-applicable respondents from involving/filling the survey. Screening question - *“Does your firm cooperate and compete at the same time with a competitor firm or a firm that has similar*

*product/service offering and similar target market*” was included to ensure that the respondents are aware of the context of the study. Similar question was employed in previous studies to screen and to identify respondents that belong to firms that are involved in cooperative relationships (Ritala and Sainio, 2014). Respondents that answered ‘Yes’ to the screening question were asked to continue with the survey keeping a horizontal competitor partner in mind, while those that answered ‘No’ were aborted from the survey with a gentle gratitude note. To add to that, the ‘cooperation’ and ‘competition’ variables that are included in the study as part of the data collection ensures that the respondents’ are aware on the cooperation context of the study. Besides, our preamble to the survey clearly describes the purpose of the survey and the nature of partner that the respondents have to select or keep in mind, which is about collaborating/cooperating and competing with a horizontal partner simultaneously in a same period of time.

The respondents held positions such as CEOs/COOs, Alliance-directors, and top-level managers in medium to large scale organisations. Respondents with these characteristics were chosen following the guidance provided in extant cooperation literature that emphasize the need for choosing these positions as they tend to be knowledgeable to answer strategic and operational nature of the variables included in the survey questionnaire. The survey instrument was utilized on a pilot test to ensure the content validity of the instrument. The pilot test procedure involves seeking the opinions of a combination of 19 experts (15 executives and 4 academics) on the survey content structure, readability, ambiguity, and completeness on the survey instrument (Dillman, 2007). Minor changes were made to the survey following the experts review and feedback. Following these changes, the live run for data collection was conducted during the period between the 15<sup>th</sup> of April 2018 until the end of June 2018.

The survey dissemination include exporting all the data got exported ‘Qualtrics’ tool to SPSS software to perform further analysis. A total 1500 web-surveys were sent out.



A total of 355 responses were received by the end of June 2018 that resulted in a response rate of 23.67%. This result is achieved after the preliminary elimination of the responses based on their size being classified as small firms (i.e., less than 250 employees), and survey is completed within less than 1/3 of the median time of all completed responses to ensure the respondent paid adequate attention. Further, a total of 42 more responses had to be eliminated from the 355 responses due to incompleteness and inadequateness of their responses. After overall screening, an effective response rate of 20.87% is achieved with a total number of effective responses of 313.

The data analysis involved utilizing software tools such as SPSS and AMOS across the three research papers. The data analysis procedures initially include conducting Harman's one-factor test (Podsakoff et al., 2003). Neither a single factor emerged from the exploratory factor analysis (EFA) of all the survey items of each of the research papers nor one factor accounted for most of the variance within the data set across the three research papers. Confirmatory factor analysis is performed to eliminate the concerns associated to the common method bias as well to assess unidimensionality, validity, and reliability of the survey measures. For unidimensionality, multiple-item measure constructs were evaluated utilizing model fit indices that include (1) Comparative Fit Index (CFI), (2) Tucker-Lewis Index (TLI), and (3) Root Mean Square Error of Approximation (RMSEA). The values for the CFI and TLI indices are found to be greater than 0.90 while RMSEA values were less than 0.08 in all three research papers which suggest the models fit the data well (Kline, 2005). For discriminant validity, all the variables utilized in three research papers were assessed by average variance extracted (AVE) estimates of 0.50 or above (Fornell and Larcker, 1981). All the variables are found to have the AVE values either equal to 0.50 or higher. The discriminant validity checks also included checking the squared correlations between pairs of constructs with their AVE values (Fornell and Larcker, 1981). The results suggest that the correlation values of all pairs of constructs were lower than the AVE values

of the corresponding constructs except for the two outcome variables of incremental and radical innovations in the case of research paper III. When it comes to reliability checks, Cronbach Alpha values of all the constructs (Nunnally, 1978) as well as the composite reliability (CR) values of all constructs were identified to be over 0.70 (Bagozzi and Yi, 1988).

When it comes to the hypotheses testing, the research applied regression analysis utilising SPSS statistics and PROCESS macro by Hayes (2018). The PROCESS tool utilises bootstrapping which is a computer-intensive resampling from a given data set for thousands of time, in this case 5000 times, to build confidence intervals for the empirical estimation of both the mediation as well as moderation effects between the variables employed in this research (Cheung and Lau, 2008, Hayes, 2018). For bootstrapping, 5000 resampling iterations were used for all three papers at a 95% confidence interval for the appropriation of the mediation and moderation effects. To establish further rigour, two tests were conducted utilising with and without PROCESS tools. For instance, for all the moderation and mediation tests conducted across the three papers, the analysis is conducted without using PROCESS tools first and later with PROCESS tools to cross-verify the results. This has improved the rigors of our results. For example, for the second paper, simple regression results suggest a potential mediation effect. However, the use of PROCESS tools indicate that the indirect effects at both partially and fully standardised levels were insignificant and thus reject the possible mediation.

#### **2.4 Central theoretical perspective – A Dynamic capabilities view of coopetition**

An important motivation for firms to pursue coopetitive relationships is to integrate and redeploy their heterogeneous resources and capabilities to address emerging and unanticipated demands as well as to achieve performance benefits that offer competitive advantage (Das and Teng, 2000b, Luo, 2007a, Shu et al., 2017). This motivation to pursue coopetitive relationships draws similarities with the proponents of the dynamic capabilities

theory. Extant research alludes an underlying significance for firms to possess dynamic capabilities to maintain competitive advantage in changing business environments (Song et al., 2016, Quintana-García and Benavides-Velasco, 2004). The dynamic capabilities are essentially organisational routines through which firms can transform their resource base into new resource configurations of competitive advantage via adaptation, integration, reconfiguration and redeployment of those resources (Eisenhardt and Martin, 2000, Teece et al., 1997). Their ability of sensing, seizing, transforming intangible assets in particular are predicted to allow firms to attain sustainable competitive advantage by being able to reconfigure/revise the available resources at the firms disposal (Winter, 2003, Teece, 2014, Crick, 2019). Although these functionalities of dynamic capabilities appear to be taking place within a firm, they are applicable across various business contexts that include strategic alliances (Smart et al., 2007). Nevertheless, their prime value lies in their ability to generate resource reconfigurations (Eisenhardt and Martin, 2000, Smart et al., 2007).

Consistent with the tenets of the dynamic capabilities theory, extant cooperation literature suggests that cooperation with competitor partners likely stimulate performance benefits that offer competitive *advantage* by triggering recombination of their complementary resources, knowledge, and skills (Estrada et al., 2016). Such a recombination is said to be essential for coopetitors to attain both the benefits and success (Ritala and Hurmelinna-Laukkanen, 2013). Moreover, extant literature consistently allude potential association between strategic relationships such as cooperation and dynamic capabilities. For instance, scholars such as Bengtsson et al. (2016a), Estrada et al. (2016), Estrada and Dong (2019), and Crick (2019) suggest that firms tend to utilize cooperation to be an useful capability to attain and sustain competitive advantage in competitive business environments. Furthermore, the dynamic capabilities are often debated to provide a basis to explain the benefits of resource acquisition through both cooperation and competition (two intrinsic factors of cooperation) between partners (Quintana-García and Benavides-

Velasco, 2004). Alternatively, the principles of dynamic capabilities are said to have the ability to explain the value-creation and appropriation concepts (Jacobides et al., 2006, Makadok, 2001), thereby, addressing the two key benefits-related aspects of cooperative relationships. Given the degree of consistency between the proponents of cooperation and the dynamic capabilities theory, this study maintains dynamic capabilities theory to be an appropriate as well as a central theoretical anchor to ground the arguments of this thesis.

### **Chapter 3: Paper I – The architecture of coopetition: strategic intent, ambidextrous managers, and knowledge sharing**

Seepana, C., Paulraj, A., Huq, F.A (2020). The architecture of coopetition: strategic intent, ambidextrous managers, and knowledge sharing. *Industrial Marketing Management*, 91, 100-113. (ABS 3)

An earlier version of this paper was presented at the 50th Decision Sciences Institute (DSI) conference in New Orleans, November 2019.

### **3.1 Abstract**

The study investigates the significance of strategic intent, manager's ambidexterity, and knowledge sharing routines for firms in their quest to pursue coopetition. We utilize the resource-based view and the dynamic capabilities theory to ground our hypotheses. We test the hypotheses using the data collected from 313 firms that engage in coopetition relationships through an online survey. The findings forward knowledge sharing and ambidextrous managers as intervening variables, in that when complemented with knowledge sharing, a firm's strategic intent could better guide the firm's managers to pursue coopetition successfully. Findings further advocate that knowledge sharing complements to enable the relationship between a firm's strategic intent and its ambidextrous managers, as well as the relationship between strategic intent and coopetition. Furthermore, results also indicate that ambidextrous managers, with a skillset of a combination of exploration and exploitation, are positively associated to coopetition. Overall, the findings make important theoretical as well as empirical contributions to the coopetition and strategic alliance literature.

### **3.2 Introduction**

Coopetition - a phenomenon of simultaneous pursuit of cooperation and competition between firms - is increasingly becoming popular in both academia and practice. The manifestation of the contradictory logics of cooperation and competition within the same relationship makes coopetition a paradoxical relationship (Bengtsson and Kock, 2014, Bengtsson et al., 2016b, Raza-Ullah, 2018, Jakobsen, 2020), wherein the cooperation part that underscores collective interests to create greater value coexists with the competition part that emphasizes private gains from the value created (Khanna et al., 1998, Raza-Ullah et al., 2014, Gnyawali et al., 2016). The juxtaposing of these two equally important yet interrelated contradictory logics into one relationship makes coopetition paradoxical (Luo

and Rui, 2009, Bengtsson and Kock, 2014, Jakobsen, 2020, Crick and Crick, 2021). Coopetition primarily occurs between two rival firms; relationships between Sony and Samsung (Ritala and Hurmelinna-Laukkanen, 2009, Gnyawali and Park, 2011), and Google and Apple (Luo, 2007a, Estrada and Dong, 2019) signify how coopetition could materialize.

Among others, an important shared trait of Samsung (Hitt et al., 1995), Sony (Hamel and Prahalad, 2010), and Apple (Mantere and Sillince, 2007) is their ability to maintain a strong strategic intent. Strategic intent represents a firm's long-term position of attaining desired objectives such as growth, market dominance, and maintaining supremacy (Hamel and Prahalad, 1989, Haugstetter and Cahoon, 2010, Mariadoss et al., 2014). Given that external learning, investments, as well as research and development (R&D) efforts are needed to attain the underlying objectives, strategic intent is likely to drive firms to seek out appropriate alliance partners (Hamel and Prahalad, 1989, Ariño, 2002, Koza and Lewin, 2000, Mariadoss et al., 2014), even though they might be competitors (Luo, 2007a). Engaging in coopetition is a firm-specific decision; therefore, it could be arguably driven by the firm's strategic intent (Dowling et al., 1996, Bonel and Rocco, 2007, Luo, 2007a, Velu, 2016, Gnyawali and Charleton, 2018). Accordingly, strategic intent could be envisioned as a key antecedent to coopetition.

While some scholars suggest the link between strategic intent and coopetition to be straightforward (Luo, 2007a, Velu, 2016, Gnyawali and Charleton, 2018), others contradict the very assumption that strategic intent could drive the formation of different types of relationships (Ryals and Davies, 2013). Alternatively, rather than directly leading to inter-organizational engagements, studies also posit that strategic intent might possibly require other intervening mechanisms so as to result in specific inter-organizational engagements (Parmigiani and Rivera-Santos, 2011). Studies argue that the link between strategic intent and relationship formation – in our case, coopetition – can be facilitated by intermediaries

such as communication channels (Hitt et al., 1995), manager intervention (O'Reilly III and Tushman, 2011, Haugstetter and Cahoon, 2010), and other transmitting variables (Koza and Lewin, 1998, Koza and Lewin, 2000). Overall, these contradictions imply an unclear understanding when it comes to the link between strategic intent and cooptition. Therefore, we contend that it is important to uncover this association given the prominence as well as the confusion surrounding strategic intent's role in the pursuit of cooptitive relationships.

A firm's need to engage in cooptition could be attributed to the need to overcome environmental conditions (Gnyawali and Park, 2011, Ritala, 2012, Luo, 2007a, Gnyawali and Charleton, 2018) advancing competitive advantage (Bengtsson and Kock, 2000, Gnyawali and Charleton, 2018, Gast et al., 2019), and to survive competitive business environments (Hoffmann et al., 2018). Cooptition's approach of doing two things – cooperation and competition – simultaneously can be viewed from the lens of ambidexterity (Bengtsson et al., 2016b, Yousef et al., 2020) as ambidexterity is argued to be the fundamental condition to define the paradoxical concept of cooptition (Bengtsson et al., 2016b). However, engaging in paradoxical dualities may not be straightforward for firms; among others, it might require ambidextrous managers (O'Reilly III and Tushman, 2011, Mom et al., 2009, Bengtsson et al., 2016b, Felício et al., 2019) who can articulate the intent of doing two opposing things simultaneously. Additionally, in relationships, a firm's strategic intent needs to be aligned with that of its partner so as to ensure congruence between their intents (Spekman et al., 1996, Haugstetter and Cahoon, 2010). Among others, knowledge sharing can assist to reconceive a firm's strategic intent (Madhok and Tallman, 1998, Haugstetter and Cahoon, 2010) so as to align it with that of the partner's intent (Hitt et al., 1995, Sirmon and Lane, 2004, Parmigiani and Rivera-Santos, 2011). The reconceived strategic intent could eventually guide managers to pursue ambidextrous activities and succeed in cooptitive relationships. Additionally, knowledge sharing may



also assist firms in learning about the alliance environment (Simonin, 2004), and potentially help firms to comprehend and pursue activities of simultaneous cooperation and competition (Grant and Baden-Fuller, 2004, Bouncken and Kraus, 2013, Gast et al., 2019). Pfeffer and Sutton (2000) reckon the importance of knowledge and managers in reducing the ‘knowing-doing’ gap in firms, wherein strategic intent could be viewed as knowing and cooperation could be viewed as doing. Although extant literature posits knowledge sharing and ambidextrous managers as potentially significant variables to bridge the link between strategic intent and cooperation, it lacks clarity on the operationalization and empirical validation of their intrinsic association. Moreover, given the confusion surrounding the relationship between the strategic intent and cooperation, we believe that it is pertinent to investigate the key role of ambidextrous managers as well as knowledge sharing.

When it comes to knowledge sharing in cooperation settings, we acknowledge that it tends to cause sharing vs protection tensions between partner firms which eventually requires a combination of legal, formal, and informal protection mechanisms to address them (Ritala and Hurmelinna-Laukkanen, 2013, Estrada et al., 2016, Fernandez and Chiambaretto, 2016, Chiambaretto et al., 2019, Gast et al., 2019). However, given our ambition to investigate how a firm’s strategic intent is complemented by knowledge sharing between the cooperative partners, we choose not to get into details of knowledge protection in this research. In summary, the purpose of the study is to not only investigate the relationship between strategic intent and cooperation, but also to explore how the intervening variables of knowledge sharing and manager’s ambidexterity could influence this relationship. By testing the hypotheses relating these factors of interest (please refer to Figure 3.1), our study makes several contributions to extant literature. *First*, the role of knowledge sharing is largely overlooked in studies that discuss the relationship between strategic intent and manager’s capabilities (O’Reilly III and Tushman, 2011, O’Shannassy, 2016, Jarzabkowski et al., 2019). It is specifically important to investigate the role of

knowledge, since partner firms tend to maintain unique strategic intents which need to be aligned when pursuing relationships. While our results suggest a negative direct effect, it also indicates that strong knowledge sharing routines could positively moderate this effect. It means that unless knowledge sharing is present in coopetition, a firm's strategic intent by itself will not be able to guide its managers. Specifically, our study showcases the importance of knowledge when it comes to the link between strategic intent and ambidextrous managers. We believe that this finding also adds to other contexts of interfirm relationships. *Second*, while previous studies discuss potential relationships between ambidextrous managers and various paradoxical activities inherent to coopetition (Luo, 2007b, Bengtsson et al., 2016a, Estrada and Dong, 2019, Chiambaretto et al., 2019, Bouncken et al., 2020a), they lack clarity in explaining what skillsets could make managers ambidextrous. Additionally, extant research has also overlooked the potential direct relationship between ambidextrous managers and coopetition. In fact, scholars call for (1) clarity on the managerial characteristics in ambidextrous relationships (Felício et al., 2019) and (2) empirical investigation into the nature of managers involved in cooperative relationships (Czakoń et al., 2019). As a response to these calls, our study proposes exploration and exploitation as the ambidextrous skills of managers that are essential to pursue coopetition. Given that we sought responses from top-ranking managers in our data collection efforts, we focus on the ambidextrous skills of such managers. *Third*, as pointed out earlier, our study contributes to extant literature by trying to shed some light on the contradictions surrounding the link between strategic intent and coopetition (Luo, 2007a, Yami et al., 2010, Velu, 2016, Gnyawali and Charleton, 2018). Our finding forwards knowledge sharing and ambidextrous managers as intervening variables, in that when complemented with knowledge sharing, strategic intent could enable managers to pursue coopetition successfully. This finding offers novel insights to potential competitors about what triggers coopetition within a firm (i.e., strategic intent) and how successful

coopetition could eventually materialize (utilizing necessary knowledge routines and ambidextrous managers).

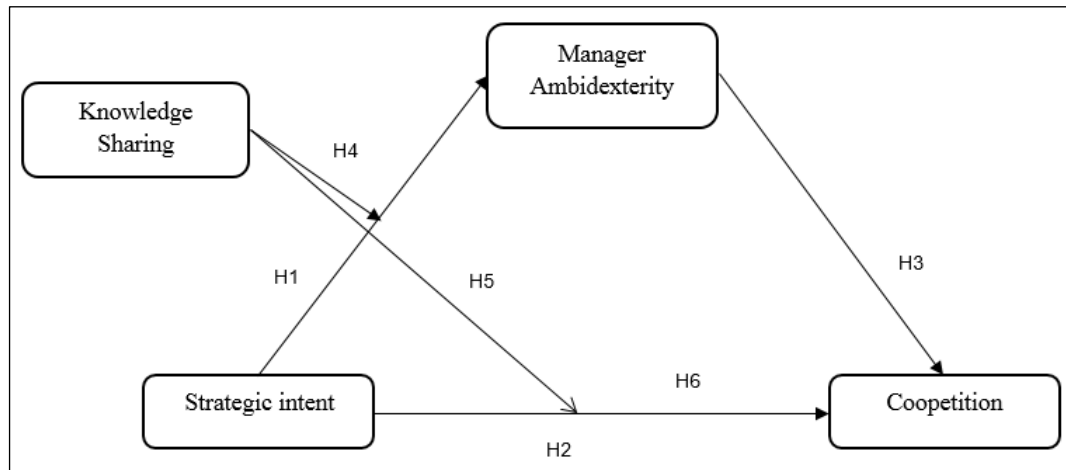


Figure 3.1: Conceptual model

### 3.3 Theoretical background

The theoretical arguments specific to this paper can be explained from the tenets of the dynamic capabilities theory. The dynamic capability theory indicates that capabilities enable firms with specific abilities to alter their resource stocks (Eisenhardt and Martin, 2000). Such abilities to alter resource stocks to create new resource recombination is concerned with how a firm's existing resources and knowledge is untangled and integrated with other external knowledge and resource stocks to create novel competencies (Eisenhardt and Martin, 2000, Helfat et al., 2007); these competencies often involve utilizing various ambidextrous resources, capabilities, and activities (O'Shannassy, 2016, O'reilly and Tushman, 2008, O'Reilly III and Tushman, 2011) that can allow formation of ambidextrous relationships such as coopetition.

Given that the dynamic capabilities allow firms to alter/recombine their resources, they acknowledge an underlying fact that such a recombination can only be performed when the firms possess necessary resources (both from internal and external) that allow the

capabilities to reconfigure such resources. This argument quite fits into the origins of the dynamic capabilities theory. RBV is argued to be the original foundation as well as a subset to the dynamic capabilities theory (Teece et al., 1997, Crick, 2019). RBV is predominantly a static theory in that it concentrates on resources identification and explains the process of how the resources may have been developed (Bowman and Ambrosini, 2003); therefore, it lacks the ability to change its resource structure under the conditions of environmental changes. However, dynamic capabilities addresses this gap by concentrating on the processes of future value generation by resource reconfigurations (Teece et al., 1997). Accordingly, extant literature consistently argues for a potential complementarity between both the RBV and the dynamic capabilities theories as organizational resources (RBV) complement capabilities (dynamic capabilities) to deliver firms with sustainable competitive advantage (Quintana-García and Benavides-Velasco, 2004, Crick, 2019, Lin and Wu, 2014). The notion that underlies the complementarity between both these theories is evolved from the arguments that suggest firms' mere possession of bundles of resources is insufficient to attain as well as sustain competitive advantage in competitive business environments (Eisenhardt and Martin, 2000, Wu, 2010, Teece et al., 1997); instead, it is essential for the firms to utilize their capabilities to reconfigure the resources at their possession to suit the business environment in which they operate and to sustain the competitive advantage (Zollo and Winter, 2002, Wu, 2010).

Extant research indicates that firms that pursue cooperative relationships are likely to possess complementary resources (Luo et al., 2007, Estrada et al., 2016, Bengtsson et al., 2016a), which they utilize in combination with their capabilities to advance their competitive advantage. Additionally, the inherent simultaneity of cooperation and competition between firms also ensures a possible quest between partners for resources that would otherwise is challenging for them to access from other external sources (Bengtsson et al., 2016a, Gnyawali and Park, 2011). These resources are significant for both the

partners to utilize them in combination with their capabilities to attain competitive advantage not only at their relationship-level but also at firm-level (Gnyawali and Charleton, 2018, Hoffmann et al., 2018). Consistent with these arguments, this research paper grounds the hypotheses in both the dynamic capabilities and RBV theories and posits for a potential complementarity between knowledge sharing as a resource and strategic intent as well as managers ambidexterity as capabilities. The paper further maintains that the potential complementarity between these variables likely allow firms to pursue successful cooperative relationships.

### **3.3.1 Strategic intent**

Strategic intent symbolizes a clear-cut statement of a firm's ambition and desired market leadership position (Hamel and Prahalad, 1989, Johnson and Sohi, 2001) and serves as an effective communication to internal and external stakeholders (O'Shannassy, 2016). The expressions of the strategic intent of several established organizations would offer better impression of how this materialises. For instance, Japanese earth moving equipment maker 'Komatsu' sets out to *encircle* 'Caterpillar', its American rival. Similarly, 'Canon' wanted to *beat* 'Xerox' (Hitt et al., 1995, Hamel and Prahalad, 1989). These expressions represent the strategic intent of Komatsu and Canon (Hamel and Prahalad, 1989). Companies are expected to have active management processes which allow consistent communication and resource allocations in line with the strategic intent so as to realize the underlying objectives (Hamel and Prahalad, 1989).

Strategic intent is said to operate as a supplement to dynamic capabilities (Døving and Gooderham, 2008), while others state that strategic intent in itself is a dynamic capability (O'Reilly III and Tushman, 2008, O'Shannassy, 2016). It tends to focus on exploration and exploitation activities (O'Reilly III and Tushman, 2011) in order to make a firm ambidextrous and improve its competitive advantage. The strategic intent of exploration typically involves discovering new opportunities that have the potential to

enhance a firm's performance, while strategic intent of exploitation involves obtaining competencies and/or extending or elaborating existing capabilities and assets (Lewin et al., 1999, Koza and Lewin, 2000). This intent to be ambidextrous is nevertheless an issue that is core to dynamic capabilities (O'Reilly III and Tushman, 2008) due to the fact that dynamic capabilities are rooted in the ability to perform the exploration and exploitation activities simultaneously (Ancona et al., 2001, Raisch and Birkinshaw, 2008). The successful interaction of the exploration and exploitation activities tends to produce complex as well as enhanced capabilities that can offer an additional source of competitive advantage for firms (Colbert, 2004). These acts that lead to and/or strengthen the competitive advantage are potentially guided by the direction that is conceived by the strategic intent (Døving and Gooderham, 2008).

Scholars argue the need for a firm to have capable managers in decision-making roles, as managers with the skills to manage both exploration and exploitation are likely to better articulate their firms' strategic intent (Rui and Yip, 2008). Accordingly, extant literature asserts the significance of firms with a strong strategic intent – strategically aggressive to win competitively with utmost emphasis on winning market share (Venkatraman, 1989) – to have skilful managers (Hamel and Prahalad, 1989, Hitt et al., 1995). Along similar lines, O'Reilly III and Tushman (2011) allude to a potential association between strategic intent and manager's ambidexterity in firm-specific context in that they argue the need for a clear and compelling strategic intent with insights of specific micro-mechanisms/directions to guide the manager's exploration and exploitation activities. To further strengthen this argument, O'Reilly III and Tushman (2011) also explain how the use of managers ambidextrous skills at IBM Network Technologies assisted in exploiting existing chipset lines while carrying out exploration for building fundamentally new chips, which appears to have been performed as part of their firm's intent. These lines of arguments clearly support an inherent relationship between the

strategic intent and managers' ambidexterity. Accordingly, we forward the following hypothesis:

*H1: Strategic intent is positively associated to managerial ambidexterity.*

Strategic intent is also said to be a key antecedent for firms that aim to engage in strategic alliances (Koza and Lewin, 1998, Yamakawa et al., 2011) such as coopetition (Luo, 2007a). It operates as a dynamic capability for firms in justifying the use of ambidexterity, i.e., the use of exploration and exploitation acts (O'Reilly III and Tushman, 2008, O'Shannassy, 2016). Besides, it is said to intellectually guide firms on the importance of carrying out acts necessary to make their ambidexterity a success (O'Reilly III and Tushman, 2011). Accordingly, strategic intent could be considered to be effective in negotiating ambidexterity and ambidextrous relationships. Luo (2007a) and Luo and Rui (2009) add that it is the strategic intent of a coopetitor that leads to coopetition at various levels including the interfirm level. Nonetheless, strategic intent being a disruptive force, encourages firms to engage in relationships with competitors in fundamentally different or even disruptive ways to create new forms of value (Charitou and Markides, 2003, Yami et al., 2010). Additionally, scholars posit that strategic intent guides to define not only the objectives for firms, but also the direction to achieve those objectives (Hamel and Prahalad, 1989, Johnson and Sohi, 2001). These objectives tend to include engaging in ambidextrous/paradoxical alliances to explore and exploit the resources, capabilities, and opportunities (Koza and Lewin, 1998, Yamakawa et al., 2011). Accordingly, Haugstetter and Cahoon (2010) mention that the ability to appreciate paradoxical activities and strategize them effectively is anchored by a firm's strategic intent. These arguments lead to the following hypothesis.

*H2: Strategic intent is positively associated to coopetition*

### **3.3.2 Manager's ambidexterity**

Ambidextrous managers are highly motivated individuals who can deal with a wide variety of different as well as opposing activities (Adler et al., 1999, Mom et al., 2015) that include exploring and exploiting activities/opportunities (Mom et al., 2007, Mom et al., 2009). The dynamic capabilities view posits that in order to pursue ambidexterity, firms require their managers to accomplish ambidextrous tasks (O'Reilly III and Tushman, 2008). This involves managers dealing with trade-offs between simultaneous exploration and exploitation (O'Reilly III and Tushman, 2011) besides being able to perform complex routines of integration and differentiation of tasks. The principle of exploration activities is to broaden managers' existing knowledge base (Levinthal and March, 1993, Mom et al., 2007). These activities include new organizational norms, structures, routines, learning, systems, and adaptability, among others (Zollo and Winter, 2002, Mom et al., 2007, Deng et al., 2021). Alternatively, exploitation activities deepen the managers' existing knowledge base. These include (1) applying, improving, and lengthening existing competencies, products and processes, and technologies (March, 1991), and (2) refining their existing knowledge base (Levinthal and March, 1993, Mom et al., 2007, Mom et al., 2009).

