Coping with Interpartner Uncertainty in Interorganizational Interactions

Angelos Kostis
To my family
Acknowledgements

My PhD journey started almost five years ago. And what a journey it was. Some say that receiving a PhD is about getting a driving license for doing research. I agree. Yet, I am wondering. Is it merely a driving license for research? I doubt it. During this journey, several different people made me realize that doctoral education is not just about learning how to conduct a literature review, collect data, write papers, and publish. I was privileged to be surrounded by people, who believed in me and supported me in the process of completing this thesis, but also in the process of identifying parts of myself I wasn’t aware of. While writing a thesis involves lonely days and nights reading prior literature and scrutinizing research ideas, the people I met at USBE provided me with great help and support, from day one. I am grateful to the whole organization for giving me the opportunity to further develop myself, both professionally and personally.

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Abstract

Interorganizational relationships are uncertain endeavors. By engaging in such relationships, organizations become vulnerable to their partner’s behavior and their success is contingent on the partner’s willingness and ability to fulfill its promises. Despite the plethora of benefits provided by interorganizational relationships, organizations face difficulty in understanding and anticipating each other’s future behavior, in aligning their views and expectations, and in predicting the potentialities of their interactions due to the influence of the broader relational context. This difficulty stems from incomplete knowledge about the intentions of the partner and it is particularly salient within coopetitive interorganizational relationships, i.e., relationships involving the simultaneous pursuit of cooperation and competition, as the partners have only partially convergent interests. Whereas prior research has focused on how firms can manage calculable risks through static governance mechanisms, little is known about the underlying processes of how firms cope with interpartner uncertainty. In this thesis, I address the following purpose: to advance the understanding of the processes through which firms cope with interpartner uncertainty in interorganizational interactions.

The purpose is addressed through five research papers, which build on each other and synergistically shed light on different processes through which organizations cope with interpartner uncertainty along the course of their interactions. With an inductive approach, this thesis mainly draws on a qualitative case study of interorganizational interactions in the robotics and automation industry in Sweden. In addition, two literature reviews and a quantitative study supported the fulfilment of the overall purpose. The findings of this thesis establish that three possible means of coping with interpartner uncertainty in interorganizational interactions are the adoption of both trust and distrust as organizing principles, reliance on hybrid interpretive schemes as forward-looking lenses and the use of digital artifacts as boundary objects. In addition, I provide answers about how each of these means of coping supports organizations to cope with interpartner uncertainty by influencing their interaction dynamics. Building upon these findings, I argue that the process of coping with interpartner uncertainty has three distinct, yet interrelated dimensions, namely managerial cognition, relationality and materiality. The thesis concludes by outlining the main theoretical contributions to the bodies of literature on uncertainty in interorganizational relationships, interorganizational trust, and coopetition. Finally, managerial implications are also outlined.
1. Introduction

“Action is undertaken in the present with an eye to the future”
(Tsoukas & Shepherd, 2004, p. 139)

A traditional way to begin this thesis would be to highlight that the boundaries between firms are rapidly blurring within the contemporary business landscape. Following this notion, one would argue that interorganizational relationships have mushroomed over the last decades and have become an important vehicle for firms to deal with various challenges triggered by today’s constantly changing and volatile business environment. This overused argument would, however, limit the agenda of this thesis and place emphasis solely on the bright side of interorganizational relationships and on the understanding of interorganizational interactions based upon the notion of actuality—i.e., focusing on existing conditions as shaped by actions taken in the past. Indeed, a focus on actuality would imply a “backward looking” approach (Gavetti, Greve, Levinthal, & Ocasio, 2012, p. 26), which may allow firms to have deeper appreciation of what shapes the present circumstances drawing upon historical events. The inherently unstable nature of interorganizational relationships (Das & Teng, 2000), however, would be discussed merely based on how firms deal with the past and the present, and not how firms approach the potentialities of their interactions and engage with an uncertain future. Consequently, relying solely upon the actuality approach would ignore the notion of potentiality—i.e., looking at what could potentially happen in the future and how this could interact with the present.

Engagement in interorganizational relationships, to use Barringer and Harrison’s (2000) metaphor, is similar to “walking a tightrope”, because such complex arrangements entail not only a plethora of potential future benefits, but also several potential drawbacks. In other words, interorganizational relationships involve dual potentialities, meaning that firms are occupied, concurrently, with both positive and negative potentialities of their interactions. Whereas, interorganizational relationships can support firms to gain access to scarce resources, engage in learning processes, and enter new markets (Doz & Hamel, 1998), they also entail negative potentialities (Oliveira & Lumineau, 2018), as they can cause dysfunctional conflicts (Mo, Booth, & Wang, 2012), result in loss of proprietary knowledge (Gulati, 1995), and even lead to decreased financial returns (Luo, 2007). This signifies that whilst interorganizational relationships are important means for achieving demanding strategic goals (Gulati, 1998; Cropper, Ebers, Huxham, & Ring, 2008), they are also unstable (Das & Teng, 2000) and uncertain, because it is hard for firms to predict how their interactions will develop.
In this thesis, I argue that a key challenge faced by firms involved in interorganizational relationships is what I call interpartner uncertainty. That is, the difficulty firms have in aligning their views and expectations (Vlaar, Bosch, & Volberda, 2006; Weber & Mayer, 2014), in understanding and anticipating the future behavior of their partners (Das & Teng, 1999; 2001; de Man & Roijakkers, 2009) and in predicting the potentialities of their interactions due to the influence of the broader relational context. In interorganizational relationships, interpartner uncertainty has mainly been ascribed to concerns about partner opportunism, which is “behavior by a partner firm that is motivated to pursue its self-interest with deceit to achieve gains at the expense of the other alliance member” (Das & Rahman, 2010, p. 57). Such concerns become even more prevalent in interorganizational relationships involving coopetition, i.e., simultaneous presence of both cooperation and competition (Bengtsson & Kock, 2000), because the partners are at the same time competitors, and therefore, there is only partial convergence of interests (Krishnan, Martin, & Noorderhaven, 2006). Because coopetition can be highly beneficial, but at the same time catastrophic for a firm, the “double-edged sword” nature of interorganizational relationships is particularly amplified in the presence of coopetition (Bouncken & Kraus, 2013). Whereas coopetition can provide unique benefits, including improved innovativeness of the partnering firms (Gnyawali & Park, 2011; Park, Srivastava & Gnyawali, 2014), it also involves interpartner uncertainty given the high likelihood of knowledge leakage (Rouyre & Fernandez, 2019) and imitation of best practices and know-how by the partner (Fernandez, Le Roy, & Gnyawali, 2014; Ritala & Hurmelinna-Laukkonen, 2009).

The identified benefits and risks of coopetition have, nonetheless, been approached as outcomes of the relationship and not as potentialities that constantly influence the engaged firms, and the way they interact with each other. The extant coopetition literature has heavily drawn on the tension-based view on alliances and highlighted the importance of engaging with paradoxical tensions (Chen, 2008; Gnyawali, Madhavan, He, & Bengtsson, 2016; Raza-Ullah, Bengtsson, & Kock, 2014). The focus has been predominantly on actuality and on how firms manage the existing tensions triggered by the simultaneous presence of cooperation and competition (see for example Ansari, Garud, & Kumaraswamy, 2016; Fernandez & Chiambaretto, 2016; Tidström, 2014). In this thesis, the importance of this stream of research is acknowledged, yet coopetition entails not only tensions, but also the consideration of dual potentialities and high degrees of interpartner uncertainty. Whilst relationships involving coopetition have consistently been characterized as both tension-filled (LeRoy & Fernandez, 2015; Raza-Ullah, Bengtsson, & Kock, 2014) and uncertain endeavors (Dussauge, Garrette, & Mitchell, 2000; Park & Russo, 1996), emphasis has been placed mainly on the former, and less on the latter. Although several studies devoted to coopetition management have hinted at the importance of looking at how firms
deal with calculable risks (e.g., the risk of opportunistic behavior, unintended leakage of confidential information (Fernandez, Le Roy, & Gnyawali, 2014), a more systematic investigation of the uncertain nature of coopetitive relationships, and of how firms cope with interpartner uncertainty remains largely unaddressed.

Whereas outside the coopetition research stream a large body of literature has discussed how risks can be managed in interorganizational relationships, the provided explanations revolve around governance issues (Roehrich, Selviaridis, Karla, Valk, & Fang, 2019; Santoro & McGill, 2005) and formal and informal safeguards (Dyer & Singh, 1998). For instance, from a Transaction Cost Economics perspective (Williamson, 1981), Carson, Madhok, & Wu (2006) suggest that concerns about uncertainty can be mitigated if firms are able to design adequate contractual means, which can prevent misappropriation of resources (Lumineau & Quelin, 2012) and specify the partners’ obligations (Malhorta & Lumineau, 2011). In addition, governance has also been discussed from a relational perspective (Dyer & Singh, 1998), which suggests that relational norms (Cannon et al., 2000) and trust-based governance (Das & Teng, 2001; Poppo & Zenger, 2002) can alleviate interpartner uncertainty. These governance-focused studies, however, adopt a static approach on the management of uncertainty in interorganizational relationships. Their focus has been mainly on performance outcomes of governance mechanisms (see Vandaele, Rangarajan, Gemmel, & Lievens, 2007), thereby limiting our understanding of the socially embedded processes through which firms cope with interpartner uncertainty once such governance means have been adopted (for a deeper discussion on this limitation, see Sydow, Müller-Seitz, & Provan, 2013). In line with Sydow and colleagues (2013), I argue that only a few notable examples (e.g., Beckman, Haunschild, & Phillips, 2004; Latusek & Vlaar, 2018; Mitsuhashi, 2002; Moynihan, 2008) have moved beyond governance to unpack how organizational members approach the inherently uncertain future of their interactions. However, still more insights are needed into the underlying processes that organizational actors employ to cope with the unexpected and sustain and gain from their interactions. Thus, I arrive at the following purpose:

**to advance the understanding of the processes through which firms cope with interpartner uncertainty in interorganizational interactions**

To address this purpose, this paper-based thesis builds mainly upon an inductive approach where the developing findings have led to the construction of the research questions and further developed my research design that initially, was left intentionally incomplete. This will be further discussed in the methodology chapter. I now present the research questions, which were formulated on the
basis of both identified gaps in prior literature and intriguing empirical findings of my study.

1.1 Research Questions

To fulfill the above purpose, I build upon prior research discussing trust as a promising organizing principle that provides the logic by which interactions take place in the face of uncertainty (McEvily, Perrone & Zaheer, 2003). In coopetitive interorganizational relationships, trust, which is built on “confident positive expectations regarding another’s conduct” (Lewicki, McAllister, & Bies, 1998, p. 439) is required because firms are particularly concerned about how the partner will behave in the relationship and how the jointly-created value will be used by the partner. Trust can support firms to deal with negative potentialities, such as knowledge leakage, imitation of best practices, and partner opportunism, and it is “especially valuable in alliances because, in varying degrees, firms have to rely on their partners’ performance and themselves remain vulnerable to partners’ actions” (Das & Teng, 1998, p. 494). Following a similar vein, coopetition studies have underlined the importance of trust for establishing and managing cooperative relationships with competitors (Czernek & Czakon, 2016; Chin, Chan, & Lam, 2008; Dagnino & Padula, 2002; de Araujo & Franco, 2017). In coopetition, firms become vulnerable to the competitor and this is a major challenge that they need to deal with. Trust can encourage them to devote strategically important resources to collective endeavors (Stevens, MacDuffie, & Helper, 2015; Zaheer, McEvily, & Perrone, 1998) and to assist them not only in making positive interpretations of the partners’ past behaviors, but also in anticipating their future behaviors (Dirks & Ferrin, 2001), and deciding how to behave within their relationships (Das & Teng, 1998; Nikolova, Möllering, & Reihlen, 2015; Schilke & Cook, 2013). Ironically, when trust is mentioned in the existing coopetition research, it is often because calls are made for further research on this phenomenon. Yet these calls remain largely unanswered. To this end and in line with Dorn, Sweiger, and Albers (2016) and Raza-Ulla and Bengtsson (2016), I argue that the role of trust has not been systematically studied in coopetition and that more research is required on how trust works as an organizing principle in interorganizational relationships involving the simultaneous pursuit of cooperation and competition.

Despite its bright side, trust can also have undesirable and even detrimental consequences for organizations (Gargiulo & Ertug, 2006; Patzelt & Shepherd, 2008; Stevens, et al., 2015; Thorgren & Wincent, 2011). For instance, when trust is insufficient, firms can be unwilling to share important resources for realizing the goals of the relationship or underestimate the partner’s strengths and capabilities. Similarly, excessive trust can lead firms to misjudge the partner’s intentions or the nature of the relationship and, thus, create room for
opportunistic behavior (for a review, see Lumineau, 2017). In light of the
theoretical insights into the dark side of trust, I build upon an emerging stream
of literature that has begun to theorize on distrust as distinct from trust (Bijlsma-
Frankema, Sitkin, & Weibel, 2015; Dimoka, 2010; Guo, Lumineau, & Lewicki,
2017; Lewicki et al., 1998; Lumineau, 2017) and as a potential means for dealing
with uncertainty (Guo et al., 2017). In this stream of research, it is suggested that
distrust is a distinct phenomenon from trust, with different antecedents and
consequences (Lewicki et al., 1998). In addition, it is proposed that although trust
is important for developing and sustaining interorganizational relationships
(Gulati, 1995; Yoshino & Rangan, 1995; Kale & Singh, 2009), distrust may also
play an important role in situations characterized by increased uncertainty (Guo
et al., 2017; Lumineau, 2017; Saunders, Dietz, & Thornhill, 2013). Distrust, which
involves “confident negative expectations regarding another’s conduct” (Lewicki
et al., 1998, p. 439), indeed may have a beneficial side (Barber, 1983; Lewicki,
Tomlinson, & Gillespie, 2006). For instance, distrust may enable healthy
suspicion (Atkinson & Butcher, 2003), encourage firms to monitor the partner’s
behavior via systems and formal mechanisms (Simon, 1957; Malhorta &
Murnighan, 2002), facilitate prevention of partner opportunism, as well as
protect against exploitation (Levi, 2000). All these benefits of distrust can be
particularly important in coopetitive interactions, as the partner is at the same
time a competitor and can behave opportunistically. Following this notion,
distrust may also serve as an organizing principle supporting firms to cope with
interpartner uncertainty in coopetitive interorganizational relationships. Yet,
there is limited understanding of the mechanisms through which distrust works.
Thus, I argue that a deeper understanding of how firms can cope with
interpartner uncertainty can be gained if attention is paid not only to the role of
trust and processes of trusting, but also to the distinct role of distrust. Taken
together, I arrive at the following research question:

**RQ1. What are the distinct roles of trust and distrust in
coping with interpartner uncertainty in interorganizational
relationships?**

While looking at the distinct roles of trust and distrust in coping with interpartner
uncertainty can be fruitful, firms often rely on both trust and distrust
simultaneously. As Luhmann (1979, p. 83) notes, “a system of higher complexity,
which needs more trust, also needs at the same time more distrust”. This is
particularly the case in coopetition where manifestations of the dark side of trust,
such as over-reliance on the partner or unlimited sharing of the most valuable
resources of the firm, can be overly detrimental as the firm can become too
vulnerable to a competitor. While there have been theoretical arguments that
trust and distrust can coexist in the face of uncertainty due to the multifaceted
nature of social relationships and the complexity of the interactions among social
actors (Lewicki et al., 1998; Guo et al., 2017), as in coopetition, the synergies that can be derived through the interplay between trust and distrust have been overlooked. Building on this, I argue that trust could offset the dark side or augment the bright side of distrust and vice versa. Thus, a promising pathway to understand how interpartner uncertainty can be coped with in multifaceted interactions, as in interorganizational relationships involving coopetition, is to pay closer attention to the synergetic implication of trust and distrust. This leads me to formulate the following research question:

**RQ2. How do trust and distrust synergistically support firms to cope with interpartner uncertainty in interorganizational relationships?**

Further, through insights from my empirical study, and inspired by the behavioral strategy approach (Gavetti, 2012, Powell, Lovallo, & Fox, 2011) and by prior research suggesting managerial cognition as the primary influence on how firms operate and interact with others (Eggers & Kapplan, 2009; Gavetti, 2005; Nadkarni & Barr, 2008), I argue that to understand how firms can cope with interpartner uncertainty, it is important to pay attention to manager's interpretive schemes. Interpretive schemes are considered as “key tools in coping with ambiguity and uncertainty that are ever-present when interruptions occur” (Das & Kumar, 2010a, p. 19). The importance of devoting attention to the individuals’ interpretations and cognitions in coping with the challenging and uncertain nature of interorganizational interactions has also been acknowledged in the extant coopetition research (Dahl, Kock, & Lundgren-Henriksson, 2016; Gnyawali, Madhavan, He, & Bengtsson, 2016; Lundgren-Henriksson & Kock, 2016; Raza-Ullah et al., 2014). Building on this, I argue that delving into what shapes the forward-looking behavior of the firm necessitates closer examination of the individuals' cognitive processes and interpretations. Sustaining relationships marked by uncertainty requires individuals to be willing and able to keep engaging in such relationships. To this end, I construct the following research question:

**RQ3. How and what interpretive schemes support firms in coping with interpartner uncertainty in interorganizational relationships?**

Moreover, my inductive study also indicated another facet of interpartner uncertainty, which is mainly coped with through other means than trust and distrust. In particular, interviewees frequently discussed that interpartner uncertainty in their interactions is also related to problems of understanding and to misalignment of the partners’ interpretations and views. Prior research refers to this challenge as interpretive uncertainty (Weber & Mayer, 2014). The
Empirical findings also highlighted the important role of digital artifacts in the process of aligning their divergent expectations and views and I realized that digital artifacts in this context serve as boundary objects (Beckky, 2003; Carlile, 2002; Nicolini, Mengis, & Swan, 2012). Intrigued by these findings, (5) I build on the literature on boundary objects, which also suggests that the role of boundary objects is often played by digital technologies (Alin et al., 2013; Dodgson et al., 2007), which have “become inextricably intertwined with social relations to weave the fabric of organization” (Zammuto, Griffith, Majchrzak, & Diugherty, & Faraj, 2007, p. 752). In this body of research, it is highlighted that boundary objects function as both translating and integrating devices, meaning that they can serve as a means for establishing joint understanding and shared terminology among diverse parties, as well as for providing an effective interaction space for negotiating and integrating divergent views (Alin, Iorio, & Taylor, 2013; Carlile, 2004; Dodgson, Gann, & Salter, 2007). In this thesis, I argue that the use of boundary objects in the form of digital technologies can be an important means to cope with a particular facet of interpartner uncertainty (i.e., interpretive uncertainty) in interorganizational interactions and I construct the following research question:

RQ4. How do boundary objects support firms to cope with interpartner uncertainty in interorganizational relationships?

To address the research questions, I formulated above and thereby, fulfill the overall purpose, this thesis includes five research papers, which build on each other and synergistically shed light on different processes through which organizations cope with interpartner uncertainty along the course of their interactions. Below, I offer a brief description of each paper and a figure showing their foci and the research question to which each of them relates (see Figure 1).

**Paper 1:** The first paper is a literature review on trust and distrust in coopetition. This paper not only provides findings from a systematic literature review on trust and distrust in the existing literature on coopetitive interorganizational relationships, but also builds a research agenda on the distinct roles of trust and distrust in coping with interpartner uncertainty triggered by coopetition. It mainly relates to RQ1 and RQ2.

**Paper 2:** The second paper is a quantitative study that focuses on the influence of trust and distrust on the relationship between coopetition intensity and relationship performance. This paper was helpful to identify whether the theoretical argument that trust and distrust have distinct influences in interorganizational relationships can be empirically supported. It mainly relates to RQ1.
**Paper 3:** The third paper is a selective review of the literature on risks and uncertainties in interorganizational relationships involving coopetition and conceptually discusses what interpretive schemes support firms in coping with interpartner uncertainty, and how. It mainly relates to RQ3.

**Paper 4:** The fourth paper is based on an in-depth case study of the robotics and automation industry in Sweden and was conducted to get a deeper understanding of the underlying mechanisms and processes through which trust and distrust support firms to cope with and sustain uncertain interorganizational relationships. It mainly relates to RQ1 and RQ2.

**Paper 5:** This is also a qualitative paper focused on interorganizational interactions in the robotics and automation industry, where the use of digital artifacts as boundary objects enables firms, with different industry memberships, distinct knowledge bases and perceptions of task complexity, to effectively cope with interpretive uncertainty. It mainly relates to RQ4.

![Diagram showing interorganizational relationships and uncertainty]

**Figure 1. Papers and research questions**

In Chapter 2, I present the conceptual background of this thesis. In particular, with the inductive approach used, this chapter introduces a conceptual background on interpartner uncertainty in interorganizational relationships, coopetition as a major source of uncertainty, and insights from prior research on trust and distrust, because these were the important conceptual entry points of my study. In Chapter 3, I provide an in-depth description of the methodology and the main empirical setting of this paper-based thesis. This chapter also presents the development of the study, over time, and how I moved from one paper to another. Chapter 4 provides an overview of the individual papers, including an extended abstract of each paper and how they are linked to the research questions.
of this thesis. Finally, in *Chapter 5*, I discuss the contributions of the papers and how they synergistically fulfill the overall purpose of this study.
2. Conceptual Background

This thesis is positioned within the body of literature devoted to uncertainty within interorganizational relationships (Das & Teng, 1996; 2001; de Man & Roijakkers, 2009; Krishnan, Geyskens, & Steenkamp, 2016; Latusek & Vlaar, 2018; Weber & Mayer, 2014). Whereas interorganizational relationships can take various forms (for a review, see Barringer & Harrison, 2000), the majority of them involve interactions among autonomous organizations that are in pursuit of a common goal, while at the same time, they keep their autonomy and hold partially divergent objectives. As Cropper et al. (2008, p. 9) point out, “what unifies IOR research is this: in one way or another, it focuses on the properties and overall pattern of relations between and among organizations that are pursuing a mutual interest while also remaining independent and autonomous, thus retaining separate interests”. This denotes that in the majority of interorganizational relationships partners have often only partially convergent interests and engage in both cooperative and competitive interactions (Zhang et al., 2010). Thus, the engaged parties are confronted by difficulties associated with the ways they relate to each other in the course of their interactions and with their surrounding relational context. More specifically, I argue that individuals who make up the interorganizational interactions face orientational difficulties, which refer to the ways they navigate their surroundings “by bringing specific expectations and anticipations to bear in determining how next to ‘go on’” (Shotter & Tsoukas, 2014, p. 382) with their activities and interactions. Following this notion, I do not place emphasis on a single form of an interorganizational relationship, but rather on internal interactions and associated orientational difficulties that make them unique and at the same time managerially challenging and uncertain endeavors.

I argue that in the context of interorganizational relationships, orientational difficulties are associated with the notion of uncertainty. Uncertainty in interorganizational relationships has been defined in several different ways depending on what level uncertainty occurs and on why uncertainty emerges. Most definitions acknowledge, however, that uncertainty refers to “the difficulty firms have in predicting the future” (Beckman et al., 2004, p. 260) and is related to unpredictability of possible contingencies in interactions (Burström & Wilson, 2018; Howell, Windahl, & Seidel, 2010). Building on such definitions (e.g.,

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1 Under the umbrella term interorganizational relationships, a plethora of different forms are encompassed including “strategic alliances, joint ventures, buyer-supplier agreements, licensing, co-branding, franchising, cross-sector partnerships, networks, trade associations, and consortia” (Parmigiani & Rivera-Santos, 2011, p. 1108). Similarly, Barringer & Harrison (2000, p. 367) reported that prior research has mainly focused on six forms of interorganizational relationships (or types of cooperative arrangements), namely “joint ventures, networks, consortia, alliances, trade associations, and interlocking directorates”.
Krishnan et al., 2006) and with a focus on the interactions between the partners, I use the term interpartner uncertainty, which encapsulates different facets of uncertainty within interorganizational relationships. I define interpartner uncertainty as the difficulty firms have in aligning their views and expectations (Vlaar et al., 2006; Weber & Mayer, 2014), in understanding and anticipating the future behavior of their partners (Das & Teng, 1999; 2001; de Man & Roijakkers, 2009) and in predicting the potentialities of their interactions due to the influence of the broader relational context. Before I present the three interrelated facets of interpartner uncertainty (that is behavioral, interpretive and relational uncertainty), I first discuss the difference between uncertainty and the neighboring concept of risk.

