

Synthesizing Value Creation in IORs for Innovation

*- Six Studies and a Stretch of Perspective
from the Specific to the General*

Sara Thorgren

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ABSTRACT

This dissertation consists of six individual studies with the overall aim to contribute to understanding value creation in interorganizational relationships (IORs), which firms establish to achieve innovation. The six research papers address several specific research questions focusing on different aspects of IORs by using qualitative, quantitative and conceptual methods. The dissertation is divided into two parts. Part I is an introductory chapter to the six research papers. This part briefly introduces the research questions, methods, paper overviews, and provides some general discussions not emphasized in the specific papers. Part II consists of the six research papers, each presenting a unique inquiry, literature framework, and method. In brief, the six papers of this dissertation are:

Paper I presents the benefits of working with the same partners in multiple (different) innovative processes.

Paper II tests the influence between relationship characteristics (knowledge transfer, interorganizational trust, and relationship diversity) and networking firms' corporate entrepreneurship.

Paper III tests the indirect effects of partner fit on networking firms' corporate entrepreneurship.

Paper IV identifies and tests important factors for innovative performance in firm networks.

Paper V tests the influence of compensating network board members on network performance.

Paper VI theorizes how and why interorganizational trust can cause rigidities, which may be particularly bothersome in some kinds of IORs.

Some general conclusions of the six studies are that they demonstrate the relevance of acknowledging social processes in studies of knowledge exchange; they also recognize that while literature suggesting that social aspects such as trust may be powerful in reducing perceived relational risks, research takes a biased path if it does not also properly acknowledge the risks and costs associated with it; and finally indicate that in discussions of trade-offs between flexibility and stability in IORs it may be useful to consider the dimension of exchange flexibility, that is, how flexible the partners are in what they exchange and when they do this. Some specific conclusions are that the studies demonstrate both antecedents to and consequences of corporate entrepreneurship (CE) in an IOR setting: in terms of antecedents, they explain why partner fit has an indirect effect on knowledge transfer and why CE has a direct effect on knowledge transfer, and in terms of consequences, they explain why knowledge transfer positively influences CE. The studies also suggest that when partners try to create conditions where they do not believe they might be exploited, there is a risk that rigidities in resources and routines develop. Further, they also show that design aspects, such as how the network is formed, configured, and governed, as well as compensation of network board members affect network performance.

ACKNOWLEDGEMENTS

This dissertation represents four years of hard work. As a Ph.D. candidate one is, however, not an island that can make progress in one's research education in isolation. Thus, this dissertation also represents how other people have provided me opportunities to develop my research skills.

Starting with the essentials. First, I am indebted to funding from Jan Wallander, Tom Hedelius and Tore Browaldh's Research Foundation and EU-funding through Interreg IIIA Nord. This support was a precondition for this dissertation's existence.

Second, the empirical portions of this dissertation depended on people representing firms or interfirm networks who were willing to share information and experiences from their work in interorganizational relationships. Thus, their participation has been critical for me to develop and test theoretical ideas. For their time and input, I thank them.

Third, I have been grateful to the many colleagues around me at Luleå University of Technology. Your support has been very important to me, not the least of which has been the daily lunch breaks we have shared during which we have talked of nothing and everything. After our lunches, I returned to work with new creative energy.

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Luleå April 2010
Sara Thorgren

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RESEARCH PAPERS IN PART II

Paper I

Title: A glimpse of benefits of long-term relationships for innovation
Author(s): Sara Thorgren
Status: Published 2007 in *International Journal of Globalisation and Small Business*, 2(1), pp. 34-46.
DOI: 10.1504/IJGSB.2007.014186

Paper II

Title: A cause-effect study of inter-firm networking and corporate entrepreneurship: Initial evidence of self-enforcing spirals
Author(s): Sara Thorgren, Joakim Wincent and Daniel Örtqvist
Status: Published 2009 in *Journal of Developmental Entrepreneurship*, 14(4), pp. 1-18.
DOI: 10.1142/S1084946709001363

Paper III

Title: Unleashing synergies in strategic networks of SMEs: The influence of partner fit on corporate entrepreneurship
Author(s): Sara Thorgren, Joakim Wincent and Daniel Örtqvist
Status: Accepted for publication in *International Small Business Journal*.