Coopetition as a paradoxical relationship has been debated from the perspectives of exploration and exploitation (Padula and Dagnino, 2007, Bouncken and Kraus, 2013, Bouncken and Fredrich, 2016, Strese et al., 2016a, Yousef et al., 2019) so as to illustrate the ambidexterity involved in it. While the cooperation dimension of coopetition is associated to the exploration phase, the exploitation phase is attributed to the competition dimension (Gnyawali et al., 2008, Yami and Nemeh, 2014, Yousef et al., 2019). Managers' ability to deal with exploration and exploitation potentially rationalises and strengthens a firm's willingness to pursue paradoxical relationships such as coopetition. Accordingly, extant coopetition literature debates the importance of ambidextrous managers for firms



(Bengtsson et al., 2016b, Yami et al., 2010, Raza-Ullah et al., 2014, Strese et al., 2016a, Bengtsson et al., 2018, Lundgren-Henriksson and Kock, 2016) that aim to pursue coopetition. Managers role in the development of capabilities to manage various functional paradoxical activities such as creating and appropriating value (Bengtsson and Johansson, 2014, Dagnino and Rocco, 2009, Fernandez and Chiambaretto, 2016), balancing resource sharing and resource protection (Bengtsson et al., 2016b), integrating and coordinating the contradictory demands (Eisenhardt et al., 2010), and managing paradoxical tensions (Bengtsson et al., 2016b, Raza-Ullah, 2018) are well discussed within coopetition literature. Although these studies postulate potential relationships between ambidextrous managers and ambidextrous activities associated to coopetition, it falls short of explaining not only the nature of manager skillsets but also their direct relationship with coopetition itself. However, given the potential links posited between ambidextrous managers and various paradoxical activities associated to coopetition in extant literature, this study argues that the presence of ambidextrous managers likely leads to coopetition as well. These arguments lead to the following hypothesis;

*H3: Manager's ambidexterity is positively associated to coopetition*

### **3.3.3 The role of knowledge sharing**

Among the motives for firms to engage in strategic alliances (Glaister and Buckley, 1996, Simonin, 2004), knowledge sharing/transfers and subsequent learning has been emphasized to be crucial (Dyer and Singh, 1998, Simonin, 2004, Bouncken and Kraus, 2013, Devarakonda and Reuer, 2018). Knowledge typically contains information related to products, markets, product/service development efforts, planning functions, and intelligence related to firms strategy (Nelson, 1982, Sher and Lee, 2004, Devarakonda and Reuer, 2018). Firms in a strategic relationship hope to learn and acquire skills, technologies, and knowledge from each other through the sharing of varied knowledge which is otherwise not available outside that relationship (Lei, 1993). Given the value that

knowledge adds, it is essential for firms that aim to engage in relationships to be able to share knowledge (Inkpen and Beamish, 1997, Soekijad and Andriessen, 2003) as that strongly motivates firms to engage in strategic relationships and to learn from such relationships (Soekijad and Andriessen, 2003, Bouncken and Kraus, 2013, Bouncken and Fredrich, 2016).

As a dynamic capability strategic intent seeks to perform exploration and exploitation of opportunities/activities (O'Reilly III and Tushman, 2008). These exploration and exploitation activities may require necessary knowledge flows to support the firm's intent and to align it with that of the partner (Norman, 2004). Alliance wide knowledge routines can assist to formulate a clear strategic intent with the specificities of the areas of exploration and exploitation that a firm aims to pursue in their strategic relationships. For instance, the intent to exploit growth opportunities and to adapt product markets can be better formulated by integrating a firm's existing knowledge with new knowledge gained externally (Bierly et al., 2009). Similarly, the intent of exploring new opportunities along with the partner and to rapidly generate innovative products can be better planned by integrating both the firms' knowledge (Zahra et al., 2000, Bierly et al., 2009, Bouncken and Kraus, 2013). However, pursuing the contradictory exploration and exploitation activities simultaneously could make the trade-off of ambidexterity challenging for firms (Gibson and Birkinshaw, 2004), due to the potential tensions such as trade-offs between pursuing one activity over the other (Gibson and Birkinshaw, 2004, Simsek et al., 2009). With the knowledge routines in place, firm's managers, as knowledge brokers, can differentiate the simultaneous activities (Chiambaretto et al., 2019), and deal with the trade-offs in relationships as per the firm's intent. Accordingly, scholars argue that when strategic intent is complemented by knowledge flows, managers can think and act ambidextrously for their firm to attain exploration and exploitation objectives simultaneously (He and Wong, 2004, Gibson and Birkinshaw, 2004), with better coordination and strategic control

(Veliyath, 1992, Bodwell and Chermack, 2010, O'Reilly III and Tushman, 2011). Given that knowledge flows can strengthen the communication, coordination, and decision making, both within and across the organizations (Fan and Ku, 2010, Lawson et al., 2009), it can also ensure a clear-cut communication about strategic initiatives and processes that form the strategic intent, and guide the decision makers/managers and other stakeholders in their efforts to realise the strategic intent (Haugstetter and Cahoon, 2010). Consequently, we argue that the strategic intent complemented by knowledge flows enable the managers to deliver the objectives of the intent. Therefore:

*H4: Knowledge sharing positively moderates the relationship between firm's strategic intent and its managers' ambidexterity*

The dynamic capabilities perspective emphasizes upon the need for knowledge and information as necessary requirements to develop competitive advantage in relational settings (Easterby-Smith and Prieto, 2008, Niesten and Jolink, 2015). Knowledge as a key resource allow reconfiguration of processes inherent to dynamic capabilities and assist to develop the future paths/directions for firms (Teece, 2007). Similarly, activities that are central to a firm's strategic intent, a dynamic capability, represent strategic behaviours of the firms (Hamel and Prahalad, 1989, Simsek et al., 2017), which generally seek resource requirements (Simsek et al., 2017) such as knowledge. This knowledge requirement is attributed to the firm's need for an accurate assessment of costs and benefits of entering into a strategic alliance. Firms expect to have a comprehensive understanding of both the strategic intent of the firms as well as knowledge over, for instance, the technological changes, stock of resources, and skills that contribute to competitive advantage (Soekijad and Andriessen, 2003). These technical knowledge and skills, and information sharing, are important parameters for the firms to be able to communicate in a transparent and receptive manner in relationships (Hamel, 1991).

Among others, the strategic objectives derived by the strategic intent tend to include entering new markets, learning and acquiring new knowledge for expanding knowledge and capabilities, and building new resource base (Rui and Yip, 2008), seeking technological advancements (Gnyawali and Park, 2011), and developing innovation (Ritala and Hurmelinna-Laukkanen, 2013). Realising these strategic objectives without the knowledge sharing routines is rather challenging. Accordingly, Ritala and Hurmelinna-Laukkanen (2013) mention that engaging in cooptation without knowledge sharing is useless for firms. Extant literature also showcases the complementary role of knowledge in driving a firm's strategic intent to pursue paradoxical activities in strategic alliances (Grant and Baden-Fuller, 2004, Bouncken and Kraus, 2013, Bacon et al., 2019), building new business models (Velu, 2016, Ritala et al., 2014), and improving competitive advantage (Gnyawali et al., 2006, Bengtsson and Raza-Ullah, 2016). Accordingly, the study posits that knowledge sharing could play a complementary role in the relationship between strategic intent and cooptation relationship. Therefore;

*H5: Knowledge sharing positively moderates the effect of a firm's strategic intent on cooptation*

### **3.3.4 Knowledge sharing and manager's ambidexterity as moderated mediators between strategic intent and cooptation**

The strategic intent of a firm to achieve specific objectives depends on the fit between the firm's intent at the beginning of an alliance and subsequent adoption of necessary channels (Nielsen, 2010). The idea of adopting necessary channels to pursue cooptation (what a firm wants to do) as per the intent (what a firm knows) draws similarities with the 'knowing-doing' concept forwarded by Pfeffer and Sutton (2000). Firms tend to experience potential barriers, such as communication gaps, between what a firm knows and how the firm does what it knows, thereby increasing the knowing-doing gap (Haamann and Basten, 2019). Therefore, there is a necessity for the channels to be setup in place to bridge the

potential gaps. For instance, if one firm in an alliance acquires knowledge externally it has to share it with the partners in order to interlink the new knowledge to their regular routines and reduce the knowing-doing gap (Mahnke et al., 2005, Demeter et al., 2016). Subsequently, Pfeffer and Sutton (2000) emphasize upon two important factors – firms' managers and the knowledge, to be potential channels to reduce the knowing-doing gap. Pfeffer and Sutton (2000) refer to firm-specific cases of British Petroleum and Barclays to illustrate how these intervening channels helped each firm to reduce the knowing-doing gap.

The dynamic capabilities literature posits that ambidexterity as a dynamic capability rests on the ability of leaders/managers to not only articulate their firm's strategic intent that justifies the exploration and exploitation activities but also manage the inherent processes associated to different organizational architectures (O'Reilly III and Tushman, 2011), such as paradoxical relationships. In accordance, scholars argue that performing ambidextrous acts such as exploration and exploitation (or cooperation and competition) as per their firms' intent (Koza and Lewin, 1998, Yamakawa et al., 2011) requires their managerial team to articulate the strategic intent that justifies being in the ambidextrous relationship (Rotemberg and Saloner, 2000, O'Reilly III and Tushman, 2008). However, in order for managers to perform these ambidextrous acts in relationships, it is important that managers comprehend the intent of not only the focal firm but also that of the partner. Accordingly, Spekman et al. (1996) maintain that the managers must ensure the strategic intent of their firm is tied to the strategic alliance (objectives). This aligning of the intents is plausible with the implementation of knowledge sharing routines. With the knowledge complementing the strategic intent, a reconceived strategic intent can better guide the managers to deal with the ambidexterity activities involved in cooperation. This is due to the fact that the sharing of information and knowledge allows reducing the possible overlapping of activities such as product lines or target markets (Jorde and Teece, 1989,

Luo, 2007a), and essentially the intents of partners. Therefore, the study posits knowledge as a complement for strategic intent, and ambidextrous managers as a transmitter/intervening variable in the relationship between strategic intent and coopetition. Accordingly, we forward the following hypothesis for formal testing:

*H6: Manager's ambidexterity mediates the relationship between strategic intent and coopetition in that knowledge sharing simultaneously moderates the effect between strategic intent and managerial ambidexterity.*

### **3.4 Research methodology**

#### **3.4.1 Data collection**

The constructs identified for this study include firm-level as well as relational-level variables which represent the strategic aspects of a focal firm and assist the firm to pursue a relationship with partner firms, thus, eventually investigating a dyadic relationship (Chen and Paulraj, 2004). Therefore, the unit of analysis is the 'dyad'. We collected data from one-side of the dyad. A mix of individuals that hold strategic as well as operational positions in organizations would be more relevant to respond to the variables investigated in this study. Accordingly, we sought responses to the survey questionnaires from top ranking managers who were knowledgeable about the coopetitive relationships of the responding firms.

A structured web-based questionnaire was employed for data collection. We utilized 'Qualtrics' software tool to build the survey by embedding all our survey questions into a shareable web-link. The survey instrument was created following extensive literature review and the sources of the survey questions are clearly explained in the measures section. The online questionnaire was self-administered for efficiency and to accommodate budget constraints for data collection. This also helps to gather a significant amount of information over a short period of time (Statsenko and Corral de Zubielqui, 2020). 'Qualtrics' software tools and their panel data are widely being utilized for data collection

across the research functions (Abbey and Meloy, 2017, Statsenko and Corral de Zubielqui, 2020, Hartmann et al., 2020). We accessed and utilized the strength of Qualtrics' robust panel data to approach the qualified respondents. Later, the collected data was imported to SPSS format files for further analysis.

The target sample encompasses firms from across the North America, UK, Ireland, and Netherlands. These firms engage sectors such as automotive/automobile, consumer electronics, engineering, information and communication technologies (ICT), machinery, pharmaceuticals, and research and development (R&D). These sectors are categorised as Hi-tech as well as knowledge intensive by the Eurostat (Eurostat, 2018), a directorate-general of the European commission which offers statistical information to the European Union's institutions. These sectors are chosen as their significance was being emphasised by scholars in coopetition research (Luo, 2007a, Ritala and Hurmelinna-Laukkanen, 2009, Dagnino and Rocco, 2009, Gnyawali and Park, 2011, Ritala and Hurmelinna-Laukkanen, 2013, Raza-Ullah et al., 2014, Wu, 2014, Chiambaretto et al., 2019, Zhu et al., 2020). These studies suggest that coopetition is more suitable for firms that operate in knowledge intensive and technology driven sectors. The endlessly evolving standards and complex nature of technologies are obliging collaboration between rival firms (Luo, 2007a, Raza-Ullah et al., 2014). To ensure that our survey is responded to by the intended group of individuals, a screening question was placed right at the start of the survey - "*Does your firm cooperate and compete at the same time with a competitor firm or a firm that has similar product/service offering and similar target market*" (representing cooperation and competition in the same relationship). Individuals that answered 'Yes' to the screening question were requested to continue with the survey keeping that competitor partner in mind, while those that answered 'No' were aborted from the survey with a thank you note. From 1500 on-line surveys sent, 355 responses were received which resulted in a response rate of 23.67%. Due to inadequate information, 42 responses were discarded and that lead

to an effective response rate of 20.87% (313/1500). Over 71.6% of respondents held positions such as CEOs/COOs, Alliance-directors, and top-level managers in their respective organisations. The respondents mostly worked for medium to large scale firms with 41.9% working for firms that each has an employee size of 251-1000 and 24.3% working for firms where each has over 1001 employees. Nearly 70.3% of firms registered over EUR 50 million revenues in the previous financial year. We evaluated *non-response* bias by testing plausible differences between sample means of demographic variables such as employee size of focal and partner firms, and the firm age. A new variable was created to represent two independent groups based on early responses and late responses. The responses received during the first 3 weeks (until the 7<sup>th</sup> of May 2018) were separated into group 1 while the later responses (from the 8<sup>th</sup> of May 2018 until end of June 2018) were separated into group 2. Using the SPSS, a non-parametric two independent sample test was performed on the variables - focal firm employee size, partner firm employee size, and the firm age. The results yielded no statistically (at 95% confidence level) significant differences between the two groups. Therefore, nonresponse bias does not appear to be a concern.

Given the fact that the study collected data from a single respondent within each sample firm regarding the variables of interest, we conducted specific tests to address concerns related to common method bias. The study conducted a confirmatory factor analysis to address common method bias related concerns (Sea-Jin et al., 2010, Roldán Bravo et al., 2018). Specifically, we ran two models – one with a single-factor and another with the factors presented in the theoretical framework. The model fit for the single factor model (Comparative fit index [CFI] = 0.811, Tucker-Lewis index [TLI] = 0.789, Incremental fit index [IFI] = 0.812, Root mean square error of approximation [RMSEA] = 0.106, normed  $\chi^2$  [NC] = 4.514) was much inferior to our measurement model (CFI =



0.962, TLI = 0.953, IFI = 0.962, RMSEA = 0.050, normed  $\chi^2$  [NC] = 1.784) signifying that the common method bias is not a concern.

### 3.4.2 Measures

A 7-point Likert scale with endpoints of “strongly disagree” to “strongly agree” is used to measure the indicators used in the survey. The details of all indicators are provided in the Appendix B.

**Independent variable:** ‘*Strategic intent*’ is operationalized by four items adapted from Johnson and Sohi (2001) which they built following the original work of Hamel and Prahalad (1989).

**Mediator variable:** Measures for manager exploration and manager exploitation are adapted from Mom et al. (2007) to build the ‘*manager ambidexterity*’ construct utilising the factor method/multiplicative approach following the same authors from where the items are adapted (Mom et al., 2007). The factor or multiplicative approach was also followed in the other studies (Mom et al., 2009) to measure manager ambidexterity. These studies argue that the multiplicative approach is the most suitable approach to measure manager ambidexterity due to it being a factor that explicitly takes the ambidextrous behaviour of individuals/managers into consideration, citing the recommendation of Gibson and Birkinshaw (2004).

**Moderator variable:** Three items scale from Wang et al. (2008) is adapted to operationalise ‘*knowledge sharing*’.

**Dependent variable:** We operationalized “*Coopetition*” by multiplying the cooperation and competition constructs following the “multiplicative or the product/interaction method” approach implemented in previous coopetition studies (Luo et al., 2006, Bengtsson et al., 2016b, Bendig et al., 2018). The variable “cooperation” is operationalised by five items adapted from Cannon and Perreault (1999), and “competition” is measured by a four items scale adapted from Tsai (2002) and Zhang et al. (2010). The multiplicative

method is interpreted to be ideal as it represents the simultaneity of both the constructs (He and Wong, 2004, Chandrasekaran et al., 2012), i.e., simultaneous cooperation and competition.

**Control variables:** We control for *relationship length* because the firms may have an incentive gained from the relationship that could be used to influence and control over time (Luo, 2005, Morris et al., 2007, Afuah, 2000, Ho and Ganesan, 2013). The scale of a firm's operations and the amount of access it has to resources are dependent on the size of the firm (Dröge et al., 2003). Also, rivalry gets intense between firms that are relatively stronger in size (Bengtsson and Kock, 1999). Thus, we controlled for *firm size* as well as *partner firm size*. We used number of employees as a measure of firm size. We also controlled for *common suppliers* between alliance firms as that may influence the decision on relationship (Vachon and Klassen, 2006). Further, intensity of collaboration between competitors was also included to control for various alliance activities. Three items - *amount of collaboration in R&D*, *amount of new product development*, and *amount of technology development* (Ritala and Hurmelinna-Laukkanen, 2013, Luo et al., 2007) were measured on a scale of 1 to 7 with endpoints of "very low" to "very high". *Firm age* (Years from inception) is also controlled as it could be a source of resource heterogeneity such as slack resources and a work force that can formulate sophisticated arrangement with partner firms (Niederkofler, 1991, Reuer et al., 2006). Besides, firm age could also influence the outcomes using its industry establishment (Ritala and Hurmelinna-Laukkanen, 2013, Lechner et al., 2016).

### **3.4.3 Instrument development**

We ensured content validity of the survey instrument by grounding it in extant literature. Additionally, before the data collection took place, we pre-tested the instrument with 19 experts (15 executives and 4 academics); their opinions were sought on structure, readability, ambiguity, and completeness of the instrument (Dillman, 2007). Based on the

feedback received, we made minor changes to the instrument before the survey launch. As specified previously, multi-item scales were utilised to measure all theoretical constructs. Normality and outliers for the measurement instrument was tested by using the plots of residuals and statistics of skewness and kurtosis. Multivariate outliers were tested based on Mahalanobis distances of predicted variables. The values of skewness and kurtosis were found to be within the limits of 2 and 7 (Curran et al., 1996). Additionally, the respective plots of skewness and kurtosis did not show any worrisome deviations.

Both the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to establish construct validity and unidimensionality. The results of this analysis are presented in the Appendix B. While conducting EFA, most of the items loaded onto their respective constructs. The eigenvalues for the constructs were above 1.0; the percent of variation was 59.80 and the factor loadings were also above 0.40 (Hair et al., 1998). The fit indices for the CFA model (CFI = 0.962, TLI = 0.953, IFI = 0.962, RMSEA = 0.050, SRMR = 0.0421, and normed  $\chi^2$  [NC] = 1.784) suggest adequate fit (Kline, 2005). Overall, these results clearly indicate that the proposed measurement model fits the data well, thereby establishing the unidimensionality of the measurement instrument.

Results establish the discriminant validity of the constructs since the squared correlations between all combinations of latent constructs is less than the average variance extracted (AVE) estimates of the respective constructs (Fornell and Larcker, 1981). The correlations values are provided in Table 2.1 and the AVE values are shown in the Appendix B. Reliability of the constructs was established using internal consistency method via Cronbach's alpha (Nunnally, 1978). All constructs showed Cronbach's alpha value of greater than 0.70 (see Appendix B). Alternatively, composite reliability (CR) values showed that all constructs had a CR value of greater than 0.70 (see Appendix B) (Bagozzi and Yi, 1988). Moreover, AVE values for all constructs were not less than 0.50. Overall, the results indicate that the theoretical constructs are reliable, valid and

unidimensional. During the instrument development process, we deleted some indicators as they did not meet the psychometric requirements; the deleted items are shown in the Appendix B.

Factors	Mean	SD	CO	CT	SI	KS	ME	MX
Cooperation (CO)	5.622	1.004	1					
Competition (CT)	5.528	1.036	0.643	1				
Strategic Intent (SI)	5.282	1.127	0.499	0.446	1			
Knowledge Sharing (KS)	5.621	1.048	0.705	0.568	0.500	1		
Manager Exploration (ME)	5.511	1.034	0.574	0.472	0.506	0.637	1	
Manager Exploitation (MX)	5.641	0.951	0.621	0.557	0.545	0.640	0.716	1

Table 3.1: Correlations

### 3.5 Results of analysis

Simple regression was performed to test the Hypotheses H1, H2, and H3. Table 3.2 presents these results. For H1, the prediction was that a competitor’s strategic intent will be positively associated to its manager’s ambidexterity. The results do not find support for the Hypothesis as the results indicate that strategic intent is negatively associated ( $\beta = -0.195$ ,  $p < 0.01$ ) to ambidexterity. For H2, the prediction was that the effect of strategic intent on competition is positive. The results do not find support for the hypothesis as the beta value indicate that the effect of strategic intent on competition is insignificant ( $\beta = 0.036$ ,  $p < 0.463$ ). In the case of hypothesis H3, the prediction was that the manager’s ambidexterity is positively associated to competition. The results provide support for this Hypothesis, in that manager’s ambidexterity on competition ( $\beta = 0.611$ ,  $p < 0.0001$ ) is found to be positive and significant.

IV	DV (Manager's ambidexterity)	DV (Coopetition)
<u>Control variables</u>		
Employee strength	0.036	0.009
Partner's employee strength	0.028	0.068
Relationship length	0.077	-0.008
Common suppliers	-0.052	0.091*
Company Age	-0.089	0.005
Amount of R&D collaboration	-0.225**	-0.083
Amount of new product development	0.040	0.040
Amount of technology development	0.002	-0.086
<u>Predictor</u>		
Strategic intent	-0.195**	
Strategic intent		0.036
Manager's ambidexterity		0.611***
<u>Model summary</u>		
R <sup>2</sup>	0.104	0.412
Adjusted R <sup>2</sup>	0.077	0.392
Model F-value	3.820***	20.599***

The regression coefficients are reported as beta values.

N=313.

\* p<0.05

\*\* p<0.01

\*\*\* p<0.001

Table 3.2: Simple regression – direct effects

To test Hypothesis H4, we utilized the model 1 of PROCESS macro designed by Hayes (2018) for SPSS. For Hypothesis H4, the prediction was that ‘knowledge sharing’ moderates the relationship between firm’s strategic intent and its manager’s ambidexterity. Table 3.3 presents these results. The results find support for this hypothesis in that results indicate that the cross-product terms between ‘Strategic intent and knowledge sharing’ ( $\beta = 0.756$ ,  $t = 18.368$ ,  $p < 0.0001$ ) on manager’s ambidexterity is significant and positive.

	B	SE	t	p	LLCI	ULCI
Strategic Intent (SI)	-0.329	0.062	-5.337	0.000	-0.450	-0.208
Knowledge sharing (KS)	0.220	0.080	2.737	0.007	0.062	0.378
SI × KS	0.756	0.041	18.368	0.000	0.675	0.837
Model values: R = 0.772, R <sup>2</sup> = 0.596, p = 0.000						

Note: N = 313. Unstandardized regression coefficients are reported. Bootstrap sample size = 5000. LLCI = lower limit confidence interval; ULCI = upper limit confidence interval. All control variables included as explained in the measures section, R&D collaboration is significant. Total conditional effect at value of moderator/knowledge sharing = 0.448, Intervals (LLCI, ULCI) range = (-1.217, -0.911) to (0.310, 0.585).

Table 3.3: Regression results for conditional indirect effect on manager’s ambidexterity

The SPSS macro PROCESS model 1 was utilised to test the last Hypothesis H5. The prediction was that ‘knowledge sharing’ positively moderates the relationship between firm’s strategic intent and coopetition. Table 3.4 presents these results. The results support the hypothesis in that they indicate that the cross-product terms between ‘Strategic intent and knowledge sharing’ ( $\beta = 0.601$ ,  $t = 12.430$ ,  $p < 0.0001$ ) on coopetition is significant and positive.

	B	SE	t	p	LLCI	ULCI
Strategic Intent (SI)	-0.149	0.073	-2.005	0.041	-0.291	-0.006
Knowledge sharing (KS)	0.150	0.094	1.585	0.114	-0.036	0.336
SI × KS	0.601	0.048	12.430	0.000	0.506	0.696

Model values:  $R = 0.640$ ,  $R^2 = 0.410$ ,  $p = 0.000$ .

Note:  $N = 313$ . Unstandardized regression coefficients are reported. Bootstrap sample size = 5000. LLCI = lower limit confidence interval; ULCI = upper limit confidence interval. All control variables included as explained in the measures section, R&D collaboration is significant. Total conditional effect at values of moderator/knowledge sharing = 0.469, Intervals (LLCI, ULCI) range = (-0.914, -0.554) to (0.307, 0.630).

Table 3.4: Regression results for conditional indirect effect on coopetition

Alternatively, the moderation effects are also tested following the guidelines of Dawson (2014). It involves mean-centering the independent variable of ‘strategic intent’ and the moderator variable of ‘knowledge sharing’ to create interaction variable (Strategic intent X Knowledge sharing routines) so as to perform the moderation effect of knowledge sharing on the outcome variables of ‘manager’s ambidexterity’ and ‘coopetition’ for the hypotheses H4 and H5 respectively. Although the approach of mean-centering may not significantly affect the moderating effects on the outcome variables, doing so ensures “*that the (unstandardized) regression coefficients of the main effects can be interpreted directly in terms of the original variables*” (Dawson, 2014, p.12). Additionally, mean-centering the variables in regression models also enables to reduce potential multicollinearity issues (Lee and Cavusgil, 2006, Dawson, 2014). Nevertheless, the results of these interactions effects remain consistent across both the methods (PROCESS model and using manually created interaction variable) of performing the moderation effects.

Hypothesis H6 was tested utilising the model 7 of macro PROCESS for SPSS. The prediction was that manager’s ambidexterity mediates between strategic intent and cooepitition when knowledge simultaneously moderates between strategic intent and ambidexterity. Table 3.5 presents these results. The results find support for this hypothesis in which the values indicate that the ambidexterity positively mediates ( $\beta = 0.594$ ,  $t = 12.937$ ,  $p < 0.000$ ) between strategic intent and ambidexterity when knowledge sharing routines are simultaneously in place between intent and ambidexterity.

	B	SE	T	p	LLCI	ULCI
Strategic intent (SI) -> Ambidexterity	-0.329	0.062	-5.337	0.000	-0.450	-0.208
Knowledge sharing (KS)	0.220	0.080	2.737	0.006	0.062	0.378
SI * KS -> Ambidexterity	0.756	0.041	18.368	0.000	0.675	0.837
Model values: $R = 0.771$ , $R^2 = 0.596$ , $p = 0.000$						
Strategic intent -> Coopetition	0.049	0.067	0.734	0.463	-0.083	0.182
Ambidexterity -> Coopetition	0.594	0.046	12.937	0.000	0.504	0.685
Model values: $R = 0.642$ , $R^2 = 0.412$ , $p = 0.000$						

Note: N = 313. Unstandardized regression coefficients are reported. Bootstrap sample size = 5000. LLCI = lower limit confidence interval; ULCI = upper limit confidence interval. All control variables included as explained in the measures section, except common suppliers none are significant. Indirect effect (SI – Ambidexterity – Coopetition) = 0.266, Intervals (LLCI, ULCI) range = (-0.920, -0.164) to (0.056, 0.482). Index of moderated mediation/KS = 0.450 (0.119, 0.636).

Table 3.5: Regression results for conditional indirect effects (moderated mediation)

### 3.6 Discussion

The study makes several important contributions to both cooepitition theory as well as practice. In particular, the results offer empirical evidence on the significance of strategic intent in enabling cooepitition. More importantly, it showcases the importance of the intervening effect of ‘ambidextrous managers’ and the interaction effect of ‘knowledge sharing’ to facilitate the effect of strategic intent on cooepitition. Figure 3.2 exhibits these results.