2.1.1 Uncertainty and Risk: Different Ways of Approaching Potentialities

Prior research on uncertainty in interorganizational relationships has tended to use the neighboring concepts of risk and uncertainty in a tautological manner (Sydow et al., 2013). While both uncertainty and risk pertain to issues of anticipating and engaging with future states of the world, they hold different assumptions regarding the nature of the future, meaning whether potentialities can be predicted, and regarding ways of engaging with the future, meaning whether potentialities can be mitigated.

Drawing on Knight (1921), I discuss uncertainty as difficulty to predict the future due to lack of complete knowledge. Uncertainty includes the unexpected and is related to potentialities which cannot be predicted in an accurate manner or to which probabilities cannot be assigned (York & Venkataraman, 2010). While uncertainty is unpredictable by definition and related to “unanticipated changes in circumstances surrounding an exchange” (Noordewier, John, & Nevin, 1990, p. 82), a central assumption in the concept of risk is that future events can be anticipated because probabilities can be estimated in a calculative manner. While uncertainty entails that predicting the future is not always possible, the notion of risk is related to “the ability to assign a probability distribution to the potential outcomes” (Townsend, Hunt, McMullen, & Sarasvathy, 2018, p. 10). The above indicates that the first aspect that distinguishes uncertainty from risk is that the two concepts provide alternative explanations of whether potentiality can be anticipated; while uncertainty is about articulating possibilities, the concept of risk is related to estimation of probabilities (see Shackle (1949) for a more detailed discussion on the importance of distinguishing between probability and possibility). Confusion revolving around the distinction between risk and uncertainty stems from the fact that risk is often synonymously treated with uncertainty, as the term ‘measurable uncertainty’ is often used to mean risk (especially in studies grounded in TCE) and the term ‘residual risk’ is often used
to mean uncertainty. In this thesis, for the sake of conceptual clarity, I do not refer to risk as uncertainty that can be quantified, but as potentialities to which probabilities can be assigned. Following this notion, I approach risk and uncertainty as concepts that aid in understanding potentialities from different prisms; whereas risk is calculable or else probabilistic and contains the assumption that potentialities can be predicted and quantified, uncertainty is non-probabilistic and contains the assumption that potentiality cannot be predicted as it includes the unexpected or else, the “unknown unknown”.

The second aspect that makes the concept of uncertainty distinct from the concept of risk is that each of them suggests a different way of engaging with the future and dealing with potentialities. The notion of risk places emphasis on controlling potentialities and on minimizing the likelihood that potential negative consequences, entailed by unforeseen changes in the circumstances existing within a relationship and in circumstances surrounding a relationship, will occur. Building on TCE (Williamson, 1981) and grounded mainly in economics, scholars have studied negative potentialities in the form of risks (or from the prism of risk) and suggested that alleviating exchange hazards and mitigating risks is possible by introducing appropriate governance structures and formal control mechanisms (Pavlou, Liang, & Xue, 2007; Williamson, 1985). In contrast, scholars with different epistemological stance and with a relational view on interfirm exchanges have studied negative potentialities in the form of uncertainties (or from the prism of uncertainty) and have underlined that embracing the unexpected and accepting surprises in a non-calculative manner is vital for capturing the benefits of relationships (Latusek & Vlaar, 2018; Möllering, 2001). Drawing on this, I argue that firms engage in coopetitive interorganizational relationships even in the light of resistant-to-mitigation exchange hazards and cope with potentialities in non-calculative ways.

2.1.2 Three Interrelated Facets of Interpartner Uncertainty
Uncertainty in the context of interorganizational relationships has been studied by prior research from different theoretical prisms. As a result, emphasis has been paid to three distinct yet interrelated facets of interpartner uncertainty which have different roots and require different means and ways to cope with them. Depending on whether uncertainty stems from within the relationship, or from the external environment in which the relationship is embedded, uncertainty can be broadly divided into behavioral uncertainty and environmental uncertainty (Abdi & Aulakh, 2017; Krishnan et al., 2006). In addition to these, interpretive uncertainty takes place due to relational characteristics and marked differences and problems of understanding between the engaged parties (Vlaar et al. 2006; Weber & Mayer, 2014). Drawing on insights from these interrelated bodies of literature discussing the notion of uncertainty in interorganizational
relationships, I introduce the concept interpartner uncertainty, which encapsulates three interrelated facets of uncertainty, namely behavioral uncertainty, relational uncertainty and interpretive uncertainty.

First, behavioral uncertainty concerns issues of unpredictability regarding the future behavior of the partner and “entails ambiguities in interorganizational relationships due to difficulties in accurately understanding partners’ behaviors” (Abdi & Aulakh, 2017, p. 776). Influenced greatly by the Transaction Cost Economics (TCE) theory (Williamson, 1981), prior research has linked the notion of behavioral uncertainty to the potential for partner opportunism, defined as “behaviour by a partner firm that is motivated to pursue its self-interest with deceit to achieve gains at the expense of the other alliance members” (Das & Rahman, 2010, p. 57). Partner opportunism refers to “strategic non-disclosure, disguise, or distortion of information” (Williamson, 1985, p. 57) and is considered to be a major issue in interorganizational relationships (Cao & Lumineau, 2015; Carson et al., 2006; Lumineau & Quelin, 2012). Concerns about opportunistic actions by the partner are more salient in relationships characterized by interdependency and interpartner competition (Krishnan et al., 2006). The existence of high degrees of interdependence means that the partners’ activities and responsibilities overlap significantly (Gulati & Singh, 1998) and that the focal firm becomes vulnerable and depends on the partner behaving as agreed and expected. In such a situation, potential deviation (intentional or not) from what is considered to be desirable partner behavior will impact the focal firm in an unforeseen way and can trigger negative consequences for the partners, hindering the success of the relationship (Park & Ungson, 2001). Anticipating the behavior of the partner is therefore critical yet particularly challenging in the face of high interdependency. Further, interpartner competition means that each partner aims to maximize the private gains from the overall value created from the relationship. Anticipating the partner’s behavior in relationships involving interpartner competition is important because the partner is at the same time a competitor that can exploit the focal firm’s vulnerabilities, misappropriate knowledge and behave in an opportunistic way. Yes, this is a major challenge for the engaged parties.

Second, in addition to difficulty in anticipating the partner’s future behavior, uncertainty can also derive from the external-to-the-relationship environment. “Environmental uncertainty refers to the instability and unpredictability of external elements on which the exchange is contingent” (Abdi & Aulakh, 2017, p. 779). Environmental uncertainty concerns issues of unpredictability in regard to “circumstances surrounding an exchange that cannot be specified ex ante” (Rindfleisch & Heide, 1997, p. 31), such as volatility (i.e., frequency and unpredictability of change) in the market and in the technological environment (Carson et al., 2006; Heide & John, 1990) and unforeseen changes in the
economic landscape (Dess & Beard, 1984). I argue that a sub-type of environmental uncertainty is what I call *relational uncertainty*, which relates to the difficulty in anticipating the potentiality of interorganizational interactions due to influences by the relational context in which interactions are embedded. For instance, in settings such as project-based industries, firms are simultaneously involved in different projects with several actors and uncertainty stems not only from how the partners will behave in the ongoing project, but also from how partners will behave in parallel or future projects. In addition, in such contexts, the influence of third parties, such as powerful industrial customers, on dyadic interactions can increase the degrees of uncertainty and inject additional unpredictability in the relationship.

Third, from a cognitive perspective, scholars have suggested that another facet of interpartner uncertainty is *interpretive uncertainty* (Weber and Mayer, 2014), which is related to what Vlaar et al. (2006) call problems of understanding within interorganizational relationships. Interpretive uncertainty is driven neither by deliberate partner opportunism nor by the influence of the broader social environment on the interactions among the engaged parties. Instead, interpretive uncertainty emerges when the partners have misaligned views and expectations and interpret the same phenomenon (e.g., an unforeseen contingency, the very objective of the relationship, key responsibilities and requirements) incongruently. Major differences between the engaged parties, high degrees of unfamiliarity, diverse knowledge bases and different perceptions of task complexity are some of the reasons that may trigger misaligned views and expectations, conflicting interpretations and unpredictability in the interaction. Interpretive uncertainty becomes particularly salient in complex interfirm interactions, such as co-creation of a tailored-made offering, where several firms cooperate and “the nature of the pie, its size, and an assessment of its ingredients may be ambiguous” (Jap, 2001, p. 86). As such, interpretive uncertainty is not related to issues of opportunism, but represents a major challenge related to unintentional misunderstandings and the difficulty in anticipating the potentiality of the interaction.

In the above paragraphs, I discussed three interrelated facets of interpartner uncertainty. Before presenting what prior research has theoretically suggested and empirically found regarding ways of coping with interpartner uncertainty, I first discuss coopetition as a unique source of interpartner uncertainty, which was a key conceptual entry point of this study.

### 2.2 Coopetition: A Source of Interpartner Uncertainty

Prior research has suggested that pairs of seemingly contradictory elements (e.g., cooperation and competition, value creation and value capture, openness and
vigilance) coexist in interorganizational relationships (Chen, 2008; de Rond & Bouchikhi, 2004; Lado Boyd, & Hanlon, 1997; Zhang et al., 2010). Nonetheless, a major blind spot of research devoted to interorganizational relationships is that the multifacetedness of interactions taking place between or among organizations is often overlooked (Lumineau & Oliveira, 2018). In addition, competition has traditionally been treated as a negative aspect that needs to be mitigated in order for cooperation to be facilitated (Hennart, 2006; Kale, Singh, & Pelmutter, 2000), while cooperation has been seen as a condition of market imperfection. To this end, the simultaneous presence of multiple valences due to both cooperative and competitive interactions has received limited attention in the broader body of literature paying attention to the management of interorganizational relationships. Yet, research on coopetition has challenged the view that cooperation and competition are the opposite ends of a single continuum and enriched the understanding of the complex, dynamic and multifaceted interactions that take place between and among organizations (Padula & Dagnino, 2007). By moving beyond an either/or conceptualization of cooperation and competition, the notion of coopetition raises awareness of the simultaneous occurrence of cooperation and competition in interorganizational relationships, in which the engaged partners have partially congruent yet partially divergent interests (Bengtsson & Kock, 2000).

As Dorn et al. (2016 p., 484) note, “the rise of coopetition reflects an increasing awareness of the complexity of relations between economic agents”. Specifically, research on coopetition places a unique feature of interorganizational relationships under focus, namely the complex, managerially challenging and uncertain interactions occurring between firms engaged in such relationships. Coopetition focuses on the simultaneous existence of cooperation and competition (Bengtsson & Kock, 2000; Brandenburger & Nalebuff, 1996) and brings into light the interrelation between these two forces and what this interrelation means for the engaged parties (i.e., both benefits and risks). Research on coopetition suggests that cooperation and competition take place on two separate continua, that multiple combinations of the two can be identified and that the fruitfulness of coopetition can be realized in a dynamic arena in which cooperation and competition interrelate (Bengtsson, Eriksson, & Wincent, 2010). Following this notion, coopetition is described as “a process based upon simultaneous and mutual cooperative and competitive interactions between two or more actors at any level of analysis (whether individual, organizational or other entities)” (Bengtsson et al., 2010, p. 170).

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2 “a valence generally refers to the degree of attraction or aversion that a party feels toward a specific event, entity, or object” (Lumineau & Oliveira, 2018, p. 447)
Coopetitive interactions can take place in several different types of relations and organizational settings, such as in broader networks and value-nets (Nalebuff & Brandenburger, 1997), in R&D networks (Ritala, Huizingh, Almpanopoulou, & Wijbenga, 2017), in joint ventures (Gnyawali & Park, 2011), in strategic alliances (Raza-Ullah, 2017), in buyer-supplier relationships (Eriksson, 2008) and also between individuals situated within organizations. Further, different types of actors can be involved in coopetition, as coopetition can be initiated either when two competitors start cooperating in some business areas (e.g., R&D activities) but keep competing in others (e.g., commercialization of products), or when two partners start competing in some activities or business areas, while maintaining cooperation in others. In addition, a firm may have an R&D alliance with a competitor, a joint venture with a customer, fierce competition with a supplier and a close relationship with a governmental organization that promotes collaboration within an industry and thus cooperates with the firm’s competitors too. However, independently of where coopetitive interactions occur and what actors are involved, coopetition has one thing in common; due to its defining characteristics, the engaged parties need to interact on the basis of contradictory logics that make the situation highly uncertain.

2.2.1 Defining Characteristics of Coopetition

Research on coopetition suggests that cooperation and competition coexist in interorganizational relationships (i.e., the coexistence or simultaneity characteristic of coopetition) as firms cooperate in one activity and at the same time compete in another. The two seemingly contradictory forces not only coexist but also interrelate and influence each other (i.e., the interrelation characteristic of coopetition) (Bengtsson & Kock, 2000). Another issue underlined in this body of research is that cooperation and competition can independently change in different directions, as they occur on two separate continua and an increase in the degree of cooperation does not necessarily imply a decrease in the degree of competition. To this end, a third defining characteristic of coopetition is the potential for cooperation and competition to independently increase or decrease in strength (i.e., the independent change characteristic of coopetition). Fourth, a cornucopia of studies highlight that coopetition is a tension-filled endeavor (Fernandez, Le Roy, & Gnyawali, 2014; Raza-Ullah, 2018), where the engaged parties not only gather a pool of resources to draw on and achieve objectives that could not be reached otherwise, but also strive for obtaining as much benefits as possible from the outcome that is generated by the joint efforts. This entails that firms are confronted with the profound challenge of handling contradictory demands and getting involved in both knowledge sharing and knowledge protecting, as well as in both joint value creation and individual value capture (Bouncken, Friedrich, Ritala, & Kraus, 2017; Cassiman, di Guardo, & Valentini, 2009; Estrada, Faems, & de Faria, 2016; Ritala & Tidström, 2014; Ritala &
Thus, management of coopetition becomes challenging and cognitively demanding for the engaged individuals (Raza-Ullah et al., 2014). Fifth, engaging in coopetition requires commitment of strategically important resources (Gnyawali & Charleton, 2018), which refer to valuable, rare, unique and difficult-to-imitate resources and knowledge held by organizations (Kogut & Zander, 1992). However, as such resources and knowledge can be a source of sustainable competitive advantage, firms find it challenging to share them with their competitors. Acting in that manner can be detrimental if the partner misuses the knowledge acquired through the relationship (see for example Hamel, 1991). Importantly, such strategically important resources need to be committed not only to cooperative efforts but also to competitive efforts, which adds to the challenging and uncertain nature of coopetition and increases coordination costs. In other words, in coopetition committing unique resources is critical for achieving the sought-after benefits, yet it can be proven detrimental. If strategically important knowledge is committed to a relationship with a competitor, the advantages of coopetition can be higher yet the entailed uncertainty in regard to the behavior of the partner will also be increased. On the contrary, as Gnyawali & Charleton (2018, p. 6) highlight, where “resources committed are not strategically important, there are minimal incentives to act opportunistically, and therefore risks of misappropriation are less”. All in all, the above defining characteristics of coopetition make interorganizational relationships involving coopetitive interactions particularly challenging and uncertain.

### 2.2.2 Two Schools of Thought in Coopetition Research

Within the coopetition research field, two schools of thought can be identified, namely the value-net approach or actor school of thought and the dyadic approach or activity school of thought (Bengtsson et al., 2010; Bengtsson & Raza-Ullah, 2016).

The actor school of thought has been initiated by the seminal work of Brandenburger & Nalebuff (1996), who were among the first who coined the term coopetition. From a game theory perspective, Brandenburger & Nalebuff (1996) developed the Value Net Model, which includes the firm and key actors (i.e., competitors, suppliers, customers and complementors) with whom the firm interacts and engages in cooperation or in competition. Studies drawing on this view divide the cooperative and competitive dimensions of coopetition between the different actors of a firm’s value net. Thereby, it is assumed that coopetition takes place when a firm cooperates with some actors while at the same time competes with other actors residing in the same value net (see for example, Afuah, 2000; Stamboulis, 2007). The actor school of thought pays attention to
dynamics of coopetition within a network of relations and offers insights into how
a firm repositions itself over time for achieving particular benefits, such as better
market position (Ritala, 2012). However, due to its focus on the reconfiguring and
restructuring of the firm’s value net for achieving a better market position, this
school of thought does not discuss the internal dynamics of a relationship in
which two firms collaborate and compete against each other simultaneously.

In light of the previous limitation, and notwithstanding the value of the actor
school of thought, scholars (Bengtsson & Kock, 2000; Gnyawali & Park, 2011)
have studied coopetition based on a narrower level of analysis (i.e., dyadic
coopetition). In the activity school of thought (Bengtsson & Raza-Ullah, 2016),
the two oppositional yet interwoven parts of coopetition are divided between
activities (Bengtsson & Kock, 2000). Phrasing it differently, two firms are
regarded to be coopetitors when they compete directly in one activity and
cooperate in another at the same time. This school of thought acknowledges that
within an interorganizational relationship, combinations of cooperation and
competition can vary (weak/strong cooperative and coopetitive interactions)
(Bengtsson et al., 2010). All in all, the activity school of thought has provided rich
insights into coopetitive dynamics and how tensions can be managed within a
coopetitive relationship. Yet, it has also a limitation. That is, the broader network
or value-net in which dyadic relationships are embedded has at large been
ignored (Bengtsson & Raza-Ullah, 2016). Studies within this body of coopetition
literature, for instance, have not touched upon the role of the relational context
in which a dyadic relationship is embedded. Acknowledging this limitation,
Bengtsson and Raza Ullah (2016) suggested coopetition researchers adopt a
blended school of thought, and study dyadic interactions in relation to the context
they are embedded. A blended school of thought is particularly important for this
study because of the multifacetedness of interpartner uncertainty, which takes
place not only due to potential partner opportunism (i.e., behavioral uncertainty)
and potential misalignment in the views of the engaged parties (i.e., interpretive
uncertainty), but also due to the influence of the relational context on the dyadic
interactions (i.e., relational uncertainty).

2.3 Dual Potentialities in Coopetitive Interorganizational
Relationships
In interorganizational relationships involving coopetition, the partners consider
dual potentialities of coopetition, which influences how they interact with each
other. Such potentialities refer to both benefits and drawbacks that may emerge
along the pursuit of coopetition. To illustrate the potentially beneficial yet
potentially detrimental nature of coopetition, scholars have characterized
coopetition as a “double-edged sword” (Bouncken & Kraus, 2013) and have
metaphorically referred to the management of coopetition as “walking a
tightrope” (Park et al., 2014). In what follows, the potential benefits and risks of coopetition are presented based on a selective review of the literature devoted to coopetitive interactions in interorganizational relationships. Against this background, it becomes clearer that coopetition involves dual potentialities and is a major source of interpartner uncertainty.

2.3.1 Potential Benefits of Coopetitive Interactions

“On the one hand, it can be positively related to the company’s growth, its competitiveness and innovativeness, and its ability to deal with the turbulent business environment.”

(Bouncken, Gast, Kraus, & Bogers, 2015, p. 590)

Studies highlighting that coopetition can be fruitful for the engaged parties abound. From a resource-based view, engaging in coopetition can enable firms to reach and integrate critical resources that reside outside the firm, and to exchange complementary and valuable knowledge with one another (Bengtsson & Kock, 2000; Gnyawali & Park, 2011; Lavie, 2006), which makes coopetition particularly important in knowledge-intensive industries (Carayannis & Alexander, 1999). In doing so, the engaged parties can utilize unique resources and construct richer knowledge bases to fulfil goals that could not be achieved otherwise (Bouncken & Kraus, 2013; Ritala & Humerlinna-Laukkanen, 2009), such as finetuning existing or developing new products and services. Not only competitors hold complementary resources, but also, they share a similar understanding of the market and are in possession of similar resources. To this end, except for resource complementarity, the noteworthy resource similarity of competing firms has been suggested as a unique advantageous aspect of being involved in coopetition. As Ritala and Sainio (2013, p. 158) note, “the distinguishing aspect of coopetition in contrast to collaboration between non-competitors is resource similarity”, which facilitates resource integration and smoothens out the interaction between the engaged parties, who as competitors, have similar understanding of the industry and serve similar customer segments (Chen, 1996).

Moreover, scholars drawing on game theory have suggested that coopeting firms adopt a positive-sum logic (Padula & Dagnino, 2007), find themselves in a position to create more value and together enlarge the ‘business pie’, which is subsequently divided due to competition and value-appropriation activities (Brandenburger & Nalebuff, 1996). As the business pie can be expanded, the potential for better market performance through simultaneous cooperation and competition has also been acknowledged in the existing literature, which leads us to the second group of potential benefits of coopetition, namely strengthening market performance. The relationship between coopetition and more ‘objective’ measures pertaining to market performance has attracted considerable attention by coopetition scholars. In particular, it has been found that coopetition improves
profitability (Mantena & Saha, 2012), acts as a catalyst for increased sales and better market position (Wu, Choi, Rungtusanatham, & 2010) and has a positive impact on financial performance (Luo, Rindfleisch & Tse, 2007). Further, Bouncken and Friedrich (2012) have shown that coopetition strengthens the firms’ market share and return on investment.

Improving innovation-related processes is another group of potential benefits of coopetition. Innovation has been the most frequently beneficial aspect of coopetition (Bengtsson & Raza-Ullah, 2016) and scholars have argued that the simultaneous pursuit of cooperation and competition may accelerate product development (Gnyawali & Park, 2009). A plethora of studies have empirically shown that coopetition can improve innovativeness of the partnering firms (Belderbos, Carree & Loskhin, 2004; Bonel & Rocco, 2007; Gnyawali & Park, 2011; Park et al., 2014). Prior research has discussed the potential enrichment of firms’ innovation performance through coopetition in different ways, depending on: i) the degree of novelty of innovation (i.e., incremental, radical, revolutionary), ii) the intensity of coopetition and iii) the type of innovation (i.e., product innovation, business model innovation). Depending on the degree of novelty of innovation, different findings concerning the relationship between coopetition and innovation performance have been reported. For instance, Bouncken and Friedrich (2012) found that the influence of coopetition on radical innovation is stronger than its impact on incremental innovation. On the contrary, some argue that cooperating with a competitor is more fruitful for incremental innovation than for radical innovation (Ritala & Hurmelina-Laukkanan, 2009). The relationship between coopetition and innovation becomes even more complicated with the findings reported by Bouncken & Kraus (2013), who delved into the effect of coopetition on the innovation performance of small-medium enterprises in knowledge-intensive industries and found that whereas coopetition is a proper strategy for achieving radical innovation, it negatively affects revolutionary innovation (i.e. impressively novel innovations and breakthroughs that shake the grounds of existing technologies and revolutionize the rules of the game in the market; see Bouncken and Kraus (2013) and Utterback (1987) for a more detailed discussion). Further, it has been shown that depending on the intensity of coopetition, the innovation output can vary. Drawing on data on R&D partnerships of 1499 Chinese firms, Wu (2014) found that there is a bell-shaped relationship between coopetition and product innovation performance, meaning that whereas low or high intensity of coopetition can be detrimental, a moderate balance between cooperation and competition may deliver optimal innovation returns. This indicates that except for taking into consideration the degree of novelty of innovation (i.e., incremental, radical, revolutionary), looking at the intensities of cooperation and competition is also important in order to explain the relationship between coopetition and innovation performance, a point also shared by Park et al (2014).
Finally, depending on the type of innovation, few studies have highlighted that innovation is not merely related to technological/product innovation. Based on this logic, Ritala and Sainio (2013) found that engagement in coopetition positively affects business-model innovation. This finding is supported by Ritala, Golnam & Wegmann (2014), who conducted a case study of Amazon.com and reported that coopetition can serve as a cornerstone for the emergence of innovative, platform-based business models.