Paper IV

Title: Designing interorganizational networks for innovation: An empirical examination of network configuration, formation and governance
Author(s): Sara Thorgren, Joakim Wincent and Daniel Örtqvist
Status: Published 2009 in *Journal of Engineering and Technology Management*, 26(3), pp. 148-166.
DOI: 10.1016/j.jengtecman.2009.06.006

Paper V

Title: The importance of compensating strategic network board members for network performance: A contingency approach
Author(s): Sara Thorgren, Joakim Wincent and Sergey Anokhin
Status: Published 2010 in *British Journal of Management*, 21(1), pp. 131-151.
DOI: 10.1111/j.1467-8551.2009.00674.x

Paper VI

Title: Interorganizational trust: Origins and regulation of rigidities
Author(s): Sara Thorgren and Joakim Wincent
Status: Under review with an academic journal.

1. INTRODUCTION

On nearly a daily basis, we see and hear about organizations building cooperative relationships with one another to strengthen their position. This phenomenon includes a variety of organizations and kinds of links, partnerships, and alliances formed and announced. To mention some examples, for consumers it is well-known that the large Sony Corporations and LM Ericsson formed a strategic alliance in which they merged their mobile phone businesses to compete in terms of market share. In another example, Star alliance is a network of 25 airlines (e.g., SAS, Thai, and United) that brings together services such as check-in, ticketing, and flights to offer customers a global airline alliance with worldwide reach. Yet another example is how charity organizations such as the Pink Ribbon, Inc. have established relationships with companies to sell products, with the profit designated to a cause or charity. By sharing of costs and pooling resources, IORs such as these make it possible for partners to engage in activities and development that would not be possible on their own.

These above examples are all large and well-known organizations that have formed interorganizational relationships (IORs) to strengthen their positions. Yet, not only large and well-known organizations are engaged in such relationships. Small businesses might also engage in cooperative IORs. For example, tourists typically select their destination on a total set of attributes such as hotels, attractions, restaurants, and infrastructure. As a result, individual firms may cooperate in a co-marketing network, which communicates the destination's total offerings rather than marketing their firms individually (Palmer & Bejou, 1995). Two such examples are the Swedish networks Destination Gotland and Swedish Lapland. Another example is that small firms might participate in formal business networks, which request changes in federal rules and legislation to strengthen their chances of survival (see Miller, Besser, & Malshe, 2007).

When formal networks like these specifically target SMEs as member firms, they may commonly receive some kind of government support (e.g., Hanna & Walsh, 2002). It may, however, also be that small firms do not participate in formal networks, but on own initiatives establish several separate IORs for a specific purpose, such as research and development. This may be the case if SMEs consider that they do not have the resources themselves, but still want to ensure that no partner has enough of their technology to become potential

competitors (Narula, 2004). Despite the existence of many forms of IORs, we are not informed about them, however, from news reports or see them in our daily life to the same extent as relationships established by very large organizations.

This dissertation focuses on IORs for innovation (e.g., Baum, Calabrese, & Silverman, 2000; Powell, Koput, & Smith-Doerr, 1996; Shan, Walker, & Kogut, 1994). This includes IORs in which firms cooperate in some form to reach innovation that “encompass any action that either puts the organization into new strategic domains or significantly alters the way the organization attempts to serve existing customers or constituents” (Mone, McKinley, & Barker, 1998: 117). Innovation can thus include developing new products and services or new production processes and technologies as well as changes in strategic orientation.

A comprehensive literature review found that IORs for innovation is an area to which researchers have given extensive attention. Pittaway et al. (2004: 145), for example, noted that some of the benefits of IORs for innovation are opportunities to share risk, access to new markets and technologies, speed to market, pooling complementary skills, and access to external knowledge. Other research has focused on why IORs are used for innovations (Hagedoorn, 1993); the relationship between interorganizational cooperation and firms’ innovative performance (Chang, 2003); the influence of partner selection processes for creating competitively advantageous innovations (Emden, Calantone, & Droge, 2006); the impact of partner technological diversity on innovative performance (Sampson, 2007); and the influence of different kinds of ties (direct, indirect, and those spanning structural holes) on innovation output (Ahuja, 2000).