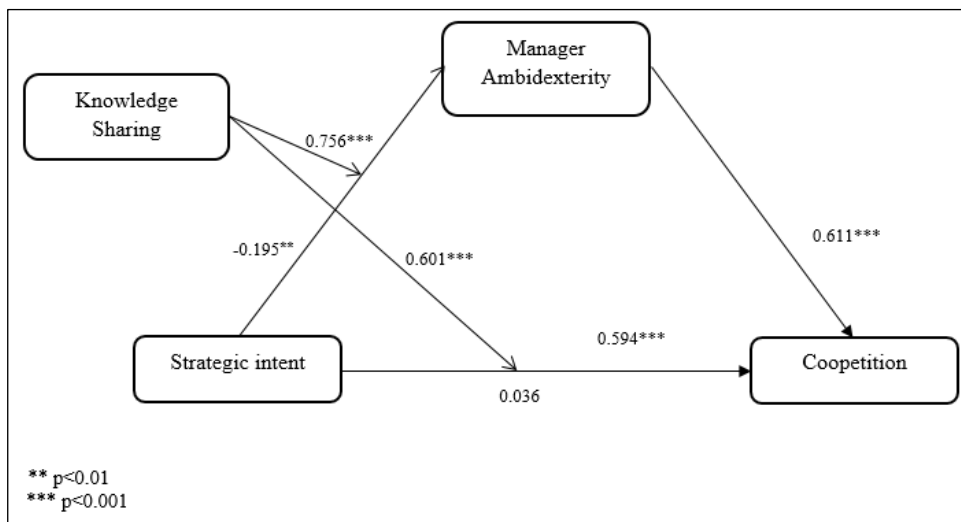


Figure 3.2: Results of the conceptual model

**Strategic intent-knowledge sharing-ambidextrous managers:** The first objective of the study was to investigate the relationship between a firm's strategic intent and its manager's ambidexterity as well as the moderating role of knowledge sharing on this relationship. The findings suggest a negative association between intent and manager's ambidexterity. This contradicts not only our hypothesis but also the views from scholars that favour a possible association between intent and managers ambidexterity (O'Reilly III and Tushman, 2011, O'Shannassy, 2016, McCardle et al., 2019, Jarzabkowski et al., 2019). This contradiction can be attributed to the lack of alignment of a firm's strategic intent with that of its partner to sufficiently guide ambidextrous managers effectively. Every firm maintains a distinctive strategic intent; the choice of adopting strategies as per the intent is driven by not only the expected outcomes of the strategies, but also the manager's cognition of the surrounding environment (Koza and Lewin, 1998) which includes comprehending partner's interests/intent. Managers who operate in a coopetitive environment also tend to execute paradoxical activities with different resource combinations (Bengtsson et al., 2016a); these managers expect the direction they receive in the form of strategic intent to enhance their knowledge of those paradoxical activities so as to assist them to perform better (Mazloomi Khamseh et al., 2017). These views seem to clearly highlight the need for knowledge routines to be integrated along with strategic intent for managers to better comprehend the



overarching relational environment. Without such routines, strategic intent that a firm pursues (without grasping relational understanding and partner interests) might lower the ambidextrous managers' ability to execute the activities effectively. Therefore, it is essential that a firm's intent is reconceived with the knowledge of relational processes, planning, and information over activities; such a reconceived intent could better guide managers' activities. This is clearly reflected in the support for hypothesis H4. The positive coefficient ( $\beta = 0.756$ ) of the interaction term, i.e., strategic intent X knowledge sharing, indicates that the effect between strategic intent and manager's ambidexterity becomes more positive as the strength of knowledge sharing increases. However, the size and precise nature of the effect cannot be effectively interpreted from the examination of coefficients alone. To overcome this challenge and to enable easier interpretation, plotting the results is suggested to be an effective way to interpret them visually (Dawson, 2014). This allows to explain the moderation effects of knowledge sharing at different conditions such as at low, medium, and high levels. From the plot based on the confidence bands presented in Figure 3.3, it can be understood that only at higher levels of knowledge sharing does strategic intent will have a significant positive effect on manager's ambidexterity.

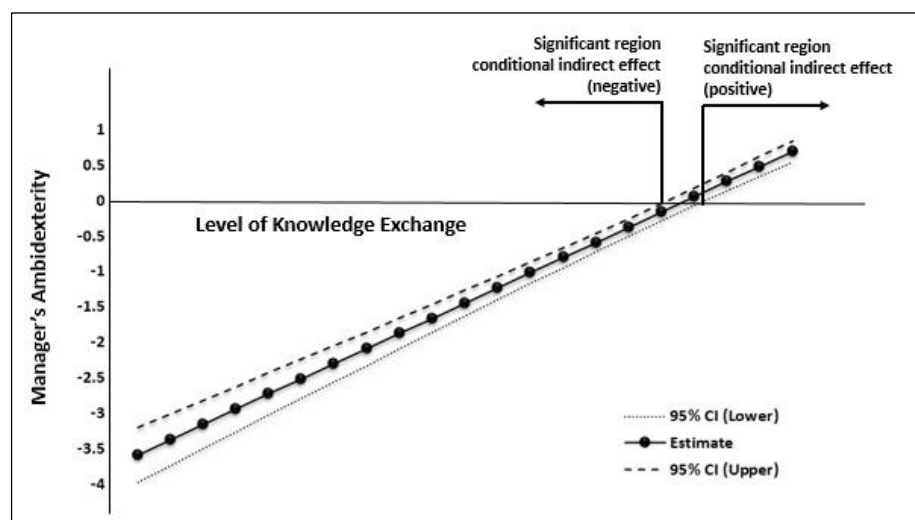


Figure 3.3: Conditional indirect effect of Strategic intent on Manager's ambidexterity at different levels of knowledge sharing

**Strategic intent-knowledge sharing-coopetition:** The second objective was to investigate ‘strategic intent-coopetition’ relationship as well as the moderating effect of knowledge sharing on this relationship. The result of insignificant direct effect could be an interesting finding given that it contradicts several notions that allude to a potential direct effect (Luo, 2007a, Yami et al., 2010, Dagnino and Rocco, 2009, Haugstetter and Cahoon, 2010). Strategic intent is meant to offer direction for firms to pursue paradoxical activities such as coopetition (Mariadoss et al., 2014, Koza and Lewin, 2000). However, a standalone strategic intent that lacks clarity over the partner’s interests may undermine its ability to pursue paradoxical activities effectively. The result of the insignificant effect appears to be indicative of the fact that a standalone strategic intent might not be effective in pursuing simultaneous cooperation and competition with its partner. This can be addressed with the use of relational-knowledge flows as they could potentially assist the intent on the areas/activities of cooperation and competition (Gnyawali et al., 2016). Harrison et al. (2001) and Mazloomi Khamseh et al. (2017) share similar views in that they suggest firms require knowledge over partner competencies, market scenario, regulators, and information over activities to strengthen the case for them to pursue strategic relationships such as coopetition. Therefore, strategic intent, by itself, might not be enough to lead to coopetition unless there is a synergy in terms of strategic intent of both the firms; such a synergy can only be achieved through knowledge sharing. This line of thought reflects in the finding of hypothesis H5 which suggests that knowledge positively moderates the relationship between strategic intent and coopetition. However, this finding also highlights the fact that only at higher-levels of knowledge sharing routines can strategic intent have a significant positive effect on coopetition. The plot based on the confidence bands presented in Figure 3.4 supports this conjecture. While this result further aligns with views that suggest knowledge sharing complements strategic intent while engaging in alliances (Grant and

Baden-Fuller, 2004, Zhang et al., 2019), our finding explicitly focuses on cooperation and forwards that strong knowledge routines complement strategic intent.

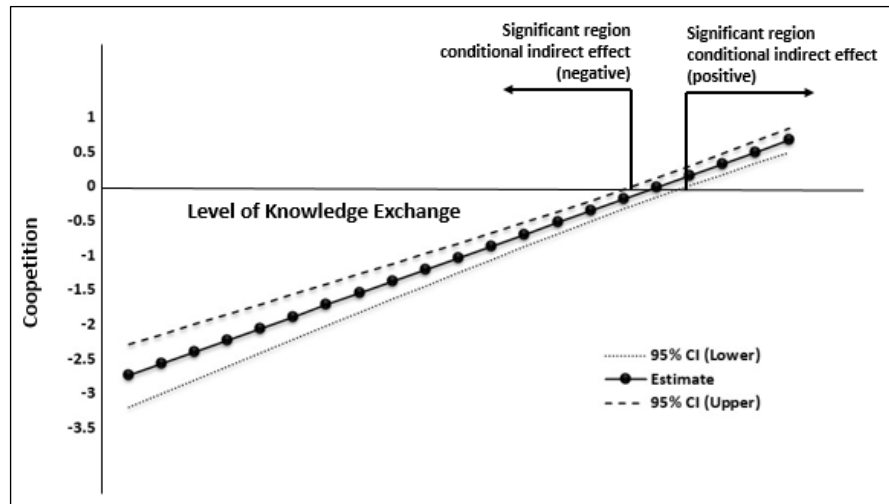


Figure 3.4: Conditional indirect effects of Strategic intent on Cooperation at different levels of knowledge sharing

**Ambidextrous managers-cooperation:** The third objective of the study was to investigate the relationship between managers’ ambidexterity and cooperation. Our result partially matches the views forwarded by various scholars that signify the importance of ambidextrous managers to perform various ambidextrous activities including value creation / value appropriation in cooperation (Bengtsson et al., 2016b, Yami et al., 2010, Raza-Ullah et al., 2014, Strese et al., 2016a, Gnyawali and Park, 2011, Bengtsson et al., 2018, Czakon et al., 2019, Lundgren-Henriksson and Kock, 2016). However, these studies do not consistently address the nature of ambidextrous managers’ skills. Subsequently, scholars call for future research to investigate the nature of ambidextrous managers in cooperative relationships (Czakon et al., 2019, Felício et al., 2019). Additionally, while these studies have related managers to various paradoxical activities associated to cooperation, they neither explain the direct effects between ambidextrous managers and cooperation nor do they provide empirical validation for the theoretical discourse. Our result specifically contends that ambidextrous managers are directly associated to cooperation

wherein managerial ambidexterity is operationalized as a combination of exploration and exploitation skills. Further, our study is the first to establish an empirical connection between ambidextrous managers and coopetition. We believe that this finding can also allow us to expand this association into a broader perspective so as to explain how different combinations of managers' ambidextrous skills can facilitate different types of coopetition. For instance, different combinations of exploration and exploitation skills may facilitate different types of coopetition that are driven by the firms objectives, resources, and structural conditions (Bengtsson and Kock, 2000, Bengtsson et al., 2016b, Chai et al., 2019). Scholars suggest that ambidextrous managers can not only host contradictions (Mom et al., 2009), but are also capable of identifying the type of coopetition their firms intend to pursue and can adopt appropriate strategies to manage them (Akpınar and Vincze, 2016). Nevertheless, our results empirically validate that ambidextrous managers are associated to coopetition as much as they are said to be associated to ambidextrous activities.

**Strategic intent-knowledge sharing-Ambidextrous managers-coopetition:** The fourth objective was to investigate the moderated mediation effects of knowledge sharing and ambidextrous managers on the relationship between the strategic intent and coopetition. The result from this investigation partially matches the previous views of Rotemberg and Saloner (2000) and O'Reilly III and Tushman (2008) that allude managers to be potential articulators/mediators between strategic intent and ambidextrous form of relationships such as coopetition. However, the key factor that has been overlooked by extant research that posited manager's mediation between intent and paradoxical relationships, is the importance of knowledge routines. Our results highlight that knowledge sharing can play a complementary role in the pursuit of cooperative relationships. The lack of information and knowledge pertaining to the details of various relationship-wide paradoxical elements could make it difficult for managers to gain deeper insights into the successful pursuit of

coopetitive relationships (Bengtsson et al., 2018). Moreover, our findings also add to the ‘knowing-doing’ gap concept (Pfeffer and Sutton, 2000, Haamann and Basten, 2019) within the interfirm coopetition context in that ambidextrous managers and knowledge sharing can help in reducing the ‘knowing(intent)-doing(coopetition)’ gap.

**Managerial relevance:** The results offer three important implications for managers of firms that engage in coopetition. *First*, the results suggest that managers should maintain strong knowledge sharing routines with their partners as such routines can complement the effect of their firm’s strategic intent. The strategic intent that is complemented with knowledge will have information over alliance activities and other routines that could ensure congruence between the firm’s interests with relational-level interests. This would guide the managers in effectively performing ambidextrous activities. Strategic intent with knowledge complementarity would assist managers to gain clarity over the activities where they need to explore and other areas where they would need to exploit. Alternatively, strong knowledge sharing routines would also complement their firms’ strategic intent in terms of differentiating the activities where their firms need to cooperate and compete simultaneously. *Second*, the results emphasize the need for managers to possess ambidextrous skills of simultaneous exploration and exploitation when engaging in strategic alliances such as coopetition. Such ambidextrous skills assist the managers to not only effectively negotiate pursuing simultaneous cooperation and competition, but also potentially allows them to effectively comprehend the paradoxical activities, such as value creation vs value appropriation, associated with coopetition. *Third*, it is important for managers to ensure the use of both the ambidextrous skills and the knowledge sharing routines concurrently to assist their firms to pursue successful coopetition. While knowledge pertaining to alliance activities complement the strategic intent to maintain congruence/synergy with that of the partner’s interest, the ambidextrous managers are

likely to better comprehend such knowledge-complemented strategic intent that can offer renewed direction to effectively pursue paradoxical activities associated to coopetition.

### **3.7 Conclusion, limitations, and future research direction**

As the phenomena of coopetition has been receiving increased attention from both the industry as well as academia, it is important that organizations, practitioners, and academics understand the significance of strategic intent as an antecedent for firms that aim to pursue coopetition. It is also equally important to comprehend the significance of knowledge sharing routines as they could complement the strategic intent of a firm and better guide the firm's ambidextrous managers. While addressing the significance of these variables, this study is the first to address the empirical connection between a firm's strategic intent and coopetition through the use of knowledge routines and the firm's managers' ambidextrous skills. The study demonstrates that the ambidextrous managers mediate the relationship between strategic intent and coopetition when knowledge concurrently moderates the relationship between strategic intent and ambidextrous managers. Overall, the study offers important contributions to practitioners as well as to coopetition theory.

Like many empirical studies, restraint may be exercised when it comes to generalizing the findings of the study. We acknowledge several limitations of the study. *First*, we have included knowledge sharing as an important complement to strategic intent. However, other relational factors such as relational investments and governance arrangements may also complement the strategic intent and the relationships outlined in the study. Future research may consider delving into these areas. *Second*, the study is developed from a focal firm's perspective as we collected data from the focal firm of the dyad, which is a common problem in inter-firm relationships (Robson et al., 2019) and may have certain influence on the results. *Third*, the study has not taken the implication of knowledge characteristics such as the depth and breadth of its complexity (Ho and Ganesan, 2013). *Fourth*, the study has not investigated the knowledge protection in its

current scope while discussing knowledge sharing routines. Given that coopetitors are serious competitors, the opportunity for knowledge spillage is very high. Future studies may consider looking into how different knowledge protection mechanisms could simultaneously moderate the relationship between intent-knowledge sharing-managers ambidexterity-coopetition relationship. *Fifth*, future studies may consider investigating the moderated mediation effects of knowledge sharing, ambidextrous managers, and other relevant variables on the relationship between strategic intent and cross-functional coopetition. *Finally*, the context of hi-technology industries spanning large geography is used for the study. Therefore, the results may not entirely fit or reflect to very specific contexts.

## **Chapter 4: Paper II – Key tensions in coepetitive relationships: The contingent role of formalization**

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## **4.1 Abstract**

Despite the increased attention on interdependence and opportunism as key cooperative tensions, little has been done to clearly comprehend the underlying relationships among cooperation, interdependence, and opportunism. Additionally, among others, competitors' adoption of formalization as a key mechanism to manage these tensions remains ambiguous. Nevertheless, calls from extant research seek clarity on the interplay of important variables that affect relationships between cooperation and tensions. Drawing upon the resource dependence theory and transaction cost theory, we forward numerous hypotheses between the constructs of interest. We test our hypotheses using the survey data collected from 313 firms that are engaged in cooperative relationships. Our results are interesting in that they suggest that cooperation will not directly lead to opportunism while it is negatively associated to partners' interdependence. Results further suggest that formalization positively moderates relationships involving cooperation and interdependence as well as cooperation and opportunism. Although our initial results indicate that interdependence does not mediate the relationship between cooperation and opportunism, our post-hoc analysis adds that interdependence could positively mediate the relationship between cooperation and opportunism in the presence of formalization as a moderator of the relationships between cooperation and interdependence as well as cooperation and opportunism.

## **4.2 Introduction**

Cooperation, a strategy that signals the simultaneous pursuit of cooperation and competition between two firms (Peng and Bourne, 2009, Sanou et al., 2016, Bouncken et al., 2018b, Sabri et al., 2020, Seepana et al., 2020), is said to be vital for firms to attain both value-creation and value-appropriation benefits (Ritala, 2012, Gnyawali and Park, 2011). As much as cooperation is beneficial, the coexistence of cooperation and competition tends to create tensions between partners (Ritala, 2012, Tidström, 2014, Tidström et al., 2018,

Crick, 2020, Crick and Crick, 2021). Extant literature discusses dependencies and opportunism as key tensions that often occur in coopetition (Lado et al., 1997, Peng and Bourne, 2009, Tidström, 2014, Raza-Ullah et al., 2014, Huo et al., 2019). Scholars also debate over the prospective relationship between coopetition and interdependence (Bengtsson and Kock, 2000, Luo, 2005, Peng et al., 2012, Raza-Ullah et al., 2014, Fredrich et al., 2019). Some scholars suggest that both the competitive and collaborative interactions inherent in coopetitive relationships cause interdependence between partners (Luo, 2007a, Peng and Bourne, 2009, Dagnino and Rocco, 2009, Peng et al., 2012). Alternatively, others contend that it is the slack/complementary resources, tasks/activities, relational mechanisms, economic and environmental aspects that leads coopetitors to become interdependent (Chin et al., 2008, Gnyawali and Park, 2011, Fredrich et al., 2019, Raza-Ullah et al., 2014). Therefore, although extant literature alludes to the potential association between coopetition and interdependence, the relationship remains ambiguous.

As for opportunism, strategic alliance arrangements are considered as breeding grounds for opportunism given that partners may have different sets of goals, the alliance's inherent temporalities, and the incentives that such arrangements offer for personal benefits (Das, 2006, Judge and Dooley, 2006). Likewise, coopetitors are argued to experience opportunistic behaviour as well; in this case, it is attributed to the dynamic and conflicting nature of the processes involved in coopetition (Peng and Bourne, 2009, Tidström, 2014, Bouncken et al., 2018b, Crick, 2020). Extant literature suggests that unanticipated changes in firms' transactional environment caused by various uncertainties (Chiambaretto and Fernandez, 2016, Paswan et al., 2017) could translate into disturbances between interdependent partners, resulting in potential tensions (Tidström, 2014) such as opportunism. Contrarily, scholars also contend that interdependence between firms may assist to reduce tensions thereby mitigating the risks associated with opportunism (Tidström, 2014, Fredrich et al., 2019, Huo et al., 2019); therefore, interdependence may

not necessarily lead to opportunism. Consequently, the relationship between cooptitors' interdependence and opportunism is also quite unclear.

Given that cooptition may lead to potential interdependencies due to the underlying exchange of transactions, a dependent partner might sense opportunities to exploit the mutuality of its relationship (Gnyawali and Charleton, 2018) as per its strategic choices as well as the uncertainties and complexity involved in the relationship (Finkelstein and Hambrick, 1996, Gaur et al., 2011). Cooptition being a complex relationship with conflicting interests tends to affect partners' interdependence differently; this, in turn, may impact partners mutuality, thereby leading one firm to take advantage of the other (Raza-Ullah et al., 2014). Accordingly, there is also a possible link between cooptition and opportunism through interdependence. Investigating this mediating link could help in not only comprehending the manifestation of opportunism, but also understanding the inherent association between the tensions of interdependence and opportunism.

Extant literature proposes several mechanisms to strengthen interdependence between cooptitors (Walter et al., 2015, Tidström, 2014, Bouncken et al., 2016a, Fredrich et al., 2019). Among others, formalization with its clearly defined policies, rules, and activity alignments (Peng and Bourne, 2009, Murray and Kotabe, 2005, Walter et al., 2015) is argued to be crucial. Alternatively, scholars posit that formalization can also control opportunism in interfirm relationships (Luo, 2007c); others contradict that it may actually promote opportunism (Walter et al., 2015, Paswan et al., 2017) due to its inflexible-rules/policies and creating a perceived threat of being controlled in a given relationship (Pertusa-Ortega et al., 2010, Paswan et al., 2017). These largely ambiguous assertions necessitate further scrutiny into whether formalization enhances or reduces opportunism both in generic alliances as well as cooptitive relationships (Walter et al., 2015). Therefore, investigating its effects on cooptitive relationships could uncover significant contributions.

In summary, the purpose of the study is to investigate the manifestation of tensions in horizontal cooperation. It includes studying the relationships between cooperation, interdependence, and opportunism and the moderating role of formalization. We utilize resource dependence theory (RDT) and transactional cost theories (TCT) to build our hypotheses. By testing the hypotheses relating to the variables of interest (please refer to Figure 4.1), our study makes several contributions to extant literature. *First*, our results respond to the calls that (a) seek more investigations with regards to inherent tensions in cooperative relationships (Peng et al., 2012, Hoffmann et al., 2018, Chou and Zolkiewski, 2018), and (b) scrutinize the relationships between interdependence and other variables that affect the cooperative tensions in general and opportunism in particular (Hoffmann et al., 2018, Gnyawali and Charleton, 2018, Tidström, 2014). *Second*, our research responds to calls that consider the general understanding over partner's opportunism in strategic alliances to be largely fragmented and inadequate (Das, 2006, Das and Rahman, 2010). Our results add to this dilemma by showing that cooperation leads to partner's opportunism through interdependence when formalization simultaneously moderates the relationships between cooperation and interdependence as well as cooperation and opportunism. *Third*, the results clarify the ambiguity and misunderstandings surrounding the effects of formalization on tensions in interfirm relationships (Luo, 2007c, Walter et al., 2015, Paswan et al., 2017). Within cooperation context, our findings forward that formalization might have differential effects; these findings may remain relevant to other forms of interfirm alliances as well.

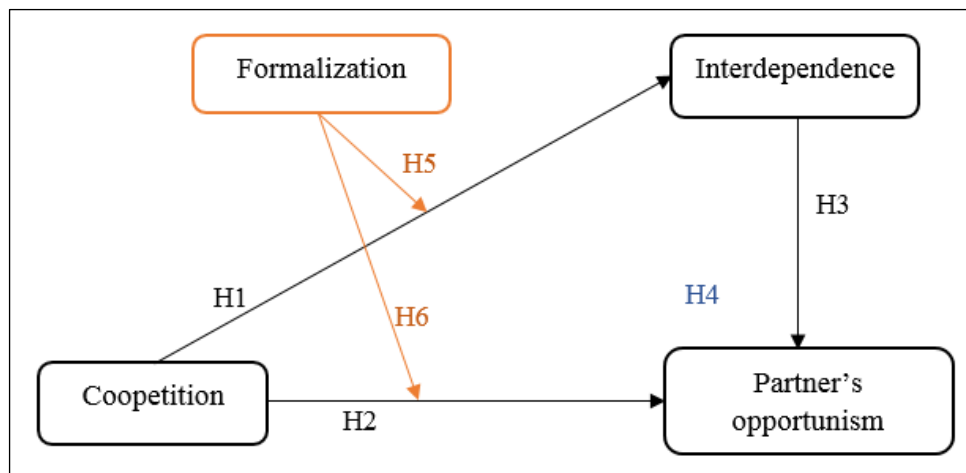


Figure 4.1: Conceptual model

### 4.3 Theoretical background

The dynamic capabilities is traditionally concerned with describing how firms can perform better than others by juxtaposing organizational capabilities with resources (Eisenhardt and Martin, 2000). Given that cooperative relationships juxtapose both cooperative and competitive activities along with their resources and capabilities, scholars consistently suggest cooperative relationships can be viewed from the perspective of the dynamic capabilities (Estrada et al., 2016, Crick, 2019, Fernandez et al., 2019). However, the juxtaposing of cooperative and competitive elements within a single relationship likely trigger various tensions such as dependencies and opportunism. Although dynamic capabilities can explain the resource and capability combinations within cooperative relationships, they are insufficient to explain various tensions that result from such combinations of cooperative and competitive interactions. Therefore, scholars indicate that capability-based view is useful to provide an anchor to show resource and capability combinations, whereas theories such as TCE (Williamson, 1991) and RDT (Pfeffer and Nowak, 1976, Pfeffer and Salancik, 2003) can provide theoretical foundation for the tensions and risks associated to the firms that pursue strategic relationships such as cooperation (Estrada et al., 2016, Jakobsen, 2020). Given that the objectives of this paper

involve investigating the tensions of interdependence and opportunism as a result of firms involvement in coopetition, the arguments specific to this paper are grounded in TCE and RDT theories.

Firms engage in coopetition to internalize parts of the knowledge and resources that are exchanged between the partners (Bouncken and Fredrich, 2016); this internalization is one of the key elements that could trigger tensions (Fernandez et al., 2014, Fernandez and Chiambaretto, 2016, Chou and Zolkiewski, 2018). TCE views such an internalization to be a result of certain conditions that involve asset specificity and involvement of know-how of partners in a given relationship (Williamson, 1985, Judge and Dooley, 2006). TCE further links these asset specificity and underlying transactions driven by the partners effort to know-how of each other to potential situations wherein one party can view the resultant conditions to be unfavourable over the other (Teece, 2014). The emergence of such situations between parties in complex relationships often translate into tensions such as opportunistic behaviours (Tidström et al., 2018). TCE proponents view opportunism to be a significant cause of vulnerabilities between firms transactions (Provan and Skinner, 1989); opportunism is seen to be an assumption in that firms often try to fulfil their self-interests primarily and ignore the interests of the partners if the conditions surrounding their transactional flows favour it to occur (Williamson, 1985). However, RDT proponents counter such arguments by stating that interfirm relationships create an environment of learning between partners and such a learning will ensure the partners to experience lower opportunism (Mitrega et al., 2017). When it comes to RDT, it is said to be a suitable anchor to investigate the developments specific to firms that pursue interfirm relationships (Huo et al., 2019). The proponents of RDT posits that firms resource requirements and shared activities likely trigger interdependence between partners (Pfeffer and Salancik, 2003, Jakobsen, 2020). RDT further clarifies that it is the firms attempts to pursue relationships which leads to facilitation of interdependence between the firms by being able to exchange

patterns of activities as well as resources that are utilized to function the relationships (Huo et al., 2019). Accordingly, it is plausible to ground the arguments specific to the variables of interdependence, opportunism, and coopetition that are employed in this paper within the tenets of TCT and RDT theories.

### **4.3.1 Coopetition and interdependence**

The simultaneous pursuit of cooperation and competition is argued to imply an inseparable interdependence between firms (Peng et al., 2012). RDT, which is a suitable theoretical anchor to study the developments related to interfirm relationships (He et al., 2020) including coopetition (Jakobsen, 2020), posits that the need for resources and activities trigger interdependencies between partner firms (Pfeffer and Salancik, 1978, Jakobsen, 2020). Furthermore, firms seek to engage in interfirm relationships that can facilitate interdependence through patterns of interorganizational activities as well as resources used within their operating environment (Pfeffer and Nowak, 1976, He et al., 2020).