Furthermore, another important aspect of the bright side of coopetition is that the engaged firms not only can capture more value from the value created within a coopetitive relationship, but also can gain a strong competitive advantage against other competitors in the industry (Ritala & Hurmelinna-Laukkanen 2009). This is especially occurring because coopetitive relationships can enable and motivate societal changes (e.g., introduction of environmentally sustainable solutions) that can raise the reputation of the coopeting firms in a given context or can trigger changes (e.g., technological advancement, price drop) in the overall processes of a whole industry that can make the coopetitors leaders of that industry (Gnyawali & Park, 2011). Thus, engaging in coopetition is a means to both protect already existing competitive advantages and strengthen the competitiveness of the partnering firms in comparison to third parties (Gnyawali, He, & Madhavan, 2008).

Finally, potential benefits of coopetition are also related to a more efficient handling of environmental challenges, such as rising R&D costs and costs associated with innovation processes (Gnyawali & Park, 2011), technological uncertainty (Bouncken & Kraus, 2013) and the emerging pressure for offering complex and time consuming tailor-made solutions that often are characterized by short life cycle (Quintana-Garcia & Benavides-Velasco, 2004). In line with this logic, it has been suggested that engaging in coopetition facilitates sharing of risks (Gnyawali & Park, 2009) and the achievement of economies of scale (Bengtsson and Kock, 2000; Luo, 2007; Miotti & Sachwald, 2003). It is worthy to note, however, that whereas coopetition can be seen as a “risk management strategy” (Morris, Koçak, & Ozer, 2007, p. 52) so that environmental uncertainty and costs can be dealt with via coopetition, it also represents a unique source of interpartner uncertainty in coopetition, which has mainly been discussed in the form of risks.

### 2.3.2 Potential Drawbacks of Coopetitive Interactions

“On the other hand, it is fraught with difficulties in the sense that opportunism, misunderstandings, and spillovers can hamper the positive impact of coopetition on performance and innovation.”

(Bouncken et al., 2015, p. 590)
Whereas the bright side of coopetition has been widely acknowledged, coopetition has also a dark side, which is associated with risks and potentially detrimental aspects that may emerge along the pursuit of coopetition. Prior research has underlined that coopetition is inherently risky, can deliver undesirable outcomes and can be proven detrimental if not appropriately managed (Park & Russo, 1996; Dussauge et al., 2000; Ritala, 2012). According to Anderson, Christ, Dekker, & Sedatole (2014, p. 10), misalignment of incentives, meaning “the risk that an alliance partner has incentives to take actions that negatively affect the firm” (which is at the core of coopetition) is a major issue in interorganizational relationships which can cause problems in the smooth functioning and continuation of such relationships. To this end, as coopetition implies that the partnering firms have also conflicting interests and competing objectives, cooperating with a competitor can be seen as an essentially uncertain endeavor. Looking at the dark side of coopetition (from a risk perspective), prior research has identified several risks.

The most frequently discussed group of risks is related to partner opportunism. In particular, the dark side of coopetition has at large been associated with the potential for partner opportunism, which is defined as “behavior by a partner firm that is motivated to pursue its self-interest with deceit to achieve gains at the expense of the other alliance members” (Das & Rahman, 2010, p. 57). Partner opportunism encompasses potentially harmful issues related to undesirable behavior and to detrimental for the focal firm actions, undertaken by the partner in a deliberate manner, such as “breaking promises, not sharing resources or facilities as per agreement, bluffing, lying, misleading, misrepresenting, distorting, cheating, misappropriating, stealing, etc.” (Das and Rahman 2001, p. 43). Evidently, partner opportunism is more acute in coopetition (Pellegrin-Boucher, Le Roy, & Gurau, 2013; Schmoltzi & Wallenburg, 2012), as all three determinants of partner opportunism suggested by Das and Rahman (2010), namely economic determinants (i.e., when the losses are higher than the economic gains), relational (i.e., when cultural diversity and goal incompatibilities exist) and temporal (i.e., misaligned alliance horizon preferences and pressures for quick results), can be identified in situations of simultaneous cooperation and competition. To this end, several risks that fall under the umbrella term ‘partner opportunism’ have been identified by prior research devoted to coopetition, including: prioritization of self-interests and private gains over the objectives of the alliance (Mitchell, Dussauge, & Garrete, 2002; Park & Ungson, 2001), misappropriation of resources and misuse of knowledge acquired from joint activities (Bouncken & Kraus, 2013; Grafton & Mundy, 2017; Park & Russo, 1996) and imitation of best practices and know-how by the partner (Fernandez et al., 2014; Ritala & Hurmelinna-Laukkanen, 2009). Further, opportunism is also associated with manipulation due to power imbalances (Osarenkhoe, 2010; Rothaermel & Deeds, 2004) and initiation of
learning races and attempts to acquire the focal firm’s gains from the alliance (Hamel, 1991; Khanna, Gulati, & Nohria, 1998; Sanou, Le Roy, & Gnyawali, 2016). Intentional use of loopholes in contracts and formalized agreements (Morgan, Kaleka, & Gooner, 2007) can also occur as the partner may have the willingness to “opportunistically exploit the dependence relationship” (Langfield-Smith, 2008, p. 345). In addition, in relationships involving coopetitive interactions among the partners, intentional underperformance due to lack of commitment (Das & Teng, 1999) or due to misaligned alliance horizons preferences (Das, 2006) is a key concern for the engaged parties.

In addition to risks related to partner opportunism, intentional knowledge leakage, defined as “the focal firm’s loss of private knowledge to partners through opportunistic activities such as private learning and unauthorized imitation” (Jiang, Li, Gao, Bao, & Jiang, 2013, p. 984) is another important and common concern for firms engaged in coopetitive interactions (Ritala, Olander, Michailova, & Husted, 2015; Rouyre & Fernandez, 2019). The idea that “coopetition is fraught with the risk of opportunism and knowledge leakage” (Bouncken et al., 2015, p. 586) is shared by several coopetition scholars. For instance, Bengtsson and Raza-Ullah (2016, p. 31) state that the “risk of knowledge leakage and opportunism are high in coopetition” (Bengtsson & Raza-Ullah, 2016, p. 31), which can have a negative impact on innovation-related processes (Ritala & Sainio, 2014). As Lumineau & Oliveira (2018, p. 239) put it, “in a given IOR, the dark side probably occurs as a “bundle of manifestations” in the sense that a set of dark-side manifestations may be tied together.” In this sense, potential opportunism and the fear of intentional knowledge leakage are associated with lack of willingness to provide the partner with the required resources for innovation-related processes (Cassiman et al. 2009; Bouncken & Kraus, 2013), which can cultivate a hostile environment and even lead to the emergence of conflicts (Fernandez et al, 2014). For instance, by means of a qualitative case-study, Tidström (2009) have shown that self-preservation due to the fear of knowledge leakage can create conflict in the process of coopetition.

In line with the latter point, research has suggested that in the simultaneous presence of cooperation and competition, there is always the potential for dysfunctional conflicts (e.g., Tidström, 2009; 2014; Schmoltzi & Wallenburg, 2012), a concern that has also been discussed in the context of buyer-supplier relations (Moretti & Zirpoli, 2016), joint ventures (Barden, Steensma, & Lyles, 2005) and alliances (Doz, 1996). Such dysfunctional conflicts are very likely to occur when the partners have conflicting goals and disagreements on how the value created by the joint activities will be distributed and how the relationship will operate (Schulze-Ehlers, Steffen, Busch, & Spiller, 2014), especially since the partners can experience asymmetric benefits from the relationship (Gnyawali & Madhavan, 2001).
Moreover, the potentialities of coopetition are interactively shaped, which means that the way the focal firm behaves in the relationship may also impact manifestations of risks related to coopetition. The potential for unintended knowledge leakage or else unwitting knowledge spillover has consistently been discussed as a major issue brought about by coopetition (Dussauge et al., 2000; Ilvonen & Vuori, 2013; Rouyre & Fernandez, 2019) and has mostly been associated with the tension between knowledge sharing and knowledge protection (Yang, Fang, Fang, & Chou, 2014). Also, such leakage can emerge due to too tight cooperation, which has a negative influence on innovation performance when the partners have also competitive interactions (Wu, 2014). On the other hand, in coopetition there can be high costs related to governance and coordination of the relationship (Ritala, Hallikas, & Sissonen, 2008), as creating detailed contracts and solid governance structures can be time-consuming and involving a third party or establishing a dedicated coopetition function is resource-demanding and can be costly. Particularly when coopetitive interactions occur in the face of overskepticism regarding the future conduct of the partner-competitor, not only coordination costs become high, but also the danger of overregulation prevails with significant consequences for the flexibility of the interactions and the emergence of a hostile environment.

Further, firms that engage in coopetitive interactions may lose flexibility (Baumard, 2009) and become overly dependent on the partner, which eventually, can cause loss of competitive advantage (Afuah, 2000). Loss of competitive advantage can also take place when firms and their offerings become too similar to each other. For example, Grafton and Mundy (2017), investigated risks pertaining to coopetition in the independent trade publishing sector in the United Kingdom and found that firms in this context face the issue of homogenizing their product offerings. Additionally, the same study has also shown that firms engaging in coopetition may develop too similar identities, which can jeopardize the fruitfulness of coopetition. This is in line with the idea that there are limitations with coming too close and withholding too similar resources (Dussauge et al., 2000), as similarity in partner characteristics and expertise is not always fruitful for the success of an interorganizational relationship (Doz & Hamel, 1998; Kim & Parkhe, 2009). Finally, prior research suggests that not only the risk of collision (Mariani, 2007), but also the failure of a coopetitive relationship can have detrimental reputational consequences for the engaged firms (Cygler, Sroka, Solesvik, & Debkowska, 2018) as the “interrelationships between coopetitors are important, because changes may affect the entire network positively as well as negatively” (Bouncken et al., 2015, p. 589).

All the above-mentioned negative potentialities influence the manner in which firms interact with each other and may make the allied firms hesitant to commit strategically important resources, thereby undermining the very partnership and
jeopardizing its fruitfulness. A typical example of the latter is the failure of the alliance between Ford and Volkswagen, whose extreme skepticism and fear to share know-how and exchange sensitive information, due to intense rivalry between them, led to early dissolution of the relationship (Park & Ungson, 2001). This does not mean, however, that the beneficial aspects of coopetition cannot be realized and that the strategic importance of coopetition should be downgraded. The fruitfulness of coopetition can still be experienced if firms can effectively cope with the entailed interpartner uncertainty.

2.4 From Governance to Processes of Coping with Interpartner Uncertainty

The phenomenon of coping with interpartner uncertainty in interorganizational relationships has mainly been studied in terms of alliance governance, which refers to “how an alliance is managed, how it is organized and regulated by agreements and processes, and how the partners control and influence its evolution and performance over time” (Doz & Hamel, 1998, p. 120).

Alliance governance is based on governance mechanisms that represent specific formal and informal rules of managing the interactions between the engaged parties (Poppo & Zenger, 2002; Vandeaele et al., 2007) and reducing uncertainty-related exchange hazards (Cao & Lumineau, 2015). Specifically, such governance mechanisms serve the purposes of coordinating, monitoring, and incentivizing the partners’ behavior (Albers, 2010) and can be of two main types: contractual (or formal) as well as relational (or informal) governance mechanisms (Li, Poppo, & Zhou, 2010). These two types of governance mechanisms have different theoretical foundations and entail different responses to uncertainty (Carson et al., 2006). While contractual governance mechanisms have mainly been informed by a structural perspective and neoclassical contract theories (i.e., TCE), the importance of relational governance mechanisms has mainly been highlighted by studies building upon a relational perspective and relational contracting theories (i.e., Social Exchange Theory, Relational Exchange Theory, and Social Capital Theory) (Cao & Lumineau, 2015; Faems, Janssens, Madhok, & van Looy, 2010; Roehrich et al., 2019).

From a structural perspective, TCE-informed studies (Williamson, 1981) advocate that management of interpartner uncertainty is based on contractual governance, defined as “the use of an extensive set of terms and clauses specifying mutual rights and obligations with legal and private sanctions for noncompliance” (Krishnan et al., 2016, p. 2522). TCE argues that by investing in formal monitoring procedures and relying on detailed legal contracts and binding agreements, firms can control and safeguard against partner opportunism and mitigate exchange hazards (Lumineau & Quelin, 2012). This occurs in particular
because contracts are used for reducing the partner’s willingness to engage in resource misappropriation, opportunism or intentional underperformance (Parkhe, 1993), for imposing penalties in case of partner misbehavior (Lumineau & Quél, 2012; Ryall & Sampson, 2009), and for clarifying the partners’ roles and responsibilities (Lui & Ngo, 2004; Lyons and Mehta 1997). In addition, as contracts have both controlling and coordinating dimensions (Lumineau, 2014; Reuer & Arino, 2007), they also serve as a means to establish a common understanding among the partners regarding the objectives of the relationship and specify communication and reporting procedures (Ryall & Sampson, 2009). However, contracts are not sufficient to safeguard against all eventualities (Mayer & Nickerson, 2005) as they are always incomplete and individuals are characterized by bounded rationality (Cannon et al., 2000). In addition, contracts tend to be inflexible and cannot be easily adjusted to ongoing changes (Carson et al., 2006). To this end, a body of related research has drawn upon organizational design and suggested implementation of flexible structural arrangements (Albers, Wohlgezogen, & Zajac, 2013), while others have adopted a real options theory perspective and placed emphasis on the need for flexible contracts that enable modifications and adaptations in the light of changes and unforeseen contingencies in the exchange (Schepker, Martynov, & Poppo, 2014). Whereas the stream of research focused on contractual governance contribute to our understanding of managing interpartner uncertainty based on more formal means and structures, the key critique towards it is that it has an undersocialized view of human action (Faems et al., 2010) and does not allow for relationship-specific adaptations, which refer to “investments made to modify processes, product technologies, or procedures to the specific needs and/or capabilities of an exchange partner” (Cannon et al., 2010, p. 181). In addition, a mere focus on governance issues limits an understanding of the underlying social processes through which uncertainty is experienced and coped with. These limitations have to some been addressed by a relational perspective on coping with interpartner uncertainty, which is the perspective adopted in this thesis.

From a relational perspective (Dyer & Singh, 1998), it is maintained that interpartner uncertainty is coped with through relational governance mechanisms, defined as “more emergent governance mechanisms that are manifested in socially derived ‘arrangements’ and that are more informal in comparison to contractual governance” (Roehrich et al., 2019, p. 1). This body of research is associated with Social Exchange Theory (Blau, 1964) and emphasizes the sociological dimension of governance. In particular, these studies underline the importance of relational norms and trust in addressing the issue of interpartner uncertainty in interorganizational relationships (Das & Teng, 2001; Faems et al., 2010; Heide & John, 1990; Liu et al., 2009; Schilke & Cook, 2013). Relational norms “reflect expectations about attitudes and behaviors parties have in working cooperatively together to achieve mutual and individual goals”
(Cannon et al., 2000, p. 183) and provide flexible guidelines about how the partners should interact within a relationship. Thus, reliance on relational norms limits concerns about and creates disincentives against partner opportunism, while at the same time, flexibility and adaptation are facilitated. While the main focus of the relational perspective has still been on governance issues and on “arrangements”, a few studies within this perspective have also moved beyond governance issues and started to acknowledge the processes through which organizational actors cope with uncertainty along the course of their interactions (Sydow et al., 2013). For instance, prior research has started to discuss the processes through which trust enables partners to accept and embrace interpartner uncertainty in a non-calculative way (Möllering, 2001; 2006) and suggested that trust serves as an organizing principle providing “the logic by which work is coordinated and information is gathered, disseminated, and processed within and between organizations” (McEvily et al., 2003, p. 92). A noteworthy example of this stream of research is the study by Latusek and Vlaar (2018), who explored how interorganizational governance actually unfolds in buyer-supplier relationships and unpacked the processes through which firms suspend exchange hazards based on trust. Another exception to the static, governance-oriented approach to uncertainty is the study by Mitsuhashi (2002), who found three types of mechanisms via which organizations can cope with uncertainty related to selecting a partner. In particular, the author identified that organizations employ three types of coping processes, that are relational (building upon networks of personal rapport), internal (boundary spanning and cultivating a collaborative know-how) and contextual (relying upon the reputation of the potential partners). Nonetheless, studies on the underlying processes through which organizational actors cope with interpartner uncertainty are still limited and more insights are needed. All in all, the perspective adopted in this thesis is that coping with interpartner uncertainty is based on underlying processes of relational means, such as trust. Therefore, I will now describe how trust has been approached by prior research.

2.5 Trust

Trust has been studied by a plethora of different theoretical perspectives and a myriad of definitions have been provided (see Zhong, Su, Peng, & Yang, 2017 for a review), which led scholars to conclude that trust is a multifaceted phenomenon (McKnight & Chervany, 2001; Lewicki et al., 2006) and “not simply a single concept but rather a set of related concepts” (McEvily, 2011, p. 1270). For the sake of conceptual clarity, it is important to note that while trust is an inherently individual concept, I use the term interorganizational trust and draw on a group of studies arguing that trust disseminates in the organization and is considered also as an interorganizational phenomenon (Currall & Inkpen, 2002), which
constitutes “the collectively-held trust orientation by members of one organization toward another organization” (McEvily & Zaheer, 2006, p. 2).

Three dominant conceptualizations of trust have been suggested by prior research, namely trust as an expectation, trust as a willingness to become vulnerable and trust as a risk-taking act (McEvily et al., 2003). First, approaching trust from a cognitive perspective, Lewicki et al. (1998, p. 439) define trust as “confident positive expectations about the other’s conduct”. Positive expectations are often built on beliefs about certain characteristics that make another party (the trustee) worthy to be trusted. These characteristics are often related to various dimensions of trustworthiness, such as ability, benevolence and integrity (Mayer, Davis, & Schoorman, 1995), openness (Mishra & Mishra, 2008), predictability and reliability (Dietz & den Hartog, 2006).

Second, those who view trust in terms of a willingness to become vulnerable take a step further and define trust as “a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behavior of another” (Rousseau et al., 1998, p. 394) and they claim that “trust is not a behavior (e.g., cooperation), or a choice (e.g., taking a risk)” (Rousseau et al., 1998, p. 395). This conceptualization (i.e., trust as a willingness to become vulnerable) is also adopted by scholars who suggest that trust is domain specific (Schoorman, Mayer, & Davis, 2007) and assessment (not necessarily calculative) of the trustworthiness of the other party is an inevitable part of the trusting experience (Mayer et al., 1995). According to this stream of research, positive perceptions of the other party’s ability, benevolence and integrity are antecedents of the willingness to become vulnerable to the actions of the trustee. Yet it is clearly stated that “trust is not taking risk per se, but rather it is a willingness to take risk” and an intention to render oneself vulnerable based on positive expectations about the other’s conduct (Mayer et al., 1995, p. 712). To this end, one can conclude that when trust is conceptualized as a willingness to become vulnerable, the intentional facet of trust is emphasized. It is worthy to note here that the first two conceptualizations of trust relate to what Das and Teng (2004) call subjective trust, which emphasizes perceptions, expectations and intentions, while conceptualizing trust as a risk-taking act relates to what the same authors call behavioral trust, which emphasizes the outcomes of the trusting experience and the ways that trust is signaled.

Third, scholars studying trust from a behavioral theoretical perspective have suggested that risk-taking is an integral part of the trusting process. Because risk-taking acts (e.g., cooperation based on relational contracting and not formal control mechanisms), which represent behavioral manifestations of trust, are excluded in both of the above two conceptualizations, Li (2007; 2008) has noted that these conceptualizations view trust-as-attitude and overlook the behavioral
facet of trust neglecting the importance of what he calls trust-as-choice. Whereas trust-as-attitude reflects an intention or a psychological willingness to act in a risky manner, trust-as-choice represents a choice or decision to engage in trusting behaviors based on leaps of faith (Möllering, 2001) and on social knowledge (McEvily et al., 2003). Trust-as-choice denotes that trust is neither an attitude nor a behavior, but it transforms the attitude to a behavior (Li, 2017, p. 9) and signals whether trust is ‘real’ (Schoorman et al., 2007). As McKnight and Chervany (2001) highlight, trust-related behavior refers to the behavioral manifestations of trust as the trustor not only has the willingness to depend on the trustee, but also performs such activities that put the trustor in a position of vulnerability.

In this thesis, I follow Dietz (2011) and adopt the view that the three abovementioned conceptual types of trust are interrelated and that the trusting experience is a universal cyclical dynamic in which trusting beliefs and intentions (i.e., trust-as-attitude or subjective trust) jointly cultivate a decision to engage in trust-related behavior (i.e., trust-as-choice), which is realized by a risk-taking and vulnerability-acceptance act (i.e., behavioral trust). Finally, the results of the trusting experience provide feedback on the assessment of the trustworthiness beliefs and shape the expectations held by the trustor. I argue that trusting is an interactive process, involving beliefs and expectations about the trustee’s conduct, a willingness and a decision to render oneself vulnerable and a risk-taking act. I intentionally use the word interactive here in order to highlight that trust is not only a mental process of the trustor, but also a social interactive process (Nikolova et al., 2015, p. 234).

2.5.1 Trust as a Means of Coping with Uncertainty

To identify uncertainty coping mechanisms in coopetition, I draw on the extant literature on trust as “contemporary trust research regards trust as a way of dealing with uncertainty and risk” (Frederiksen, 2014, p. 130), especially in situations of increased interdependence (Sheppard & Sherman, 1998), vulnerability (Nikolova et al., 2015) and interpartner competition (Krishnan et al., 2006). As Dirks and Ferrin (2001) note, trust is important for dealing with uncertainty as it influences how the future behavior of another party is assessed and how the past and present actions are interpreted. Following a similar notion, McEvily et al. (2003) suggest trust as an organizing principle, which represents a means for dealing with issues of uncertainty by providing guidelines in terms of how individuals interpret information and select appropriate behaviors. Such guidelines are of particular importance for interorganizational relationships, because uncertainty and interdependence take place in the light of difficulty in controlling the other party, which makes interorganizational relationships “a natural and recurring backdrop for studying trust” (Börjeson, 2015). In
interorganizational relationships involving coopetition, in particular, trust deserves closer attention as all of the contextual elements which, according to Li (2012), make trust to matter the most are present. In particular, in this context, it is uncertain whether expectations will be met, interdependence is high and implementing formal control mechanisms is challenging. To this end, I argue that in light of uncertainty, trust is crucial (Fredriksen, 2014; Lewicki et al., 1998; Luhmann, 1979) and plays a particularly important role in coping with uncertainty in interorganizational relationships (Latusek & Vlaar, 2018; Becerra, Lunnan & Huemer, 2008) as it relates to assessment of the future behavior of the partner and may result in ‘leaps of faith’ (Li, 2015; Möllering, 2001).

Building upon McEvily et al. (2003), I view trust as an organizing principle, which is suggested to influence organizing under uncertainty through seven pathways: (i) transferability (i.e., positive expectations transfer among individuals facilitating interactions between unknown parties), (ii) generative capacity (i.e., engaging in more and deeper exchanges), (iii) delayed reciprocity (i.e., reciprocity becomes possible in the long run), (iv) role specialization (i.e., differentiating and standardizing roles and positions), (v) disclosing and screening (i.e., reduction of controlling processes), (vi) identifying (i.e., viewing the partners’ goals as collective goals) and (vii) suspending judgement (i.e., giving others the benefit of the doubt). Following a similar notion, Latusek and Vlaar (2018) have empirically identified three processes through which trust enables suspension of judgment in light of negative potentialities that cannot be eliminated: (i) creating fictions (i.e., behaving based on the assumption that everything will unfold as expected), bracketing concerns (i.e., accept issues that cannot be resolved) and having the willingness to believe (i.e., wanting to believe in the benevolent intentions of the partner). While by identifying these three acts of suspension, Latusek and Vlaar (2018) highlighted the importance of trust in the presence of uncertainty and empirically shed some light on how suspending judgment occurs due to trust in an interorganizational setting, the rest of the pathways through which trust operates remain to a large extent understudied and importantly, a deeper analysis into the underlying cognitive and behavioral mechanisms of these processes and pathways is missing. Building on this, I delve into the mechanisms through which trust supports firms to cope with interpartner uncertainty in interorganizational interactions.