Evidently, the literature has provided comprehensive knowledge about IORs for innovation. Still, more research is needed on several issues for IORs and innovation that are particularly challenging. Cooperative IORs are typically non-hierarchical, where partners lack authority to command one another to behave in a certain way at a certain time. This may cause risks associated with creating competitors, profitability, and dissolution. First, the risk of creating competitors reflects the danger that, unintentionally, knowledge may be transferred to such an extent that partners can become competitors (Helm & Kloyer, 2004). Such risks are associated with exposing the own competencies and technologies to partners over which one lacks formal authority. This risk is well illustrated by a firm manager: “These competencies are too important to us...We have spent

many years building our strength in these sectors...frankly we have world class competences...I am loathe to consider letting anyone near our technology. We only use alliances if we have to.” (Narula, 2004: 157). If partners have such concerns over unintended knowledge transfer, there is a risk that they will not be willing to share their knowledge. Second, profitability risk captures the exposure that partners may achieve greater profitability than the own firm from innovation returns (Helm & Kloyer, 2004). Because of difficulties in positing the exact nature of innovations derived from the IORs ex ante, there may be difficulties regulating its returns in contracts. Largely, partners cannot but accept that contracts by nature will be incomplete and face the risk that they may not gain their share of innovation returns. Third, there is dissolution risk. This reflects the risk that partners may unexpectedly decrease their commitment to the IOR or dissolve the relationship (Singh & Mitchell, 1996). Because IORs often lack formal power and complete contracts, partners may choose to end the work without their partners’ consent. There is thus a risk that the innovative work will abruptly end prior to fruition, even if not all partners have agreed on termination.

These abovementioned risks imply that in IORs for innovation the key issues of knowledge exchange, relational risk, and relationship stability are particularly challenging. Whereas some IORs overcome these challenges, they contribute to difficulties in creating value in other IORs. A literature review on these challenging issues (presented in section 3) reveals that while they have received some research attention, several gaps deserve further research. By highlighting challenges with IORs and examining causes of variance in creating value, it is possible to evaluate how IORs can be formed, designed, and developed to create the most value and avoid failure.

With this background in mind, this dissertation consists of six studies with the overall aim to contribute to increasing our understanding of value creation in IORs for innovation. Each research paper has its unique problematization, research question, literature framework, and method. Table 1 outlines the specific research problems and questions of these six papers.

Table 1. Research problems and questions

Paper	Research problems	Research questions
I	<p>Innovation opportunities are suggested to be present in relationships that include variety and non-redundant information. Thus, a view might be nourished that the formation of new relationships for different innovative processes is preferable since it secures a constant flow of new information. Despite this theoretical notification, in practice it is evident that some firms do not form new external links for different innovative processes but repeatedly turn to the same partners for advice and information.</p>	<p>How and why could it be beneficial for a firm to work with the same partners in multiple (different) innovative processes?</p>
II	<p>Research has demonstrated the importance of trust, diversity, and knowledge transfer in IORs. This has not been broken down, however, to a level where the effects of these relationship characteristics have been tested on firms' corporate entrepreneurship, which is the outcome many networking firms want from their IOR engagement.</p>	<p>What is the influence of relationship characteristics (knowledge transfer, interorganizational trust, and relationship diversity) on networking firms' corporate entrepreneurship?</p>
III	<p>Literature suggests that "partner fit," in terms of high capability complementarity (i.e., partners have different capabilities) and high compatibility (i.e., partners' organizational cultures, management, and operating styles are similar), can explain why firms are generally motivated to engage in IORs. No studies have, however, examined the role of potential partner synergies by testing the relationship between the degree of partner fit and a firm's level of corporate entrepreneurship.</p>	<p>What is the influence of partner fit on networking firms' corporate entrepreneurship?</p>
IV	<p>Despite the current significant policy attention and widespread implementation of strategic networks as a tool to strengthen innovation and competitiveness for SMEs, the academic study of how to design such networks is still in its infancy. Thus, scholars face a situation in which practitioners must design strategic SME networks without much specific support from the research community to guide their decisions.</p>	<p>What factors are important for innovative performance in firm networks?</p>
V	<p>It is common to establish a network board that assists in overcoming challenges arising when multiple firms with limited individual resources engage in networks with complex joint activities. Taking departure from an agency theory perspective there might be a need to compensate board members to motivate them to take actions that are consistent with the goals and interests of all the firms. Because the principal-agent relationship between network firms and the network board differs from those usually studied, we cannot simply transfer the body of literature of compensating managers/CEOs to this new setting to predict network board members' behavior.</p>	<p>What is the influence of compensation of network board members on network performance?</p>
VI	<p>While the evidence of the positive effects of trust is undisputed, there are recent attempts recognizing that trust may, in fact, also bring costs and risks. Although this position is relatively underresearched, a suggested solution to overcome such problems has been not to develop overly strong trust levels but rather maintain a lower level of trust which is considered more "optimal". Without the highest trust among partners, environmental turbulence and time constraints may cause severe difficulties for realizing the objective with some IORs to the extent it is not worthwhile maintaining or even joining such cooperation.</p>	<p>How and why do negative trust effects in terms of rigidities develop already at low levels of trust and accumulate in parallel to the positive trust effects as trust builds stronger over time?</p>