The notion of coopetition, in general, suggests that coopetitors are neither self-contained nor self-sufficient, and need to interact with each other to improve their chances of gaining benefits (Dagnino and Rocco, 2009, Sanou et al., 2016, Chou and Zolkiewski, 2018). These interactions may include both resources and activities. Nonetheless, interfirm coopetition tends to be divided between activities of cooperation and competition related to product and market areas (Bengtsson and Kock, 2000, Peng and Bourne, 2009) wherein attainment of these activities require the competitors to work closely together. Besides, resource constraints and market opportunities also offer a strong incentive for competitors to work together and to become mutually dependent (Tsai, 2002, Peng and Bourne, 2009). These structural conditions orchestrated by the presence of both cooperation and competition within the same relationship pave way for the development of interdependencies between competitors (Peng and Bourne, 2009, Chen, 2008, Peng et al.,

2018). For instance, Sony and Samsung were two fiery independent rivals between whom cooperation and interdependence could never be imagined. However, unavoidable factors (i.e., capital, short product life cycles, technological activities) that offer win-win prospects would have propelled them from being independent to becoming interdependent (Gnyawali and Park, 2011). Therefore, coopetition remains a critical antecedent for firms to become interdependent (Dagnino and Rocco, 2009, Chou and Zolkiewski, 2018). Accordingly, we hypothesise;

H1: Coopetition has a positive effect on interdependence

#### **4.3.2 Coopetition and opportunism**

Among the tensions in strategic alliances, opportunism is said to be of particular concern (Das, 2006, Judge and Dooley, 2006). TCT posits opportunism to be an important cause of economic vulnerabilities in firms' transactions (Williamson, 1985, He et al., 2020). As per TCT, opportunism refers to the assumption that firms primarily, if not often, lean towards fulfilling their self-interests in the first place and tend to disregard interests of the partners if the environment surrounding their transactions allow it to happen (Williamson, 1985, Judge and Dooley, 2006). Rival firms, in general, view themselves to be independent of each other and a prospective relationship between them, i.e., coopetition, is argued to cause uncertainties and tensions (Chen, 2008, Raza-Ullah et al., 2014) such as opportunism (Dagnino and Rocco, 2009, Tidström et al., 2018). However, the direct relationship between coopetition and opportunism may not necessarily be positive and engaging in coopetition can actually lead to reduction in partner's opportunistic behaviours. The general belief could be that the diverging interests (Padula and Dagnino, 2007) that coopetitors pursue may lower the commitments and trust between the partners (Park et al., 2014b, Raza-Ullah and Kostis, 2019) acting as a catalyst for tensions when uncertainties/complexities flare up in the relationship. However, a cognition that partner cooperation is important to attain desired benefits may offset or reduce the competition



within the relationship, and therefore stimulate positive interactions that include information and activity exchanges (Park et al., 2014b, Bouncken et al., 2016a). These positive interactions between partners that underlie their pursuit of simultaneous cooperation and competition can lead to the development of social embeddedness and subsequent trust which would operate as an antidote to any opportunistic motives (Das and Teng, 2000a, Fernandez et al., 2014). This phenomenon premises that such interactions in relationships not only develop social embeddedness between partners, but also operate as an informal mechanism to discourage and reduce opportunistic behaviours (Nooteboom et al., 1997, Yu, 2019, Huo et al., 2019). Correspondingly, scholars argue that interfirm relationships that involve both the cooperative and competitive interactions may experience less opportunistic behaviours (Yu, 2019). Therefore, we conjecture that the potential direct effect between cooperation and opportunism is likely to be negative;

H2: Coopetition has a negative effect on partner's opportunism

### **4.3.3 Interdependence and opportunism**

Dependence refers to a firm's need to maintain a relationship with a strategic partner to access complementarity and to manage environmental uncertainties (Pfeffer and Salancik, 1978, Thorgren and Wincent, 2011). On the other hand, the sum, or the sum of the levels of focal and partner firm dependencies in inter-firm relationships, is called interdependence or mutual dependence (Casciaro and Piskorski, 2005). RDT posits that dependence asymmetries are particularly common in relationships when all the exchanges are not equally important for both the partners (Pfeffer and Salancik, 1978). Such asymmetries can create ground for one firm to take advantage of the other (Jakobsen, 2020).

Interdependence incentivises partners to build up more resources and strengthen the bargaining position in the relationship over time (Luo, 2007a). Given the availability of such incentives, firms can contemplate reducing its dependence over time (through

accumulating/developing own resources) in order to obtain more control in the relationship (Luo, 2005). Such instances can translate into perceptual differences in each other's dependencies and the competitive paradigm then overtakes the cooperative paradigm within the relationship. This fits into the narrative of RDT in that inter-firm relationships characterize a situation in which resource needs and dependence prompts firms to exert coercion over firms that possess such scarce resources (Pfeffer and Salancik, 1978, Muthusamy and White, 2005). Alternatively, overlap of activities and responsibilities between partners as a result of interdependence cause partners to share valuable resources and intensive knowledge routines (Park and Ungson, 2001, Schilke and Lumineau, 2018, Vlachos and Dyra, 2020). Such situations may cause misunderstandings with regards to the partner's actual intents as well as contributions that they hope to make to the alliance; these may also often escalate into tensions (Schilke and Lumineau, 2018). Nevertheless, interdependence between coopetitors have the potential to generate uncertainties due to one firm's strategy largely being reliant on the actions of the other firm (Chiambaretto and Fernandez, 2016) and any unanticipated changes in their environment having the potential to cause disturbances. These uncertainties consequently transpire as tensions such as opportunism (Tidström, 2014, Fredrich et al., 2019). Although both the interdependent parties can show opportunistic behaviours, we limit this investigation to only the exchange partner's side of opportunism. Accordingly, we hypothesise;

H3: Interdependence has a positive effect on partner's opportunism

#### **4.3.4 Interdependence as a mediator**

Both the RDT and TCA indicate that the extent to which firms are dependent on each other influence the nature as well as outcomes of the relationships (Pfeffer and Salancik, 1978, Williamson, 1985, Gaur et al., 2011). Firms in alliances often experience 'lock-in' situations as they seldom hold control over all activities and rather rely on the partners to derive value using each other's share of expertise (Gaur et al., 2011). TCA studies attribute

the lock-in effect between partners to possible asset specificity as well as underlying transactions in their relationship (Lui and Ngo, 2005). This lock-in nevertheless refers to dependence between firms (Narasimhan et al., 2009). Similarly, interactions between coopetitors tend to include economic transactions, asset specificity, and activity undertaking that require them to work together to fulfil their business goals. This can also translate into plausible interdependencies (Luo, 2007a, Peng and Bourne, 2009, Peng et al., 2018). However, a partner with appropriation-interests may utilize the opportunity of mutuality/dependencies and exploit ways to misappropriate the other partner's resources or interests (Gnyawali and Charleton, 2018). This is likely because the strategic choices that firms make – such as engaging in relationships to develop dependencies and to benefit opportunistically from it, are a result of firms' inherent values and cognitions (Finkelstein and Hambrick, 1996, Gaur et al., 2011) based on the surrounding environment. Therefore, when the environment surrounding the transactions involve complexities, resource uncertainties, opportunities, and dependencies as is the case with coopetition (Gnyawali and Charleton, 2018), an interdependent partner that is self-interested may exploit the opportunities to benefit at the personal-level (Raza-Ullah et al., 2014, Gnyawali and Charleton, 2018). Accordingly, we hypothesise;

H4: Interdependence positively mediates the effect of coopetition on opportunism

#### **4.3.5 Formalization as a moderator**

The importance of formalization has been debated as a key structural property in interfirm relationships (Child, 1972, Murray and Kotabe, 2005). Formalization refers to rules, policies, and procedures that govern relationships. It spells out in detail the tasks, activities, operating procedures, and schedules for the partners in relationships (Murray and Kotabe, 2005, Schmoltzi and Wallenburg, 2012). The importance attached to formalization is attributed to its ability to capture the extent to which firms rely on rules and regulations to manage the behaviours and expectations in a given alliance (Paswan et al., 2017). Although

general contractual arrangements have an overarching structural influence, formalization can influence day-to-day interactions between partners as it can align partners' interests, increase visibility of behaviours and processes, and establish agreement-based procedures and operational activities (Schmoltzi and Wallenburg, 2012). As a result, a positive confluence is likely to develop between partners since their operational activities become closely aligned (Thorgren and Wincent, 2011). Consequently, research suggests formalization to be crucial for strategic alliances (Alvarez and Barney, 2001, Walter et al., 2015). However, another stream of literature suggests that formalization may not necessarily be a positive for partners as it can consume considerable resources and tends to result in agreements that are often incomplete, and importantly, not fully enforceable (Williamson, 1985, Dickson et al., 2006, Paswan et al., 2017). Therefore, formalization is argued to instead trigger frictions between partners (Paswan et al., 2017).

A key application of RDT is to manage and strengthen interdependencies between partners (He et al., 2020). RDT adds that when the building of bonds between partners is attained through the pooling of activities and resources under the purview of a reliable mechanism, it will lead to strengthened interdependencies (Pfeffer and Nowak, 1976). Formalization could be regarded as a reliable mechanism because with its codified and explicit routines it can operate as a source for the creation and the use of knowledge and resources for partner firms (Kern, 2006, Pertusa-Ortega et al., 2010). A lack of formalized structure may lead to the partners' routines being disorganized, ineffective, and sporadic (Okhuysen and Eisenhardt, 2002). Such situations may cause more harm to partners' interdependence. Extant literature argues that the dynamic interactions between cooperation and competition in cooperative relationships makes partners' interdependence a complex task (Bengtsson and Kock, 2000, Gnyawali and Charleton, 2018). Challenges associated to it can be managed with the implementation of formalization routines (Kern, 2006, Peng and Bourne, 2009). Formalization could help in shaping up the structure as well

as the scope of interactions between firms (Kern, 2006, Pertusa-Ortega et al., 2010). It can also facilitate transfer of codified information through a set of rules which are meant to ease the exchanges between partners (Cordón-Pozo et al., 2006). Furthermore, it assists to reduce ambiguity between partners' interactions in complex relationships and thus reduces distance between the partners (Pertusa-Ortega et al., 2010). These conditions can enable a cordial environment between partners and assist in the development of interdependencies. As a result of improved transparency, exchange facilitation, and predictability between the partners (Murray and Kotabe, 2005), the assessment of the other partner could be positive (Thorgren and Wincent, 2011) thereby leading to stronger interdependence. Accordingly, we hypothesize;

H5: Formalization positively strengthens the effect between coo-competition and interdependence

TCT suggests the importance of employing appropriate interaction mechanisms for firms to control possible opportunism (Williamson, 1985). It adds that established mechanisms can effectively control the opportunism hazards by explicitly specifying the roles of partners in operating environments (Williamson, 1985, Cao and Lumineau, 2015). However, it also cautions that the effectiveness of such mechanisms are constrained under the conditions of bounded rationality (Cao and Lumineau, 2015). Firms tend to get suspicious when collaborating with competitors due to the resource and market similarities which can increase their vulnerability to opportunistic tactics (Bouncken and Fredrich, 2016, Bouncken et al., 2020b). This would require the partners to monitor the relationship to negate potential opportunism (Bouncken et al., 2020b). A formalized mechanism could help partners avoid overlaps, operational redundancies, role conflicts, and allow for information sharing (Schmoltzi and Wallenburg, 2012). Therefore, coo-competitors are likely to formalize their roles, tasks, procedures, and responsibilities (Bouncken et al., 2016a) so

as to reduce risks associated with opportunism. However, other research suggests that formalization of roles and activities within relationships might not necessarily help to control opportunism but it may rather enhance the opportunism (Walter et al., 2015). Keeping details explicit will likely effect a partner's commitment negatively (Jap and Ganesan, 2000) as a rule-bound formalization that monitors business relationships may cause misunderstanding among partners (Paswan et al., 2017). Enhanced monitoring of behaviour guided by the formalization can result in 'reactance types of effects' in that the attitude of a partner appears defensive in nature but entails certain opportunism (Heide et al., 2007). For instance, a relationship that insists upon work schedules with tight deadlines and rules will appear to a partner as an intruding form of control and thus the partner may ignore the request sometimes. Such actions can often be perceived as a form of opportunism by the focal firm (Paswan et al., 2017). Besides, formalization may create mechanistic form of management practices that allow little room for adaptation. When changes take place around firms' transactional environment, a partner firm's insistence on the modifications to the original agreement may be interpreted to be counterproductive (Wathne and Heide, 2000). Therefore, it may be likely that formalized rules and policies to manage relationships may cause an insidious problem of opportunism (Paswan et al., 2017). Given that cooptitors tend to focus on value-appropriation benefits, the rules-based mechanism that allows access to each other's activities, processes, and knowledge may add more power for a partner to behave opportunistically. Accordingly, we hypothesize;

H6: Formalization positively moderates the negative effect of cooptition on opportunism

## 4.4 Methodology

### 4.4.1 Industry context and data collection

Coopetition is particularly critical for firms that operate in high-tech and knowledge intensive industries (Gnyawali and Park, 2011, Ritala and Hurmelinna-Laukkanen, 2013, Bouncken et al., 2018b, Jakobsen, 2020). These knowledge and hi-technology industries are highly important for economies all over the world, and particularly in America and Europe, given the significant contributions they make. The EU and the USA's combined share of world's high-tech product exports stands close to 30 percent; besides, they occupy the first two positions in the world when it comes to the share of knowledge-intensive commercial exports (NSF, 2018). With this in consideration, the target sample of this study consists of firms from countries including the North America (USA and Canada), and the advanced north European countries of UK, Ireland, and Netherlands. The specific industries include information and communication technologies (ICT), R&D, pharmaceuticals, consumer electronics, machinery, engineering, and automotive/automobile. These sectors are distinguished as knowledge intensive as well as Hi-tech by the Eurostat (Eurostat, 2018).

The constructs identified for this study include both relational-level as well as firm-level variables that represent the strategic aspects of a relationship between two rival firms. The unit of analysis of this study is the dyadic relationship (Chen and Paulraj, 2004). A structured web-based questionnaire was utilized for data collection. Responses to the survey questionnaires were sought from managers who were knowledgeable about the firm as well as its relationship with a competitor partner. To make sure that the survey is responded to by only the envisioned group of respondents, we placed a screening question right at the beginning of the web-survey - "*Does your firm cooperate and compete at the same time with a competitor firm or a firm that has similar product/service offering and similar target market?*" (to represent simultaneous cooperation and competition within the

relationship). A similar query was utilised by Ritala and Sainio (2014) and Yu (2019) to recognise respondents within cooperative relationships. Respondents that answered 'Yes' to this screening query were asked to continue answering the remainder of survey keeping a horizontal rival partner in mind, whereas those that responded 'No' were not able to continue with the survey. We received 355 responses from a total of 1500 on-line surveys sent which results in a response rate of 23.67%. 42 responses were rejected due to the information being inadequate. This resulted in a 20.87% (313/1500) effective response rate. Nearly 71.6% of respondents held positions such as CEOs/COOs, alliance-directors, and top-level managers in their respective firms that completed the web-survey. All respondent firm sizes were medium to large scale in that 41.9% of firms have an employee size of 251-1000, while 24.3% of firms consists of over 1001 employees.

**Non-response bias:** Non-response bias was assessed by testing differences between the sample means of demographic variables such as employee size and company age. The responses were separated into two groups based on when they were received. The responses received during the early 3 weeks were categorized as group 1 while the responses that arrived late were categorized as group 2. Group comparison tests indicate no statistically (at 95% confidence level) significant differences. Thus, the results indicate little danger of non-response bias.

**Common method bias:** Common method bias was tested mainly due to utilizing a single respondent within each sample firm to collect the data. Therefore, specific tests were performed to preclude concerns with regards to common method bias. It was tested using a confirmatory factor analysis approach (Sea-Jin et al., 2010, Roldán Bravo et al., 2018). We ran two models – one with a single-factor and another with the factors presented in the theoretical framework. The model fit for the single factor model (Comparative fit index [CFI] = 0.545, Tucker-Lewis index [TLI] = 0.488, Incremental fit index [IFI] = 0.547, Root mean square error of approximation [RMSEA] = 0.181, normed  $\chi^2$  [NC] = 11.204) was



significantly worse in comparison to our measurement model (CFI = 0.947, TLI = 0.934, IFI = 0.948, RMSEA = 0.065, normed  $\chi^2$  [NC] = 2.315), suggesting little danger of common method bias.

#### **4.4.2 Measures**

A 7-point Likert scale with endpoints of “strongly disagree” to “strongly agree” is utilised to measure the indicators of all constructs employed in the online-survey. These details are provided in the Appendix C. We operationalized the independent factor of “coopetition” through product method by multiplying the cooperation and competition constructs; this approach is consistent with previous coopetition studies (Luo et al., 2006, Bengtsson et al., 2016b, Bendig et al., 2018). The variable “cooperation” is operationalised by five items adapted from Cannon and Perreault (1999), while “competition” is measured by a four items scale adapted from Tsai (2002) and Zhang et al. (2010). The product method is interpreted to be ideal as it characterizes the simultaneity of both the constructs (i.e., simultaneous cooperation and competition) (Shukla, 2011, Chandrasekaran et al., 2012).

Interdependence is operationalized following the guidelines of Vijayasathy (2010). The procedure includes adding both the Focal dependence (FD) and Partner dependence (PD) and then subtracting from it the absolute value of the difference between the focal and partner dependencies: “Interdependence = (FD+PD) – Absolute(FD–PD)”. This procedure helps to capture the true magnitude of interdependence, besides adjusting the skewed dependencies of both the firms. Following the dependence literature (Pfeffer and Salancik, 1978, Buchanan, 1992, Xia, 2011), ‘FD’ is defined as the extent to which the focal firm is dependent on the partner’s critical resources for which there are few alternatives available. Similarly, ‘PD’ is defined as the extent to which the partner firm is dependent on the focal firm’s critical resources, the availability of alternatives for which are few. The “FD” and “PD” are operationalized on a three items scale each and are adapted from Lusch and Brown (1996). Alternatively, the “additive approach” (i.e., the total or the

magnitude of interdependence = focal firm's dependence + partner firm's dependence) is also used to test for the variations in output results with that of previously operationalised method. Additive approach is a widely utilised approach (Gundlach and Cadotte, 1994, Kumar et al., 1995), and is said to contain the least information loss in aggregating two individual constructs into a single latent construct (Lubatkin et al., 2006, Cao et al., 2010). Our results were consistent across the two methods of operationalization of interdependence construct.

Four items scale from Rokkan et al. (2003) and Liu et al. (2009) is adapted to operationalise '*Partner's opportunism*'. Three items scale from Buvik and Reve (2001) and Murray and Kotabe (2005) is adapted to operationalise '*Formalization*'.

We control for *firm size* as well as *partner firm size* as the magnitude of a firm's operations and the extent of access it has to resources are contingent on the size of the firm (Dröge et al., 2003). We control for *relationship length* since firms may utilize the benefits gained in the extended relationship and use it to exert control over time (Afuah, 2000, Ho and Ganesan, 2013). *Common suppliers* between firms is included as a control as they may influence the firms decision on their relationship (Vachon and Klassen, 2006). *Firm age* (Years from inception) is also controlled as it can become a source of resource heterogeneity of slack resources as well as a work force that can develop sophisticated arrangements with partners (Niederkofler, 1991, Reuer et al., 2006). Finally, we controlled for firm-specific *R&D expenditure* as it can influence alliance outcomes (Bouncken et al., 2016a) and firms capacities (Bouncken et al., 2020b) which influence their behaviour in an alliance.

#### **4.4.3 Instrument development**

Content validity of the survey instrument is ensured by establishing it in extant literature. In addition, before data collection, we pre-tested the instrument with 19 experts (15

executives and 4 academics) to pursue their opinions on the structure, ambiguity, readability, and completeness of the instrument (Dillman, 2007). Following their opinions, minor changes were made to the instrument. The instrument was tested for normality and outliers by using the plots of residuals and statistics of skewness and kurtosis. The maximum absolute values of skewness and kurtosis were noticed to be within the limits of 2 and 7 (Curran et al., 1996). In addition, the plots of these tests did not show considerable deviations.

Construct validity and unidimensionality were established utilizing both the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). These results are presented in the Appendix C. While conducting EFA, most of the items loaded onto their respective constructs. The eigenvalues for the constructs were found to be above 1.0 while the percent of variation was 67.45%; and the factor loadings were also above 0.40 (Hair et al., 1998). The fit indices for the CFA model (CFI = 0.947, TLI = 0.934, IFI = 0.948, RMSEA = 0.065, and normed  $\chi^2$  [NC] = 2.315) suggest adequate fit (Kline, 2005). Mostly, these results imply that the proposed measurement model suits the data well.

Results determine the discriminant validity of the variables since the squared correlations between all combinations of latent variables is less than the average variance extracted (AVE) estimates of the respective variables (Fornell and Larcker, 1981). The correlations values are provided in Table 4.1 and the AVE values are shown in the Appendix C. Reliability of the constructs was established employing the internal consistency method via Cronbach's alpha (Nunnally, 1978). All variables have shown Cronbach's alpha value of greater than 0.70 (see Appendix C). Alternatively, composite reliability (CR) values showed that all variables had a CR value of greater than 0.70 (see Appendix C) (Bagozzi and Yi, 1988). Furthermore, AVE values for all variables were not less than 0.50. Overall, the results indicate that the theoretical constructs are reliable, valid and unidimensional. The instrument development process involves exclusion of several

indicators as they did not meet the psychometric requirements; the removed items are presented in the Appendix C.

Factors	Mean	SD	CO	CT	FD	PD	OP	FN
Cooperation (CO)	5.622	1.004	1					
Competition (CT)	5.528	1.036	0.643	1				
Focal Dependence (FD)	5.291	1.110	0.525	0.552	1			
Partner Dependence (FD)	5.402	1.085	0.516	0.540	0.692	1		
Opportunism (OP)	4.502	1.820	0.006	0.107	0.276	0.187	1	
Formalization (FN)	5.611	1.035	0.683	0.569	0.550	0.591	0.061	1

Table 4.1: Correlations

#### 4.5 Analysis and results

Regression results relating to hypotheses H1 through H3 are presented in Table 4.2. H1 suggests a positive relationship between cooperation and interdependence. The regression result does not provide support for the hypothesis in that cooperation’s effect on interdependence (Model 1) ( $\beta = -0.157, p < 0.01$ ) is found to be negative and rather significant. H2 posits a negative relationship between cooperation and opportunism while H3 proposes a positive relationship between interdependence and opportunism. The regression result of H2 does not provide support for the hypothesis in that cooperation’s effect on opportunism (Model 3) ( $\beta = 0.022, p > 0.05$ ) is found to be insignificant while the result of H3 offers support for the hypothesis in that the effect of interdependence on opportunism (Model 3) ( $\beta = 0.210, p < 0.0001$ ) is found to be positive and significant.

The prediction for the hypothesis H4 is that interdependence positively mediates between cooperation and opportunism. SPSS macro PROCESS designed by Hayes (2018) was utilized to test this hypothesis. The result does not find support for the hypothesis in that the mediation effect of interdependence ( $\beta = 0.174, p < 0.0001, 95\% \text{ CI } [0.079, 0.268]$ )

is found to be significant. However the indirect effect (Effect/interdependence = -0.039, 95% CI [-0.081, 0.033]), partially standardised indirect effect (Effect/interdependence = -0.021, 95% CI [-0.045, 0.018]), and fully standardised indirect effect (Effect/interdependence = -0.033, 95% CI [-0.084, 0.018]) were all found to be insignificant.

Moderation effects are performed following the guidelines of Dawson (2014). Both the independent variable of 'coopetition' and the moderator variable of 'formalization' are mean-centered to create interaction variable (Coopetition X Formalization) so as to perform the moderation effect of 'formalization' on the outcome variable of 'interdependence' and 'opportunism' for the hypotheses H5 and H6 respectively. Mean-centering is significant as it ensures "*that the (unstandardized) regression coefficients of the main effects can be interpreted directly in terms of the original variables*" (Dawson, 2014, p.12). Additionally, mean-centering in regression models also assists to reduce multicollinearity-specific concerns (Lee and Cavusgil, 2006, Dawson, 2014). Hypothesis H5 suggests formalization to positively moderate the relationship between coopetition and interdependence while H6 proposes formalization to positively moderate the relationship between coopetition and opportunism. The regression results of H5 provides support for the hypothesis in that formalization positively moderates the effect of coopetition on interdependence (Model 2) ( $\beta = 0.260$ ,  $p < 0.01$ ). The results of H6 find support for the hypothesis in that formalization positively moderates the effect of coopetition on opportunism (Model 4) ( $\beta = 0.237$ ,  $p < 0.05$ ). These results are presented in Table 4.2.

	Interdependence Model 1	Interdependence Model 2	Opportunism Model 3	Opportunism Model 4
<u>Control variables</u>				
Employee strength	0.033	-0.006	-0.008	0.006
Partner's employee strength	0.117	0.102	0.132	0.157*
Relationship length	0.088	0.081	0.063	0.078
Company Age	-0.088	-0.118*	-0.205**	-0.222***
Common suppliers	0.117*	0.052	0.020	0.028
R&D expenditure	0.051	0.011	-0.007	-0.008
<u>Predictor</u>				
Coopetition (CP)	-0.157**	0.194**	0.022	0.149
Interdependence (ID)			0.210***	
Formalization (FN)		0.468***		-0.048
CP * FN		0.260**		0.237*
<u>Model summary</u>				
R <sup>2</sup>	0.071	0.354	0.109	0.088
Model F-value	3.091**	17.140***	4.325***	3.034**

The regression coefficients are reported as beta values.

N=313

\* p<0.05

\*\* p<0.01

\*\*\* p<0.001

Table 4.2: Simple regression – direct and interaction effects

#### 4.5.1 Post-hoc analysis

Given that the study consists of both the mediation and moderation variables, it underlines the need to test for a likely moderated mediation effect. Therefore, we performed a post-hoc analysis utilizing all the variables included in our model. The moderated mediation was tested using the Hayes' index of moderated mediation (Hayes, 2015). A key feature of this test is that “evidence of statistically significant interaction between any variable in the model and a putative moderator is *not* a requirement of establishing moderation of a mechanism” (Hayes, 2015, p.3); and that “an indirect effect could be moderated even if one cannot substantiate moderation of one of the components of the indirect effect by an inferential test. By the same token, establishing that a component of an indirect effect is moderated does not necessarily establish that the indirect effect is” (Hayes, 2015, p.3). Accordingly, we performed the post-hoc on the potential moderated mediation effect between coopetition, formalization, interdependence, and opportunism. SPSS macro PROCESS was utilized to conduct this post-hoc analysis. All control variables as explained

in the measures section were included. The result suggests that the mediation effect of interdependence ( $\beta = 0.207$ ,  $p < 0.0001$ , 95% CI [0.094, 0.320]) is positive and significant when the moderation effect of formalization on the relationship between coopetition and interdependence ( $\beta = 0.110$ ,  $p < 0.001$ , 95% CI [0.043, 0.177]) is significant and simultaneously when formalization's moderation effect between coopetition and opportunism ( $\beta = 0.060$ ,  $p < 0.074$ , 95% CI [-0.006, 0.126]) is marginally significant. Overall, the indirect effect values at low, medium, and high levels are shown to be 0.036 (95% CI [-0.022, 0.113]), 0.059 (95% CI [0.005, 0.164]), and 0.081 (95% CI [0.014, 0.224]) respectively. The index value of moderated mediation was also found to be significant (index = 0.023, 95% CI [0.005, 0.079]).