2.6 Distrust as Distinct from Trust

Whereas scholars have acknowledged the importance of trust for organizations (Argyris, 1962; Granovetter, 1985) and highlighted that trust is important for developing and sustaining interorganizational relationships (Gulati, 1995; Yoshino & Rangan, 1995; Kale & Singh, 2009), trust can also have a dark side. In particular, while prior research has widely acknowledged that trust is a critical
social element of interorganizational relationships (Bachmann & Inkpen, 2011; Kale & Singh, 2009; McEvily & Zaheer, 2006; Nielsen, 2011; Poppo & Zenger, 2002) facilitating risk acceptance, transparency, smooth knowledge sharing, joint problem solving and reduction of negotiation and monitoring costs (Claro, Hagelaar, & Omta, 2003; Cook & Schilke, 2010; Dyer & Chu, 2003; Gulati, 1995; Möllering, 2001, 2006; Schilke & Cook, 2013), trust can also be detrimental (Skinner et al., 2014). As McEvily et al. (2003, p. 99) highlight, trust “binds and blinds, making economic actors insufficiently vigilant and excessively vulnerable”. When this occurs, trust can lead, for example, to strategic inflexibility, overconfidence, limited motivation to negotiate and monitor the other party, persistence of non-productive relationships and inability to realize partner opportunism (Jeffries & Reed, 2000; Patzelt & Shepherd, 2008; Skinner et al., 2014; Thorgren & Wincent, 2011).

In light of theoretical insights into the dark side of trust, an emerging stream of literature has begun to theorize on the beneficial side of distrust, which has been suggested as distinct from trust (Lewicki et al., 1998) and as playing an important role under uncertain conditions (Guo et al., 2017; Lumineau, 2014; Saunders et al., 2014). Building on Luhmann (1979, p. 83), who argues that “a system of higher complexity, which needs more trust, also needs at the same time more distrust”, this limited body of research has suggested that distrust, defined as “confident negative expectations regarding another’s conduct” (Lewicki et al., 1998, p. 439) may have a beneficial side (Barber, 1983). In particular, it has been argued that distrust may assist in monitoring the partner’s behavior via systems and formal structures (Simon, 1957; Malhorta & Murnighan, 2002), in preventing opportunism and exploitation (Levi, 2000) and in enabling healthy suspicion (Atkinson & Butcher, 2003). Also, distrust may enhance creativity due to the desire of partners to search for alternative scenarios avoiding thereby to become too dependent and too vulnerable to each other (Schul, Mayo, & Burnstein, 2008). Building on this, I utilize the concept of distrust to identify how firms cope with uncertainty related to coopetition and delve into the mechanisms through which distrust may support firms to engage in forward-looking behavior.

While trust has gained a certain, but not satisfying level of attention by coopetition researchers, the notion of distrust has at large been overlooked. Due to the potential negative outcomes of coopetition, firms and the involved individuals may experience certain levels of fear, skepticism and vigilance, which according to Lewicki et al. (1998) are the fundamentals of distrust. In other words, the inherently uncertain nature of coopetition indicates that firms engaging in coopetition may experience a healthy level of distrust, in order for trust not to be overembedded (Uzzi, 1997), for core competences and knowledge to be protected and for disadvantages of trust to be tackled. Despite the beneficial role of trust in interorganizational relationships (Nielsen, 2011), scholars have
highlighted that too much trust may also entail detrimental effects and undesired rigidities (Jeffries and Reed, 2000; Thorgren & Wincent, 2011). For example, trust may lead to strategic blindness (Zahra, Yazuv & Ucbasaran, 2006), reduce organizational flexibility (Thorgren & Wincent, 2011), lead to oversatisfaction and overconfidence, acting as a precursor of opportunistic behavior (Langfred, 2004), and persistence of underperforming alliances (Patzelt & Shepherd, 2008). All these downsides of trust may be offset if a healthy level of distrust takes place, an idea communicated by Guo et al. (2017). Drawing on this, I argue that the literature should move beyond the normative belief that ‘the more trust, the better’ and that distrust is undesirable. On the contrary, this thesis suggests that trust and distrust may synergistically support firms to manage interpartner uncertainty related to coopetition.

Although constructive synergies can be derived from the ‘dialogue’ between trust and distrust, there is still no consensus among trust researchers regarding the nature of the relationship between the two concepts. Prior research on this issue has provided two main explanations, namely the unidimensional view and the bidimensional view. Whereas the unidimensional view posits that trust and distrust constitute two ends of a single continuum and that they negate each other (Mayer et al., 1995; Schoorman et al., 2007), the bidimensional view posits that trust and distrust are distinct and may coexist within a relationship (Guo et al., 2017; Lewicki et al., 1998; McKnight & Chervany, 2001). On the one hand, it has been argued that because trust is domain specific distrust is the polar opposite of trust, meaning that absence of trust is the same as existence of distrust (Schoorman et al., 2007). On the other hand, Lewicki et al. (1998) argue that because relationships are multifaceted, and balance and consistency are temporary states, a model that allows for simultaneous trust and distrust within a relationship is needed. Based on this, trust can be experienced in certain facets of a social relationship and distrust can simultaneously be experienced in other facets, meaning that trust is not the same as low distrust (Connelly, Miller, & Devers, 2012). I adopt the latter view and in line with Guo et al. (2007) argue that trust and distrust can coexist within a relationship in three distinct ways: i) simultaneous occurrence of trustworthiness beliefs and distrustworthiness beliefs (e.g., perception of the partner as being competent (ability), but simultaneous perception of the partner as motivated to act for their own benefit at the expense of one’s interests (malevolence)), ii) trust in one domain of a relationship and distrust in another (e.g., trust in customer-related activities, but distrust in R&D related activities), and iii) trust from one side of a relationship and distrust from the other side (i.e., misaligned trusting experience – A trusts B, while B distrusts A). Both trust and distrust play a critical role in dealing with uncertainty as they jointly shape the decision to render oneself vulnerable, but in different ways (Luhmann, 1979). Whereas trust relates to hope, faith and confidence in the partner’s intentions, distrust relates to fear, vigilance and
skepticism (Lewicki et al., 1998). Thus, while trust aids firms to cope with uncertainty through positive expectations of the trustee’s conduct, distrust may support firms to cope with uncertainty through negative expectations of the prospective behavior of the other party (Lewicki, et al., 1998). For distinguishing trust from distrust, I follow a similar to Powell’s (2001) argument, who stated that competitive advantage is different from competitive disadvantage in the following manner: “the two are quite independent—if competitive advantage stems from inimitable, idiosyncratic resources, competitive disadvantage is not merely the non-existence of such resources (which would create economic parity), but rather the failure even to satisfy the minimum success requirements [...] required of any firm.” Following a similar line of argumentation, I argue that trust and distrust are distinct – if trust relates to hope and faith, distrust is not merely the non-existence of them, but rather the fear and skepticism that the partner will fail to satisfy the minimum requirements.

To sum up, I view trust and distrust as distinct phenomena that have different antecedents and both are promising means of coping with interpartner uncertainty in interorganizational relationships.
3. Research Methodology

In this Chapter, I present the metatheoretical underpinnings of this study, my research design, the empirical context of my study, as well as the methods used for collecting and analyzing data.

3.1 Ontological and Epistemological Foundations

“Nor is wisdom only concerned with universals: to be wise, one must also be familiar with the particular, since wisdom has to do with action, and the sphere of action is constituted by particulars.”

(Aristotle, 2002, p. 1141b15)

This thesis studies how firms manage interpartner uncertainty in interorganizational relationships. Uncertainty is not studied as a given and ‘external to the individuals’ phenomenon, but as constructed by the engaged individuals, who make sense, approach and cope with uncertainty in an interactive manner. Core metatheoretical assumptions of this study are partially in line with what Tsoukas (2017) describes as a complex ‘system of picturing’ (inter)organizational life, which consists of “an open-world ontology, a performative epistemology, and a poetic praxeology” (p. 148).

Regarding the way reality is accomplished (i.e., ontology), I assume that social actors with different viewpoints and experiences interact with each other, resulting into a constant reconstruction of the multiple realities that coexist in the social world. “Realities exist in the form of multiple mental constructions, socially and experientially based, local and specific, dependent for their form and content on the persons who hold them” (Guba, 1990, p. 27). An open-world ontology acknowledges that such realities are in constant flux and that the social world is in “a process of becoming, of turning to something different” (Tsoukas, 2017, p. 148), making the future inherently unknowable. By interacting with each other and undertaking novel and purposive actions in a given context, individuals trigger changes in their realities. Phrasing it differently, individuals (re)construct their realities and represent the spinners of the wheel of change rather than the spokes on it. Having said that, this study assumes also that individuals are embedded in, depended on, and constrained by the already existing, yet ephemeral (Sawyer, 2005), social order, as it is perceived to be at the moment individuals face it. The perceived social order, in which individuals at a specific point in time are ‘thrown into’, represents the shared frame (re)created by individuals in the past, as the context in which the actors act “pre-date the social actors’ actions, which can transform it” (Archer, 1998, p. 375). To this end, I assume that reality is interactively accomplished and that the social world is
(re)shaped by the contemporary social actors, yet the reality in which individuals identify themselves at a given time also constrains their interpretations and interactions, meaning that social phenomena cannot be constructed from scratch through interaction between contemporary social actors. As Mesle (2008, p. 43) notes: “every drop of experience is a novel weaving of the world of preceding experiences out of which that drop arises”. This view is in line with Granovetter, who notes: “the behavior and institutions to be analyzed are so constrained by ongoing relations that to construe them as independent is a grievous misunderstanding” (1985, p. 482). Building on the above, a fundamental ontological assumption of this thesis is that social phenomena are neither pure constructions of the contemporary agents alone, nor just external facts beyond their influence. Inevitably, the social world experiences changes and is constantly (re)constructed by social actors, who engage in social performances and influence each other’s perceptions and actions (Goffman, 1959). Nonetheless, the social world constrains individuals, as their actions and interactions occur in the light of pre-constructed (by the interaction of prior individuals) patterns, an issue that is highlighted in a provocative yet very convincing manner by Goffman:

“Universal human nature is not a very human thing... By acquiring it, the person becomes a kind of construct, built up... from moral rules that are impressed upon him [or her] from without. These rules, when followed, determine the evaluation [s]he will make of [herself or] himself and of [her or] his fellow-participants in the encounter, the distribution of [her or] his feelings and the kinds of practices [s]he will employ...” (Goffman, 1969, p. 45).

To conclude regarding the ontological standpoint of this thesis, reality is viewed here as processual, socially constructed and contextually situated. The cognitive and mental processes of individuals influence and are influenced by others’ behaviors, meaning that perceptions of potentiality are constantly shaped and altered through the interactions between the engaged parties. Importantly, in this interactive process, both human agency and material agency play a critical role. Building on Gidden’s idea that agency is only a property of human beings, I acknowledge that digital technologies as boundary objects have a material agency, which plays an important role in social interactions among individuals as the interactions between the material agency and the human agency enable realization of affordances—i.e., unique possibilities of action—that the engagement with a digital artifact affords— (Zammuto, Griffith, Majchrzak, Dougherty, & Faraj, 2007). Such affordances are neither simply provided by the features of a digital technology, nor merely determined by the individuals’ perceptions of what a digital technology can do. Following this notion, I view reality as constructed not only from individuals’ interactions, but also from what scholars call imbrication between the human and the material agencies (Leonardi, 2011).
Further, with a performative epistemology, I adopt the view that knowledge is “the outcome of embodied knowers who are embedded within a discursive action” (Tsoukas, 2017, p. 148). Drawing on this, a core epistemological assumption of this thesis is that knowledge about reality can be accomplished by placing emphasis on how individuals perform actions and interact with each other based on their perceptions and interpretations. Because the world is socially constructed, understanding social phenomena requires consideration of the contextually-situated interpretations and interactions of the actors involved. If meaning is important to gain knowledge about the social world, context is a critical element in this effort as “meaning is created in the interplay between individuals and their social context” (Pfeiffer, 2016, p. 79). In other words, meaning is created in interactions and in the ‘dialogue’ between the individuals – ‘selves’ – and the social world in which they are embedded – ‘society’ – (Mead, 1934). Thus, in order to advance knowledge about how interpartner uncertainty in interorganizational relationships can be managed, the role of the individuals’ interpretations and interactions needs to be considered in relation to the context in which all these are embedded. All in all, in this thesis I assume that knowledge about social phenomena requires: i) shedding light on the individuals’ interpretations, cognitive processes and interactions with others (human or material agents)³, ii) delving into the role of the relational context in the creation of meaning and in the formation and development of the social phenomena in question.

Moreover, praxeology is another philosophical aspect that influences research practice (Tsoukas & Knudsen, 2005, p. 363). Simply put, praxeology refers to how knowledge and theory are associated with action and practice (Tsoukas & Chia, 2011, p. 7). With a poetic praxeology view, the research practice in this thesis is influenced in two ways. First, it is assumed that actionable knowledge is not about providing practitioners with decontextualized generalizations and guiding them to undertake certain actions by feeding them with propositional rules of action to be followed. Instead, I view that theory serves a less instrumental purpose and that the purpose of theory is not generalization but “elucidation: to illuminate a phenomenon through making ever finer distinctions that provide practitioners a clearer and more integrated understanding of their practice” (Tsoukas, 2017, p. 32). Based on this, actionable knowledge is seen as inextricably linked to a deeper contextual understanding that is actionable for practitioners in the sense that they can self-interpret and reflect upon the way they engage in their practice and thereby change the manner in which practice unfolds and is experienced. To this end, this thesis does not intend to provide managers with a crystal-clear pathway towards coping with interpartner uncertainty but to support them in engaging in

³ This as “agents may always reweave their beliefs and desires, as a result of their interaction with themselves, other agents, and material objects” (Tsoukas, 2017, p. 23).
a self-interpretation process that can be fruitful but in a different, more internal, manner. In addition, from a poetic praxiology view, actors and their practices are seen as mutually shaped, meaning that actors not only engage in practice, but reflect upon it, alter it and such alterations shape them back.

This section provided a detailed presentation of key philosophical assumptions of this thesis. It is important to note that the above-described assumptions have clear-cut implications for my methodological choices (Collis & Hussey, 2013) as the latter are nourished at an epistemological level (Bryman, 1984). As will be discussed in more depth in the next section, the adopted epistemological stance that is close to the constructivist thought (Lincoln & Guba, 2013) guided my interest to: i) pay attention to situational particularities and provide context-sensitive accounts of social phenomena, ii) give voice to individuals and place emphasis on their interpretations and interactions and iii) see my role as an active participant of the research process and co-creator of meaning.

3.2 Research Design: Intentionally Incomplete and Emerging

As in Järv, Almanopoulou, and Ritala (2018), the research design of this thesis was left intentionally incomplete to permit ongoing modifications during the research process. This thesis builds mainly upon findings of an inductive case study, but along the process of collecting and analyzing data in an iterative manner, I also identified needs and interesting research issues that made me conduct parallel studies. While in the main study I focused on how trust and distrust work and support organizations to cope with interpartner uncertainty in interorganizational relationships in the context of the robotics and automation industry in Sweden, this research inquiry both triggered and was supported by parallel studies I conducted. Before I describe in detail the main case study, I first explain how the parallel studies provided me with insights of importance for fulfilling the research purpose of this thesis.

3.2.1 A Literature Review on Trust and Distrust to Clarify Conceptual Issues

In the beginning of my research journey, the focus was on the role of trust in interorganizational relationships involving coopetition. Soon, I realized that I needed to become more knowledgeable of how prior coopetition research has discussed the role of trust as well as to clarify my conceptual entry points (i.e., trust, coopetition, uncertainty). To address this need, I used the method of a systematic literature review, which helped me not only to identify how trust has been discussed by prior research devoted to coopetition, but also to spot promising research avenues. In particular, by reviewing the literature, I noticed that whereas there were theoretical arguments that trust is critical for managing coopetitive interactions and coping with the entailed risks, few empirical studies
provided insights into how trust plays an important role in the coopetition process. In addition, while in the trust literature there was an emerging stream of research suggesting that trust and distrust are distinct yet interrelated phenomena, none of the papers included in the literature review studied trust and distrust as distinct.

In what follows I present more details about the methods used in the paper. As mentioned above, we conducted a systematic literature review (Crossan & Apaydin, 2010), which is a helpful tool not only for synthesizing the existing research but also for identifying promising research avenues in a given research field (Transfield, Denyer, & Smart, 2003). For our review, we used two databases: ISI Web of Knowledge’s Social Sciences Citation Index (SSCI) and EBSCO host web’s Business Source Premier. We searched for coopetition and trust in both the title and the topic fields of ISI and the title and the abstract fields of EBSCO. To specifically examine research using the concept coopetition and following Bouncken et al. (2015), the search items ‘coopet*’ and ‘co-opet*’ were used. While we conducted a narrow literature review, which is a limitation, we consider this type of a review as particularly relevant to our purpose as it enabled the creation of a precise research agenda on trust and distrust in coopetition and facilitated the creation of a solid bridge for trust and coopetition researchers. The search was done in April 2019 and resulted in a total of 29 papers, after removing duplicates or papers that were off-topic and adding three contributions (i.e. Castaldo & Dagnino, 2009; de Araujo & Franco, 2017; Morris et al., 2007). These were seen as relevant as they: (i) were frequently referred when coopetition scholars discussed trust-related issues, (ii) directly address trust in coopetition and (iii) mention both concepts in the title and/or abstract (Dorn et al., 2016; Wassmer, 2010). Then, the analysis of the papers was conducted in three steps. First, the papers were carefully read by both authors, who independently identified and summarized a number of aspects about each paper; purpose, methodology, context, industry, and key findings. Second, the focus was on how the papers included in the review approached a number of aspects of trust, namely definition, type and dimensions, role of trust, level on which trust was discussed, and if distrust was mentioned (See Table 1). As shown in the table, to arrive at these aspects, we drew on the extant literature on trust in organization and management studies.

Thus, these aspects were chosen based on a predefined theoretical background and were used as a guide to the analysis of the papers. The coding took place based on these key aspects and we used QSR NVivo 11, which supported the coding process, enabled an initial categorization of the papers based on their approach to trust, and allowed an early identification of promising research opportunities. This initial categorization of the papers was discussed and put into an excel file for further comparison. Finally, the findings were further analyzed based on the
trust-alliance co-evolutionary research model by Nielsen (2011), and the Drivers, Process, Outcomes (DPO) framework of coopetition suggested by Bengtsson and Raza- Ullah (2016). Then, following Wiesmann, Snoei, Hilletofth, and Eriksson (2017), the findings were compared and discussed by both researchers in order for researcher triangulation to take place (Flick, 2009).
Table 1. Key aspects of trust guiding the reading and analysis of the papers in the literature review

<table>
<thead>
<tr>
<th>Key aspect of trust</th>
<th>Key question driving the analysis</th>
<th>Authoritative definitions, conceptualizations or findings</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Definition</td>
<td>How is trust defined?</td>
<td><em>Definitions associated with Trust-as-Attitude:</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trust is defined as “confident positive expectations regarding another’s conduct” (p. 439)</td>
<td>Lewicki <em>et al.</em> (1998)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“A state involving confident positive expectations about another’s motives with respect to oneself in situations entailing risk” (p. 194)</td>
<td>Boon and Holmes (1991)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“The extent to which one is willing to ascribe good intentions to and have confidence in the words and actions of other people” (p. 39)</td>
<td>Cook and Wall (1980)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“Trust is a psychological state comprising the intention to accept vulnerability based upon positive expectations of the intentions or behaviors of another” (p. 395)</td>
<td>Rousseau <em>et al.</em> (1998)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Definitions associated with Trust-as-Choice:</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Trust is defined as “the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective of the ability to monitor or control that other party” (p. 712)</td>
<td>Mayer <em>et al.</em> (1995)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>“The extent to which a person is confident in, and willing to act on the basis of, the words, actions and decisions, of another” (p. 95)</td>
<td>McAllister (1995)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Definition of Trust-as-Choice:</em></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>“Trust (trust-as-choice) is trustor’s deliberate decision to voluntarily increase trustor’s specific vulnerability toward trustee above and beyond trustor’s propensity to trust as well as above and beyond trustor confident expectation of trustee’s trustworthiness (either due to trustee’s trait-like characters or due to institutional assurance)” (p. 10).</td>
<td>Li (2015)</td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>Definition of Trust as Observable Behavior:</em></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>“an individual may be said to have trust in the occurrence of an event if he expects its occurrence and his expectation leads to behavior which he perceives to have greater negative motivational consequences if the expectation is not confirmed than positive motivational consequences if it is confirmed.” (p. 266)</td>
<td>Deutsch (1958)</td>
</tr>
<tr>
<td>The trust belief:</td>
<td>What are the key dimensions for</td>
<td><em>“Ability is that group of skills, competences and characteristics that enable a party to have influence within some specific domain”</em> (p. 717)</td>
<td>Mayer <em>et al.</em> (1995)</td>
</tr>
<tr>
<td>dimensions of</td>
<td>the assessment of the other party’s trustworthiness?</td>
<td><em>“Benevolence is the extent to which a trustee is believed to want to do good to the trustor, aside from an egocentric profit motive.”</em> (p. 718)</td>
<td></td>
</tr>
<tr>
<td>trustworthiness</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Sources of evidence for the trust belief

**What is the fundamental source of evidence for the trust belief and/or the decision to become vulnerable?**

| Integrity refers to the “trustor’s perception that the trustee adheres to a set of principles that the trustor finds acceptable” (p. 719) | Dietz and de Hartog (2006) |

**Interaction-rooted Trust** or Relational Trust, which means that repeated interactions is the fundamental source of evidence for trust

- Institution-rooted Trust
- Macro-level aspects and relationship-specific sources
- Individual, Relational and Organizational sources
- Affect- and Cognition-based Trust

### Types of trust

**What type of trust is discussed?**

**Based on what social element is trust in place?**

- **Deterrence-based Trust:** “Deterrence-based trust exists when the potential costs of discontinuing the relationship or the likelihood of retributive action outweigh the short-term advantage of acting in a distrustful way (p. 366)”
- **Knowledge-based Trust:** Having enough knowledge about the other in order to be able to predict their behavior. A basis for trust is knowledge, which enhances predictability.
- **Identification-based Trust:** “The higher order of trust assumes that one party has fully internalized the other’s preferences” (p. 371). The interests of the partner are one’s interests too.

- **Calculus-based Trust:** This type of trust emerges after calculating and comparing the ‘gains and pains’ of the relationship.

- **Knowledge-based Trust:** Predictability is important and knowledge about the partner builds trust, as their behavior is perceived as predictable.

- **Identification-based Trust:** Trust derives due to identification with the partner’s goals, expectations and desires

**Lewicki and Bunker (1995)**

### Levels of trust

**At what level does trust take place?**

<p>| Trust can take place on multiple levels and this is why a multi-level perspective on trust needs to be adopted | Currall and Inkpen (2002; 2006) |
| Trust takes place across levels | |
| Interorganizational Trust | |
| Intergroup Trust | |
| Interpersonal Trust | |
| Trustor (Person, Group or Firm) and Trustee (Person, Group or Firm) | |</p>
<table>
<thead>
<tr>
<th><strong>The double-edged sword of trust</strong></th>
<th>How are the bright side and dark side of trust discussed?</th>
<th>Trust is positive yet can also be detrimental and Distrust is not only negative, but also beneficial</th>
<th>Lumineau (2017)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Trust - distrust relation</strong></td>
<td>Is Distrust discussed?</td>
<td>Polar opposites (i.e., either/or view)</td>
<td>Mayer et al. (1995), Schoorman et al., (2007)</td>
</tr>
<tr>
<td><strong>Coevolution of trust and interorganizational relationship</strong></td>
<td>Where in the ‘DPO framework is Trust discussed?</td>
<td>Trust evolves over time</td>
<td>Currall and Epstein (2003)</td>
</tr>
<tr>
<td></td>
<td>Trust can be a driver of coopetition, a process-related factor and/or as an outcome of coopetition</td>
<td></td>
<td>Bengtsson and Raza-Ullah (2016)</td>
</tr>
<tr>
<td></td>
<td>What is the Role of Trust?</td>
<td>Trust is dynamic, co-evolves with interorganizational relationships and serves as antecedent in the formation phase, as moderator in the implementation phase and as an outcome in the alliance evolution phase</td>
<td>Nielsen (2011)</td>
</tr>
</tbody>
</table>
3.2.2 A Quantitative Study to Answer a Fundamental Question: “Do trust and distrust indeed play distinct roles?”

The findings of the literature review focused my attention on the distinct roles of trust and distrust in coping with uncertainty in interorganizational relationships. Being intrigued by the idea that trust and distrust are separate and can play different roles and building on the findings of the literature review showing that no paper has paid attention to the distinct roles of trust and distrust in coopetition research, I wanted to see whether these two relational phenomena are perceived by individuals, who engage in coopetition, as polar opposites or as distinct yet interrelated. Thus, my co-author and I used a survey method where we examined the roles of trust and distrust and answered a critical question for this thesis: “Do trust and distrust in coopetition matter to performance?”. In this paper, we confirmed the theoretical suggestion that trust and distrust play distinct roles in coopetition and my interest in learning more about how trust and distrust “precisely do their jobs” was further increased.

The survey was sent to 404 Swedish firms engaged in coopetition and was administered from May 2015 to December 2015. The final number of usable responses was 225. The main respondents of this survey were senior managers who were directly involved in the coopetition relationship or were responsible for achieving desired performance objectives. The analysis of this empirical material was led by the first author of the paper, while I was responsible mainly for other parts of the paper. Regarding the analysis, structural equation modeling via partial least squares (PLS-SEM) was applied to analyze the data using SmartPLS 3 (Ringle, Wende, & Becker, 2015). PLS-SEM is a variance-based approach and the interpretation and evaluation of its estimates follow a two-stage step. First, the measurement model is evaluated to test for convergent and discriminant validities as well as for the internal consistency of constructs. Second, the structural (path) model is assessed based on the significance of path coefficients, coefficient of determination \(R^2\), and model predictive relevance \(Q^2\). We also assessed the model fit index of Standardized Root Mean Square Residual (SRMR).

3.2.3 A Selective Literature Review on Uncertainty and a Conceptual Piece on Interpretive Schemes as Means to Cope with Uncertainty

Further, building upon the finding of the quantitative study that trust and distrust play distinct roles in coopetition and inspired by the theoretical argument that trust and distrust can be distinct yet interrelated means to cope with uncertainty (as suggested by Guo et al., 2017), I also wanted to review the literature on uncertainty in interorganizational relationships involving coopetition and thereby further clarify my conceptual entry points. Given the opportunity to write
a book chapter on managing interpartner risks in strategic alliances, I conducted a selective literature review (for another example of selective review, see Mosakowski & Earley, 2000) on risks and uncertainty in relationships characterized by both cooperative and competitive elements. By conducting this selective review, I not only identified different types of risks and uncertainties discussed by prior research, but also came across the notion of interpretive schemes as a particularly important means for coping with uncertainty triggered by interruptions in the smooth functioning of interorganizational relationships. Thus, this conceptual book chapter includes both the selective review on risks and uncertainty as well as theoretical arguments that firms can adopt hybrid interpretive schemes to engage in both calculation and suspension of exchange hazards and better cope with dual potentialities. The analysis of the papers included in the selective review supported the fulfillment of the purpose of this thesis as I not only became more knowledgeable of how uncertainty is discussed in research on coopetitive interorganizational relationships, but also came across and argued for a potential means to cope with interpartner uncertainty.

3.2.4 Surprises along the Process Turned my Attention to the Role of Digital Artifacts as Boundary Objects
As mentioned above, in parallel with the quantitative study and the writing of the conceptual book chapter, I was also collecting and analyzing qualitative interview material because I wanted to get rich and contextualized descriptions of people’s experiences with trusting and distrusting in the face of uncertainty. Following an inductive approach, I was trying to see how trust and distrust work and support organizations to cope with uncertainty in a knowledge-intensive industry in which coopetition is commonplace: the robotics and automation industry in Sweden. Based on insights I derived from this study and inspired by the argument that trust can serve as an organizing principle under conditions of uncertainty, I focused on the underlying processes or else mechanisms through which trust and distrust work as organizing principles in interorganizational interactions in this context. Soon, I came across several surprises, which is rather common (and even desirable) in inductive studies. First, I realized that while I was thinking of mainly one facet of uncertainty (i.e., behavioral uncertainty related to partner opportunism), the interviews provided evidence of other types of uncertainty (i.e., interpretive uncertainty due to misalignment of views which is discussed in the literature as “interpretive uncertainty” (Weber & Mayer, 2014), and uncertainty related to the influence of the relational context on dyadic interactions, which I named “relational uncertainty”). In light of these insights, I decided to encapsulate all three types of uncertainty under the notion of interpartner uncertainty. Second, while my initial focus was on coopetition as a key source of uncertainty, my analysis of the inductive material showed two more unique sources of uncertainty: (1) complex interdependencies that exist among different firms...
within the robotics and automation industry and (2) the temporal nature of interorganizational interactions in this project-based industry where firms are involved in multiple temporal alignments to deliver complex tailor-made solutions. Finally, a third surprise of the inductive study was that the challenge of interpretive uncertainty is mainly dealt through another means than trust and distrust. In particular, interviewees frequently discussed the important role of digital solutions in the process of aligning their divergent expectations and views. A closer analysis of the material made me realize that digital artifacts in this context serve as boundary objects and then, I turned to the related literature. In addition, I conducted additional interviews with firms that mentioned the importance of using digital artifacts as boundary objects and collected rich secondary material that further enriched my understanding of these digital artifacts in this relational context. As a result, I wrote a paper focusing on the role of digital artifacts in coping with interpretive uncertainty and showed that dual potentialities require a redefining of the boundary roles of the engaged firms.

3.3 Main Research Strategy: A Qualitative Case Study

As hinted above, this thesis builds on a mixed-methods approach and includes not only a qualitative but also a quantitative study. Yet, during my PhD time main emphasis has been placed on collecting, analyzing, and building upon qualitative data and as a result, this thesis is largely positioned within the qualitative research tradition. Due to this, in what follows I describe in detail the methods used in the qualitative study.

Two of the appended papers are built on a case study (Silverman, 2015) of interorganizational interactions in the robotics and automation industry in Sweden, which is the main empirical setting of this thesis. Case study research enables the researcher to become familiar with the particularities of the empirical setting, to collect context-sensitive data from multiple respondents and to develop concrete and context-dependent knowledge of social phenomena (Flyvbjerg, 2006). Shedding light on the conditions under which a phenomenon takes place enables contextualized and “thick description” of the case (Geertz, 1973), which facilitates in-depth understanding of associated events, activities and processes (Creswell, 2012). Because case studies allow utilization of multiple sources of evidence and provide rich contextualized knowledge, they are well suited to understand how individuals ascribe meaning to their own world (Lincoln & Guba, 1985) and to explore how meaning is created in the interactions between social actors and their surroundings. As Eriksson & Kovalainen (2015, p. 135) highlight, the main purpose of case studies is “to offer interpretations on the case made by the researcher, and sometimes by the business actors involved in the study”. This is in line with a fundamental assumption of this thesis that understanding social phenomena requires not only a detailed contextual
description of the case, but also close proximity between the researcher and the empirical setting, as “the researcher is part of the social world that is studied” (Alvesson, 2003). In doing so and acting as “an interpreter who both constructs the case and analyzes it” (Eriksson & Kovalainen, 2015, p. 135), the case researcher is in position to better understand the different context-dependent processes related to the phenomenon under investigation, to identify the particularities that make it unique, and to capture not only how individuals make sense of the surrounding realities, but also how such interpretations interrelate with social interactions. My role as a researcher, therefore, was to first account for context, to focus on interpretations made by individuals experiencing uncertainty related to coopetition, and to investigate the implication of these interpretations on how firms within the automation and robotics industry in Sweden operate and interact with each other in the face of interpartner uncertainty.

Paying close attention to the empirical setting allowed me to first realize what the different actors of the industry are and what partnerships exist in this context. This has been critical for capturing the internal dynamics of the industry and for identifying how competing firms relate to each other, which facilitated a contextualized understanding of how individuals make sense, experience and cope with uncertainty in interorganizational relationships. The case has not been studied in every detail, since the focus has been on the abovementioned predefined theoretical interests of the researcher. For the sake of clarity, it is important to mention that the unit of analysis of this study is a dyadic coopetitive relationship embedded in a broader relational context or ecosystem.

### 3.3.1 Selecting the Empirical Setting

As a fundamental assumption of this thesis is that context is necessary and sufficient condition for gaining understanding of how firms cope with interpartner uncertainty, selecting a relevant empirical setting was a critical issue. Identifying this piece of the puzzle has undoubtedly been the most challenging, irritating, time-consuming and cognitively-demanding process of my research journey. This ‘bumpy’ journey, nonetheless, allowed me to identify mistakes, set more concrete criteria for selecting the empirical setting and most importantly, it provided me with the opportunity to reflect upon my research focus and rethink the initial research design.

The process through which I selected the empirical setting of my study can be divided into three stages, namely i) over complexification based on too many predefined criteria and inflexibility to redefine the initial research goals, ii) muddling through due to failure to identify cases that fulfill all of the initial expectations, and finally, iii) sieving and prioritizing certain criteria over others.
This process helped me realize that engaging with empirical material may result into a need to revisit the initial assumptions, to rethink the selected theoretical concepts, and to change the research questions formulated at the beginning of the research journey. The first stage of this process was very much related to these issues as in the beginning, I was looking for a case setting that could fulfill all the initial expectations. Failure to achieve this led me to realize that I need to become more flexible, and to set more ‘relaxed’ criteria. This has been fruitful as difficulties in identifying a relevant case resulted into a second round of theoretical navigation, which changed my research focus and redefined the research goals I wanted to achieve. With these goals in mind, I separated the initial criteria for selecting the case into two groups: the desirable and the necessary. Once this sieving took place, I prioritized them and arrived at the conclusion that the necessary criteria for selecting an industry suitable as the empirical setting for my study are the following four. First, repeated coopetition should take place, because it is likely that the engaged firms and individuals have experience of interpartner uncertainty associated with coopetition. Second, co-development of products and services should be a key focus, which makes interorganizational relationships crucial. Third, knowledge-intensive processes should take place, because it is likely that interorganizational interactions involve sharing of sensitive and strategically important knowledge, which may expose firms to increased vulnerability, making interpartner uncertainty a key concern. Finally, it was important that I could gain access to the engaged firms and collect rich secondary data.

The relevance of these criteria is supported by prior research, as it has been suggested that coopetition is more critical in high-tech, knowledge-intensive and dynamic industries (Gnyawali & Park, 2011; Ritala & Hurmelinna-Laukkanen, 2009), where it is more likely for interpartner uncertainty to take place (Park & Ungson, 2001). While the first three criteria relate to issues of relevance and appropriateness, the last is related to the issue of gaining access. All these criteria are fulfilled by the robotics and automation industry in Sweden and this is why I selected this industry as the empirical setting for my study. Firms operating in this industry have rich experience with establishing and managing coopetitive interorganizational relationships with more than one member of the industry and with engaging in recurrent project-based collaborations in which interdependence and temporality exacerbate the challenge of interpartner uncertainty. To be able to serve powerful firms, such as Volvo Cars AB and Scania AB, for example, firms engage in knowledge sharing even with their fierce competitors. Coopetition is commonplace in this empirical setting, but what is even more striking is that the structure of the industry creates ample room for complex relationships and interdependencies between the firms, which is explained in the case overview below.
Empirical Setting: The Robotics and Automation Industry in Sweden

In the robotics and automation industry, interdependent actors with unique complementarities offer distinct components that hold little value in isolation yet integration of which is a prerequisite for building complex and customized systems. In particular, actors temporally align in multiple projects to create tailored-made, robot-based automation solutions for industrial processes, such as a robotic cell or a complete production line with industrial robots.

The activities required to be performed for such solutions to materialize revolve around the delivery and integration of hardware devices and associated engineering processes. Depending on the robot application (e.g., welding, laser cutting, picking and placing, painting, palletizing, assembling) and the intended purpose of the robot, different types of hardware devices are needed, yet the majority of the applications include many different types of hardware such as robots, grippers, lasers and programmable logic controllers. For all these hardware devices to be integrated into a coherent and tailored-made solution, a large number of activities and additional components are required, as illustrated in Figure 2. Because all these components of the ecosystem require different knowledge bases and areas of expertise, a robot-based automation system necessitates co-specialization of capabilities and alignment of actors, positions, and flows within this industry.

![Figure 2. Components and processes for constructing a robot-based automation solution](image)

Based on the role that the different firms adopt in a project and the main activities they undertake, they can be classified into four broad categories, which represent all the roles that need to be present in a project for a robot-based automation
system to be built. The four main groups of firms operating within the robotics and automation industry and the ways they relate to each other can be seen in Figure 3.

The first are *robotic providers* and other suppliers (for example, suppliers of grippers, conveyor systems, and simulation tools). *Robotic providers* sell programmable machines, which can be used in order to automate industrial processes, such as picking and packing, palletizing and depalletizing, painting and laser cutting. In Sweden, there are mainly four large robot providers, namely ABB Robotics, KUKA, FANUK, and Yaskawa and two robot providers that specialize in collaborative robots, namely Rethink Robotics and Universal Robots. Collaborative robots are robots that can work alongside humans without installing any additional safety fences or other devices and these robots can be introduced in a production line for direct collaboration with the individual. It is important to note that all of the six above-mentioned robot providers are fierce competitors.

The machines provided by the robot providers are used in industrial automation projects by automation companies, so called *System Integrators*, which is the second broad category of firms operating in this industry. Typically, a robot supplier relies heavily on system integrators, as an industrial robot cannot be directly introduced to a customer’s shop floor without tailoring and integration, for which system integrators are responsible. The primary task of system integrators is to bring together and integrate different subsystems in order to provide a complete automation solution for a specific task or industrial process. In the Swedish market, most of the system integrators are small firms with limited resources, which means that they often need to cooperate with and rely on each other for the completion of demanding robot-based automation projects. As the CEO of the largest system integrator in Sweden noted: “I think collaborating is more like in the genes of the industry... that we are too small... I mean... to take on really big projects that are coming up today... some of the competitors have special knowledge that we would like to use...” (CEO, Elektroautomatik). In addition, system integrators often use *sub-contractors*, who hold unique competence, knowledge and expertise about different processes or technologies that can be integrated into the systems. This is the third group of firms in this empirical setting and the role of these firms is critical, especially in large projects where different types of expertise are needed. A project manager of a system integrator explained: “When we have a big project, I maybe have five different sub-suppliers” (Project Manager, RobNor AB). Sub-contractors are engaged by the system integrators leading a project to provide support and to deepen the existing pool of technologies, knowledge and expertise. For instance, Virtual Manufacturing provides system integrators with services, such as robot simulation, dimensioning of robots and their surroundings via simulation
systems, virtual verification and off-line programming. As some system integrators also have specialized knowledge in certain technologies or processes (e.g., laser automation solutions or machine safety), they often act as subcontractors to other system integrators and can hence be included in the third group of firms as well, which further increases interpartner uncertainty in the interorganizational interactions in this context.

The fourth group of firms in this industry is the end-users or else industrial customers. These are firms mainly from the automotive, medical and healthcare, food and beverage and manufacturing industries that need to automate their processes by introducing robotics in their production line. For instance, Norrmejerier, a dairy co-operative in Sweden owned by around 500 local farmers, has introduced several different robot applications in their production line by installing FANUC industrial robots. This required two competing system integrators, namely RCN and NILAAB, to partner up and automate Norrmejerier’s rather demanding production line. Regarding the role of the end-users in this setting, it is important to note that due to the tailor-made nature of the offerings, the end-users play an orchestrating role and can chose what elements will be used as well as who will deliver the different components. This is worthy to mention because the orchestrating role of the end-customers is an element contributing to high degrees of interpartner uncertainty.

**Figure 3. Main actors in the robotics and automation industry**
As mentioned above, this empirical setting is particularly relevant for studying the phenomenon of how firms cope with interpartner uncertainty in interorganizational relationships. The multilateral interdependencies among the actors, the potential for coopetition, and the temporality of their interactions as occurring in projects, make interpartner uncertainty a key organizing challenge in this empirical setting. Depending on the project, an ecosystem participant can be located in different positions in the flow of activities and can be responsible for delivering different components. For instance, a robotics firm called Yaskawa acts as a robotics provider in many projects, meaning that they provide a robot, train and support system integrators to win a project, but in projects including ‘arc welding’ robot applications, they act as a system integrator and they perform activities concerning design, programming and installing a robot-based automation solution. Such shifts in the positions that ecosystem participants make are important, because they influence the alignment of multilateral positions. Further, the links between the different actors can differ significantly. For example, robot providers supply system integrators not just the robot, but also, they offer them training, share with them information about prospects, and attempt to persuade them and influence their choice of the robot brand by using a number of strategies (e.g., approaching the end-customer directly). As a result of all these challenging interactions, firms need to identify ways to cope with interpartner uncertainty, which makes this empirical setting a suitable setting for fulfilling the purpose of this thesis.

3.3.2 Data Collection
The primary data collection method of this thesis is semi-structured interviews (Creswell, 2012; Alvesson, 2003) with individuals of firms operating within the robotics and automation industry in Sweden. Interviews are a common research method in business research (Eriksson & Kovalainen, 2015) and of particular relevance for studying complex and multifaceted aspects of social life based on individuals’ views, experiences, interpretations, values and understandings (Goulding 2002; Wengraf, 2001). Following this notion, this study approaches interviews as an appropriate data collection method for shedding light on how individuals experience challenging interactions in interorganizational relationships and how they make sense of and cope with interpartner uncertainty. Having said that, interviews are not mere tools for producing ‘true’ confessions and “authentic accounts of subjective experience” (Silverman, 2015, p. 178). According to Alvesson (2003), looking at interviews from such a “romantic” prism would lead the researcher to neglect that interviews are complex social phenomena which can serve as arenas for interaction between the interviewer and the interviewee and thereby for construction of meaning by both parties. Building on this, interviews are seen in this study not only as a way to delve into the inner world of the interviewee and gain insight into how they describe their
world, but also as “dramaturgic performances (Goffman, 1956) where participants attempt to impact the others’ evaluation of and behavioral response towards themselves” (Pfeiffer, 2016, p. 113). With this view, I conducted guided and semi-structured interviews, as they provide both a pre-designed outline of themes and the necessary flexibility to allow interviewees to choose what they want to talk about and how and to permit our interaction to influence the interview process (Eriksson & Kovalainen, 2015). Information about the interview guide and the main themes included in it are provided in a following paragraph (in the section “Interview Process”).

Data collection took place from November 2017 to November 2019 and included 49 semi-structured interviews at 23 organizations. In particular, I conducted interviews at four firms classified as robotics providers, 12 firms classified as system integrators and subcontractors, two software suppliers, three industrial customers, and two organizations that promote robotics and automation in Sweden. The interviews lasted from 31 minutes to one hour and 41 minutes, and the majority of them was done through Skype and telephone calls. These interviews were also complemented by post-interview emails in case further clarifications were needed, and by secondary data to get a better understanding of the context. In Table 3, a description of the organizations from which I collected data, a full list of the interviewees representing the organizations, and the duration of the interviews are presented. As shown in the table, I decided to interview individuals from firms that play different, but to some extent overlapping, roles in this empirical setting, because I wanted to include different perspectives and experiences related to coping with interpartner uncertainty. In addition to variety in regard to firms and the roles firms adopt in a project or in the ecosystem overall, I also found it important to interview individuals holding diverse positions as they may entail different experiences. Thus, the 49 semi-structured interviews were conducted with CEOs, sales managers, project managers, and experienced technicians, as illustrated in Table 3. All of the interviewees had rich experience and were able to talk about interaction processes within interorganizational relationships in this context.

Regarding the logic by which I selected the interviewees, I started by interviewing individuals from system integrators who most often are needed in automation projects and frequently interact with other firms as they are responsible for integrating components from multiple providers. In addition, system integrators frequently engage in coopetition and were able to talk about trust and distrust dynamics when organizations deal with challenges related to simultaneously collaborating and competing (which was my initial research focus). The rest of

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4 Including interviews outside the robotics and automation industry, the total amount of interviews conducted in this research journey is 62. Yet, after the decision to focus on this context, the rest of the interviews have not been included in the analysis.
the interviewees were contacted either because there were mentions of their names or the firms they work with in previous interviews (following a snowball sampling logic), or because I identified them through secondary online data. For instance, I collected material on the firms’ websites or LinkedIn posts presenting the firms’ system partner network, or descriptions of projects, where the names of the participating firms were mentioned. Such information was identified, for example, on the websites of robotic providers who list their qualified and certified system integrators and other suppliers and strategic partners. In addition, in the interviews I also asked our respondents with whom they collaborate frequently and who else could offer insights into their relationship. That many of the interviewees were contacted because their names or names of partnering organizations were mentioned in a previous interview enabled me to consider the viewpoints of people that collaborated in projects although most of them preferred not to mention in which specific projects they collaborated. Further, regarding our choice to interview people from organizations promoting robotics and automation in Sweden (e.g., SWIRA-Swedish Industrial Robot Association and Automation Region), this was important for gaining a deeper understanding of how the ecosystem is structured, the interdependencies among key participants, and for identifying interviewees that are willing and able to provide rich insights into interorganizational interactions in this context. What is more, I attended an industry fair which also facilitated attracting interviewees for the research project as well as allowed observations on how organizations interacted during the fair (e.g., in panel discussions, in visits to booths of other firms and what robot brands the different integrators chose to exhibit).
**Table 2. Firms and Interviewees**