#### **4.6 Discussion**

The study offers several contributions to both coopetition theory and practice. The first objective of the study is to investigate the effects between coopetition and interdependence, coopetition and opportunism, and interdependence and opportunism. As for the *effect of coopetition on interdependence*, our results contradict the views that posit coopetition to lead to partners' interdependence (Dagnino and Rocco, 2009, Peng et al., 2012, Gnyawali and Park, 2011). On the contrary, our results appear to endorse that coopetition can lead to negative interdependence mainly on account of possible competitive issues within relationships (Chou and Zolkiewski, 2018). Intrusion of unmonitored competitive issues within relationships can lead to conflicts and consequently cause distance between the partners (Yan et al., 2019). Rivals view themselves to be independent of each other (Chen, 2008, Raza-Ullah et al., 2014) and a prospective relationship between them may necessitate elements of not only exchanges between firms, but also, importantly, the use of appropriate mechanisms that can monitor and manage the dynamics associated to coopetition (Bouncken et al., 2016a). Lack of such mechanisms, supposedly, undermine the need to develop positive dependencies between partners (Lado et al., 1997, Luo, 2005, Chen, 2008,

Peng and Bourne, 2009). The necessity of an appropriate mechanism can be attributed to a belief that both the cooperative and competitive paradigms have limitations as they tend to neglect the inclusion of certain elements that can appropriately manage the simultaneity, thereby affecting the partners interdependencies differently (Padula and Dagnino, 2007). The need for an appropriate mechanism is also evident from our results pertaining to the *moderation effect of formalization on coopetition and interdependence* relationship. The dynamic interactions within coopetitive relationships could make partner interdependence complex (Bengtsson and Kock, 2000, Gnyawali and Charleton, 2018); such complexities can perhaps be better managed through appropriate formalization routines (Kern, 2006, Eriksson, 2008, Peng and Bourne, 2009, Paswan et al., 2017). The positive coefficient value of the interaction term, i.e., Coopetition X Formalization, explains that the effect between coopetition and interdependence becomes more positive as the strength of formalization increases. However, the precise nature of such an effect cannot be explained effectively based on only the coefficients values. To enable effective as well as easier interpretations, it is important to plot the results to explain them visually (Dawson, 2014). This further allows to explain the moderation effects of formalization at different levels such as low, medium, and higher levels of formalization. The results in this case suggest that only at higher levels of formalization does coopetition will have a significant positive effect on firms interdependence. Accordingly, our results explicitly forward that formalization positively strengthens the relationship between coopetition and interdependence while the direct effect is negative. This finding clears some confusion when it comes to whether the prospective link between coopetition and interdependence is positive or negative (Padula and Dagnino, 2007, Dagnino and Rocco, 2009) in that it indicates that the presence of appropriate mechanisms (in our case, formalization) could lead to positive interdependence between coopetitive partners.



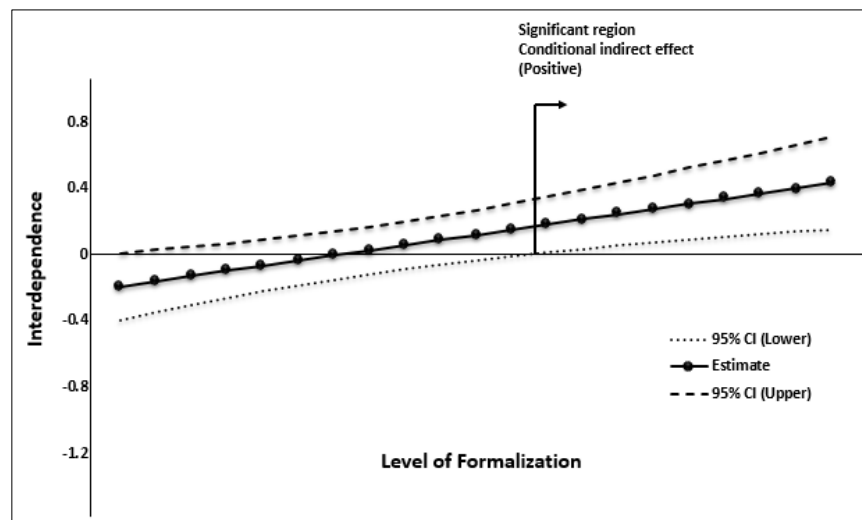


Figure 4.2: Conditional indirect effect of cooperation on interdependence at different levels of formalization

As for the *effect of cooperation on partner's opportunism*, the results contradict the views that caution higher risk of opportunism in strategic alliances/cooperation as a result of simultaneity of cooperation and competition (Pangarkar and Klein, 2001, Das, 2006, Bouncken et al., 2015, Bouncken and Fredrich, 2016). Alternatively, the results also disregard the views that posit simultaneous cooperation and competition can lead to the development of firms' social embeddedness and consequent trust, which may assist to reduce potential opportunism (Das and Teng, 2000a, Fernandez et al., 2014). The insignificant effect of cooperation on opportunism can be linked to the lack of influential elements (particularly from TCA and RDT perspectives) that can either generate or reduce perceived threats to the interests of the partners. For instance, a focal firm that is chiefly focused on committing more resources to develop a relationship through resource sharing with a partner can become susceptible to the partner's opportunism when the variables in the transactional environment enforce changes (Niesten and Stefan, 2019). Alternatively, reducing the frequency or commitment to share resources regularly by the partners lessens the possibility of resource/knowledge spillovers (Capaldo and Messeni Petruzzelli, 2011, Yami and Nemeh, 2014, Niesten and Stefan, 2019). Lack of spillovers would translate into diminished possibilities for a partner to gain opportunistically. Therefore, our results imply

that the direct effect between cooperation and opportunism is neither positive nor negative. Instead, it may be the influence of other variables that could trigger resources and/or transactions related environmental dynamics that affect opportunism differently. Such an assumption appears to be evident in our findings related to the *moderation effect of formalization's on cooperation and opportunism* relationship. Extant research posits that relationships could likely experience tensions under high-levels of formalization of rules, policies, and tasks as such arrangements can trigger opportunistic behaviour (Walter et al., 2015). The rules-based routines that strictly monitor ongoing relationships may lead the exchange partner to perceive that they are being controlled, thereby paving way for misunderstandings and plausible tensions between partners (Paswan et al., 2017). Besides endorsing these views, our finding puts forward formalization to positively moderate the relationship between cooperation and opportunism. The plot based on the confidence bands presented in Figure 4.3 further validate this conjecture. According to this conditional indirect effect plot, only at higher-levels of formalization can cooperation have a significant positive effect on opportunism. Overall, our findings add more clarity to studies that debate the significance of formalization in cooperative relationships (Eriksson, 2008, Peng and Bourne, 2009, Strese et al., 2016b, Le Roy and Czakon, 2016). The results suggest that as much as formalization could strengthen the effect between cooperation and interdependence, it could alternatively also enhance the effect of cooperation on opportunism.

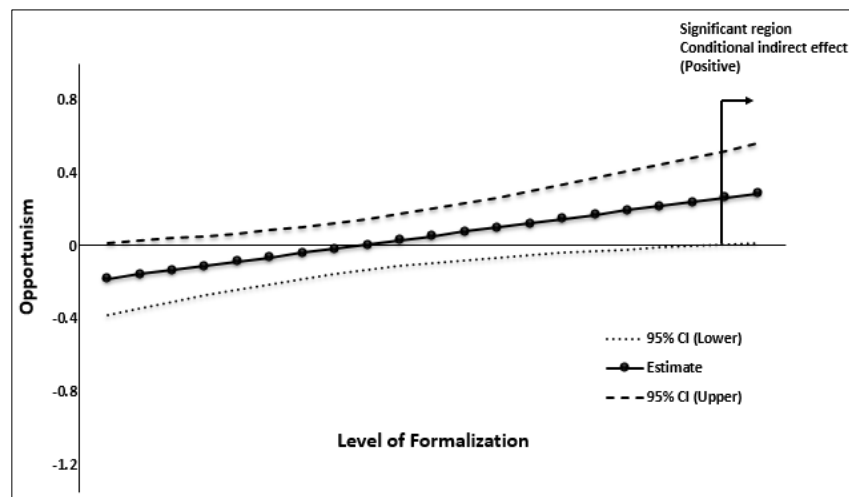


Figure 4.3: Conditional indirect effect of cooperation on opportunism at different levels of formalization

When it comes to the *effect of interdependence on opportunism*, our findings validate previous views that dependencies constitute tensions in cooperative relationships (Tidström, 2014) and forwards partner's opportunism as the specific type of tension transpired. This finding also matches with the views contextualised in generic alliances (i.e., non-cooperation) wherein Frazier (1983) and Heide and John (1988) forward that the higher the interdependence, the higher the risk of mutual negative consequences of opportunistic behaviour.

Another objective of the study was to investigate the *mediating role of interdependence on the relationship between cooperation and opportunism*. The insignificant mediation effect contradicts the views that posit potential associations between strategic alliance/cooperation, interdependence and opportunism (Gaur et al., 2011, Raza-Ullah et al., 2014, Gnyawali and Charleton, 2018). Both interdependence and opportunism are often influenced by variables that can accommodate the prospects for alliance partners to become interdependent as well as to act opportunistically. For instance, a need for resource sharing, co-development, and integration of activities under the purview of a reliable rule-based mechanism can generate motivation for firms to work together closely and to become interdependent (Peng and Bourne, 2009, Pertusa-Ortega et al.,

2010). Similarly, an operating environment that involves resource sharing between the interdependent partners can be mis-utilized for self-interests when there is a lack of formal rule-based mechanism to underpin the interactions in a given relationship. However, although such a mechanism may bring positive benefits, the stricter/high-level transactional policies/rules that govern a relationship can trigger perceived opportunistic threats between the interdependent partners due to possible inflexibilities associated to the rules (Wathne and Heide, 2000) as well as the perception of being controlled (Paswan et al., 2017). These can threaten partners' interests (Yami and Nemeah, 2014, Bouncken et al., 2016a). Therefore, the missing link between coopetition, interdependence and opportunism perhaps is attributable to such influencing variables. Accordingly, it is plausible to presume that the absence of regulated transactions or a reliable transactional mechanism within a relational environment may not only undermine the need for firms to work together to become interdependent, but it might simultaneously also fail to have any effect on opportunistic behaviours. These assumptions seem to corroborate with the *results of our post-hoc analysis*. Interdependence between firms tend to experience complexities due to overlapping interests, roles, responsibilities, as well as adjustments that are needed to be made as per the changes in their relational environment (Gulati and Singh, 1998). Occurrence of these changes likely affect the mutuality between the dependent partners in unforeseen ways, thereby causing behavioural uncertainties (Krishnan et al., 2006, Schilke and Lumineau, 2018). A rule-based formalized mechanism with provisions for rules, activities, and responsibilities may be adapted to manage both the dynamism in the relationship as well as interdependencies (Schilke and Lumineau, 2018). However, as much as formalization could complement coopetition to benefit partners interdependence, it may alternatively affect partner's opportunism differently (Bouncken et al., 2016a, Jakobsen, 2020). This can be attributed to the nature of formalization to keep the contractual details explicit, constant monitoring of the partnership with rules (Jap and Ganesan, 2000, Wathne

and Heide, 2000, Paswan et al., 2017), and establish guidelines that enables access to each other's resources and information. These could arguably lead to the risks associated to opportunism within cooperative relationships. Accordingly, on the one hand increased formalization can assist to develop stable routines and processes between alliance partners (Patel, 2011) and strengthen interdependence (Murray and Kotabe, 2005, Bouncken et al., 2016a). On the other hand, the rule-based, codified, procedural regulations can be perceived as controlled mechanisms meant to draw desirable behaviours between the dependent partners and therefore trigger tensions, such as opportunism, in the relationship (Gaur et al., 2011, Walter et al., 2015). Our results support these beliefs and forward that interdependence serves as a mediator between cooperation and opportunism when formalization positively moderates the relationship between cooperation and interdependence as well as cooperation and opportunism. This finding is a significant contribution given that extant cooperation literature largely views the relationships between 'cooperation and interdependence', 'interdependence and opportunism', 'cooperation and opportunism', as well as the effects of formalization as independent areas of investigation and do not offer a clear understanding on the true magnitude of their inherent associations. Our findings offer clarity in that they indicate that formalization at medium to high levels (Low = 0.036, 95% CI [-0.022, 0.113]; Medium = 0.059, 95% CI [0.005, 0.164]; High = 0.081, 95% CI [0.014, 0.224]) is significant for competitors as it helps to strengthen interdependencies, but could concurrently increase the risk of opportunism.

**Managerial relevance:** The findings of the study offer important implications for managers of firms that are involved in cooperative relationships. *First*, our results enhance managers' comprehensions over the use and effectiveness of formalization in cooperative relationships. It is important for managers of firms that pursue cooperation to maintain strong formalization routines should a need occur to strengthen the interdependencies with their competitor partners. This result could also be relevant to the managers of firms that

engage in other forms of interfirm relationship. *Secondly*, our results caution managers on the risks of possible opportunism as a result of utilizing strong formalization routines. Introducing codified and strongly regulated rules into relationships tends to create distrust, misunderstandings, and intransigence between partners which may motivate one firm to take advantage of the other for short-term benefits before exiting the partnership. Therefore, managers are advised against over-formalizing their relationships with competitor partners. *Third*, although interdependencies are argued to bring benefits for firms, our results specifically suggest that strong interdependence between competitors should not be misunderstood to be a reason to celebrate but a reason to be vigilant as it can lead to risks associated to partner's opportunism. *Fourth*, results caution managers that engaging in cooperation to develop interdependence between partners using formalization routines will alternatively prompt opportunism. As suggested by scholars (Walter et al., 2015, Tidström et al., 2018), perhaps managers need to consider employing a combination of different mechanisms instead of formalization alone to strengthen interdependence while controlling opportunism risks.

#### **4.7 Conclusion, limitations, and future direction**

Our study suggests that cooperation will not directly lead to partner's opportunism. Alternatively, it forwards that cooperation leads to partner's opportunism through the intervening variable of interdependence when formalization moderates the cooperation. We integrated RDT and TCT theories with cooperation literature to outline a theoretical rationale for the plausible direct as well as indirect linkages between cooperation, interdependence, and opportunism. To this end, we applied the use of formalization as an influential mechanism to suggest how it could positively moderate the varying effects between the cooperation and interdependence as well as cooperation and opportunism. Overall, our study offers nuanced arguments for the mediation as well as interaction effects between cooperation, formalization, interdependence, and opportunism.

Our study comes with several limitations. *First*, this study is developed by collecting data from one firm of each cooperation relationship which represents only one side of the dyad; this is a conventional conundrum in relationships (Robson et al., 2019), and may in part impact the results (Cao and Zhang, 2011). *Second*, we utilized existing scales to measure the variables, which may be a limitation. *Third*, the sample used for the study represents varied industries and a large geography which may limit the generalisation of results to specific industry/geography. *Fourth*, we have studied only formalization's effects on cooperative tensions. However, future studies may study the effects of other contractual and relational mechanisms on various cooperative tensions. *Fifth*, investigating the opportunism of the focal firm may add another useful perspective while looking at tensions in cooperation research.

## **Chapter 5: Paper III – Performance effects of organizational resources and capabilities within horizontal cooperative relationships**

Seepana, C., Huq, F.A., Paulraj, A. (in press). Performance effects of entrepreneurial orientation, strategic intent and absorptive capacity within cooperative relationships. *International journal of Operations and Production Management*. (ABS 4)

An earlier version of this paper was submitted and presented at the *Production Operations Management Society* (POMS) conference in Brighton, September 2019.



## 5.1 Abstract

**Purpose:** While the significance of organizational resources and capabilities is widely discussed, little is known about their interrelationships as well as benefits for firms that are involved in coopetitive relationships. Against this backdrop, we aspire to investigate the performance effects of entrepreneurial orientation, strategic intent, and potential absorptive capacity as well as their complementarity effects on operational and innovation performance of firms involved in horizontal coopetitive relationships.

**Design/methodology/approach:** Drawing upon the resource-based-view and the dynamic capabilities theory, we forward numerous hypotheses between the constructs of interest. We test the hypotheses using survey data collected from 313 firms that are engaged in horizontal coopetitive relationships.

**Findings:** Our results clearly suggest that entrepreneurial orientation, strategic intent, and potential absorptive capacity could impact innovation and operational performance outcomes independently. Additionally, we also find strategic intent and potential absorptive capacity to have differential moderating effects on the relationships between entrepreneurial orientation and the performance outcomes.

**Originality:** Our findings suggest that although strategic intent and potential absorptive capacity could lead to performance benefits independently, when it comes to coopetitive relationships, the use of both these capabilities may not substantially increase the positive impact of entrepreneurial orientation on performance outcomes. Specifically, given that these capabilities could intensify competitiveness as well as hostility between partners, they seem to affect the firm's performance differently.

## 5.2 Introduction

A wide-spectrum of literature has discussed the significance of cooperation, i.e., collaboration between competitors, in improving a firm's competitive advantage (Li et al., 2011, Wilhelm, 2011, Gnyawali and Park, 2011, Ritala and Hurmelinna-Laukkanen, 2013,

Hoffmann et al., 2018, Wilhelm and Sydow, 2018, Raza-Ullah and Kostis, 2019). Extant literature has also simultaneously discussed the significance of organizational resources and capabilities for coopetitors in realising their performance objectives (Ritala and Hurmelinna-Laukkanen, 2013, Pathak et al., 2014, Wilhelm and Sydow, 2018). Given that organizational resources and capabilities tend to interact with each other in a firm's pursuit to attain competitive advantage, it is especially important to investigate the underlying linkages between different, yet parsimonious, set of organizational resources and capabilities. But recent studies highlight not only the lack of attention to the interactions among capabilities, but also the need for investigating interactive capabilities in relationships (Raddats et al., 2017, Sodhi and Tang, 2021). Against this backdrop, in this study, we investigate the direct as well as contingent performance impacts of organizational resource – entrepreneurial orientation (EO), and capabilities – strategic intent (SI) and potential absorptive capacity (PAC) – within horizontal coopetitive relationships.

We envision EO as an intangible resource that represents a firm's orientation towards risk taking, proactive, and aggressive behavior (Covin et al., 2006, Atuahene-Gima and Ko, 2001, Kickul et al., 2011). Extant literature forwards EO as an important as well as integral part of coopetitive relationships (Li et al., 2011, Jiang et al., 2016, Bouncken et al., 2015, Li et al., 2017). Operations management (OM) studies also posit EO to assist firms' supply chains to respond effectively to market opportunities (Handfield et al., 2009) as well as to improve operational responsiveness (Sahi et al., 2019). However, extant literature does not seem to offer sufficient insights into how EO could result in superior performance outcomes for firms that are involved in coopetitive relationships. It is important to study this context as coopetitors tend to possess higher-levels of EO (Li et al., 2011). Additionally, firms in coopetitive relationships tend to maintain relatively high levels of organizational capabilities such as PAC (Ritala and Hurmelinna-Laukkanen, 2013) and SI (Luo, 2007a, Yami et al., 2010). Though the influential role of firm-level

capabilities, in general, on the relationship between EO and outcomes is considered as highly certain (Covin et al., 2006, Engelen et al., 2014), there is no evidence on the level of performance outcomes that these specific capabilities can deliver either on their own, or by complementing EO.

As for the performance benefits of our variables of interest, there is ample theoretical support for the impact on innovation (both incremental and radical) and operational outcomes (quality, efficiencies, flexibility, etc.) (Covin et al., 2006, Luo, 2007a, Ritala and Hurmelinna-Laukkanen, 2009). Innovation and operational performance are of importance to coopetitors as they are not only often discussed as the potential performance outcomes in coopetition, but also linked to enhancing coopetitors' competitive advantage (Luo, 2007a, Gnyawali and Park, 2011, Gnyawali and Charleton, 2018, Sabri et al., 2020). Both OM (White, 1996, Terjesen et al., 2011, Sahi et al., 2019), and strategic management research (Lahiri and Narayanan, 2013, Wang and Rajagopalan, 2015, Hoffmann et al., 2018) emphasize the importance of these performance measures for firms involved in coopetitive relationships. Against this backdrop, in this study, we aspire to investigate the effects of EO, SI, and PAC on innovation and operational performance outcomes of firms that engage in horizontal coopetition. Additionally, we also investigate the moderating effects of PAC and SI on the relationship between EO and performance outcomes.

The study makes several important contributions to literature. *First*, to the best of our knowledge, our study is the first to investigate the effects of a firm's EO and SI on the firm's innovation and operational performance within the context of horizontal coopetitive relationships. Several studies posit a potential link between EO and performance in terms of sales growth and costs (Covin et al., 2006) as well as quality, flexibility, and efficiencies (Handfield et al., 2009, Chavez et al., 2017). Similarly, while there have been deliberations over the link between SI and performance (Luo, 2007a, Lawson and Potter, 2012), little

theoretical and empirical evidence has been documented. Even though studies such as Ritala and Hurmelinna-Laukkanen (2013) suggest a link between PAC and innovation, it is unknown whether such performance prevails when PAC interacts with other equally important resources and capabilities (in our case, EO and SI) that firms tend to utilise in their effort to achieve superior performance benefits. Accordingly, our study contributes to extant literature in that it validates the positive performance effects of all three firm-level characteristics, i.e., EO, SI, and PAC. These performance effects represent the benefits that a firm gains from engaging in a horizontal cooperative relationship. More importantly, our study adheres to the call for researchers to focus specifically on the EO-performance relationship within competitive contexts (Sahi et al., 2019).

*Second*, the findings pertaining to the moderating effect of both PAC and SI contribute to the research that seeks to explore (1) firm-level capabilities that could assist competitors to be successful (Bouncken et al., 2015, Bouncken and Fredrich, 2016) and (2) the use of interactive capabilities in relationships (Covin et al., 2006, Raddats et al., 2017). The potential linkages between our variables of interest are theoretically supported by the dynamic capabilities view which purports that resources (in our case, EO) could get reconfigured by the use of capabilities (in our case, SI and PAC). Additionally, the moderating effect of firm-level capabilities on the relationship between EO and outcomes is considered to be highly certain (Covin et al., 2006, Engelen et al., 2014). But our results clearly suggest that this conjecture need not be true when it comes to firms involved in horizontal cooperative relationships. In fact, our results pertaining to the moderating effect of SI and PAC seem to be counterintuitive to current belief and suggest that there might be an “icarus paradox” at play. Specifically, when it comes to the combined effects of EO, SI, and PAC, having all three might indicate “too much of a good thing” and end up being detrimental to firms involved in competitive relationships.

*Finally*, and more importantly, our study adds to OM calls for cross-disciplinary research between OM and entrepreneurship (Kickul et al., 2011, Sahi et al., 2019) as well as OM and strategic management concepts (Hitt, 2011, Weele and Raaij, 2014, Sodhi and Tang, 2021). Specifically, we combine EO (entrepreneurship literature), SI and PAC (strategic management concepts) with innovation and operational performance. Besides, the contributions also add to OM studies that seek to explore inherent organizational capabilities of coopetitors (Wilhelm and Sydow, 2018), and their interaction effects (Li et al., 2011).

### **5.3 Theoretical background**

This research study investigates underlying complementary association between EO as a resource and SI as well as PAC as capabilities and further explains how their complementarity leads to performance outcomes that offer coopetitors with competitive advantage. A key proponent of dynamic capabilities view is that it could revise and redeploy firms resources to create competitive advantage for the firms that operate under competitive environments (Helfat et al., 2007). However, extant literature concerning the dynamic capabilities also caution that dynamic capabilities do not create a product or service on their own (Teece et al., 1997, Helfat and Peteraf, 2003); instead, they become influential when the firms possess useful resources which could complement the capabilities to create outcomes of competitive advantage (Helfat and Peteraf, 2003, Zollo and Winter, 2002). Thus, they highlight the need for necessary resources so as to complement the capabilities to generate benefits for the firms. This line of thought clearly highlight an underlying potential complementarity between dynamic capabilities and RBV theories in that the dynamic capabilities address capabilities part of their complementarity whereas RBV addresses the resources. Alternatively, the tenets of both the RBV and dynamic capabilities suggest that firms can possibly attain competitive advantage by being able to possess valuable, rare, inimitable, and non-substitutable resources (VRIN) (Barney,

1991, Teece et al., 1997). As much as VRIN resources are beneficial, these resources need to have continuously upgraded so as to keep the resources distinctive from the competitors (Eisenhardt and Martin, 2000) and to attain long-term competitive advantage.

Scholars consistently argue that dynamic capabilities can ensure to keep the resources distinctive by constantly revising them (Eisenhardt and Martin, 2000, Zahra and George, 2002). When it comes to interfirm relationships, firms particularly make use of the learning opportunities that the relationships could offer to partners and utilize such opportunities to enhance their capabilities as well as strengthen their abilities for resource reconfigurations and redeployment (Dyer and Kale, 2007). This ability is attributed to the fact that a firm's resources and capabilities tend to better fit with the resources and capabilities of its partner in relationships (Dyer et al., 2018). As a result, there will be opportunities for a better complementarity between partners resource and capability combinations which likely lead to enhanced value generation for the firms (Dyer et al., 2018). In addition, these interfirm relationships likely to facilitate capabilities as well as resource flows between partners so as to enable them to leverage on the jointly created value (Dyer and Singh, 1998). In other words, it allows partners to create their own additional value by juxtaposing their proportion of the joint value with their own set of internal capabilities (Gnyawali and Charleton, 2018). Accordingly, both the dynamic capabilities and RBV theories emphasize on the significance of resource and capabilities combinations in order generate competitive advantage. Consistent with these proponents, this paper grounds the arguments associated to EO as coopetitors' key resource and SI and PAC as coopetitors' key capabilities and how their complementarity could lead to innovation and operational performance benefits.

### **5.3.1 Entrepreneurial orientation**

Most of the firms, no matter whether they engage in coopetition or not, involve in implementing EO (Wales et al., 2011). When it comes to coopetition, extant literature

indicates high levels of EO to be an integral part of coopetitors. For instance, this is evident in the widely-cited successful coopetitive relationship between ‘Sony and Samsung’ (Ritala and Hurmelinna-Laukkanen, 2009, Gnyawali and Park, 2011). The common characteristic among Sony and Samsung is their ability to maintain high levels of EO (Lumpkin and Dess (1996), Ireland et al. (2001); (Lee and Slater, 2007, Paek and Lee, 2018). The rationale for firms to choose partner firms with high EO is linked to their propensity for proactiveness, aggressiveness, innovativeness, risk-taking, and autonomy to cope with the changing environment (Covin and Slevin, 1991, Lumpkin and Dess, 1996) as well as to improve their performance (Bouncken et al., 2016b).

EO refers to the set of practices that firms use to identify new opportunities (Dess and Lumpkin, 2005). It is widely addressed using three characteristics – innovativeness, risk-taking, and proactiveness (Miller, 1983, Covin and Slevin, 1989). Subsequently, two additional characteristics – aggressiveness and autonomy – were further emphasized to characterize EO (Lumpkin and Dess, 1996). Nevertheless, an aggregate measure of three characteristics that comprise either ‘innovation, aggressiveness, and risk taking’ (Miller, 1983, Li et al., 2017, Shu et al., 2014) or ‘aggressiveness, risk-taking, and proactiveness’ (Atuahene-Gima and Ko, 2001) have consistently been utilized in extant literature. RBV suggests that EO is an intangible resource as it is embedded in organizational routines and distributed across an organization and its partners (Hughes and Morgan, 2007, Lisboa et al., 2016, Li et al., 2017). Entrepreneurial firms tend to maintain dissimilar complementary resources and consistently aspire to access such resources of other entrepreneurial firms (Teng, 2007) so as to generate novel outcomes. The EO’s aggressive and risk-taking nature specifically assists the firm’s ability to access necessary resources from their alliance partners (Li et al., 2017, Teng, 2007). In other words, highly entrepreneurial firms are in constant search for new information and keen to engage in relationships to tap entrepreneurial knowledge and utilize it to improve their competencies and performance

(Sumo et al., 2016, Chen et al., 2020). These entrepreneurial knowledge exchanges assist them to leverage on operational competencies (Handfield et al., 2009, Kickul et al., 2011) which can transpire in improved efficiencies, quality, and flexibility (Handfield et al., 2009). Additionally, these firms are willing to partner with competitors to generate conducive resource combinations and better performance outcomes (Li et al., 2011, Jiang et al., 2016, Ojha et al., 2016). This is consistent with the tenets of RBV that resource combinations among the entrepreneurial firms potentially lead to new combinations of products, markets, or processes through leveraging existing as well as externally obtained resources (Greene et al., 1999, Teng, 2007). Therefore, a firm's EO could lead to innovation and operational improvements as a result of its partnership with a competitor. Accordingly, the study forwards the following hypothesis.

H<sub>1</sub>: Entrepreneurial orientation has a positive effect on innovation and operational performance.

### **5.3.2 Strategic intent**

Strategic intent refers to a firm's ambition of winning marketplaces by creating synergies between the firm's supply chain relationships, resource stocks and capabilities, and strategic goals (Hamel and Prahalad, 1989, Han et al., 2018). It is one of the most important drivers for firms to invest outside their boundaries (Deng, 2004); this also includes striking up alliances with competitors (Hamel et al., 1989, Nielsen, 2010, Gnyawali and Charleton, 2018, Seepana et al., 2020) so as to enhance firm-level capabilities and maximize performance (Deng, 2004, Rui and Yip, 2008). Given that strategic intent operates as a dynamic capability (O'Reilly III and Tushman, 2008, O'Shannassy, 2016), it has the ability to improve performance and deliver competitive advantage for firms (Teece et al., 1997, Teece, 2014, Mariadoss et al., 2014). Strategic intent also offers the impetus for firms to set up ambitious performance targets as well as work towards fulfilling those aspirations.



It also serves as an anchor to channel resource allocation decisions, resource slacks and research and development (R&D) investments, directing alliance arrangements, and eventually shows direction for firms to realize their performance objectives (Mariadoss et al., 2014, Koza and Lewin, 2000).

A firm's strategic intent often translates into a learning intent in relationships which motivates the firm to remove barriers with partners (Lawson and Potter, 2012). Such a learning paves the way for alignments between the partners' intent as well as strategies and further advances into the development of valuable and innovative outcomes (Kim et al., 2015). Specifically, strategic intent provides the impetus for firms to pursue joint research and product development with the ambition to acquire necessary information, resources, and capabilities to support such developments for generating innovations (Ahuja, 2000, Sampson, 2007). Additionally, for strategic intent, ensuring competitiveness of the firm through increased efficiencies and customer satisfaction holds one of the central priorities (McAdam et al., 2014). This performance optimization particularly is paramount for the attainment of objectives such as winning new product markets and expanding the scope of capabilities (Rui and Yip, 2008). Alternatively, given that strategic intent is an integral part of a firm's operational strategy, it also plays a fundamental role in setting up operational priorities which can influence the firm's operational practices and decisions (Contiero et al., 2016). These operational practices could subsequently help firms to achieve operational efficiencies, flexible supply chain operations, and adapt to the customer needs (Shin et al., 2015). In other words, intent to gain competitive advantage through identifying opportunities, learning, as well as gathering and building resources would result in improved innovation and operational benefits. Therefore,

H<sub>2</sub>: Strategic intent has a positive effect on innovation and operational performance.

### **5.3.4 Potential absorptive capacity**

The significance of absorptive capacity for firms that engage in cooptation is widely acknowledged in extant literature (Cepeda-Carrion et al., 2012, Ritala and Hurmelinna-Laukkanen, 2013). The broader scope of the absorptive capacity is interpreted in terms of ‘potential absorptive capacity’ and ‘realized absorptive capacity’ (Zahra and George, 2002). Potential absorptive capacity refers to a firm’s capacity to acquire and assimilate external knowledge and resources, whereas realized absorptive capacity refers to its capacity to leverage the absorbed knowledge and exploit it for performance benefits (Zahra and George, 2002). Accordingly, potential and realized capacities are essentially different concepts (Zahra and George, 2002, Newey and Zahra, 2009) as the former requires change, flexibility, and creativity whereas the latter seeks control, order, and stability (Cepeda-Carrion et al., 2012). Given our ambition to study the ways in which external knowledge could be useful for the focal firm to derive benefits, we follow the work of Ritala and Hurmelinna-Laukkanen (2013) and focus on the potential absorptive capacity.

Absorptive capacity is envisioned as a dynamic capability given its ability to foster organizational change (Zahra and George, 2002, Todorova and Durisin, 2007). The ability to learn, which is to recognize the significance of the potential value that new knowledge could bring, makes potential absorptive capacity a key building block of dynamic capabilities (Todorova and Durisin, 2007). Cooptative relationships are potentially useful grounds for PAC to absorb useful knowledge since competing firms tend to possess similar knowledge, infrastructure, and technological capabilities. Additionally, the knowledge scanning abilities of PAC allows cooptitors to quickly acquire necessary knowledge from each other and apply it for their benefits (Ritala and Hurmelinna-Laukkanen, 2013). This knowledge absorption could result not only in firms generating new products and technologies, but also enhance the value of existing product lines by utilizing the unique combinations of resources (Ritala and Hurmelinna-Laukkanen, 2013, Zhang et al., 2018,

Chen et al., 2020). As espoused by the dynamic capabilities view, the ability of firms to recombine and reconfigure organization-wide resources could impact their operational activities (Teece et al., 1997), and, subsequently, operational performance (Obayi et al., 2017). Firms tend to gain access to a range of external operational practices from their partnerships; the more operational practices that a firm adopts from external sources by utilizing its absorptive capacity, the larger the body of knowledge the firm gains (Jinhui Wu et al., 2012). Access to a larger body of knowledge over operational practices could likely improve the firm's operational capabilities, thereby generating benefits such as improved flexibility, quality, responsiveness to varied customer demands, and other operational efficiencies (Obayi et al., 2017, Patel et al., 2012). Accordingly,

H<sub>3</sub>: Potential absorptive capacity has a positive effect on innovation and operational performance benefits.

### **5.3.5 Contingent effects of strategic intent and potential absorptive capacity**

Entrepreneurial firms are relatively more dependent on their ability to effectively utilise their own resources in the first place than the resources that come from outside (Kreiser, 2011). In this line of thought, the importance of deploying internal capabilities and optimizing internal resources has received increased attention (Cepeda-Carrion et al., 2012, Jinhui Wu et al., 2012, Engelen et al., 2014, Bouncken et al., 2016b). For instance, Engelen et al. (2014) suggest that EO interacts with organizational capabilities to increase firm performance because such capabilities play a central role in converting EO into improved performance. More importantly, firms' use of PAC (Ritala and Hurmelinna-Laukkanen, 2009) and SI (Johnson and Sohi, 2001, Han et al., 2018) have drawn particular attention for their ability to reconfigure the internal resource combinations to produce enhanced performance. Given that firms in cooperative relationships tend to possess and use multiple capabilities of PAC (Ritala and Hurmelinna-Laukkanen, 2013, Bouncken et al., 2015) and

SI (Luo, 2007a, Yami et al., 2010), understanding how these capabilities could facilitate EO to lead to better performance is important.

PAC provides firms a new pattern of resource combinations through the integration of internal and external knowledge (Kanter, 1988, Patel et al., 2015, Obayi et al., 2017). Absorptive capacity, as a dynamic capability, is particularly relevant to EO (Engelen et al., 2014) as it assists in implementing entrepreneurial activities effectively and efficiently by dealing with firm's resource uncertainties (Lumpkin and Dess, 1996, Engelen et al., 2014). EO can better regulate and facilitate its efforts towards combining diverse knowledge as well as other resources when complemented by the firm's PAC (Patel et al., 2015). For instance, the *proactiveness* dimension of EO is nourished by absorptive capacity to increase the variety of possible positive outcomes through better organisation-wide responsiveness (Liao et al., 2003, Patel et al., 2015). Besides, absorptive capacity, with a strong and continuous knowledge inflow, nourishes proactiveness and further assists the firm to generate consistent incremental and breakthrough improvements (Liao et al., 2003). The *risk-taking* characteristic of EO is said to be complemented by absorptive capacity's ability to gather domain specific knowledge and technological advancements (Patel et al., 2015). Such technological advancements could lower the perception of losses and increase the controllability and flexibility of operations in relationships (Obayi et al., 2017). Similarly, EO's *competitive aggressiveness* complemented by the use of its absorptive capacity could drive a firm's efforts to outperform the rivals in the industry. Taken together, the combined effect of EO and PAC is useful in integrating internal and external knowledge to address expectations and market trends. This likely allows a focal firm to respond aggressively to competition and increase investments in functions such as R&D to improve its product development efforts as well as operational efficiencies (Wiethaus, 2005). Accordingly, we posit the following hypothesis.

H<sub>4</sub>: Potential absorptive capacity will positively moderate the effect of a firm's entrepreneurial orientation on its innovation and operational performance.

Alternatively, as is the case with any dynamic capability, SI could also provide firms with a key source of organizational momentum to initiate the reconfiguration as well as recombination of diverse resources (Teece et al., 1997, Eisenhardt and Martin, 2000, Salvato, 2003). SI is said to be a useful tool for firms to improve their sensing, seizing, and reconfiguring capabilities (O'reilly and Tushman, 2008). A firm with a strong SI aims to search out and muster all possible resources, such as EO, to utilise them in achieving strategic objectives as well as sustaining competitive advantage (Johnson and Sohi, 2001, Han et al., 2018). Alternatively, the boundary conditions for the use of EO seek to tighten the linkages between entrepreneurial actions such as learning, resources, and mechanisms that can ultimately facilitate and control the EO (Green et al., 2008). Accordingly, the presence of SI as an organizational learning and a risk management capability facilitates and controls the linkages between the firm's entrepreneurial actions and mechanisms (Green et al., 2008) to produce better outcomes. Nevertheless, a firm that has a clear sense of entrepreneurial vision and the SI of achieving strategic targets and goals (Hamel and Prahalad, 1989) could embed that vision so as to formulate an appropriate entrepreneurial strategy (Ireland et al., 2001). Such an entrepreneurial strategy, driven by a combination of EO and SI, is likely to have a positive impact on the firm's performance over time (Tan and Tan, 2005, Ma and Tan, 2006). On the other hand, without the assistance of relevant complementary capabilities such as SI, EO might lack the means to realise the desired outcomes (Engelen et al., 2014). Therefore, we forward the following hypothesis for formal testing.

H<sub>5</sub>: Strategic intent will positively moderate the effect of a firm's entrepreneurial orientation on its innovation and operational performance.

## 5.4 Research methodology

### 5.4.1 Data collection

The constructs identified for this study represent firm-level variables that lead to benefits for a firm that is involved in a relationship with a competitor. We solicited responses to the questionnaires from managers who are knowledgeable about the firm and its strategic relationship with a competitor partner. The target sample consisted of firms from across the North America (USA and Canada), UK, Ireland, and Netherlands. These firms spanned industries including automotive/automobile, consumer electronics, engineering, information and communication technologies (ICT), machinery, pharmaceuticals, and R&D. These sectors are categorised as Hi-tech as well as knowledge intensive by the Eurostat (Eurostat, 2018), a directorate-general of the European commission that provides statistical information to the institutions of European union. These sectors are chosen as they were considered appropriate by scholars in coepetition literature (Luo, 2007a, Ritala and Hurmelinna-Laukkanen, 2009, Gnyawali and Park, 2011, Ritala and Hurmelinna-Laukkanen, 2013, Chiambaretto et al., 2019).

A structured web-based questionnaire was engaged for data collection. To ensure that our survey is responded to by the intended group of individuals, a screening question was placed right at the start of the survey - *“Does your firm cooperate and compete at the same time with a competitor firm or a firm that has similar product/service offering and similar target market”* (representing simultaneous cooperation and competition in the same horizontal relationship). A similar question was employed by Ritala and Sainio (2014) and Yu (2019) to identify respondents from coepetitive relationships. Individuals that answered ‘Yes’ to the screening question were asked to answer the remainder of the survey keeping a horizontal coepetitive partner in mind. From 1500 on-line surveys sent, 355 responses were received, resulting in a response rate of 23.67%. Due to incomplete information, 42

responses were discarded, resulting in an effective response rate of 20.87% (313/1500). Over 71.6% of respondents held positions such as CEOs/COOs, Alliance-directors, and top-level managers in their respective organisations. The respondents mostly worked for medium to large scale firms with 41.9% working for firms that have an employee size of 251-1000, while 24.3% were working for firms with over 1001 employees. Nearly 70.3% of firms had revenue of over EUR 50 million in the last financial year.

*Non-response bias* was assessed by testing possible differences between sample means of demographic variables such as employee size and company age of the firm. The responses were separated into two groups based on when they were received. The responses received during the first 3 weeks were labelled as group 1 while the late responses were labelled as group 2. Group comparison tests yielded no statistically (at 95% confidence level) significant differences between the two groups. Thus, nonresponse bias does not appear to be a concern. Given that we used a single respondent within each sample firm to collect information regarding the variables of interest, we conducted specific tests to rule out concerns with regards to *common method bias*. This test is conducted using a confirmatory factor analysis approach (Sea-Jin et al., 2010, Roldán Bravo et al., 2018). We ran two models – one with a single-factor and another with the factors presented in the theoretical framework. The model fit for the single factor model (Comparative fit index [CFI] = 0.835, Tucker-Lewis index [TLI] = 0.818, Incremental fit index [IFI] = 0.836, Root mean square error of approximation [RMSEA] = 0.101, normed  $\chi^2$  [NC] = 4.164) was significantly worse in comparison to our measurement model (CFI = 0.946, TLI = 0.936, IFI = 0.947, RMSEA = 0.060, normed  $\chi^2$  [NC] = 2.111), suggesting that common method bias is not a concern.

#### **5.4.2 Measures**

A 7-point Likert scale with endpoints of “strongly disagree” to “strongly agree” is used to measure the indicators of all constructs used in the web-survey. The details of all indicators

are provided in the Appendix D. The independent variable of “EO” with its three dimensions – proactiveness, risk-taking, and strategic aggressiveness – is operationalised on a five items scale and is adapted from Atuahene-Gima and Ko (2001). “PAC” is measured by a four items scale and is adapted from Ritala and Hurmelinna-Laukkanen (2013). “SI” is operationalised on a four items scale and is taken from Johnson and Sohi (2001). “Operational performance” is measured on a six items scale which is adapted from McDermott and Stock (1999) and Zacharia et al. (2011). “Incremental innovation” and “radical innovation” are measured on a three items scale each and are adapted from Ritala and Hurmelinna-Laukkanen (2013), Chandy and Tellis (1998), and Kim et al. (2012). Specifically, the respondents were asked to answer these innovation-related questions based on the performance benefits they gained in the past three to five years from the specific horizontal cooperative relationship chosen.

We included various control variables that could impact our performance measures. We controlled for *relationship length* because firms that engage in alliances may have an incentive gained from the relationship which could be used for more personal gains and control the partner (Morris et al., 2007, Luo, 2005). We controlled for *firm size* as larger firms (potentially stronger EO, PAC, and SI) likely prevent the exploitation of opportunities to be pursued by relatively smaller partners in alliances (Sarkar et al., 2001, Li et al., 2017). *Firm age* (years from commencement) was also controlled for, given that it could be a source for resource heterogeneity such as slack resources (Niederkofler, 1991, Reuer et al., 2006). Besides, firm age could also affect the outcomes using its industry establishment (Ritala and Hurmelinna-Laukkanen, 2013, Lechner et al., 2016). *Amount of R&D collaboration, new product development, and technology development* are also controlled for as these items indicate the intensity and strength of alliance activities between the partner firms in cooperation (Luo et al., 2007, Ritala and Hurmelinna-Laukkanen, 2013) which likely influence the performance outcomes.



### 5.4.3 Instrument development

Content validity of the survey instrument is ensured by grounding it in extant literature. In addition, before data collection, we pre-tested the instrument with 19 experts (15 executives and 4 academics) to seek their opinion on the structure, readability, ambiguity, and completeness of the survey instrument (Dillman, 2007). Based on the opinions received, minor changes were made to the instrument. The instrument was tested for normality and outliers by using the plots of residuals and statistics of skewness and kurtosis. Multivariate outliers were tested based on Mahalanobis distances of predicted variables. The maximum absolute values of skewness and kurtosis were found to be within the limits of 2 and 7 (Curran et al., 1996). In addition, the plots of these tests did not show considerable deviations.

Construct validity and unidimensionality were established using both the exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). The results of this analysis are presented in the Appendix D. While conducting EFA, most of the items loaded onto their respective constructs. The eigenvalues for the constructs were found to be above 1.0 while the percent of variation was 59.02%; and the factor loadings were also above 0.40 (Hair et al., 1998). The fit indices for the CFA model (CFI = 0.946, TLI = 0.936, IFI = 0.947, RMSEA = 0.060, SRMR = 0.0397, and normed  $\chi^2$  [NC] = 2.111) suggest adequate fit (Kline, 2005). Largely, these results indicate that the proposed measurement model fits the data well.

Results also established the discriminant validity of the constructs since the squared correlations between all combinations of latent constructs were less than the average variance extracted (AVE) estimates of the respective constructs (Fornell and Larcker, 1981), except between EO and incremental innovation and incremental and radical innovations. The squared correlation of incremental innovation is slightly higher than that of EO. Eliminating one item from EO measures (A strong emphasis on R&D, technological

leadership, and innovation) would resolve the correlation issue. However, we retained the measure to give due consideration to the significance of R&D, technology, and innovation for EO to generate performance outcomes. The relatively high correlation between outcome variables of incremental and radical innovation is widely prevalent in extant literature (McDermott and Prajogo, 2012, Forés and Camisón, 2016); this phenomena is linked to the close nature of constructs such as types of innovations (Chang et al., 2014) or knowledge-related variables (Jiménez-Jiménez and Sanz-Valle, 2011). The correlation values are provided in Table 5.1 and the AVE values are shown in the Appendix D.

Reliability was checked using multiple measures. Initially, we evaluated the coefficient alpha (Nunnally, 1978) and coefficient omega (McDonald, 1999) values. Though coefficient alpha is the widely used measure of reliability, scholars suggest that it does not yield a consistent estimate of reliability when the underlying items are not tau-equivalent (Deng and Chan, 2017). Although all of the constructs had a coefficient alpha value of greater than 0.70, the items within SI, radical innovation and operational outcomes were not tau-equivalent. Therefore, we have reported both coefficient alpha and coefficient omega in the Appendix D. Composite reliability (CR) values for all the constructs were also greater than 0.70 (Bagozzi and Yi, 1988). Furthermore, AVE values for all constructs were above 0.50. Overall, the results indicate that the theoretical constructs are reliable, valid, and unidimensional. Some indicators were eliminated during the instrument development process as they did not meet the psychometric requirements; the deleted items are indicated in the Appendix D.

Factors	Mean	S.D	EO	PAC	SI	OO	II	RI
EO	5.484	0.981	1					
PAC	5.666	0.985	0.695	1				
SI	5.282	1.127	0.562	0.493	1			
OO	5.647	0.970	0.672	0.690	0.544	1		
II	5.605	1.039	0.743	0.746	0.523	0.714	1	
RI	5.469	1.054	0.704	0.644	0.497	0.664	0.767	1

N=313;  
P<0.01 level.

Table 5.1: Correlations

## 5.5 Results of analysis

Moderation effects are performed following the guidelines of Dawson (2014). Both the independent variable of 'EO' and the moderator variables of 'SI' and 'PAC' are mean-centered to create interaction variables (EO X SI; EO X PAC) so as to perform the moderation effect of 'SI' and 'PAC' on the outcome variables of 'innovation' and 'operational performance' for the hypotheses H4 and H5 respectively. Mean-centering is significant as it ensures "*that the (unstandardized) regression coefficients of the main effects can be interpreted directly in terms of the original variables*" (Dawson, 2014, p.12). Additionally, mean-centering in regression models also assists to reduce concerns specific to multicollinearity (Lee and Cavusgil, 2006, Dawson, 2014). Regression results pertaining to hypotheses H1 through H3 are presented in Table 5.2. H1 suggest that there is a positive relationship between EO and operational as well as innovation performance. The regression results provide support for the hypothesis in that EO's effect on operational performance (Model 1) ( $\beta = 0.293$ ,  $p < 0.0001$ ), incremental innovation (Model 3) ( $\beta = 0.378$ ,  $p < 0.0001$ ), and radical innovation (Model 5) ( $\beta = 0.412$ ,  $p < 0.0001$ ) are all found to be positive and significant. H2 proposed that a positive relationship exists between SI and operational as well as innovation performance. The regression results provide support for the hypothesis in that SI's effect on operational performance (Model 1) ( $\beta = 0.192$ ,  $p < 0.0001$ ), incremental innovation (Model 3) ( $\beta = 0.083$ ,  $p < 0.05$ ), and radical innovation (Model 5) ( $\beta = 0.109$ ,  $p < 0.05$ ) are all found to be positive and significant. H3 suggest that a positive relationship exists between PAC and operational as well as innovation performance. The results provide support for the hypothesis in that PAC's effect on operational performance (Model 1) ( $\beta = 0.381$ ,  $p < 0.0001$ ), incremental innovation (Model 3) ( $\beta = 0.383$ ,  $p < 0.0001$ ), and radical innovation (Model 5) ( $\beta = 0.250$ ,  $p < 0.0001$ ) are all found to be positive and significant.

The regression results pertaining to H4 and H5 are presented in Table 5.2. The prediction for hypotheses H4 and H5 were that both ‘PAC’ and ‘SI’ would positively moderate the effect of a firm’s EO on its operational and innovation performance. The results indicate that the cross-product term between ‘SI and EO’ ( $\beta = -0.136$ ,  $p < 0.01$ ) on firm’s operational performance was negative and significant while the product term between ‘PAC and EO’ ( $\beta = 0.098$ ,  $p > 0.05$ ) on operational performance was positive but insignificant (Model 2). Further, results indicate that the cross-product term between ‘SI and EO’ ( $\beta = -0.134$ ,  $p < 0.01$ ) on firm’s incremental innovation was negative and significant while the product term between ‘PAC and EO’ ( $\beta = 0.086$ ,  $p > 0.05$ ) on incremental innovation was positive but insignificant (Model 4). When it comes to radical innovation, results indicate that the cross-product term between ‘SI and EO’ ( $\beta = -0.100$ ,  $p > 0.05$ ) on firm’s radical innovation was negative and insignificant while the product term between ‘PAC and EO’ ( $\beta = 0.090$ ,  $p > 0.05$ ) on radical innovation was positive and insignificant (Model 6). These results do not find support for hypotheses H4 and H5. We also tested the moderation effects using the SPSS macro PROCESS designed by Hayes (2018). The bias-corrected confidence intervals (Preacher et al., 2006) for all the moderation effects were in line with our above results: moderation effect of SI (95% CI = -0.154 to -0.022) and PAC (95% CI = -0.008 to 0.139; *ns*) on the relationship between EO and operational performance; moderation effect of SI (95% CI = -0.155 to -0.030) and PAC (95% CI = -0.008 to 0.131; *ns*) on the relationship between EO and incremental innovation; moderation effect of SI (95% CI = -0.144 to 0.002; *ns*) and PAC (95% CI = -0.015 to 0.147; *ns*) on the relationship between EO and radical innovation.

	Operational performance		Incremental Innovation		Radical Innovation	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
<u>Control variables</u>						
Employee size	-0.041	-0.043	-0.008	-0.010	-0.076	-0.079
Company age	-0.055	-0.051	-0.050	-0.047	-0.053	-0.050
Relationship length	-0.021	-0.015	0.017	0.023	0.074	0.078
Amount of R&D collaboration	0.121*	0.133*	-0.002	0.008	0.114*	0.126*
Amount of New Product Development (NPD)	-0.017	-0.034	0.043	0.028	-0.038	-0.055
Amount of technology development	-0.067	-0.067	0.073	0.072	0.056	0.056
<u>Predictor</u>						
EO	0.293***	0.285***	0.378***	0.370***	0.412***	0.409***
SI	0.192***	0.180***	0.083*	0.072	0.109*	0.098*
PAC	0.381***	0.410***	0.383***	0.407***	0.250***	0.278***
SI * EO		-0.136**		-0.134**		-0.100
PAC * EO		0.098		0.086		0.090
<u>Model summary</u>						
R <sup>2</sup>	0.571	0.581	0.664	0.673	0.562	0.568
Adjusted R <sup>2</sup>	0.558	0.565	0.653	0.661	0.549	0.552
Model F-value	43.577***	36.884***	64.678***	54.890***	41.118***	35.026***

The regression coefficients are reported as beta values.

N=313.

\* p<0.05

\*\* p<0.01

\*\*\* p<0.001

Table 5.2: Simple regression: direct and indirect effects

## 5.6 Discussion

The study offers several contributions to theory and practice in the context of cooperative relationships. The first objective of the study is to investigate the effects of a firm's EO, SI, and PAC on the firm's operational and innovation performance gained from a horizontal cooperative relationship. As for the EO's effects on innovation, our result is consistent with the findings of studies such as Jiang et al. (2016) that show that a firm's EO positively impacts the innovation performance in its alliance with a competitor firm. However, our findings add to extant literature by testing the effect of EO on both incremental and radical innovations; we find that EO could have a positive effect on both types of innovation. Further, our findings also suggest that EO could positively impact operational performance. This finding contradicts with previous studies that suggest no direct relationship between

EO and operational performance (Walter et al., 2006); however, Walter's study was carried out in a non-coopetition context.

Additionally, given that EO has been operationalized differently, it is important to explore whether the performance impacts of EO might be different for different operationalizations. Studies such as Jiang et al. (2016) and Bouncken et al. (2016b) measure EO as an aggregate measure of innovativeness, risk-taking, and proactiveness where innovativeness of EO could potentially influence firm's ability to generate innovations. However, the aggregate measure of EO in this study includes strategic aggressiveness (in place of innovativeness), risk-taking, and proactiveness following Atuahene-Gima and Ko (2001). The strategic or competitive aggressiveness plays an important role in increasing both the volume and diversity of competitive activities undertaken by a coopetitor to accomplish superior performance (Sanou et al., 2016). The underlying rationale is that aggressiveness assists firms to exploit resources more swiftly (Clark and Montgomery, 1998, Morgan and Strong, 2003); thus, it increases the firm's potential to produce better performance benefits such as product/process innovation and business efficiencies (Zahra, 1993). Therefore, our measurement clarifies an underlying argument that EO is capable of delivering better performance in coopetitive relationships irrespective of whether the innovativeness characteristic is part of the EO measurement. In essence, our results are in line with extant research suggesting that EO, as an overarching construct (combination of all of its characteristics rather than one in particular), is capable of delivering a positive impact on performance using the joint strength of the combinations of its characteristics (Wiklund and Shepherd, 2005, Handfield et al., 2009).

Regarding the SI's effects on innovation and operational performance, the results explicitly add to previous literature that posit SI to be capable of delivering performance benefits (Mariadoss et al., 2014, Contiero et al., 2016). However, past views that discuss SI's performance effects have largely come from either traditional alliance or non-alliance

studies (McAdam et al., 2014, Kim et al., 2015, Contiero et al., 2016). Besides, fewer efforts have been made on identifying the nature of SI's performance benefits in coopetition. Our results indicate that SI, as an important capability of a coopetitor, can lead to both innovation and operational performance. When it comes to PAC's performance effects, studies such as Ritala and Hurmelinna-Laukkanen (2013) indicate that PAC can lead to innovations in coopetitive relationships; our findings further reinforce these studies. However, for radical innovation, potential absorptive capacity was conjectured to have an insignificant effect (Ritala and Hurmelinna-Laukkanen, 2013). On the contrary, our findings indicate a positive and significant relationship between PAC and radical innovation. Our study also expands the scope of PAC's performance impacts to operational outcomes. This is an interesting finding given that only few studies have tested absorptive capacity-operational performance relationship in the context of alliances (Whitehead et al., 2016, Sáenz et al., 2014), and some studies including that of Whitehead et al. (2016) found no direct relationship. But our result reinforces PAC's ability to assimilate and transform operational knowledge from external sources, specifically from the coopetitive partner, and integrate such knowledge across its internal functions to improve operational efficiencies (Patel et al., 2012, Jinhui Wu et al., 2012, Obayi et al., 2017).