<table>
<thead>
<tr>
<th>Firm</th>
<th>Main Role</th>
<th>Nr of Interviews</th>
<th>Interviewee's Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>KUKA Nordic</td>
<td>RP</td>
<td>7</td>
<td>CEO, Sales Manager Nordic, Area Sales Manager, Key Account Manager</td>
</tr>
<tr>
<td>YASKAWA Nordic</td>
<td>RP</td>
<td>3</td>
<td>CEO, Sales and Marketing Manager, Sales Manager</td>
</tr>
<tr>
<td>FANUC Nordic</td>
<td>RP</td>
<td>1</td>
<td>Sales Manager</td>
</tr>
<tr>
<td>Opiflex</td>
<td>Provider of a flexible robot</td>
<td>2</td>
<td>CEO, Sales and Marketing Manager</td>
</tr>
<tr>
<td>Elektroautomatik</td>
<td>SI</td>
<td>1</td>
<td>Project and Sales Leader, Project Managers, Technical Development and Machine Safety Specialists</td>
</tr>
<tr>
<td>AH Automation</td>
<td>SI</td>
<td>7</td>
<td>Technical Development and Machine Safety Specialists</td>
</tr>
<tr>
<td>Evomatic</td>
<td>SI</td>
<td>2</td>
<td>CEO</td>
</tr>
<tr>
<td>APR Automation</td>
<td>SI</td>
<td>1</td>
<td>CEO</td>
</tr>
<tr>
<td>Teamster</td>
<td>SI</td>
<td>1</td>
<td>Sales Manager</td>
</tr>
<tr>
<td>Status Automation</td>
<td>SI</td>
<td>1</td>
<td>CEO</td>
</tr>
<tr>
<td>Vingebro Automation</td>
<td>SI</td>
<td>1</td>
<td>CEO</td>
</tr>
<tr>
<td>Karlskoga Automation</td>
<td>SI</td>
<td>1</td>
<td>CEO</td>
</tr>
<tr>
<td>RobNor</td>
<td>SI</td>
<td>4</td>
<td>CEO, Project Manager, Robot Programmer</td>
</tr>
<tr>
<td>Permanova</td>
<td>SI</td>
<td>2</td>
<td>CEO</td>
</tr>
<tr>
<td>Steirnberg Automation</td>
<td>SI</td>
<td>3</td>
<td>Sales Manager</td>
</tr>
<tr>
<td>Spectrum Technology</td>
<td>SI</td>
<td>1</td>
<td>CEO</td>
</tr>
<tr>
<td>Virtual Manufacturing</td>
<td>SSC</td>
<td>2</td>
<td>Business Unit Manager</td>
</tr>
<tr>
<td>Indexator</td>
<td>IC</td>
<td>2</td>
<td>CEO</td>
</tr>
<tr>
<td>Ålō</td>
<td>IC</td>
<td>2</td>
<td>CEO, Director Manufacturing Engineer</td>
</tr>
<tr>
<td>AGCO</td>
<td>IC</td>
<td>1</td>
<td>Robot Programmer</td>
</tr>
<tr>
<td>SWIRA</td>
<td>Industry Organization</td>
<td>(2 but already counted as members of other org.)</td>
<td>Heads of SWIRA (already counted in the total number of interviews as one is the Sales Manager Nordic at KUKA Nordic and the other is the Sales and Marketing Manager at Opiflex)</td>
</tr>
<tr>
<td>Automation Region</td>
<td>Industry Organization</td>
<td>2</td>
<td>Project Managers</td>
</tr>
<tr>
<td>Siemens</td>
<td>Software Supplier</td>
<td>2</td>
<td>Simulation Manager, Product Manager for Digital Enterprise</td>
</tr>
<tr>
<td>Visual Components</td>
<td>Software Supplier</td>
<td>1</td>
<td>Sales Manager</td>
</tr>
<tr>
<td>Eradity</td>
<td>Consultant</td>
<td>1</td>
<td>CEO</td>
</tr>
</tbody>
</table>
Interview Process. In the beginning, my supervisors and I had several meetings where we discussed the research design as well as decided on the main themes of an interview guide. We also discussed that flexibility is important while conducting the interviews and that in interviews with individuals from different firms (e.g., system integrator or robotic provider), different questions could be more relevant and different themes might deserve more attention. For instance, in interviews with system integrators we realized that it was important to ask them about how they perceive that robotic providers often enter the system integration business and compete with them. As our research design was left intentionally incomplete to allow ongoing modifications during the research process, while the interviews were based on a predefined interview guide, the guide was constantly revised as more empirical material was collected and my theoretical understanding of the phenomenon was increased. In the beginning (interviews conducted until early 2018), the interviews were more open and the goal was to understand how firms work in partnerships, whether and how coopetition takes place in this empirical setting and what their perceptions are about coopetition and the entailed interpartner uncertainty. Each interview helped me refine and thereby construct a more helpful and relevant interview guide. However, the revised guide still included themes rather than very concrete questions that would over-structure the interview process and hinder potential surprises during data collection. The main themes included were: background information on the interviewee and the organization, dynamics of the industry, dominant actors and interdependencies and strategic collaborations and partnerships with other firms in the industry, main competitors and their relationship with them, how individuals experience the simultaneous presence of cooperation and competition (both negative and positive sides of coopetition), perceptions of individuals in regard to the sources and nature of uncertainty in their relationships with others, how firms assess the future behavior of the partner and how they make sense of their intentions and v) relational, formal and later on, digital-based mechanisms5 through which firms cope with interpartner uncertainty. Finally, a key theme was related to the bright and dark sides of trust and distrust as well as experiences associated with trusting and distrustng. Specifically, in order to capture the role of trust and distrust in coping with uncertainty, questions revolved around the interviewees’ positive and/or negative expectations of the future behavior of their partners and around the implications of these expectations. Also, when trust was mentioned, questions such as ‘what does trust/distrust mean to you?’, ‘how do you know if trust/distrust is present?’,

5Because uncertainty related to misaligned views among key players in specific projects was mentioned as a key concern and there were mentions of digital technologies as means to deal with this challenge, interviews at a later stage included more questions about the role of digital technologies in coping with interpartner uncertainty.
'what makes a partner trustworthy?' ‘how would you behave when you interact with a (dis)trustworthy partner?’, were also asked in order to capture how and how trust and distrust are experienced and influence interorganizational interactions taking place under interpartner uncertainty. During the interviews, the respondents were encouraged to provide examples and if possible, mention projects.

Moreover, in addition to interviews, this thesis builds on secondary data (Silverman, 2015), such as firms’ internal documents, material collected in an industry fair and presentations that took place there, field notes, speeches from key people from the industry, articles in industry-specific journals, magazine articles, release notes, photos taken when I visited the firms’ facilities (first-hand field visits), videos uploaded to online channels providing information about the industry as well as about specific projects, and interviewees’ posts on social media (mainly LinkedIn posts). The collection of secondary data was very useful for getting a better understanding of the context and of particularly important for getting insights into how digital artifacts as boundary objects work and help firms to cope with interpretive uncertainty.

### 3.3.3 Data Analysis

The process of analyzing the empirical material started after transcribing the interviews. Yet listening to the recorded interviews a couple of times was also part of the analysis process (Psathas & Anderson, 1990), as important aspects were identified and initial interpretations of the material were already made. In particular, after conducting an interview, the audio was listened a couple of times and notes were taken, which facilitated the subsequent analysis. Then, I analyzed the data⁶ based on a thematic content analysis approach (Miles & Huberman, 2003). Following the principles described in Gioia, Corley, and Hamilton (2013) and inspired by Strauss and Corbin (1998), the coding procedure was based on multiple iterations and involved multiple interpretations based on different levels of abstraction. Starting out with open coding, I moved to a higher level of abstraction, based on identified patterns and on a constant comparison between the findings and insights from the literature. Importantly, while the themes derived partly from our analysis of instances where the social phenomena in question were taking place, they also derived from the theoretical insights provided by the existing literature. In that sense, the themes were the outcome of a process where I drew upon my “interpretative repertoire” (Alvesson & Kärreman, 2007, p. 1268), which was constructed and further developed through

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⁶ (i.e., coding interview transcripts, social media posts, portions of videos and sections of images with the use of Nvivo 12)
my interactions with the co-authors and the interviewees and from extant theoretical frameworks and findings.

The analysis of the empirical material was occurring along data collection but the main analysis was done after the completion of all the interviews. In this process, an interplay between the developing theorizing and the data collection took place, and on several occasions, an interviewee was contacted for clarifications or arranged a second interview to facilitate a more fruitful dialogue between my understanding of the phenomenon under study, the analysis of the empirical material and the existing theory. The coding was done sentence-by-sentence, supported by the use of Nvivo 12 software and included a plethora of memos. To ensure the trustworthiness of the research findings (Lincoln & Guba, 1985), my co-authors and I applied the logic of researcher triangulation and had joint coding meetings in which all the authors made suggestions, changes, and challenged the interpretations and codes created. In these meetings, we had different roles and inter-coder reliability was not the main goal as discussions, disagreements and negotiations were more important than an early alignment of our views on the initial codes. In particular, while I was leading the analysis and was the main coder, my co-authors enriched the quality of the process by playing the devil’s advocate and by providing alternative ways of approaching the empirical material. In doing so, we all engaged in a very constructive process of realizing the productive and generative potential of doubt in theorizing (Locke, Golden-Biddle, & Feldman, 2008) as we dissociated the inquiry process from validating my views and beliefs (i.e., avoid confirmation bias) and questioned my initial interpretations. This was very fruitful for selecting the most relevant codes and for creating new ones. The analysis was also revisited many times during the writing of our papers, as new insights were developed along the process. For instance, we often discussed our analysis based on models, tables with quotes and the associated codes, figures and data structures of ours, and already existing theoretical frameworks, which altered our interpretations and triggered further changes in the coding. In addition, we shared our final interpretations on two occasions with interviewees, who reflected upon them and provided us with feedback that encouraged us to consider actors, activities, and other important aspects that we otherwise could have missed in our analysis.

**Analysis of secondary data.** Overall, secondary data was used to gain a more holistic picture of the empirical setting under investigation, to understand what the different firms do, to realize what partnerships exist within the industry and to identify projects in which coopetition may take place. For instance, a number of LinkedIn posts shared by a project manager of a system integrator shed light on what robotic provider they preferred in their last projects and why. Another example is the photos I took when I attended the Elmia Automation fair where all the system integrators and robotic providers were presenting their products. This
was important to understand what the different firms do and with whom they have built the solution presented at the fair (the logos of the firms were on the exhibited robotic arm). This type of data helped me to become familiar with the main empirical context of my study and supported my interpretations of the interview transcripts. In this sense, secondary data was used in both of the qualitative sub-studies, but its use was more critical and instrumental in the fifth paper appended in this thesis, which looks into the role of digital artifacts as boundary objects in coping with interpartner uncertainty. For this paper, the primary use of secondary data in the analysis process was to familiarize that authors with the processes and tools that were described by our interviewees. For instance, analysis of videos was very useful for understanding what the interviewees meant by statements, such as “I can draw on the air with VR and the other parties can see on their screen exactly what I don’t like and then we can discuss” (See Figure 4 for screenshots of videos that I analyzed).

The analysis of this video was performed by coding portions of the video timeline with the use of Nvivo and it was critical as it helped to interpret the interviewee’s words and supported the insights from the interviews with people from AH Automation. Similarly, portions of a video that was uploaded on YouTube by RobNor were placed into nodes in Nvivo and this supported interpretation of the interviews and the explanations of interviewees regarding how a paint robot is programmed in VR by a non-knowledgeable user. Further, secondary data was used in the analysis process for triangulating information provided by the interviewees and for cross-checking findings from the interviews. For instance, a LinkedIn post (see Figure 5) from the official account of RobNor provided information about their VR solution and I was able to triangulate related information provided by an interviewee (customer of RobNor). The information provided by this post was also imported to Nvivo and codes such as “benefits of VR”, “reduction of path programming time”, “better ergonomics”, “simplifying complex tasks”, “lowering threshold for entering robot automation” were created.

Figure 4. Screenshots of videos collected and used in the analysis
Moreover, secondary data were used also for including the ‘voice’ from third-party actors to whom I didn’t have access. For example, in the RobNor case, we were also interested in enriching our dataset with the viewpoint of ABB Robotics and this was enabled by press releases, release notes and industry-specific journals. For more detailed description of the methods used in each individual, please see the appended papers. In the next Chapter, I provide an overview of the five papers included in this thesis and a figure showing the focus of each paper regarding different facets of interpartner uncertainty.

\textbf{Figure 5.} Example of a social media post used in the analysis
4. Summary of the Individual Papers

This thesis is built on a collection of five papers: a systematic literature review (P1) on trust and distrust in coopetition in which we elaborate on the need to consider both trust and distrust as important under uncertainty, a conceptual paper (P3) on the role of interpretive schemes to deal with both mitigable and immittigable uncertainty, which also provides a selective review of the literature on risks and uncertainties involved in interorganizational relationships, and three empirical studies. While two of the empirical studies (P4 and one P2) focus on the distinct roles of trust and distrust in uncertain interorganizational relationships, the last one (P5) is a qualitative study that pays attention to the role of digital artifacts as boundary objects in coping with interpretive uncertainty. As previously discussed, each paper is associated with different research questions (see Figure 1). Furthermore, the five papers focus on different facets of interpartner uncertainty, which is also triggered by the influence of the broader relational context (see Figure 6). In what follows, an extended abstract for each of the papers is presented.

Figure 6. The focus of each paper included in this thesis regarding coping with different facets of interpartner uncertainty
4.1 Extended Abstract of Paper 1


This co-authored paper is based on a systematic literature review and its purpose is: to identify limitations and gaps in the extant literature on trust in coopetition, bring promising research opportunities into light, and create an agenda for future research focused on the roles of both trust and distrust in coopetition.

Trust has been acknowledged as an important aspect of interorganizational relationships. Yet, limited attention has been paid to the importance of trust in the light of coopetitive interactions, i.e. simultaneously cooperating and competing. Research on trust has started to acknowledge that more trust may not always be better, and that trust and distrust are separate and distinct phenomena. Whilst coopetition research has mentioned the important role of trust, the potential role of distrust is even less acknowledged, although it may be particularly relevant due to the tensions, risks, and uncertainties involved. The purpose of this paper is to identify limitations and gaps in the extant literature on trust in coopetition, bring promising research opportunities into light, and create an agenda for future research focused on the roles of both trust and distrust in coopetition. By means of a systematic literature review, we find that the importance of trust in different phases of coopetition has been acknowledged by prior research, yet deeper explanations of how, when, and why different aspects of trust and distrust matter to coopetition are missing. A normative view on trust prevails and the potential fruitfulness of distrust is neglected. Based on these limitations, an agenda including six promising research avenues is constructed. Importantly, trust and distrust are suggested as promising tools to deal with uncertainty and further research on this is encouraged.

This paper aids in fulfilling the purpose of this thesis in three ways. First, this literature review facilitated a better understanding of how trust (and distrust) are discussed in the extant coopetition literature and clarified my conceptual entry point. Second, because we drew on the extant literature on trust in organization and management studies to identify key aspects that could serve as a guide for analyzing the papers, I became more knowledgeable about key themes and debates in this stream of research. This enriched my theoretical understanding on the role of trust in interorganizational relationships, which supported the analysis of the qualitative material collected in the main case study. For instance, by delving into this literature, I came across the notion of trust as an organizing principle (McEvily et al., 2003) and considered the potential for looking at trust
and distrust as distinct organizing principles in the face of interpartner uncertainty.

4.2 Extended Abstract of Paper 2


This is a quantitative study focusing on the relationship between coopetition and performance and the distinct roles of trust and distrust in enhancing the potential outcomes from coopetitive relationships, which are characterized by tensions and interpartner uncertainty.

Coopetition involves an abundance of potential benefits. Yet limited knowledge exists about how and when coopetition intensity leads to superior performance. Realizing the sought-after positive outcomes of coopetition requires from firms to effectively manage the tension-filled and uncertain nature of coopetitive interactions. In order to deal with such challenges and tap into the positive potential of coopetition, prior research has emphasized the importance of developing trust between the engaged parties (Czernek & Czakon, 2016; Dorn et al., 2016; Kraus, Klimas, Gast, & Stephan, 2019). Trust builds confidence in things hoped for (Guo, Lumineau, & Lewicki, 2017) and provides a sense of assurance (Lane, Salk, & Lyles, 2001) during the close interactions that involve sharing of tacit knowledge and hard-to-codify assets (Soekijad & Andriessen, 2003). Building on these insights, we argue that trust serves as an important intervening mechanism that explains how coopetition intensity enhances relationship performance. Further, in situations of coopetition, having a degree of skepticism can be critical even in the light of trust, as the trusted partner might behave opportunistically. Thus, distrust, defined as “confident negative expectations regarding another’s conduct” (Lewicki et al., 1998, p. 439) can play an important role in coopetition. Yet its role has been overlooked in the extant coopetition research. Building on the theoretical work suggesting that trust and distrust are distinct phenomena (Lewicki et al., 1998; Lumineau, 2014) and that both are critical relational mechanisms for dealing with uncertainty (Guo et al., 2017), we look into the roles of trust and distrust in relation to the linkage between coopetition intensity and performance. In particular, we argue that whereas trust likely serves as an intervening mechanism through which coopetition intensity enhances relationship performance, distrust positively influences the association between coopetition intensity and relationship performance. We test our hypotheses on a sample of 225 Swedish firms engaged in coopetition. We find that trust mediates the link between coopetition intensity and relationship performance, and distrust positively moderates this link. To the best of our knowledge, this quantitative study is the first one in the extant
coopetition literature that provides empirical evidence that both trust and distrust matter to coopetition as they play distinct roles in achieving superior performance from the simultaneous pursuit of cooperation and competition.

This paper advances the understanding of the distinct roles of trust and distrust in supporting firms to collectively deal with the tensions and uncertainty in coopetition in order to achieve superior performance. We establish that trust is one of the key mechanisms through which coopetition intensity positively impacts relationship performance, while distrust is an important moderator that further enhances the positive relationship between coopetition intensity and relationship performance (see Figure 7). Overall, we advance coopetition research by suggesting that trust and distrust, in different roles, are important in the context of coopetition. We also call for further research on the very mechanisms through which trust and distrust operate and facilitate thereby the management of the tension-filled and uncertain nature of coopetition.

![Figure 7. The distinct roles of trust and distrust in coopetition](image)

This article aids in fulfilling the purpose of this thesis by establishing that trust and distrust play distinct roles in coopetitive interorganizational relationships, where interpartner uncertainty is a key challenge and is mainly associated with concerns about partner opportunism.

### 4.3 Extended Abstract of Paper 3


This is a conceptual book chapter which is built on a selective literature review on risks and uncertainties in interorganizational relationships involving simultaneous cooperation and competition. The purpose of this chapter is to advance the understanding of the synergistic implication of seemingly
contradictory interpretive schemes and to increase clarity about when and how such schemes can be integrated to better cope with interpartner uncertainty.

Whereas strategic alliances have been acknowledged as an important means for achieving challenging strategic objectives (Hagedoorn, 1993), prior research has noted that they also have a dark side (Dussauge, Garrette, & Mitchell, 2000; Oliveira & Lumineau, 2018; Park & Russo, 1996), are inherently unstable (Das & Teng, 2000) and experience high failure rates. The dark side of strategic alliances has been discussed in terms of uncertainty about the future behavior of the partner (Krishnan et al., 2006) and in terms of interpartner risks (Das & Teng, 1996; Lumineau & Quelin, 2012; Poppo & Zenger, 2002), perceptions of which make the interaction between the engaged parties particularly challenging. In this book chapter, I argue that such concerns relate to the notion of dark potentialities. I define dark potentialities as latent conditions that can become salient and interrupt the smooth functioning of the interactions between the partners and argue that concerns related to dark potentialities intensify when unexpected events emerge along the pursuit of a relationship. To solve issues related to dark potentialities, prior research has suggested that closer attention should be paid to the cognitive processes of the individuals engaged in interorganizational interactions. Following this notion, from a cognitive perspective, scholars have suggested that interpretive schemes are critical for alliance managers to make sense and deal with unexpected events that raise concerns about the partner’s future behavior (Das & Kumar, 2010b). In particular, two alternative interpretive schemes have been suggested, namely sensemaking of chaos and sensemaking in chaos (Das & Kumar, 2010a). Whereas the former drives alliance managers to calculate and mitigate exchange hazards, the latter encourages them to suspend and embrace dark potentialities inherent in alliances. However, while a nascent stream of research suggests that both suspension and calculation of exchange hazards are required for effectively managing interpartner uncertainty (Latusek & Vlaar, 2018), there is still limited understanding of how the two interpretive schemes operate individually and synergistically. To this end, the purpose of the appended book chapter is to advance the understanding of the synergistic implication of these two interpretive schemes and to increase clarity regarding when and how these can be integrated. To fulfill this purpose, I draw upon bodies of literature on risk and uncertainty (Packard, Clark, & Klein, 2017; Townsend, Hunt, McMullen, & Sarasvathy, 2018; Vilko, Ritala, & Edelmann, 2014), and argue that while risk is the cornerstone of sensemaking of chaos, uncertainty is the cornerstone of sensemaking in chaos. Building on this, I suggest that when the prisms of both risk (i.e., focusing on predicting and eliminating facets of dark potentialities) and uncertainty (i.e., focusing on accepting the perceived unpredictable nature of dark potentialities) are utilized, alliance managers use a combination of the two interpretive schemes and engage in what I call, the hybrid interpretive scheme of complexifying the
perceived chaos. This hybrid interpretive scheme assumes that engaging with dark potentialities is a multi-solution task and adoption of it encourages successful engagement not only with potentialities that are perceived as predictable and eliminable, but also with potentialities that are perceived as unpredictable and ineliminable. Thereby, both calculation and suspension of exchange hazards are enabled and alliance managers are supported to engage in forward-looking behavior and better deal with the inherent dark potentialities in strategic alliances and the unpredictability of their partner’s future behavior.

This book chapter aids in fulfilling the purpose of this thesis in two ways. First, it is suggested that by deploying seemingly contradictory interpretive schemes to make sense of potentialities of interorganizational interactions, individuals engage in both calculation and suspension of exchange hazards. Second, the selective review of the existing literatures on risk and uncertainty in interorganizational relationships provides an overview of how the nature of interpartner uncertainty has been discussed by prior research.

**4.4 Extended Abstract of Paper 4**


This paper is a qualitative study with the following purpose: (1) to explore the underlying processes through which trust and distrust work as organizing principles in project-based collaboration in ecosystems, and (2) to propose a theoretical model of how trust and distrust interrelate and enable or constrain sustained productive interactions.

Project-based collaboration in ecosystems is increasingly required to develop tailor-made and technologically-complex solutions. Yet, as multilaterally interdependent organizations cooperate in projects to develop tailor-made value propositions, interactions in such contexts are marked by copetition, interdependency, and temporality. The interdependence among partners, and the simultaneous presence of cooperation in some projects and competition in others, can make the firm vulnerable to its partners. Due to these characteristics, organizations are need of organizing principles, which represent a logic by which interactions can be coordinated in the face of uncertainty (McEvily et al., 2003). Prior trust studies have offered important insights into organizing in such complex settings. It has been argued that trust aids organizations to engage in fruitful interactions (Bachmann, Gillespie, & Priem, 2015; Brattström, Faems, & Mähring, 2019; Mayer, Davis, & Schoorman, 1995; Pratt, Lepisto, & Dane, 2019) and serves as a unique organizing principle providing firms the logic by which interactions are coordinated under uncertain conditions (McEvily et al., 2003).
However, trust can also have undesirable and even detrimental consequences for organizations (Gargiulo & Ertug, 2006; Patzelt & Shepherd, 2008; Stevens et al., 2015; Thorgren & Wincent, 2011). For example, sensitive knowledge can unintentionally be leaked to and misused by partnering organizations. We suggest that distrust plays a critical role as it can counterbalance such negative consequences of trust by bringing negative potentialities to the foreground. This corresponds with an emerging body of literature that views distrust as beneficial for organizing uncertain interactions, and as distinct from trust (Guo, Lumineau, & Lewicki, 2017; Lewicki, McAlister, & Bies, 1998; Luhmann, 1979). Based on the above, we argue that in such uncertain interorganizational interactions, trust often coexists with distrust, which also plays a critical role in dealing with uncertainty (Guo et al., 2017) and sustaining productive project-based interactions. Although we have extensive knowledge about the critical role of trust, and to some extent distrust, more research is needed on the underlying processes of both trust and distrust as organizing principles and on their interplay.

To shed light on these processes and their interplay, we conducted a case study of trust and distrust dynamics in the Swedish robotics and automation industry where interpartner uncertainty is prevalent due to three characteristics of interfirm interactions: complex interdependencies, multiple temporal alignments, and recurrent coopetition. By building on rich empirical insights derived from an analysis of 49 semi-structured interviews with firms operating in this industry, we identified that trust and distrust as organizing principles operate through trusting and distrusting mechanisms that are distinct from each other, interwoven, and provide firms with different orientations or “ways of seeing” their partners and the interactions with them. The identified mechanisms of trusting explain how trust works as an organizing principle by orienting the firm towards its partner, and by providing a behavioral orientation for the interaction. These processes are interrelated and together foster an orientation of what we call blindness (see Figure 8). Blindness means that firms intentionally or unintentionally fail to perceive and actively pay attention to negative or positive potentialities of interactions. As shown in figure 8, however, the identified mechanisms of distrust foster an orientation watchfulness; making firms watchful for possible undesired consequences and decreasing their vulnerability.
Further, different intensities of trust (insufficient, moderate, excessive) provide firms with different levels of blindness, different intensities of distrust lead to different levels of watchfulness (see Figure 9). Moreover, our study suggests that if a firm is able to maintain a moderate level of both trust and distrust in the relationship with a partner over multiple projects they are involved in, the organizing principles work together to enable sustaining fruitful interactions. In Figure 7 continua, an area where the two continua of trust and distrust both are maintained at moderate levels is illustrated. We refer to this area as watchful blindness - where blindness and watchfulness interplay on their “optimal” levels enabling sustained productive cooperation. Finally, based on our findings, we develop an integrative theoretical model of how trusting and distrusting work as organizing principles (Figure 10). This illustrates how the inner interplay of the mechanisms of each principle give orientations (blindness or watchfulness of different levels) that by themselves can constrain interactions if insufficient or excessive. In addition, we show the interplay of these orientations enables sustaining constructive project-based interaction.
Figure 9. Trust and distrust and the area of watchful blindness

Figure 10. Trust and distrust as complementary organizing principles
This paper aids in fulfilling the purpose of this thesis in three ways. First, the findings of the paper show that trust and distrust as organizing principles are a unique means for coping with interpartner uncertainty. Second, the paper sheds light on how exactly trust and distrust individually work as organizing principles (i.e., the mechanisms of trust and distrust) providing firms with different orientations. Third, we theorize on the synergistic implication of trust and distrust and argue that the interplay between trust and distrust mechanisms allows firms to balance opposing orientations, that is to pursue a balance of watchfulness and blindness.