The second objective of the study is to investigate the moderating effects of SI and PAC on the EO-performance relationship. SI has a significant negative moderating effect on the EO-performance relationship with the exception being that SI's effect on EO-Radical innovation is insignificant. While PAC was found to have a positive moderating effect on the EO-performance relationship, it was found to be insignificant. The findings of SI's moderating effects are important as these findings contradict extant literature that suggest SI to be a driving factor for firms to realize their objectives using their resources (Luo, 2007a), and that SI is vital for firms to guide their resource allocations and resource based decisions in order to enhance performance (Mariadoss et al., 2014). In other words,

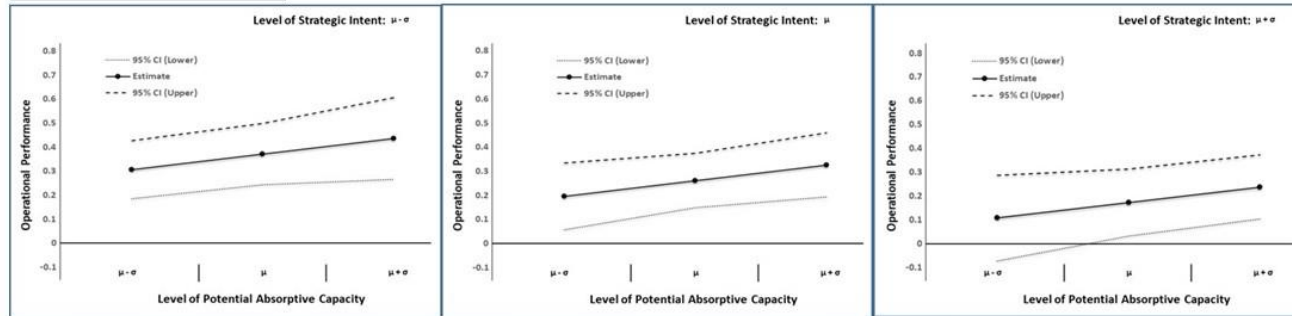
SI is supposed to nurture EO to produce better performance outcomes (Simpson et al., 2007, McAdam et al., 2014, Han et al., 2018). However, our findings suggest otherwise. Similarly, PAC's moderation effects did not align with previous research that suggests (1) a complementary association between PAC and EO to deliver enhanced operational outcomes (Patel et al., 2015), and (2) the ability of PAC to generate significant positive outcomes for firms in cooperation (Ritala and Hurmelinna-Laukkanen, 2013). The insights from our study indicate that a strong PAC delivers neither EO-operational performance nor EO-innovation performance. These findings suggest that although competitors boast of possessing multiple competitive capabilities, such capabilities may not necessarily aid in transforming the resources into higher performance benefits. We attribute this novel phenomenon to the possible intense competition caused by the competitive capabilities of SI and PAC. Firms' use of competitive capabilities seek rapid advancements and potentially instigate competitive expectations due to learning races and internalization of partners' resources (Cao and Zhang, 2011). This will reflect in competitive intensities which cause hostilities within the operating environment (Zahra and Covin, 1995), thereby causing friction between the cooperative partners. Referring to the competitive intensities, Sahi et al. (2019) suggest that EO-performance association will only become fruitful when the intensity of competition caused by different variables, such as interactive competitive capabilities, is not high. Besides, cooperation being an already competitive relationship (Gnyawali and Charleton, 2018, Chiambaretto et al., 2019, Crick and Crick, 2021) could further heighten the competitive intensities when competitors utilize competitive capabilities to seek higher firm-level benefits from the relationship. Such an intense competition might motivate a tug of war among firms, thereby consuming excessive resources so as to beat the competition. These situations leave entrepreneurial firms with few or little critical resources to innovate, thereby negating their abilities to be aggressive and take risks (Sahi et al., 2019). Therefore, we forward that a competitor's use of



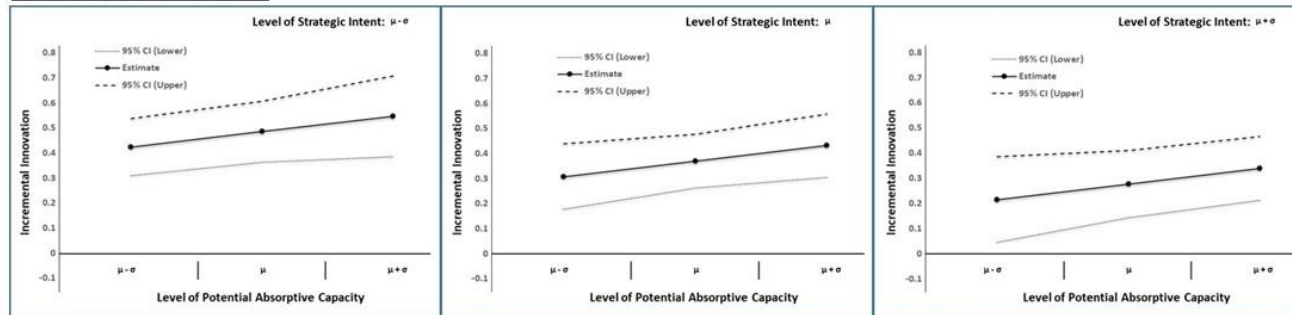
competitive capabilities of PAC and SI on the relationship between EO and performance could intensify the competition with its partner, and eventually reduce the firm's chances of benefitting from its EO. In effect, we believe that this result signifies the presence of the Icarus paradox (Miller, 1990), wherein too much of a good thing might actually hurt firms in competitive relationships (Wales et al., 2013).

To shed better light on this paradox, the study follows the guidelines of Dawson (2014) to better interpret the effects of two moderators on the relationship between EO and performance outcomes by plotting the results. The confidence bands for the moderating effects of PAC and SI are presented using the bootstrapping approach (Preacher et al., 2006); the results were based on 5000 replications. The confidence bands included in Figure 5.1 exhibit how SI and PAC moderate the relationship between EO and performance. The plots reveal numerous effects as mentioned in the results section. For instance, the effect of EO on performance (operational performance, incremental innovation, and radical innovation) is higher under the conditions wherein firms use low-level of PAC and low-level of SI whereas the effect of EO on performance (operational performance, incremental innovation, and radical innovation) is started to decline when firms use medium levels of PAC as well as SI. However, the effect of EO on performance (operational performance, incremental innovation, and radical innovation) is at the lowest when firms use high levels of PAC as well as SI.

**OPERATIONAL PERFORMANCE**



**INCREMENTAL INNOVATION**



**RADICAL INNOVATION**

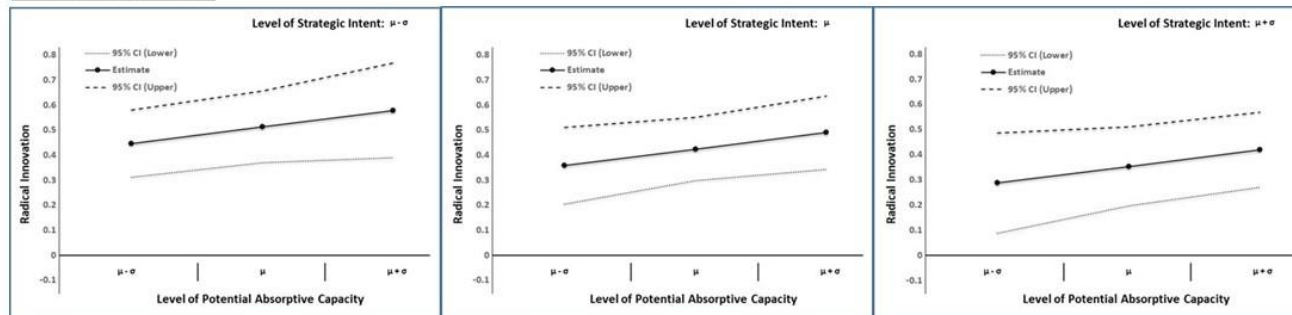


Figure 5.1: Moderating effects of SI and PAC on EO-Performance relationships

## **Managerial implications**

The findings of the study offer important implications for managers of firms that are involved in horizontal cooperative relationships. Specifically, our results motivate managers to focus on prioritization and effective utilisation of their firm-level intangible, yet competitive, resources and capabilities to gain better performance benefits for their firms. Pursuing high levels of EO with strong emphasis on aggressive technology investments and R&D activities would likely improve their chances of reaping better benefits in strategic relationships. Besides, managers are likely to benefit from the use of firm-level capabilities such as SI and PAC independently, considering their ability to consistently focus on achieving ambitious goals and acquiring necessary new resources and information. However, the use of both of these capabilities to complement their firm's strategic resources such as EO to gain better benefits may not be plausible in cooperative relationships given that the use of competitive capabilities along with their EO might signal the firm to be too hostile to their partner firms; this could potentially dilute the partner's motivation to continue to engage in the relationship and eventually affect the firm's chances to gain potential performance benefits.

## **5.7 Conclusion, limitations, and future research direction**

The question about the potential benefits that EO as a firm's resource, and SI and PAC as the firm's capabilities can bring to firms has been receiving increased attention in operations as well as strategic management literature (Kickul et al., 2011, McAdam et al., 2014, Patel et al., 2015, Sahi et al., 2019). Given their underlying significance, it is becoming increasingly important for organisations, academics, and practitioners to understand not only performance effects, but also the underlying complementary interactions of EO, SI, and PAC. It is important to test these relationships not only due to the lack of evidence, but also because the literature emphasizes them to be an important and integral part of firms involved in cooperative relationships (Luo, 2007a, Li et al., 2011,

Bouncken et al., 2016b). Further, our study provides nuanced arguments for the interaction effects of internal resources and competitive capabilities in the case of firms involved in competitive relationships. Overall, our study contributes to extant research by empirically showing that while EO, SI, and PAC could deliver performance benefits on their own, their interaction effects might not be beneficial.

As is the case with most research studies, our study also has its limitations. First, this study is developed by collecting data from one firm of each cooperation alliance which represents only one side of the dyad; this is a common problem in relationships (Robson et al., 2019). This may partly influence the outcomes (Cao and Zhang, 2011). Second, we used existing scales to measure the constructs, which may be a limitation. Third, the sample used for the study represents varied industries and a large geography which may limit the generalisation of results to very specific industry or geography. We recommend future studies to assess the impacts of relational variables (idiosyncratic resources, knowledge sharing, complementary etc.) as well as industry level variables (technology conditions, market conditions, institutional environment etc.) on the relationship between EO and performance. Another recommendation could be assessing the potential impact of indirect capabilities (systems integration) and expanded boundaries (ownerships and incentive offsets to address hold-up problems) to accommodate partners' interests while utilising multiple competitive capabilities to enhance the EO-performance relationship.

## **Chapter 6: Conclusion**

### **6.1 Summary**

Pursuing coopetition relationships is not straightforward but challenging due to its inherent nature of being paradoxical. Therefore, it is important to first understand the key antecedent variables as well as the interplay of the variables that can enable firms to pursue successful coopetition relationships. However, the interplay of cooperation and competition within coopetition is bound to create various tensions. Understanding the key cooperative tensions, potential relationships between tensions, and management of such tensions is important particularly given the confusions as well as ambiguous assertions in extant literature, and consistent calls from researchers to explore such tensions. Additionally, coopetition is argued to offer significant performance benefits for firms that operate in constantly changing markets and business environments. Although previous studies discuss various performance benefits, the knowledge gaps exist when it comes to the specific firm-level strategic resources and capabilities as well as combinations of resources and capabilities that these firms tend to utilize in order to gain performance benefits at firm-level from their engagement in interfirm coopetition. This research contributes to the existing body of knowledge in operations management as well as strategic alliance literature. The novel components of this empirical investigation is identifying the key variables that will assist firms to pursue coopetition relationships – strategic intent, manager’s ambidextrous skills, and knowledge sharing and their complementarity; identifying the underlying relationships between cooperative tensions of interdependence and opportunism; and forwarding the key strategic resources and capabilities – strategic intent, entrepreneurial orientation, and potential absorptive capacity that coopetitors potentially utilize to gain firm-level performance benefits from their engagement in interfirm coopetition.

Several conclusions can be drawn from this research on interfirm cooperation relationships. Conclusion one – It is important for firms that aim to pursue cooperation relationships to have a strong strategic intent, managers with ambidextrous skills of exploration and exploitation, and the firm's willingness to maintain strong knowledge sharing routines in order to pursue a successful cooperation relationship. Conclusion two – cooperation will not directly lead to partner's opportunism but it will be through the interdependence in the presence of formalization routines between firms complementing the relationship between cooperation and interdependence as well as cooperation and opportunism. Conclusion three – the strategic resource of entrepreneurial orientation and the strategic capabilities of strategic intent and potential absorptive capacity enable the competitors to gain both innovation and operational performance benefits from their engagement in cooperation relationships. However, firms effort to use excess use of these to enhance performance benefits, for example complementing these resource and capabilities, may not necessarily results in desired benefits.

This chapter further discusses the (1) validity of the research design and results presented, (2) critical evaluation of the results that include theoretical contributions that are made through this research, (3) implications for managers/practitioners, and (4) limitations and research direction for future studies.

## **6.2 Research validation**

A prominent issue with the research studies that employ quantitative research is to make sure that the measurement adapted is reliable, generalizable, and valid. Scholars argue that the use of rigorous sampling procedures and providing reliable sources of information for the measures of the variables that are utilised for research studies is important to obtain valid empirical generalization in quantitative studies (Meredith, 1998). To address such concerns in this research – (a) The sample selection has been made carefully from the

interfirm cooperative relationships populations. The research sample specifically was drawn from technology and knowledge-intensive sectors and located in the UK, Ireland, Netherlands, the USA, and Canada. The preamble within the survey as well as the screening question helped to identify appropriate research sample. Additionally, the inclusion of measures of both the cooperation and competition variables within the survey ensure that the sample firms involve in cooperation relationships. Additionally, inclusion of the sample firms from advanced European and north American countries improved the generalizability of the research findings; (b) The validation of constructs is ensured by adapting the measures from the research studies that have been published in highly ranked academic journals as ranked in chartered association of business schools (CABS). These journals include but not limited to Journal of operations management, Journal of marketing research, Organization science, Journal of marketing, Journal of product innovation management, Journal of management studies, and journal of business research. Additionally, the measures and the survey in general was validated by an expert group that include both practitioners as well as academics. The survey got operationalised only after making relevant modifications following the comments provided by the expert group.

The rigour of the research is further ensured by making sure that all the variables utilized in the conceptual models consist of at least three item measures each (Baumgartner and Homburg, 1996). Additionally, the variables utilized in the conceptual models that explain that direct, moderation, and mediation relationships are justified with the use of existing theories as well as extant literature from a combination of operations management, strategic alliance, and strategic management literature. Furthermore, all three research models controlled for a range of variables that include firm size, partner firm size, firm age, relationship length, common suppliers, amount of R&D collaborations, amount of technology collaboration, amount of new product development collaborations. Besides taking care of these validation steps as part of the survey design stage, several other

validation steps were also taken post the data collection. These include performing Harman's once-factor and CFA tests to exclude concerns associated to the common method bias; the validation of the models fit indices such as CFI, TLI, IFI, RMSEA, and normed  $\chi^2$  [NC] of all three papers were estimated utilizing the CFA tests. Reliability of all of the constructs were estimated using Cronbach Alpha values, and composite reliability values. To further reinforce the validity of the research, all three papers have received academic validation through participation in three different international-level conferences and the first of three papers has been published in a peer-reviewed academic journal:

1) Paper I – “The architecture of coopetition: strategic intent, ambidextrous managers, and knowledge sharing”

- The 50<sup>th</sup> Decision Sciences Institute Conference (DSI) in New Orleans, USA, November 2019.
- Published in the Industrial Marketing Management Journal.

2) Paper II – “Key tensions in cooperative relationships: The contingent role of formalization”

- The 10<sup>th</sup> European Decision Sciences Institute Conference (EDSI) in Nottingham, UK, June 2019.
- The 51<sup>st</sup> Decision Sciences Institute Conference (DSI) in USA, to be held in November 2020.
- British Management Journal, under review, September 2020.

3) Paper III – “Performance effects of organizational resources and capabilities within horizontal cooperative relationships”

- Production Operations Management Society Conference (POMS) in Brighton, 2019.



- International Journal of Operations and Production Management, under review, June 2020.

### **6.3 Theoretical implications and knowledge evaluation**

The conceptual models developed as part of this thesis were meant to address specific knowledge gaps and limitations identified in extant literature which were discussed in the chapter 1 as well as the chapters 3 through 5. These gaps and limitations are particularly associated to the lack of clarity and understanding over antecedents that could lead firms to pursue coopetition relationships, underlying associations between various coopetition tensions and the different effects of formal mechanisms on these tensions, and the specific strategic resources and capabilities that firms could utilize to gain various performance benefits from their engagement in coopetition relationships. The overarching research question, i.e., “How the interrelationships among antecedents, and tensions, and resources and capabilities influence various outcomes within interfirm horizontal coopetition?”, and the associated three sub-research questions – (1) How does the interplay of key antecedents enable firms to pursue successful coopetition relationships?, (2) How does coopetition lead to different tensions and what role formalized routines play in managing the tensions?, and (3) How do firm-specific resources and capabilities affect a firm’s performance within coopetition relationship?; were developed to address these specific knowledge gaps and limitations. While addressing these gaps, the overall findings of this thesis clarify not only the key antecedent variables that are necessary to develop coopetition relationships but also improve our understanding over the complex nature of coooperative tensions as well as importance of specific firm-specific strategic resource and capabilities to gain performance benefits.

Through interfirm coopetition relationship as the core focus, the research identified a set of interconnecting factors to explain the antecedents, tensions, and performance outcomes and to eventually address the overarching research question. These factors

include (1) strategic intent, (2) manager's ambidexterity ('manager's exploration' and 'manager's exploitation'), (3) knowledge sharing, (4) interdependence ('focal dependence' and 'partner dependence'), (5) opportunism, (6) formalization, (7) entrepreneurial orientation, (8) potential absorptive capacity (9) operational performance, (10) innovation performance (incremental innovation and radical innovation), (11) coopetition ('cooperation' and 'competition'). These variables were underpinned by appropriated theoretical anchors (e.g. dynamic capabilities, resource-based view, resource dependence theory, transaction cost theories) as well as relevant literature from extant research to specify plausible relationships between them and to develop the hypotheses for each of the three research papers. The empirical examination of these relationships reveal in greater detail how the theoretical anchors complement the arguments from extant literature. For example, as demonstrated in paper III from the RBV and dynamic capabilities perspectives: resource (entrepreneurial orientation) complements the capabilities (strategic intent and potential absorptive capacity) to develop competitive advantage (innovation and operational performance outcomes). Furthermore, the research has provided empirical evidence of implications based on the conceptualization and testing of the relationships between these eleven interweaving factors to manage interfirm coopetition relationships.

The findings from this research contribute to the corpus of operations management, strategic alliance as well as strategic management literature (Li et al., 2011, Kickul et al., 2011, Peng et al., 2012, Weele and Raaij, 2014, Raddats et al., 2017, Wilhelm and Sydow, 2018, Gnyawali and Charleton, 2018, Hoffmann et al., 2018, Sahi et al., 2019). Moreover, in particular, the findings of this thesis expand the works that discuss antecedents, tensions and tension management, and performance outcomes in extant coopetition literature. For instance, studies have identified numerous motives as antecedents for coopetition relationships extant literature. These include firm-level/internal antecedents such as strategic intent, managers, other internal resources or skills (Luo, 2007a, Bonel and Rocco,

2009, Bengtsson et al., 2016b); external conditions such as market dynamism, technology dynamism, institutional conditions (Bengtsson and Kock, 2000, Quintana-García and Benavides-Velasco, 2004, Luo, 2007a, Gnyawali and Park, 2011, Ritala, 2012, Hoffmann et al., 2018); and relational conditions such as relational investments, knowledge sharing, complementarity (Gnyawali and Park, 2011, Ritala and Hurmelinna-Laukkanen, 2013, Bouncken and Kraus, 2013, Ritala et al., 2014, Bouncken et al., 2016a, Hoffmann et al., 2018) among others. As much as previous studies enhance the general understanding about the plausible antecedents that could motivate firms to engage in coopetition, they tend to cause ambiguity when it comes whether all of the antecedents discussed in previous studies are necessary for firms to pursue coopetition or what antecedents or combinations of such antecedents are necessary to pursue a coopetition relationship. Rationally, not all the antecedents that are discussed or listed out in extant literature would be necessary triggers to pursue coopetition as they may not be an ultimate criteria given that antecedents could be subjective to a given relationship's surrounding environmental conditions (Dyer and Singh, 1998, Dyer and Kale, 2007). Nevertheless, it is plausible to argue that a group of specific antecedents can be a common requirement in firms efforts to pursue a successful coopetition. In this line of thought, the research findings associated to the first research paper, i.e., *'The architecture of coopetition: strategic intent, ambidextrous managers, and knowledge sharing'*, complement previous literature in that it suggests the importance to have a strong strategic intent, managers that can deal with ambidextrous activities, and to maintain knowledge sharing routines as necessary variables for any firm that aim to pursue coopetition. Alternatively, these findings not only assists to significantly narrow down the variables from the existing literature that highlights many factors as antecedents and the confusion surrounding them but also offers clear understanding for the research about the specific important variables that are necessary to pursue successful cooperative relationships.

When it comes to tensions, this research expands the existing knowledge associated to cooperation tensions. This research shows that there is an inherent connection between different types of cooperative tensions (interdependence and opportunism) when competitors formalize their relational routines. Previous studies such as Tidström (2014), Wilhelm and Sydow (2018), Gnyawali and Charleton (2018), Fredrich et al. (2019), Yu (2019), Tidström (2014), Wilhelm and Sydow (2018), and Tidström et al. (2018) among others view cooperative tensions such as interdependence and opportunism as independent tensions in that the focus of the discussions mainly contribute to how cooperation could lead to opportunism or interdependence or other forms of tensions. As much as the discussions in previous studies assist with the general understanding about the tensions in cooperation (Tidström, 2014, Tidström et al., 2018, Gnyawali and Charleton, 2018), there is some inhibition to discuss about the other side of the tensions perspective which is about whether there is an inherent relationships between the tensions themselves, in this case interdependence and opportunism (Tidström, 2014, Tidström et al., 2018, Gnyawali and Charleton, 2018). In general, non-cooperation alliances indicate plausible associations between different tensions types in inter-organizational relationships (Kumar et al., 1995) and this could apply to other forms of relationships such as cooperation. Explicating the inherent association in the context of cooperation will enhance our level of understanding and also adds relevant knowledge associated to tensions literature. Accordingly, findings of this thesis address this specific concern in that it explains the presence underlying associations between cooperation, interdependence, and opportunism. It is plausible that a cooperation relationship could experience the occurrence of multiple tensions at a given time; however, the arguments in previous studies appear to overlook such discussions as they address potential relationships between cooperation and one type of tension or the other (and other variables to manage such tensions) but do not include different types of tensions within a same conceptual model. This can be a limitation when it comes to the development

of a holistic understanding over evolving nature of multiple tensions in cooperation relationships. The findings associated to the second research paper of this thesis, i.e., '*key tensions in cooperative relationships: The contingent role of formalization*', significantly adds to such knowledge gaps in extant literature as well as enhances current understanding associated to cooperative tensions. Additionally, the belief that having a standardized routines between firms as useful mechanisms to mitigate tensions is widely debated across not only in cooperation but also in operations management and strategic alliance literature (Walter et al., 2015, Pertusa-Ortega et al., 2010, Murray and Kotabe, 2005). The thesis findings clarify and expand the current understanding surrounding the use of formalization routines to manage cooperative tensions and forwards where formalization is actually highly beneficial and where it hurts.

When it comes to the performance outcomes, contributions from this thesis expand the knowledge that is specific to the areas of firm-specific strategic resources and capabilities that are capable to benefit firms at the firm-level from their involvement in cooperation relationships. Extant literature discusses about numerous performance benefits that firms can gain from cooperation, and these benefits were further explained in the form of value creation and value appropriation (Li et al., 2011, Bengtsson and Raza-Ullah, 2016, Park et al., 2014b, Santos, 2021). Previous studies also discuss about the importance of various resources, skills, capabilities, governance, and formal and informal appropriation mechanisms to enable cooperators to enhance performance benefits (Ritala and Hurmelinna-Laukkanen, 2013, Bouncken et al., 2016a, Gnyawali and Charleton, 2018, Bicen et al., 2021). However, as much as the existing knowledge offers a greater understanding over the potential benefits as well as the importance of capabilities and mechanisms for cooperators, it overlooks at the role of firm-specific resources and capabilities that firms could utilize to attain specific performance benefits. It is important to develop knowledge about the internal side of a cooperator given that engaging in

coopetition is a firm-specific decision (Bonel and Rocco, 2007, Dowling et al., 1996, Luo, 2007a, Hoffmann et al., 2018), and that firms tend to assess or review their resources and capabilities when they engage in collaborations (Paulraj, 2011, Anderson et al., 2009) to make appropriate use of those resources and capabilities to benefit them from the relationships. Accordingly, the findings associated to the third research paper of this thesis, i.e., *'performance effects of organizational resources and capabilities within horizontal cooperative relationships'*, contribute to address the specific knowledge gaps associated to competitor's firm-specific strategic resources and capabilities while advancing our understanding about internal side of coopetitors.

## **6.4 Contributions to knowledge**

### **6.4.1. Research paper – I: The architecture of coopetition: strategic intent, ambidextrous managers, and knowledge sharing**

A combination of resource-based view and dynamic capabilities theory were found to be appropriate theories to underpin the variables utilized in this paper – strategic intent, ambidextrous managers, knowledge sharing, and coopetition. A combination of these theories from strategic management discipline and the coopetition-specific literature from operations management and strategic alliance research were utilised to develop the hypotheses of this paper. Therefore, it validates the importance of these theoretical anchors from strategic management discipline to advance the arguments for coopetition research. Integration of these theoretical anchors with coopetition literature is a forward step to advance the calls from operations management studies about the importance of cross-sectional knowledge advancement between operations management and strategic management (Hitt, 2011, Weele and Raaij, 2014).

This research paper is the first to validate an underlying empirical connection between strategic intent and coopetition and also to adapt the variables of strategic intent

and ambidextrous managers into the coopetition literature. This research paper answered four objectives. *First objective* is to investigate the potential relationship between a firm's 'strategic intent' and its 'manager's ambidexterity', and how 'knowledge sharing' could moderate the relationship. The results associated to this objective bring empirical evidence to the debates on the importance of a firm's strategic intent to guide the firm's ambidextrous managers (O'Reilly III and Tushman, 2011, O'Shannassy, 2016). Additionally, this finding also advances the knowledge on the importance of active knowledge sharing routines to complement the firms' strategic intents in strategic relationships in order to maintain congruence between the strategic intent of the both the partners and thus to offer better assistance to their ambidextrous managers. Knowledge sharing is often an overlooked variable when discussing about strategic intent in strategic alliances. However, this finding advances knowledge by highlighting on the importance of maintaining knowledge routines for firms that pursue strong strategic intent to better assist managers with their ambidextrous activities of exploration and exploitation within the relationship. *The second objective* is about investigating the potential relationship between a firm's 'strategic intent' and 'coopetition', and how 'knowledge sharing' could moderate the relationship. The results associated to this objective not only adds empirical evidence on the importance of strategic intent that could guide firms to pursue coopetition (Luo, 2007a) but importantly contributes to the extant literature on the significance of knowledge routines in order to complement a firm's strategic intent to direct its objectives of simultaneously cooperating and competing on specific areas/functions in its relationship with a competitor partner. *The third objective* is about studying the relationship between manager's ambidexterity and coopetition. The finding associated to this objective is the first in the coopetition literature to discuss about the significance for firms to have managers that can effectively pursue both explorative and exploitative activities simultaneously to assist their firms to pursue simultaneous cooperation and competition. This empirical finding forwards a possible

direct association between exploration and exploitation skills of manager's ambidexterity with cooperation and competition of coopetition, and thus offers support to the recent theory building efforts such as Yousef et al. (2020) in that direction. *The fourth objective* is to study the moderated mediation effect of knowledge sharing and ambidexterity between strategic intent and coopetition. This finding advances the knowledge in extant coopetition research by forwarding three key variables of strategic intent, ambidextrous managers, and knowledge sharing, and the interplay between these three variables as an essential requirement for firms that aim to pursue a successful coopetition relationship. This result could be a valuable knowledge addition for firms that involve in other forms of strategic alliances also.

#### **6.4.2. Research paper – II: Key tensions in coopetitive relationships: The contingent role of formalization**

A combination of resource dependency theory and transaction cost theories were found to be appropriate theories to underpin the variables utilized in this paper – coopetition, focal firm dependence, partner firm dependence, formalization, and partner's opportunism. A combination of these management theories and the coopetition-specific literature from operations management and strategic alliance research were utilised to develop the hypotheses of this paper.