4.5 Extended Abstract of Paper 5


In this paper, based on the author’s qualitative study, we examine how the use of VR-enabled digital artifacts influences the interactions among industrial co-creators and how firms cope with interpretive uncertainty.

Prior research devoted to interpartner uncertainty has placed emphasis predominantly on the potential for partner opportunism and the demanding task of anticipating the future behavior of the partner. In other words, main attention has been paid to a single facet of interpartner uncertainty, namely behavioral uncertainty. However, uncertainty can also emerge in the form of interpretive uncertainty, which occurs when unintentional misunderstandings between the engaged parties and misaligned cognitive views and expectations take place (Weber & Mayer, 2014). In contrast to behavioral uncertainty that is driven by exchange hazards due to transaction characteristics, interpretive uncertainty stems from relational characteristics (i.e., attributes of the parties in relation to each other). This is particularly relevant to industrial co-creation projects, in which the engaged parties are often characterized by heterogeneity of technological competences, domain-specific expertise, and professional seniority. All of this contributes to interpretive uncertainty and often leads to major difficulties, considerable delays and even project failure. To manage this challenge, firms have started to complement traditional governance mechanisms with the use of digital technologies, which have brought to light new forms of organizing (Zammuto et al, 2007). As research suggests, digital technologies can play a critical role in the coordination of and communication among diverse parties within complex projects because they enable using of digital artifacts (Boland, Lyytinen, & Yoo, 2007). Digital artifacts are editable and interactive objects in digital environments, such as factory installation layouts or design visualizations that can be viewed and edited real-time in virtual reality. Although
digital artifacts can serve as “boundary objects,” (Barrett & Oborn, 2010; Bechky, 2003; Carlile, 2002) or “digital boundary objects,” (Alin et al., 2013) that support firms in bridging their boundaries, coordinating collective action, and engaging in negotiations, their role in dealing with interpretive uncertainty has received scant attention. In this study, we focus on the usage of virtual reality technology (VR) in industrial co-creation, which allows co-creation participants to work on digital artifacts and more effectively design, interpret and modify intended solutions in industrial projects (Leonardi, 2010). In particular, we examine how the use of VR-enabled digital artifacts influence the interactions among industrial co-creators and support firms to cope with interpretive uncertainty.

We utilize data from the robotics and automation industry in Sweden, a context characterized by large industrial co-creation projects that involve high demands for co-specialization, rapid development of new technologies, and major heterogeneity among participants’ features. In other words, the co-creation projects in this industry are subject to major interpretive uncertainty. We zoom in to two cases that illustrate the co-creation practices used in the past and how the adoption of new digital artifacts has transformed managerial practice and enhanced performance. In the two cases, VR technology was used for different tasks (design in AH Automation and programming in RobNor), and the main realized benefits were different (i.e., successful reviews and clarity for AH Automation and more efficient programming and simplicity for RobNor). In both cases, the use of VR afforded digital co-creation practices, which lead to a reframing of the boundary roles of the engaged parties.

Building upon insights from the two cases and identified patterns across the cases, we put forward an integrative model of the process of how leveraging digital artifacts, such as the ones enabled by VR, support firms to cope with interpretive uncertainty (Figure 9). The model portrays how the utilization of digital artifacts and engagement in digital co-creation practices can facilitate redefining boundary roles, which supports firms to cope with interpretive uncertainty.
Figure 11. Digital artifacts in coping with interpretive uncertainty

This paper aided the fulfillment of this thesis by placing emphasis on the process of coping with an important facet of interpartner uncertainty, that is interpretive uncertainty, which is related to problems of understanding and the difficulty in aligning the partners’ expectations and views. In particular, the findings of our analysis showed that to cope with interpretive uncertainty firms involve digital artifacts that allow them to redefine their boundary roles and engage in alignment contests. As discussed in the following chapter, this paper showed that in addition to cognitive (interpretive schemes) and relational (trust and distrust as organizing principles), there are also material mechanisms of coping with uncertainty, that is the use of digital artifacts as boundary objects.
5. Discussion

In this chapter, I synthesize the findings of the five papers and discuss how they synergistically aided in fulfilling the purpose of this thesis. The purpose was to advance the understanding of the processes through which firms cope with interpartner uncertainty in interorganizational interactions. In the introductory chapter, I formulated four research questions and argued that the purpose can be fulfilled if these questions are adequately addressed. Each research question is now revisited and I present the answers provided in this thesis, reflect upon their importance, and discuss how my study supports, extends, and questions prior research.

5.1 Addressing the Research Questions

**Addressing RQ1 and Elaborating on Key Findings.** The first research question is related to the distinct roles of trust and distrust in coping with interpartner uncertainty in interorganizational relationships. This question was formulated by building upon theoretical arguments on trust as an organizing principle (McEvily et al., 2003) and trust and distrust as distinct and important means to cope with uncertainty (Guo et al., 2017). To answer this research question, I first had to investigate whether these two are indeed distinct (Lewicki et al., 1998) or not (Schoorman et al., 2007), and then to study the mechanisms through which they work, or else, the underlying processes of trusting and distrusting. With this in mind, I (i) conducted a literature review on trust and distrust in coopetition to see how prior research has discussed the roles of trust and distrust in the uncertain context of coopetitive interorganizational relationships, (ii) used a survey to investigate the distinct roles of trust and distrust in coopetition, (iii) conducted an in-depth case study to uncover the (possibly) distinct mechanisms of trust and distrust that influence how firms cope with interpartner uncertainty in their interorganizational relationships.

In line with prior research on trust in strategic alliances (see Nielsen, 2011 for a review), the findings of my systematic literature review showed that trust can play three important roles in coopetitive interorganizational relationships, that is, serve as an antecedent or driver of coopetition in the formation phase of the relationship, as a means to manage coopetition in the implementation phase and as a critical success factor of coopetition in the evolution phase. Surprisingly, I found that only few of the papers devoted to the role of trust as a means to manage coopetition have discussed trust with regard to dealing with interpartner uncertainty or risks (Bouncken & Fredrich, 2012; Eriksson, 2008), and that the role of distrust was completely neglected. Furthermore, in the few papers discussing trust in the coopetition process, trust was presented as complementing
contracts and formal governance (Bouncken et al., 2015). Yet, the findings of the literature review suggested that the question of how trust works as an organizing principle in coopetition has received limited attention. In addition to this, the literature review concluded that while prior research on organizational trust discussed trust and distrust as two distinct means of coping with uncertainty (as the former injects hope and the latter injects skepticism (Lewicki et al., 1998)), coopetition research has not considered the possibility that trust and distrust can play different roles in the coopetition process. This led us to construct a research agenda for future research, which calls for more conceptual clarity and encourages research on the distinct roles of trust and distrust in coopetitive interorganizational relationships.

*Confirming the distinction between trust and distrust*. In light of the identified limitations in the literature, and the suggested agenda for future research, I went further and investigated the distinction between trust and distrust in the context of interorganizational relationships by means of a quantitative study. This study showed that trust and distrust indeed play distinct roles in coopetitive interorganizational relationships. In particular, while trust mediates the relationship between coopetition intensity and alliance performance, distrust plays a moderating role and influences the strength of coopetition’s effect on alliance performance. This finding can be explained based on that trust enables necessary openness and knowledge sharing while distrust encourages firms to keep the partner at a distance safeguarding itself by establish monitoring systems. By showing that trust and distrust play distinct roles in coopetitive interorganizational relationships, this study contributes to the field of trust in management and organization studies by adding to the long-standing debate among trust scholars on whether trust and distrust are polar opposites or independent and co-existing (e.g. Lewicki et al., 1998; Schoorman et al., 2007). In particular, this thesis supports the body of research suggesting that trust and distrust are distinct yet interrelated phenomena (Bijlsma et al., 2015; Dimoka, 2010; Lumineau, 2017; McKnight & Chervany, 2001). To this end, this thesis questions the view that trust and distrust are two sides of the same coin (Schoorman et al., 2007) and rather suggests that in the context of interorganizational relationships, trust and distrust can co-exist. To the best of my knowledge, this is one of the first empirical studies in the interorganizational relationships literature that empirically shows that trust and distrust are distinct and can take place simultaneously.

To address the need for more conceptual clarity regarding trust and distrust as distinct phenomena and their roles in coping with interpartner uncertainty, I also conducted a qualitative study that, first, clarifies that in addition to coopetition, there are other conditions that trigger interpartner uncertainty in interorganizational relationships. Second, this study unpacks the underlying
processes of trusting and distrusting as organizing principles in uncertain interorganizational interactions, thereby providing more clarity about what distinguishes these two interrelated phenomena (Guo et al., 2017). In addition, this study shows the distinct orientations of trusting and distrusting processes to cope with uncertainty in interorganizational relationships, which can be both enabling and constraining. Thereby, this thesis adds to prior research on the enabling and constraining nature of organizing principles (McEvily et al., 2003) and on the dark and bright sides of both trust and distrust (Lewicki, 2017).

*Clarifying conditions triggering interpartner uncertainty.* In order to understand how trust and distrust support firms in coping with interpartner uncertainty, it was important to first understand where the interpartner uncertainty stems from. While coopetition is more and more evident in many industries and represents a major source of interpartner uncertainty, my findings show that other conditions also trigger difficulties in understanding and anticipating the potentialities of interorganizational relationships. In particular, in complex and uncertain contexts, such as in knowledge-intensive industries, the complexity of the tasks needed to develop a tailor-made solution require in-depth knowledge, smooth integration of multiple sub-systems and technologies, and close collaboration of multiple actors with different knowledge bases and expertise. Interdependency and temporality are thus two additional sources of interpartner uncertainty.

Value creation, in the context of interdependencies between activities and actors, means that there is uncertainty about the actors’ ability and willingness to contribute, and about the partners’ expectations about positions and roles. In addition, in such context, a firm’s success is contingent on that the partner will have the ability and willingness to deliver the complementary component. Depending on the intended purpose of the robot, different types of hardware devices and software engineering processes are required, each requiring different knowledge areas and expertise, and, therefore, co-specialization of capabilities and temporal alignment of actors are necessary. These interdependencies create uncertainty related to responsibilities in the event of problems with delivered solutions. In addition, power struggles among co-creators can occur, since proximity to end-customers who can favor certain ecosystem participants, is critical.

The level of interpartner uncertainty, furthermore, is even higher due to the temporality of the interorganizational interactions as many knowledge-intensive industries are project-based, which means that firms are involved in many different projects and their interactions with others are highly influenced by past projects and the possibility to engage in prospective ones. Temporality means, consequently, that besides uncertainty about how to align activities and actors
within one project there is also interpartner uncertainty about how partners will behave in other projects and relationships. Partners might use the value provided to them, and the value created in one project to develop another competing value proposition. At the same time, they have to be open and share their unique abilities to increase the possibility for future interactions in additional projects. In addition, firms need to understand the temporal nature of their interactions as well as that their partners in a project can play different roles depending on the project and can have close relationships with numerous firms, operating in the broader relational context. All in all, I argue that in such complex contexts, interpartner uncertainty can be triggered by many different sources, and in my study, I identified three of them, namely coopetition, interdependence and temporality.

Unpacking underlying processes of trust and distrust as organizing principles. My study showed that to cope with interpartner uncertainty, entailed by the above three conditions, trust and distrust play critical roles (McEvily et al., 2003). I unveil in detail the mechanisms inherent in both trusting and distrusting, which provide firms with different orientations. Thereby, I add more clarity about the two phenomena and their roles under uncertain conditions. Shedding light on the underlying processes through which trust and distrust serve as organizing principles is particularly important given that prior research has discussed uncertainty management in terms of formal and relational governance without delving into the underlying processes through which these governance mechanisms do their job (Sydow et al., 2013). In this thesis, I address this limitation and unpack the very mechanisms that are at work when trust and distrust serve as organizing principles. The findings indicate that both trust and distrust involve mechanisms related to both cognitive and relational processes, which influence how firms think of the partner and interact in the relationship respectively. In particular, this study shows that while three mechanisms of trust and three mechanisms of distrust orient the firm towards the partner (i.e., influence the firm’s alignment or position with regard to the partner’s trustworthiness (Mayer et al., 1995), three other mechanisms of both trust and distrust provide behavioral orientations in the interaction, that is “tendencies to respond or act in certain ways” (Coombes, Morris, Allen, & Webb, 2011, p. 832). In this way, I extend our understanding of both cognitive and behavioral aspects of (dis)trust (McEvily et al., 2003). This further entails that coping with uncertainty by relying on trusting and distrusting is both a cognitive and a relational process, in which trust and distrust provide firms with different orientations as how to think of the partner and how to behave in their interactions.

Enabling and constraining effects of trusting and distrusting processes. Moreover, this study shows that the interplay between trusting processes
facilitates blindness, while the interplay between distrusting processes encourage the firm to be watchful. My analysis reveals that depending on the intensity of trust and distrust, different degrees of blindness and watchfulness emerge. This has an important implication regarding the way firms think of the partner and interact in the light of uncertainty. In particular, when trust and distrust are maintained at moderate levels, firms cope with interpartner uncertainty by being willfully blind and discreetly watchful, respectively. Willful blindness means that firms intentionally place emphasis on positive potentialities and purposefully, yet not naively, ignore negative potentialities of the interaction. In doing so, firms are enabled to deal with the unexpected in a non-calculative manner and engage with the future as if they know how the interaction will develop. Discreet watchfulness, on the other hand, means that firms consider negative potentialities of the interactions (yet without overemphasizing them) and are oriented towards safeguarding oneself and controlling others, but in a discreet manner, which also has an enabling effect on uncertain interactions.

Whilst my analysis of the empirical material suggests that moderate levels of trust and distrust can be fruitful and play an enabling role with regard to interorganizational interactions under uncertainty, excessive or insufficient levels of them can trigger undesired consequences and have a constraining effect. This because excessive or insufficient levels of trust and distrust cultivate naive or ignorant blindness and naive or paranoid watchfulness respectively, which entails that either positive or negative potentialities are either neglected or overlooked. To this end, this thesis highlights that trust, as well as distrust, influence how firms cope with uncertainty as they both constrain and enable interorganizational interactions. Thus, my study supports prior research suggesting that trust has a dark side (Thorgren & Wincent, 2011) and that firms should strive for a moderate level of it (Stevens et al., 2015), but also extends this view by highlighting that a moderate level of distrust can also be beneficial under uncertain conditions. In doing so, this thesis questions prior research that views distrust as necessarily detrimental for a relationship and as an element that needs to be reduced by default (see Lewicki, 2007). Additionally, by finding that distrust can play a beneficial role under uncertain conditions, this study not only empirically backs-up similar arguments made by Lewicki and colleagues (2006) and Lumineau (2017), but also extends this view by showing where the bright side of distrust originates from, meaning the mechanisms that can give rise to manifestations of such a bright side. Building on this finding, I suggest future research to consider the possibility that distrust is not necessarily a dysfunctional component of a relationship but rather that distrust may aid organizational actors under uncertain conditions.

In answer to the first research question, this thesis establishes that trust and distrust are distinct, can co-exist within an interorganizational relationship, and
support firms to cope with uncertainty as they provide blindness and watchfulness. Importantly, I show the underlying processes based on which these orientations are cultivated.

**Addressing RQ2 and Elaborating on Key Findings.** The second research question of this thesis is related to the synergistic implication of trust and distrust in interorganizational relationships and how the interaction between them can support firms to cope with interpartner uncertainty. To address this question, I analyzed how mechanisms of trust and distrust interact with each other and influence the way firms cope with interpartner uncertainty. This study shows that trust and distrust can be experienced simultaneously and that their constructive synergistic implication is realized due to counterbalancing dynamics when firms stay within the ‘space’ of watchful blindness.

**Trust and distrust can be experienced simultaneously.** The findings of this thesis establish that the same firm can simultaneously experience both trust and distrust towards the same partner, but with regard to different aspects or facets of the interaction. This means that trust and distrust can coexist within a relationship, which is in line with the theoretical argument made by Lewicki et al. (1998) that the two phenomena can simultaneously be present because of the multifacetedeness of organizational relationships. My analysis revealed that in many situations firms were oriented by both trust and distrust mechanisms.

**Counterbalancing dynamics in the space of watchful blindness.** In addition to the simultaneity issue, I show that trust and distrust are complementary organizing principles because they can add value to each other in the sense that trust counterbalances the effects of the dark side of distrust and vice versa (which I call counterbalancing dynamics). As “trust and distrust can be increased side by side” (Luhmann, 1979, p. 89-90), one could expect that the complementarity could take the form of elevating dynamics, meaning that trust could elevate distrust or the positive effect of its bright side. However, the findings of this thesis advance the understanding of the complementarity of trust and distrust by showing that in the context of coopetitive interorganizational relationships, the interplay between trust and distrust manifests in the form of counterbalancing dynamics. Specifically, my analysis revealed that the mechanisms of trust work to counterbalance distrust’s dark side, which supported firms to pursue a balance of trusting and distrusting orientations. Balancing such opposing orientations kept firms stay within the ‘space’ of watchful blindness, where the potential dominance of trusting (or distrusting) is counterbalanced (and is not allowed to be persistent over time) by distrusting (or trusting) and its associated mechanisms. Balancing watchfulness and blindness is critical because it permits firms to both take a leap of faith (Möllering, 2001) in the face of the unexpected due to trusting processes, but also inject the relationship with constructive
skepticism, withhold sensitive information and try to deflect the negative consequences of partner misbehavior due to mechanisms of distrusting.

When distrusting mechanisms are accompanied with trusting mechanisms, firms can maintain the bright side of distrust (i.e., discreet watchfulness), because these mechanisms counterbalance to prevent a highly destabilized system characterized by a persistent dominance of distrust. Similarly, when trusting mechanisms are accompanied with distrusting mechanisms, firms are able to stay within the “willful” space of blindness and intentionally, but not naively, ignore negative potentialities of the interaction.

**Addressing RQ3 and Elaborating on Key Findings.** The third research question of this thesis is related to the roles of interpretive schemes used by firms in coping with interpartner uncertainty. This question was formulated while I was conducting a literature review on the notions of risk and uncertainty (which was important for clarifying the conceptual entry points of my study). Building upon research on the role of interpretive schemes in making sense and cope with unexpected events (e.g., a competitive move by a partner), which raise concerns about the future behavior of the partner and about negative potentialities of the interactions with the partner (Das & Kumar, 2010a), I argue that interpretive schemes are important means to cope with interpartner uncertainty. This because interpretive schemes contain assumptions about the future and are forward-looking lenses that managers use to engage with the future and not backward-looking as prior research has suggested and a hybrid interpretive scheme enables firms to engage in both calculation and suspension of exchange hazards.

**Interpretive schemes as forward-looking lenses.** When an unexpected event (e.g., a competitive move by a partner) takes place, firms experience an interruption in the smooth functioning of a relationship and interpartner uncertainty is increased as the firm has major difficulty to anticipate how the partner will behave next. In the face of such interruptions, managers rely on interpretive schemes not only to subscribe meaning to the event’s origins and importance, but also to identify a course of action despite the entailed interpartner uncertainty. From a prospection perspective, I argue that the cognitive processes of interpreting an unexpected event, and tracing down its origins are linked to the way organizational actors view the future. If the future is seen as predictable (as in the case of employing “sensemaking of chaos”), managers engage in a thorough examination of the source of the unexpected event and use this understanding to calculate future exchange hazards with the ambition to prevent them from being realized. If the future is seen as unpredictable (as in the case of employing “sensemaking in chaos”), on the other hand, managers see no reason to devote resources and engage in the rather timely and costly process of thoroughly tracing down the source of the unexpected event.
Instead, their cognitive response to the unexpected event is to accept it and suspend future exchange hazards associated with it, based on the view that taking precautionary measures is seen as pointless. By arguing that interpretive schemes are forward-looking lenses, this thesis questions the view that interpretive schemes contain merely assumptions about “why events happen as they do”, as prior research suggests (Bartunek, 1984, 355), and argues that such schemes also contain assumptions about the predictability of the future. Following this notion, I also question the idea that schemes are past-oriented dimensions that “neglect the future-oriented of forward-looking dimensions of agency (e.g., imaging and inventing new possibilities)” (Patvardhan & Ramachandran, 2020, p. 4). While interpretive schemes indeed inform the interpretation of unexpected events, they are not merely backward-looking, as they contain assumptions about the future, which influence how unexpected events are approached (i.e., calculating vs embracing) and how firms deal with interpartner uncertainty (i.e., calculation and mitigation acts vs suspension acts).

**Engaging in both calculation and suspension acts.** In this thesis, I argue that the schemes “sensemaking of chaos” and “sensemaking in chaos” can be combined to produce a hybrid interpretive scheme I call “complexifying the perceived chaos”, which gears firms toward engaging in both suspension and calculation of exchange hazards. This because by adopting both schemes, managers complexify their thinking; whereas in some situations they acknowledge that interorganizational relationships are uncertain and thereby acceptance of the unexpected event and suspending processes are needed, in other situations, they choose to look at the future from the prism of risk, see the future as predictable and get involved in calculation and mitigation processes. In other words, while the former scheme places emphasis on immittigable facets of uncertainty, the latter emphasizes mitigable, or else, epistemic facets of uncertainty, i.e., ignorance of pertinent but knowable information, which can to some extend be mitigated (Packard & Clark, 2019). Following this notion, I argue that the hybrid interpretive scheme “complexifying the perceived chaos” is critical for coping with interpartner uncertainty because it encourages the engaged individuals to not only accept “the impossibility, even in principle, of defining the probability distribution of the events themselves” (Dosi & Egidi, 1991, p. 148), but also strive to deal with “ignorance of knowledge that is knowable in principle” (Packard & Clark, 2019, p. 9). To this end, this thesis argues that this hybrid interpretive scheme contains the assumption that interpartner uncertainty involves both immittigable and mitigable facets and by considering both, firms engage in refining their interpretations of the origins of unexpected events and in both suspending (i.e., embracing the entailed interpartner uncertainty) and calculating (i.e., reducing the entailed interpartner uncertainty) exchange hazards. To revisit the third research question, this thesis answers that the interpretive scheme “complexifying the perceived chaos” supports a more holistic
interpretation of interruptions in the smooth functioning of a relationships and encourages firms to engage with the future by both suspending and calculating negative potentialities.

By highlighting the cognitive processes in which managers are involved to cope with interpartner uncertainty and arguing that such cognitive processes oftentimes guide organizational actors to both accept and reduce ‘uncertainty’), this thesis adds to the literature discussing coping with uncertainty triggered by unforeseen incidents (Müller-Seitz, 2013). In addition, it further enriches the discussion on the interplay between suspension and calculation (see Latusek & Vlaar, 2018) as the cognitive mechanisms underlying the interplay are discussed. Further, the discussion on the hybrid interpretive scheme “complexifying the perceived chaos” also extends the view that “sensemaking of chaos” and “sensemaking in chaos” are “key tools in coping with ambiguity and uncertainty that are ever-present” (Das & Kumar, 2010a, p. 19) in interorganizational relationships, by arguing that these two can be combined to better cope with interpartner uncertainty in interorganizational relationships. In addition, by arguing that the two schemes can be combined to cultivate a hybrid one that encourages a more holistic interpretation of unexpected events, I address a call for looking into how hybrid social judgements are produced (McEvily, 2011).

**Addressing RQ4 and Elaborating on Key Findings.** The fourth research question of this thesis is related to the role of boundary objects in coping with interpartner uncertainty in interorganizational relationships. This research question was formulated based on emerging findings of my in-depth qualitative study on interorganizational interactions in the robotics and automation industry. In particular, the findings of this study show that interpretive uncertainty is a key facet of interpartner uncertainty within projects in this knowledge-intensive industry, with which firms cope by using digital artifacts as boundary objects. This study establishes that boundary objects are critical to deal with this major challenge because they enable the processes of identification, iteration, and realization and support redefining boundary roles and common categorization, that is, the autonomous firms view one another as members of a project team with shared interests and goals.