This research paper validates an underlying empirical connection between coopetition and two different types of coopetitive tensions such as interdependence and opportunism within a single conceptual model. This research paper answered four objectives. *The first objective* is about studying the effects between 'coopetition and interdependence', 'coopetition and opportunism', and 'interdependence and opportunism'. The results associated to this objective clarifies the popular belief that coopetition could directly lead to partner opportunism (Hoffmann et al., 2018, Tidström, 2014, Fernandez et al., 2014, Jakobsen, 2020). More specifically, this finding not only validates the



assumptions that coopetition could lead to multiple tensions but importantly forwards the underlying associations between the different tensions. This sets up a new precedence when it comes to the current understanding of viewing interdependence and opportunism as separate standalone tensions that do not appear to have inherent association between them (Tidström, 2014). *The second objective* is about studying the moderating effects of ‘formalization’ on the relationships between ‘coopetition and interdependence’ as well as ‘coopetition and opportunism’. The use of formalization has been subject to debate in extant literature in that some scholars argue that it could assist to reduce tensions (Peng and Bourne, 2009, Murray and Kotabe, 2005, Walter et al., 2015) while others oppose such a belief (Pertusa-Ortega et al., 2010, Paswan et al., 2017). Within the context of interfirm coopetition, the findings of this objective add to the current knowledge that formalization is not advantageous to address all tension types but it has variable effects on the tensions. In this study’s case, formalization is beneficial to strengthen interdependencies but it also increases opportunism. *The third objective* is about investigating the mediating role of interdependence between coopetition and opportunism. The finding of this objectives adds to the knowledge that interdependence will not mediate between coopetition and opportunism and therefore clarifies the confusing and ambiguous arguments from extant coopetition research. *The fourth objective* is about investigating the moderated mediation effect of formalization and interdependence between coopetition and opportunism. Given that formalization is utilized as a moderating variable and interdependence as a mediating variable between coopetition and opportunism in this conceptual model, it alluded a possible moderated mediation effect. The finding of this objective significantly advances the current understating over the use of formalized routines in strategic alliances and coopetition in particular. The result of this objective clarifies to the current knowledge on the varying effects of formalization on multiple tensions of interdependence and

opportunism in that on one hand it enhances interdependence but simultaneously it also increases opportunism.

#### **6.4.3. Research paper – III: Performance effects of organizational resources and capabilities within horizontal cooperative relationships**

A combination of resource-based view and dynamic capabilities theory were found to be appropriate theories to underpin the variables utilized in this paper – entrepreneurial orientation, strategic intent, potential absorptive capacity, incremental innovation, radical innovation, and operational performance. A combination of the management theories of resource-based view and the dynamic capabilities and the cooperation-specific literature from operations management and strategic alliance research were utilised to develop the hypotheses for this research paper.

This research paper is the first to empirically validate the linkages between strategic intent and performance benefits of innovation as well as operational performance; besides, this paper also is the first to address the linkage between entrepreneurial orientation and operational as well as innovation performance in the context of cooperation relationships. This research paper answered two sub-research questions/objectives. *The first objective* is to study the effects of a firm's entrepreneurial orientation (EO), potential absorptive capacity (PAC) and strategic intent (SI) on the firm's innovation and operational performance within cooperation. The findings contribute to advance the knowledge associated to the significance of resources (in our case EO) and capabilities (in our case SI and PAC) for strategic alliances to generate performance outcomes. These resources and capabilities are recognised to be strategic (Covin et al., 2006, Luo, 2007a, Ritala and Hurmelinna - Laukkanen, 2013, Chavez et al., 2017) and therefore they can be viewed as more suitable for firms that pursue strategic alliances such as cooperation given the nature of it being an aggressive and a risky venture. Accordingly, the results empirically validate the assumptions and further advance the knowledge on the importance of strategic

resources and capabilities for cocompetitors to gain performance benefits from their engagement in cocompetition relationships. *The second objective* is to investigate the moderating effects of PAC and SI between the EO and performance relationship. This finding challenges the common belief that complementarity between multiple strategic resources and capabilities is beneficial for firms in strategic alliances (Schreiner et al., 2009, Li et al., 2011, Bouncken et al., 2015). In contrary, the findings of this objective adds to the knowledge that such a complementary will not necessarily enhance performance benefits for firms in cocompetition relationships. Furthermore, this specific objective adds in cocompetition context that too much use of aggressive resources and capabilities is not too good for cocompetitors as they would perceive one firm to be too hostile for another within the complex cocompetition relationships and which likely impact their performance adversely.

## **6.2. Implications for managers**

Cooperation relationships generally involve complex managerial challenges particularly due to the presence of simultaneity of cooperation and competition within the same relationship. To advance managers understanding on cocompetition relationships, the finding of the thesis offer several important inputs to managers on three important areas of interfirm cocompetition relationships – antecedents, tensions, and performance benefits. Moreover, the results in particular assist to enhance managers' understanding on several important variables in regard to these three areas.

The results of the first paper advance managers' understanding on the importance of strategic intent that can set up direction for the firms to pursue strategic relationships such as collaborations with competitors, thus, it essentially confirms the strategic intent to be the first trigger point from where the process to build cocompetition relationship begins. In regard to it, the results further highlight the significance for managers to develop and possess ambidextrous skills of exploration and exploitation to manage the simultaneity of cooperation and competition involved in cocompetition. Results suggest managers that

ambidextrous managers who can simultaneously explore and exploit the opportunities or activities will be able to manage simultaneous cooperation and competition. Alternatively, the results associated to the first paper also urge managers to ensure high-levels of knowledge sharing routines between the partners. This is to ensure that firms are aware of each other's intent within the same strategic relationship and by sharing knowledge they would be able to better align their intents. Therefore, with the explanations on the importance of strategic intent, ambidextrous skills, and knowledge sharing routines for competition relationships, the results advance managers understanding on these variables to be an essential criteria that managers need to ensure in order to pursue successful competition engagements.

As for the second research paper, the findings advance managers knowledge associated to the tensions in competition relationships. The results suggest managers that their firms involvement in competition relationships alone will not lead their partner firms to behave opportunistically but it is the implementation of high-levels/intensity of formalization routines with strict rules and policies to monitor their relationship likely influence their partner to act opportunistically. However, this finding also cautions managers to not to completely avoid formalization routines due to it being a factor that leads to partner's opportunism since the results also indicate managers that formalization is useful to strengthen interdependence between the partner firms. Overall, the findings advise managers that competition will not directly lead to opportunism but the presence of strong formalization routines and a strong interdependence between firms lead to opportunism. Alternatively, it could also mean that managers may need to adapt a combination of mechanisms rather than formalization alone to both strengthen the interdependence and concurrently reduce partner's opportunism within their competition relationships. This result can be applicable to managers of not only competition relationships but also other forms of strategic alliances.

As for the third research paper, the results advance managers knowledge on the significance of firms' strategic resources and capabilities. It suggests managers that coopetitor firms tend to pursue high levels of entrepreneurial orientation which operates as a strategic resource besides the strategic capabilities of absorptive capacity and strategic intent. The use of these resources and capabilities independently (i.e., without complementing each other) are proved to offer performance benefits for firms as these capabilities consistently focus on achieving ambitious goals and acquiring necessary new knowledge and information for the firms. Therefore, managers need to appropriately put them to use based on their firms surrounding environment and needs to attain performance benefits from these resources and capabilities. The results advise managers that although the strategic resources and capabilities on their own offer performance benefits, using them as complementaries to each other make their firm to be perceived by their partners as too aggressive and hostile. This will limit not only the relationship's advancement but also potential performance benefits.

### **6.3. Limitations and future research directions**

Notwithstanding the contributions that the three research papers make, several common limitations must be acknowledged. First common limitation – the data for all three studies are collected from one firm of each interfirm coopetition relationship as collecting data from both the firms of each coopetition dyad did not materialize. This, however, is a common problem in studies that focus on interfirm relationships (Robson et al., 2019). Therefore, this limitation may have certain influence on the generalizability of the results achieved in each of the three research papers. Second common limitation – existing scales from established studies are utilized to measure the constructs utilized in the three research papers. However, adapting and utilizing existing scales from established studies is a common norm across the business and management academic research (Meredith, 1998). Third common limitation – the sample used for the three studies represent varied industries

and a relatively a large geography, therefore, this may become a limitation for generalization of the results to very specific industry or narrower geography. Fourth common limitation – this thesis did not specifically present endogeneity related analysis (e.g. two stage least square) for each of the research papers. It is not possible to statistically completely resolve endogeneity related concerns in regression models due to many potential exogenous variables of concern is not measured (Roberts and Whited, 2013, Ketokivi and McIntosh, 2017). Although the theoretical constructs, particularly the independent and dependent variables, utilised in the three models and their purpose differ significantly from one another, the endogeneity concerns cannot be ruled out. For example, in the research paper I, strategic intent and manager's ambidexterity are the independent variables which also happen to be firm-level variables whereas the dependent variable of cooperation is a relational-level variable. The potential endogeneity problem could occur for this model due to two aspects. One, although strategic intent is a key factor that could trigger a firm's decision to engage in cooperation but there may be other unobservable factors that could influence the firm's decision to pursue cooperation. Second is reverse causality - the changes that take place within cooperation due to simultaneous cooperation and competition could influence a firm to make changes to its strategic intent. However, it can be unusual to assume that cooperation could lead to changes in a firm's strategic intent and consequently establishes a reverse causality; as this model from research paper I theorizes that strategic intent could lead to cooperation but does not argue about the after effects of pursuing cooperation in order to explain how cooperation could cause changes to the strategic intent.

As for the research paper I, by showing the materialization of the relationship between strategic intent and cooperation through the intervening variables of knowledge sharing routines and ambidextrous managers, the study addresses existing knowledge gaps about the potential relationship between strategic intent and cooperation/strategic alliances

(Luo, 2007a, Mariadoss et al., 2014, Gnyawali and Charleton, 2018). As much as the findings of this research paper address the existing knowledge gaps, the result associated to this paper can create opportunities for future studies to explore more combinations of interplay of antecedents and how they are connected to the coopetition construct. For instance, previous studies discuss numerous antecedents and further categorises them in terms of internal, external, and relational antecedents as motives for firms to engage in coopetition relationships (Bengtsson and Raza-Ullah, 2016, Raza-Ullah et al., 2014). The variables employed in this paper are mostly internal (firm-specific) except for the knowledge sharing routines, which indicate how interplay of key internal antecedents drive firms to pursue coopetition. Similarly, future studies may investigate how different combinations of external antecedents such as market dynamics or technology dynamics or industry structure as the intervening variables on the one end, and relational antecedents such as relational investments and ambidextrous governance mechanism (relational and contractual) as the moderators or mediators on the other end. The results of such investigations can assist to develop a greater understanding on the importance of interplay of various groups of antecedents (internal or external or relational) in leading firms to engage in coopetition or other forms of strategic relationships. Therefore, these specific areas of research could be useful avenues to explore for future studies to make useful contributions to the knowledge pertained to coopetition antecedents.

As for the research paper II, by showing that interdependence positively mediates between coopetition and opportunism when formalization moderates between coopetition and interdependence as well as coopetition and opportunism, this result addresses the knowledge gaps on the potential relationships between coopetition and the two specific tensions (Tidström, 2014, Hoffmann et al., 2018). Although this result advances knowledge pertained to two specific coopetition tensions, it presents opportunities to advance our understanding over various types of other coopetitive tensions and tension management

mechanisms discussed in extant literature. For instance, tensions associated to knowledge sharing vs knowledge protection and value-creation vs value-appropriation (Tsai, 2002, Bouncken and Kraus, 2013, Chiambaretto et al., 2019, Gnyawali and Song, 2016, Bengtsson and Raza-Ullah, 2016) and managing these tensions utilizing various combinations of a formal and informal mechanisms and appropriability regimes (Ritala and Hurmelinna-Laukkanen, 2013, Bouncken et al., 2016a) could not only advance knowledge but offer empirical clarity on the continuously evolving discussions pertained to coopetition tensions literature. Future studies may also focus on advancing the use of coopetition capability (Bengtsson et al., 2016b) as a tension management mechanism as against the traditional mechanisms (for instance, contractual and relational) to explicate its role in managing various cooperative tensions. Additionally, another area to advance coopetition tension literature is to study coopetition capability as a complementarity mechanism to other forms of tension management mechanisms as highlighted above so as to understand which combinations of governance mechanisms would do well when it comes to managing different types of tensions in coopetition as well as other forms of paradoxical relationships.

When it comes to the research paper III, entrepreneurial orientation as a strategic resource and potential absorptive capacity and strategic intent as strategic capabilities are found to be useful for firms when they are utilized independently instead of utilized as complementarities. Although the current findings clarify and contribute to the current state of discussions surrounding these variables (Hamel et al., 1989, Patel et al., 2015, Jiang et al., 2016, Li et al., 2017); future studies can explore more characteristics of resources and capabilities of competitors to investigate their role in benefiting the firms from coopetition relationships. For instance, studying strategic orientation, market orientation, technology orientation (Venkatraman, 1989) and other internal capabilities of competitors can be potential areas to explore their effects on firms performance within coopetition



relationships. These can advance the knowledge in the much-neglected area of cooptitors firm-specific resources and capabilities and their potential complementarities. Besides, this study addresses only the firm-level performance benefits utilizing firm-specific resource and capabilities; thus, it offers little understanding over the relational-level performance benefits as a result of firms' use of these capabilities. Therefore, future research may consider addressing knowledge gaps in this direction. Overall, pursuing future research in these directions advances not only the current knowledge and ongoing discussions but also addresses consistent calls from the extant research on pursuing cross-sectional investigations between operations management discipline and entrepreneurship as well as strategic management disciplines (Kickul et al., 2011, Hitt, 2011, Sahi et al., 2019, Weele and Raaij, 2014).

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## Appendices

### Appendix A – Research survey instrument

Welcome to the survey about coopetition relationships. This survey is aimed at studying ‘coopetition’ relationships, i.e., cooperating and competing at the same time with a partner firm. Your responses will help us to understand the key motivations for coopetition, anticipated tensions and methods to manage them, and the outcomes of such relationships.

The survey should take not more than 20 minutes of your time. The questions in this survey do not ask you to reveal any personally identifying information such as your name, your company name etc. Once the survey data is collected from over 200 respondents, we perform statistical analysis to document and present only group results, not individual answers. Participation is strictly voluntary, and you may refuse to participate at any time. Your responses are completely anonymous and all answers you provide will be kept in the strictest confidentiality.

Thank you in advance for your time. If you have any questions about the survey or the approach in general, please contact the research project team for more information: [chandrasekararao.seepana@manchester.ac.uk](mailto:chandrasekararao.seepana@manchester.ac.uk) or [fahian.huq@manchester.ac.uk](mailto:fahian.huq@manchester.ac.uk) or [antony.paulraj@manchester.ac.uk](mailto:antony.paulraj@manchester.ac.uk).

We use a third-party survey tool, Qualtrics, to collect the data for this research project. You may refer to the information on Qualtrics privacy policy: <https://www.qualtrics.com/privacy-statement/>

### Screening Question

Does your firm cooperate and compete at the same time with a competitor firm or a firm that has similar product/service offering and similar target market?

No  
Yes

Condition: No - Survey aborts Is Selected. Skip To: End of Block.

### Firms Qualification Criteria

The following questions will give you an opportunity to tell us more about your background, your firm, and about your partner firm.

Q1. Which statement best describes your current employment status?

Full time employed  
Part-time employed



Unemployed  
Retired  
Disabled  
Other  
Prefer not to answer

Condition: Full time employed Is Not Selected. Skip To: End of Block.

Q2. In which country your firm is located?

Canada  
Ireland  
Netherlands  
United Kingdom  
United States of America

Q3. Please select from the list below your firm main industry.

Engineering  
Pharmaceuticals  
R & D  
Machinery  
Automobile/Automotive  
Information and communication technology  
Consumer electronics  
None of the above

Condition: None of the above Is Selected. Skip To: End of Block

Q4. Which from the below list best describes your designation/job title at your company?

R&D Manager  
Product Manager  
Alliance Manager  
General manager-Alliance  
Managing director-Alliance  
Vice president-Alliance  
CEO/CFO/COO/CTO  
Sales representative  
Administrator

Condition: Sales representative Is Selected. Skip To: End of Block.

Condition: Administrator Is Selected. Skip To: End of Block.

Q5. How long have you been in your current position? (in years)

Less than 6 months  
6 months to 1 year  
1 - 2 years  
2 - 5 years

5 - 10 years  
10 - 20 years  
More than 20 years

Condition: Less than 6 months Is Selected. Skip To: End of Block.  
Condition: 6 months to 1 year Is Selected. Skip To: End of Block.  
Condition: 1 - 2 years Is Selected. Skip To: End of Block

Q6. How many people are employed at your company?

< 10  
11-50  
51-250  
251-1000  
> 1001

Condition: < 10 Is Selected. Skip To: End of Block.  
Condition: 11-50 Is Selected. Skip To: End of Block.

Q7. How long has your company been in this business? (in years)

1 - 5 years  
5 - 10 years  
10 - 20 years  
20 + years

Q8. What is the annual revenue for your company last year?

Less than 2 million EUR  
2-10 million EUR  
10-50 million EUR  
more than 50 million EUR

Condition: Less than 2 million EUR Is Selected. Skip To: End of Block.  
Condition: Less than 2-10 million EUR Is Selected. Skip To: End of Block.

Q9. How many people are employed at your partner company?

< 10  
11-50  
51-250  
251-1000  
> 1001

Q10. What is the length of the relationship with your partner? (In years)

\_\_\_\_\_

Q11. Relative share of R&D expenditure to total sales/revenue of your firm in the last year? (Please give us a PERCENT '%' figure)

\_\_\_\_\_

Please answer the following questions keeping your horizontal competitor partner in mind [Horizontal competitor partner examples – Sony and Samsung, Airbus and Bombardier, Apple and Google]

Q12. Please estimate the following

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
The amount of R&D collaboration with your partner firm							
The amount of new product development with your partner firm							
The amount of technology development with your partner firm							

Q13. Do your firm and partner firm have common supplier base?

No  
Yes

## Variables

### Coopetition

#### Cooperation

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
No matter who is at fault, problems are joint responsibilities.							
Both firms are willing to make cooperative changes.							
Both firms work together to achieve a common goal.							
Both parties are concerned about the other's profitability.							
One party will not take advantage of a strong bargaining position.							

#### Competition

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
We have the same suppliers as our partner.							
We are in the same product market as the partner.							
We have a product line very similar to the partner's.							
We need the same type of knowledge related to new product or process development as the partner's.							

### Knowledge sharing

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Both firms have set up rules for regular information sharing activities.							
Both firms have established norms and procedures for sharing information.							
Both firms regularly assign budgets to encourage knowledge and information sharing.							

### Formalization

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
We and our partner have written documents that spell out detailed tasks, activities and schedules for this relationship.							
We and our partner use very detailed standard operating procedures (e.g., rules, policies, forms, etc.) for this relationship.							
We and our partner have a shared formal understanding based on specific terms and conditions for this relationship.							

## Interdependence

### Focal firm dependence

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Our firm is dependent on our partner.							
It would be difficult to replace our partner.							
It would be costly to lose our partner.							

### Partner firm dependence

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Our partner is dependent on us.							
Our partner would find it difficult to replace us.							
It would be costly for our partner to lose us.							

## Strategic intent

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Is strategically aggressive?							
Seeks competitive dominance?							
Focuses on ambitious strategic targets and goals?							
Focuses attention of winning in the market place?							

## Partner's Opportunism

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
This partner sometimes lies about certain things in order to protect its interests.							
This partner often fails to deliver promises, as described in the							

contract, for its own interests.							
This partner sometimes breaches informal agreements between our companies to maximize its own benefits.							
This partner sometimes uses unexpected events to extract concessions from our firm.							

### Manager's ambidexterity

#### Manager's exploration

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Searching for new possibilities with respect to products/services, processes or markets.							
Focusing on strong renewal of products/services or processes.							
Activities requiring quite some adaptability of you.							
Activities requiring you to learn new skills or knowledge.							

#### Manager's exploitation

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
Activities of which a lot of experience has been accumulated by yourself.							
Activities which serve existing (internal) customers with existing services/products.							
Activities of which it is clear to you how to conduct them.							
Activities which you can properly conduct by using your present knowledge.							
Activities which clearly fit into existing company policy.							

### Entrepreneurial orientation

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
A strong emphasis on R&D, technological leadership, and innovation.							
A strong tendency for high-risk projects which have a chance of very high returns.							
A tendency to initiate actions that competitors respond to.							
A tendency to be a leader, always introducing new products, service or technology first.							
A tendency to adopt a competitive 'undo-the-competitors' posture.							

### Potential absorptive capacity

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
We can identify and quickly acquire the information we need.							
We try to acquire new information in our company as soon as it is available.							
We constantly try to increase the number of our information sources.							
We have invested heavily in acquiring new information.							

### Operational performance

Item	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
This relationship resulted in 'reduced costs'.							
This relationship resulted in 'increased efficiency'.							

This relationship resulted in 'increased reliability'.							
This relationship resulted in 'increased repeatability'.							
This relationship resulted in 'increased quality'.							
This relationship resulted in 'increased flexibility'.							

## Innovation performance

### Incremental innovation

Item	No such benefits	less benefits	Somewhat less benefits	Neutral	Somewhat benefits	High benefits	Very high benefits
Improving current products/services.							
Percentage of total sales from improved current products/services is up substantially.							
Percentage of improved current products/services in the product range is significantly higher compared to the competitors.							

### Radical innovation

Item	No such benefits	less benefits	Somewhat less benefits	Neutral	Somewhat benefits	High benefits	Very high benefits
Creating completely new products/services.							
Percentage of total sales from completely new products/services is up substantially.							
Percentage of completely new products/services in the product range is significantly higher compared to the competitors.							



## Appendix B – Measures and CFA Analysis

<b>Strategic intent</b> ( $\alpha = 0.857$ ; AVE = 0.60; CR = 0.86)	Loadings
Is strategically aggressive?	0.734
Seeks competitive dominance?	0.802
Focuses on ambitious strategic targets and goals?	0.822
Focuses attention of winning in the market place?	0.747
<b>Knowledge sharing</b> ( $\alpha = 0.806$ ; AVE = 0.58; CR = 0.81)	
Both firms have set up rules for regular information sharing activities.	0.764
Both firms have established norms and procedures for sharing information.	0.793
Both firms regularly assign budgets to encourage knowledge and information sharing.	0.734
<b>Manager Exploration</b> ( $\alpha = 0.768$ ; AVE = 0.52; CR = 0.76)	
Searching for new possibilities with respect to products/services, processes or markets*.	
Focusing on strong renewal of products/services or processes.	0.790
Activities requiring quite some adaptability of you.	0.714
Activities requiring you to learn new skills or knowledge.	0.651
<b>Manager Exploitation</b> ( $\alpha = 0.836$ ; AVE = 0.57; CR = 0.84)	
Activities of which a lot of experience has been accumulated by yourself*.	
Activities which serve existing (internal) customers with existing services/products.	0.682
Activities of which it is clear to you how to conduct them.	0.815
Activities which you can properly conduct by using your present knowledge.	0.749
Activities which clearly fit into existing company policy.	0.759
<b>Cooperation</b> ( $\alpha = 0.743$ ; AVE = 0.50; CR = 0.75)	
No matter who is at fault, problems are joint responsibilities*.	
Both firms are willing to make cooperative changes.	0.726
Both firms work together to achieve a common goal.	0.738
Both parties are concerned about the other's profitability.	0.653
One party will not take advantage of a strong bargaining position*.	
<b>Competition</b> ( $\alpha = 0.780$ ; AVE = 0.54; CR = 0.78)	
We have the same suppliers as our partner*.	
We are in the same product market as the partner.	0.705
We have a product line very similar to the partner's.	0.761
We need the same type of knowledge related to new product or process development as the partner's.	0.742

\*Items deleted due to having not met the psychometric requirements.

## Appendix C – Measures and CFA analysis

	Loadings
<b>Coopetition</b>	
Cooperation ( $\alpha = 0.743$ ; AVE = 0.50; CR = 0.75)	
No matter who is at fault, problems are joint responsibilities*.	
Both firms are willing to make cooperative changes.	0.716
Both firms work together to achieve a common goal.	0.737
Both parties are concerned about the other's profitability.	0.662
One party will not take advantage of a strong bargaining position*.	
Competition ( $\alpha = 0.780$ ; AVE = 0.55; CR = 0.78)	
We have the same suppliers as our partner*.	
We are in the same product market as the partner.	0.727
We have a product line very similar to the partner's.	0.779
We need the same type of knowledge related to new product or process development as the partner's.	0.715
<b>Interdependence</b>	
Focal Dependence ( $\alpha = 0.722$ ; AVE = 0.50; CR = 0.75)	
Our firm is dependent on our partner.	0.568
It would be difficult to replace our partner.	0.804
It would be costly to lose our partner.	0.732
Partner Dependence ( $\alpha = 0.784$ ; AVE = 0.56; CR = 0.79)	
Our partner is dependent on us.	0.625
Our partner would find it difficult to replace us.	0.803
It would be costly for our partner to lose us.	0.807
<b>Formalization</b> ( $\alpha = 0.819$ ; AVE = 0.60; CR = 0.82)	
We and our partner have written documents that spell out detailed tasks, activities and schedules for this relationship.	0.775
We and our partner use very detailed standard operating procedures (e.g., rules, policies, forms, etc.) for this relationship.	0.773
We and our partner have a shared formal understanding based on specific terms and conditions for this relationship.	0.780
<b>Partner's Opportunism</b> ( $\alpha = 0.939$ ; AVE = 0.80; CR = 0.94)	
This partner sometimes lies about certain things in order to protect its interests.	0.840
This partner often fails to deliver promises, as described in the contract, for its own interests.	0.883
This partner sometimes breaches informal agreements between our companies to maximize its own benefits.	0.924
This partner sometimes uses unexpected events to extract concessions from our firm.	0.920

\*Items deleted due to having not met the psychometric requirements.

## Appendix D – Measures and CFA analysis

<b>Entrepreneurial orientation</b> ( $\alpha = 0.804$ ; $\Omega = 0.806$ ; AVE = 0.52; CR = 0.81)	Loadings
A strong emphasis on R&D, technological leadership, and innovation.	0.669
A strong tendency for high-risk projects which have a chance of very high returns*.	
A tendency to initiate actions that competitors respond to.	0.730
A tendency to be a leader, always introducing new products, service or technology first.	0.819
A tendency to adopt a competitive ‘undo-the-competitors’ posture.	0.647
<b>Potential absorptive capacity</b> ( $\alpha = 0.788$ ; $\Omega = 0.792$ ; AVE = 0.56; CR = 0.79)	
We can identify and quickly acquire the information we need*.	
We try to acquire new information in our company as soon as it is available.	0.690
We constantly try to increase the number of our information sources.	0.749
We have invested heavily in acquiring new information.	0.808
<b>Strategic intent</b> ( $\alpha = 0.857$ ; $\Omega = 0.860$ ; AVE = 0.61; CR = 0.86)	
Is strategically aggressive.	0.748
Seeks competitive dominance.	0.828
Focuses on ambitious strategic targets and goals.	0.799
Focuses attention of winning in the market place.	0.734
<b>Incremental innovation</b> ( $\alpha = 0.848$ ; $\Omega = 0.849$ ; AVE = 0.65; CR = 0.85)	
Estimate the extent of the following benefits this relationship has brought to ‘your company’ in the past 3-5 years ...	
Improving current products/services/processes.	0.820
Percentage of total sales from improved current products/services is up substantially.	0.795
Percentage of improved current products/services in the product range is significantly higher compared to the competitors.	0.803
<b>Radical innovation</b> ( $\alpha = 0.795$ ; $\Omega = 0.796$ ; AVE = 0.56; CR = 0.79)	
Estimate the extent of the following benefits this relationship has brought to ‘your company’ in the past 3-5 years ...	
Creating completely new products/services/processes.	0.711
Percentage of total sales from completely new products/services is up substantially.	0.786
Percentage of completely new products/services in the product range is significantly higher compared to the competitors	0.754
<b>Operational outcomes</b> ( $\alpha = 0.849$ ; $\Omega = 0.850$ ; AVE = 0.54; CR = 0.85)	
This relationship has resulted in ...	
Reduced costs.	0.645
Increased efficiency.	0.772
Increased reliability.	0.837
Increased repeatability.	0.701
Increased quality*.	
Increased flexibility.	0.711

\*Items deleted due to having not met the psychometric requirements.