**Interpretive uncertainty as a key challenge in interorganizational interactions.** My analysis revealed that in robotics and automation projects, in addition to behavioral and relational uncertainty, firms face another important facet of interpartner uncertainty. This facet of uncertainty emerges when different firms need to coordinate and jointly perform complex tasks within a project to collectively build a tailor-made solution. Particularly, I show that in the process of designing and developing a tailor-made robot-based automation solution, firms face major difficulty in coordinating their actions and in aligning their views
and expectations about how the solution will be developed and how the different components will be integrated. This difficulty is intensified due to relational differences between the different co-creators, who oftentimes have divergent industry memberships and divergent perceptions of the complexity of the task at hand, use divergent terminology, and hold knowledge and expertise in different technologies and automation processes, which need to be integrated in order for the solution to be developed. I found that such differences between the engaged parties can create unintentional misunderstandings with noteworthy negative consequences for the successful implementation of the project. Thus, the findings of my study support the theoretical argument made by Weber and Mayer (2014) that interpretive uncertainty, arising from misaligned interpretations of the processes and the nature of the task around which the relationship is formed, is a key challenge within interorganizational interactions. To this end, I empirically support the view that “bounded rationality is an alternative source of significant transaction costs, even in the absence of opportunism” (Foss & Weber, 2016, p. 62). Even if incentive conflict is absent, relational differences and bounded rationality create problems of understanding (Vlaar et al., 2006) and major difficulty in pursuing joint tasks in a project in a coordinated way (Gulati, Lawrence, and Puranam, 2005). To this end, my study questions prior research placing emphasis merely on deliberate partner opportunism and the associated behavioral uncertainty (Carson et al., 2006; Krishnan et al., 2016) and calls for more research on interpretive uncertainty and means and ways to cope with it.

Enabling identification, iteration, and realization. The findings of this thesis suggest that firms are able to cope with interpretive uncertainty related to the performance of joint tasks within projects, because using digital artifacts as boundary objects enables three co-creation processes, namely identification, iteration and realization. Specifically, it is shown that through their engagement in these processes, firms become self-aware of their individual understanding of the problem that is solved, invite the partner to engage in the co-creation of the solution and through multiple iterations, the solution is implemented based on the views and inputs of all the engaged parties. The finding that firms can cope with interpretive uncertainty through these processes further entails that coping with this facet of interpartner uncertainty is both a cognitive process (as firms need to become self-aware of their own expectations and preferences and interpret the partner’s ones) and an interactive practical accomplishment in which firms try to collectively overcome knowledge barriers. To this end, this thesis suggests that interpretive uncertainty can be discussed in terms of epistemic or else procedural uncertainty, which stems from “a competence gap in problem-solving” (Dosi & Egi, 1991, p. 146). Following this notion, I argue that once procedural limits to prediction are overcome, interpretive uncertainty, as any other kind of epistemic uncertainty, is not wholly unpredictable and can be mitigated. What is needed, nonetheless, for predicting and mitigating such
uncertainty is “increases in information and in cognitive awareness and capacity” (Packard & Clark, 2019, p. 21). This is exactly where the boundary objects play their important role. In particular, with the use of boundary objects, firms are able to understand and determine all the relevant factors and information needed to reduce the levels of unpredictability surrounding the task at hand and thus, to cope with interpretive uncertainty faced by firms within a project.

Redefining boundary roles and enabling common categorization. Further, the findings of this study suggest that by using digital artifacts and engaging the above-mentioned processes, firms redefine their boundary roles (or else, constantly exchange roles in the co-creation process), which has an important implication. That is, the autonomous firms engage in common categorization, “the self-classification of actors into particular groups” (Weber & Mayer, 2014, p. 351) and self-classify themselves as members of a team with joint goals. In line with prior research, I found that categorization is critical for establishing alignment processes and coping with interpretive uncertainty. Viewing themselves as members of the same group rather than as members of different and autonomous organizations was found in my study as particularly important for firms to more easily and more actively engage in the processes of identification, iteration and realization. This because common categorization was also accompanied with a sense of ownership of the final solution by all engaged parties. Further, by showing that digital artifacts as boundary objects enable redefining of the boundary roles of the engaged parties and common categorization (and they do not merely serve the purpose of facilitating exchanges among diverse parties), this thesis also adds to the boundary objects literature (Star & Griesemer, 1989; Carlile, 1997; Beckhy, 2003). The results of this study extend this literature by concretizing the understudied social dynamics and processes through which enriched boundary work (Abbott, 1995) and reduction of misunderstandings among groups with heterogeneous knowledge bases (Bechky, 2003) take place in interorganizational relationships in knowledge-intensive contexts. In addition, this study adds to the literature discussing the social dynamics and relational processes that take place when boundary objects are used to engage in enriched boundary work (e.g., forming and reshaping organizational identities (Gal, 2008; Gal, Lyytinen, & Yoo, 2008) and reconfiguring boundary relations (Barrett, Oborn, Orlikowski, & Yates, 2012).

Moreover, by answering this question, I also contributed to the literature discussing affordances of digital technologies. When firms collectively engage with boundary objects, they are able to better solve problems existing in the boundary between them because they interactively make the boundary space thinner. By suggesting that a possible way of making the boundary space thinner is to engage with the materiality of digital artifacts and enrich the dialogue with the partner, this thesis also supports the relational view on the affordances of
digital artifacts, which advocates that the importance of an object is not determined by its inherent physical properties but by the way firms incorporate its attributes in their relationships with real others (Barrett et al., 2012; Faraj & Azad, 2012) and by the way the material and human agencies become imbricated (Leonardi, 2011). The digital materiality of boundary objects is argued here to be critical but insofar organizational actors make use of it. This study supports the view that affordances of digital artifacts, meaning unique possibilities of action derived from the use of digital artifacts, are relational (Zammuto et al., 2007) in the sense that firms use the same digital artifact in different ways to influence their interaction dynamics differently and cope with interpartner uncertainty. To this end, I show that an important dimension of coping with interpartner uncertainty is the materiality of boundary objects, with which human agencies are interwoven and influence their interaction dynamics.

5.2 Revisiting the Overall Purpose

The above discussion focused on the answers this thesis provides to each research question and on what these answers mean in relation to prior and future research. Building on the findings of the studies presented above, I develop an integrative model (see Figure 10), which shows that firms can cope with the multifaceted nature of interpartner uncertainty triggered by different conditions, by relying on three different means and related processes. I first present the upper part of the model, which is about the nature of interpartner uncertainty, before I turn to the lower part of the model, which shows the means and processes through which firms cope with interpartner uncertainty in interorganizational interactions.

![Figure 12. A model of coping with interpartner uncertainty in interorganizational interactions](image-url)
Sources of Interpartner Uncertainty. Regarding the sources of interpartner uncertainty, my study shows that there are three main conditions injecting unpredictability in an interorganizational interaction. While the initial entry point was coopetition as a source of uncertainty, which was also evident in my study, I also identified that other sources of uncertainty simultaneously are in play in my empirical setting. Because of coopetition, complex interdependencies and the temporal nature of their interactions, organizations consider dual potentialities of their interactions and cannot anticipate how the interaction will develop. In addition to coopetition, complex interdependencies and temporality are found to be two other important sources of interpartner uncertainty in this knowledge-intensive context, making it difficult to anticipate how the partners will behave. Besides uncertainty about how to align activities and actors within one project there is also interpartner uncertainty about how partners will behave in other (parallel or prospective) projects and relationships. This highlights that the level of interpartner uncertainty in such complex relational environments is dependent on a number of interrelated sources stemming from the broader relational context and conditions surrounding interorganizational interactions. While my study identified three of them, future research can consider other sources as well as their interplay.

Interpartner Uncertainty. In the center of the proposed model is the notion of interpartner uncertainty. In this thesis, I introduced this concept in order to emphasize that uncertainty in interorganizational relationships taking place in knowledge-intensive environments can have many different facets, which are interrelated. I argue that three of them are behavioral, relational and interpretive uncertainty. In line with prior research, I see behavioral uncertainty as a facet of uncertainty that is always present in interorganizational relationships especially because of the coopetitive elements of such relationships. However, my study also questions prior research, rooted mainly in transaction cost economics (Williamson, 1981), which tends to place emphasis merely on behavioral uncertainty and associated concerns about partner opportunism (Abdi & Aulakh, 2012; Carson et al., 2006; Krishnan et al., 2016). By placing emphasis solely on behavioral uncertainty, prior research has paid limited attention to the presence of other important facets of uncertainty. Uncertainty can also arise due to the influence of the broader relational context on the interactions between the partners (i.e., relational uncertainty) and due to mere misalignment of the partners’ views during their interactions (i.e., interpretive uncertainty). I introduce the notion of relational uncertainty to highlight that the broader relational context has major influence in the way two firms interact. This is line with the blended perspective suggested by Bengtsson & Raza-Ullah (2016) and their call to examine the interlinks between the dyadic and the context in which a relationship is embedded. Although the notion of relational uncertainty was identified late in this research journey, I see a great potential for future research
to further examine how this facet of uncertainty emerges and to identify other means of coping with it. In addition, it is critical to distinguish between different facets of uncertainty, because different facets may require different means of coping, yet these three facets are interrelated. Future research could pay more attention to how their interaction and their potentially different intensities influence the choices of firms regarding means of coping with uncertainty in their interorganizational interactions.

Coping with Interpartner Uncertainty. Now, I turn to the lower part of the model, which shows the means and processes of coping with interpartner uncertainty. I argue that coping with interpartner uncertainty is supported by adopting three different means, that is (1) trust and distrust as organizing principles, (2) a hybrid interpretive scheme as forward-looking lens and (3) digital artifacts as boundary objects. The main function of these three means of coping with interpartner uncertainty is that they enable firms to influence their interaction dynamics in different ways. In particular, the three means I identified are related to three distinct dimensions of the process of coping with interpartner uncertainty, that is managerial cognition, relationality, and materiality.

A first dimension of the coping process is about the way organizational actors cognitively cope with and think of the situation and the future of their interactions with others. In their efforts to cope with uncertainty, organizational actors can cognitively (i) balance opposing orientations towards the partner by being guided by both trust and distrust (as organizing principles) and (ii) interpret phenomena and approach exchange hazards in a more holistic manner (both calculating and suspending) by using hybrid interpretive schemes (as a forward-looking lens) and (iii) perceive one another as members of a joint team by using digital artifacts (as boundary objects). This further adds to prior research suggesting that the cognitions of managers involved in coopetitive interorganizational relationships are critical as managers use their cognition, i.e., thinking, appraising, and judging, to deal with challenges linked to coopetition (Bengtsson, Raza-Ullah, & Vanyushyn, 2016; Lundgren-Henriksson, 2017; Raza-Ullah, 2017). Similar ideas of cognitively being able to uphold conflicting logics have been discussed under the concept of paradoxical mindset (Miron-Spector, Ingram, Keller, Smith, & Lewis, 2018).

A second dimension of coping is that it takes place in the interaction process. This dimension has to do with the way firms relate to each other and adopt certain behavioral orientations in their interactions. Coping with uncertainty involves identifying behaviors along the process of interacting with the partners and responding to the consequences of the interaction with them. In this sense, coping with uncertainty is not merely a cognitive process but also a relational one where “coming to a judgment involves moving around within a landscape of
possibilities, and in so doing, being spontaneously responsive to the consequences of each move” (Shotter & Tsoukas, 2014, p 377).

A third dimension of the process of coping is associated with the way partners engage with materiality to align their expectations. I argue that a possible way for organizations to cope with interpretive uncertainty is to make the “boundary space” thinner by incorporating material artifacts in their interaction. This because each organizational actor can both engage in “quasi-dialogues” with the artifact and enrich the dialogue with its partners. Nonetheless, in line with prior research, I argue that the importance of a material object is not determined by its inherent physical properties, but by the way firms incorporate its attributes in their relationships with real others (Barrett et al., 2012; Faraj & Azad, 2012; Levina & Vaast, 2005; Zammuto et al., 2007) and by the way the material and human agencies become imbricated (Leonardi, 2011). In other words, the digital materiality of boundary objects is argued here to be critical but only insofar organizational actors make use of it. To this end, I show that an important dimension of coping with interpartner uncertainty is the materiality of boundary objects, with which human agencies are interwoven and influence their interaction dynamics.

5.3 Theoretical Contributions

While in the discussion above I have already mentioned how this study supports, extends and questions findings of prior research, I use this space to briefly crystallize the main theoretical contributions of this thesis. This thesis contributes to three bodies of literature.

This thesis contributes to the literature on uncertainty in interorganizational relationships (Das & Teng, 1999; 2001; Carson et al., 2006; Krishnan et al., 2006; Latusek & Vlaar, 2018; Sydow et al., 2013; Mitsuhashi, 2002) in several ways. First, regarding sources of uncertainty in interorganizational relationships, I establish that uncertainty can originate from other conditions than coopetition and the entailed concerns regarding partner opportunism. Second, regarding the nature of uncertainty faced by the partners, I introduce the concept of interpartner uncertainty, which I clearly distinguish from the calculable interpartner risk, to add conceptual clarity about the multifacetededness of uncertainty in interorganizational interactions and to extend the view that behavioral uncertainty is the only facet of uncertainty in interorganizational relationships. In addition, by introducing relational uncertainty as a facet of interpartner uncertainty, I clarify that uncertainty is also related to the influence of the broader relational context on dyadic interactions, which is an important contribution given that prior research on uncertainty has mainly focused on dyadic relationships and paid limited attention to the environment in which such
relationships are embedded. Third, and most importantly, regarding coping with uncertainty, I challenge the emphasis of prior research on governance and contribute to the literature by unpacking the very mechanisms that are at work when organizational actors face interpartner uncertainty. I provide a more processual view of coping and uncover three dimensions of the coping process, namely cognitive, relational and material.

This thesis also provides important contributions to the organizational trust literature. First, while there have been theoretical arguments that trust serves as an organizing principle (McEvily et al., 2003), empirical insights into the mechanisms through which this occurs are to a large extent missing, especially in the body of research on trust in interorganizational relationships. Based on rich empirical evidence, I establish that trust can be a widely-accepted logic based on which interfirm interactions occur. In this thesis, novel mechanisms of trust are identified which provide not only orientation towards the partner but also behavioral orientation in the interaction, which supports the view of those who suggest that trust “transforms the attitude to a behaviour” (Li, 2017, p. 9). By separating these two interrelated and inextricably linked types of trust mechanisms based on the orientations they provide and by showing what they result in (i.e., blindness), I also add clarity on how identified acts of suspension (Latusek & Vlaar, 2018) take place based on cognitive and relational processes. The notion of willful blindness adds to the debate on whether trust has both calculative and non-calculative facets (McEvily, 2011) and whether risks can be mitigated or accepted (Gulati & Nickerson, 2008; Möllering, 2001). In particular, willful blindness denotes that trust is related to active acceptance of negative potentialities based on assessing the future behavior of the other in a positive manner (i.e., linked to calculative facets of trust) and as such to embrace the negative potentialities involved (i.e., linked to the suspension-related facets of trust).

Second, this thesis advances the understanding of the bright side of distrust in light of uncertainty by showing that distrust operates as a complementary organizing principle. Few have looked into the role of distrust although it has been suggested as a promising research avenue (Guo et al., 2017; Latusek & Vlaar, 2018). By addressing these calls, this thesis establishes that distrust can provide unique benefits as by becoming discreetly watchful, firms cope with interpartner uncertainty.

Third, I bring further insights and add clarity to the longstanding and unresolved debate on the conceptual relationship between trust and distrust: “polar opposites (Mayer et al., 1995; Schoorman et al., 2007) or distinct and coexisting (Guo et al., 2017; Lewicki et al., 1998)”. In particular, supporting those that view trust and distrust as distinct yet interrelated phenomena (Guo et al., 2017;
Lewicki et al., 1998; Lumineau, 2014; McKnight & Chervany, 2001), this thesis empirically advances the understanding of what drives this distinction and adds to the limited number of studies reporting similar findings (Cho, 2006; Dimoka, 2010; Saunders et al., 2014). More specifically, I establish that distrust operates based on mechanisms that differ from those of trust and that both of them are organizing principles that can co-exist within a relationship. Further, while prior research (e.g., Dimoka, 2010) focused on differentiating trust and distrust by looking at the perceptions about the qualities of the partner (e.g., trust relates to credibility and benevolence while distrust relates to discredibility and malevolence), I bring further clarity to the debate by showing what trust and distrust mean for the interaction between the (dis)trustor and (dis)trustee and their relationship with the broader relational environment. Finally, by introducing the concept of watchful blindness for situations where individuals pursue a dynamic balance between trust and distrust to cope with interpartner uncertainty, I emphasize the fruitful synergy of trust and distrust and address a call for more research on “how positive and negative valences jointly operate in a productive and beneficial manner in IORs” (Lumineau & Oliveira, 2018, p. 457). To this end, I provide a nuanced understanding of the interaction between trust and distrust and show that their interplay is based on counterbalancing dynamics.

Finally, this thesis contributes to the literature on coopetition. First, while trust has frequently been acknowledged as important for managing coopetition and reduce tension (Dorn et al., 2016; Tidström, 2014) and calls for further research on trust in coopetition have been made (Czernek & Czakon, 2016), the insights on how trust operates in coopetition remain limited (Lascaux, 2020). I answer these calls by identifying the mechanisms of trust and distrust. In addition, the concept of distrust has largely been neglected in the extant coopetition literature, although I would argue that in the face of uncertainty involved, the dark side of trusting each other too much is especially relevant in coopetition. Thus, I contribute to the coopetition literature by showing that distrust can counterbalance problems that may emerge from misplaced trust. Second, research on coopetition has to a great extent focused on the tension-filled nature of coopetition and its uncertain nature was studied to a lesser extent. When it was studied, nonetheless, the focus has been on the (calculable and mitigable) risks involved in the coopetition process and not on (the unexpected and unpredictable uncertainty. By focusing on uncertainty and suggesting that trust and distrust are approaches to cope with uncertainty, I thereby also contribute to the literature on coopetition management and further enrich the stream of research highlighting the importance of managerial cognition in dealing with challenges related to coopetitive interactions (Raza-Ullah, 2017). Third, although much of the research on coopetition has focused on dyadic relationships or coopetition within a network, often from the perspective of a focal firm, I contribute to the
understanding of how dyadic coopetitive interactions are affected by the context of the ecosystem they are in. I thus answer to calls for a blended view on coopetition (Bengtsson & Raza-Ullah, 2016) and increase the understanding of how relationships are influenced by the broader relational context.

5.4 Managerial Implications

The findings of this thesis provide a number of practical implications for managers engaged in interorganizational relationships involving coopetition, complex interdependencies, and temporal interactions.

First, the findings of this thesis can help managers to better understand the nature and source of the uncertainty that they face in their interactions with others and to choose appropriate means for dealing with different facets of uncertainty stemming from different conditions. It is highlighted that coping with uncertainty is a process that requires managers develop cognitive capabilities, use relational means and engage with materiality to align expectations with others.

Second, the findings imply that in order to cope with interpartner uncertainty, are required to engage in balancing acts, meaning that they need to trust their partners, but also to be skeptical about the future and have a healthy level of distrust. While it is reasonable that familiarity and stronger ties that are developed with the passage of time can lead to trusting behaviors (e.g., sharing valuable knowledge), managers need to be able to ‘step back’ and consider negative potentialities of their interactions, meaning that they need to have a moderate level of distrust towards the partner and the potential hazards associated with the interaction. This especially because relationships are embedded in ecosystems and the partner has relationships with several other firms to which the internal knowledge of the firm can be unintentionally or intentionally be leaked. However, watchfulness based on trust needs be discreet in order for the partner not to be offended. For instance, attempting to alter expected undesired behavior by the partner based on the presence of distrust needs to be done with discreetness and careful expressions and actions. At the same time, managers are advised to ‘let things go’ and try not to approach interpartner uncertainty as something that can be mitigated. Being willfully blind can allow interorganizational interactions to be sustained despite the prevailing uncertainty about the future behavior of the partner. To this end, managers need to consider that both trust and distrust in the specific context of coopetitive interorganizational interactions have their bright and dark sides.

Third, this thesis provides managers with guidance on how to respond to the emergence of an unexpected event, such as a competitive move by a partner. Again, a balancing act is needed. In the light of an unexpected event, it is of course
valuable to try to analyze the causes and get a better hold of the situation, but such a calculation should not be done in order to accurately predict the future. While estimating probabilities indeed can help to create a sense of understanding and confidence about the potentiality of the interactions with the partner, such calculation is more related to self-fulfilling prophecies. Cultivating forward-looking behavior is thus a matter of interpreting unexpected events from a holistic perspective where the future is seen as both ‘risky’ and uncertain and thus, calculations are combined with suspension, which allows firms to move around with confidence but without neglecting that the future is inherently unpredictable.

Fourth, this thesis suggests that interorganizational interactions are highly influenced by the broader relational environment in which dyadic interactions take place. Managers need to consider and reflect upon the influence of the relational context on the current and prospective behavior of their partners. In addition, in temporal interorganizational interactions, firms need to avoid being locked-in in a relationship with a specific partner to be able to engage in different projects with different firms. It is therefore critical for a firm to create a portfolio of relationships with several partners who hold different expertise in different areas. Further, firms need to consider reputational consequences when interacting with a partner as misbehavior can easily be communicated to the rest of the ecosystem participants. Based on my findings, I advise managers to deeply consider how their interactions with a specific partner can influence and be influenced by other firms operating in the surrounding ecosystem. By doing so, managers can even use other firms as a leverage for influencing the future behavior of the partner, which is a common practice in the robotics and automation ecosystem.

Fifth, the last paper of this thesis provides clear-cut advice on how firms can use digital technologies to deal with several different challenges firms face in aligning their views and expectations. It is highlighted that successful incorporation of digital artifacts in co-creation projects requires firms to create joint “teams” in which actors from different organizations make use of the digital artifact and work toward a common goal. This, however, requires firms to increase the orchestrating power of their partners and of their industrial customers. Yet, digital technologies are not magic bullets. While by using them in their interactions firms can better solve problems of understanding, they need to make internal (re)arrangements, such as establishing new organizational roles, as well as to open up their organizational boundaries and use digital tools together with other co-creators.
5.5 Limitations and Future Research

This thesis has also a number of limitations and interesting findings, which motivate future research. First, my study established that interpartner uncertainty in complex relational environments is dependent on a number of interrelated sources, stemming from conditions surrounding interorganizational interactions and from the broader relational context. Further research could study if other sources are prominent in other types of contexts and whether these identified sources are idiosyncratic to the project-based nature of the interactions this study focused on. While I identified three of them, more work is needed with regard to other sources as well as their interplay in different contexts (this because in less dynamic contexts, other sources may be more prevalent). Second, this thesis identified three important facets of interpartner uncertainty, which are interrelated. Future research could build on this finding and focus on the interaction between the different facets and on how different intensities of the different facets may influence the coping process. More attention needs to paid to the intensity of different facets of uncertainty, as different intensities may require different means of coping and related processes. Third, while my study provides a snapshot of how firms cope with interpartner uncertainty, longitudinal data can further enrich our understanding of the coping process by uncovering elements that can destabilize or stabilize the balancing act that takes place in the area of watchful blindness. For example, future research can explore how competitive moves by the partners or a history of smooth interactions with a particular partner can provide stability in their interactions. A focus on a relationship over time rather than single interactions within an ecosystem can be fruitful. In addition, further work is needed on how the temporal nature of the interactions influences the coping process. For instance, future research could focus on how firms move from project to project with different firms and how this influences the adoption of different means and processes of coping. Further, interorganizational interactions, by definition involve two sides. However, in this study I mainly took the perspective of the focal firm and did not study both sides’ perspectives. This is a limitation given that firms may experience different phenomena differently (for instance, asymmetric trust can take place), which may have an implication for how uncertainty is coped with. By taking into consideration both firms’ perspectives, further research can look into how the process of coping is influenced by the moves, countermoves and responses of partners.
6. References


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