This introductory chapter to the six dissertation papers is structured as follows. The first section presents the idea behind the dissertation approach in more detail. Following is a section that provides a brief overview of literature on IORs and challenging issues that need further research attention. The next section introduces the methods used in the papers that comprise this dissertation, including philosophy of science, approaches, and techniques. Next, this introductory text offers an overview of the dissertation papers with the intent to capture their core essence. Finally, a concluding section presents a general discussion and conclusions, including literature contributions to IORs, overall limitations, future directions, and practical recommendations.

2. DISSERTATION APPROACH

2.1 Part I and Part II

This dissertation is divided into two parts.

- Part I (comprised of this text) is an introductory chapter to the six research papers presented in Part II. This part consists of several sections that briefly introduce the research questions, methods, paper overviews, and highlight contributions to a wider literature.
- Part II consists of the six research papers, each having a unique problematization, research question, literature framework, and method.

Part I's purpose is to introduce the six research papers. In doing this, the intent of Part I is also to lift the readers' view from the detailed and context-specific approach found in the research papers to show how the papers also join a broader dialogue on a more abstract and general level. This is possible because a dissertation does not make just one contribution to a single conversation. Rather, it joins several conversations with several constructs, theories, and literatures. An introductory chapter such as this provides an excellent opportunity to highlight a "new pattern", which becomes visible when the separate papers are integrated into a cohesive whole and wrapped within a context. Specifically, it is possible to highlight implications for literature that are not addressed in any of the separate papers. This implicates, however, that the research papers cover much more than the themes upon which this introductory chapter touches. Likewise, it implies, perhaps, that this introductory chapter includes more than what is explicitly delineated in the research papers. Readers are thus encouraged to read all the dissertation papers and consider this introductory chapter as a complement that provides a broader understanding of the research design and implications than can be gained simply from the papers themselves. As this approach differs somewhat from ones traditionally employed in a compilation thesis, the principal idea behind this approach is outlined in more detail hereafter by the use of illustrative figures and tables.

2.2 Identifying contributions to theory and literature

By nature, dissertations include several conversations related to the constructs, theories, and literatures. As such, a dissertation also has the potential to join such conversations into a broader discussion. A collection of manuscripts can thus

interconnect several streams of thought, in terms of adding value to what we already know. This is true even if only few of these thoughts are presented within the manuscripts' boundaries and the rest are latent. Figure 1 illustrates how contributions can be identified in four steps by answering questions. The two first steps assist in identifying theoretical contributions, which Whetten (1989) proposed means answering the questions what, how, and why in providing description and explanation. The last two steps assist in identifying contributions to the literature by asking what implications a study has for different literatures. Typically, journal articles focus on the two first steps (which can partly be explained by word limits for journal articles), while the latter steps tend to be more peripheral. Latent contributions would thus be primarily literature contributions, but literature contributions are by necessity not latent.

Applied on this dissertation, this reasoning means that several contributions can be identified by answering the questions in the four steps. Not all contributions are necessarily discussed within the boundaries of this compilation's manuscripts. Figure 2, an extension of Figure 1, illustrates study contributions. At the left end of Figure 2, the six icons (composed of four triangles each) illustrate the six dissertation papers in Part II. The colours of the four triangles illustrate that both theoretical and literature contributions can be identified from any single study (these contributions are, however, not necessarily explicated within research papers). This dissertation combines both the explicit and latent contributions of the six manuscripts. This provides a new pattern that was not apparent when studying the papers in isolation. The right end of Figure 2 illustrates how several contributions composing this dissertation separately diffuse into the existing body of literature.

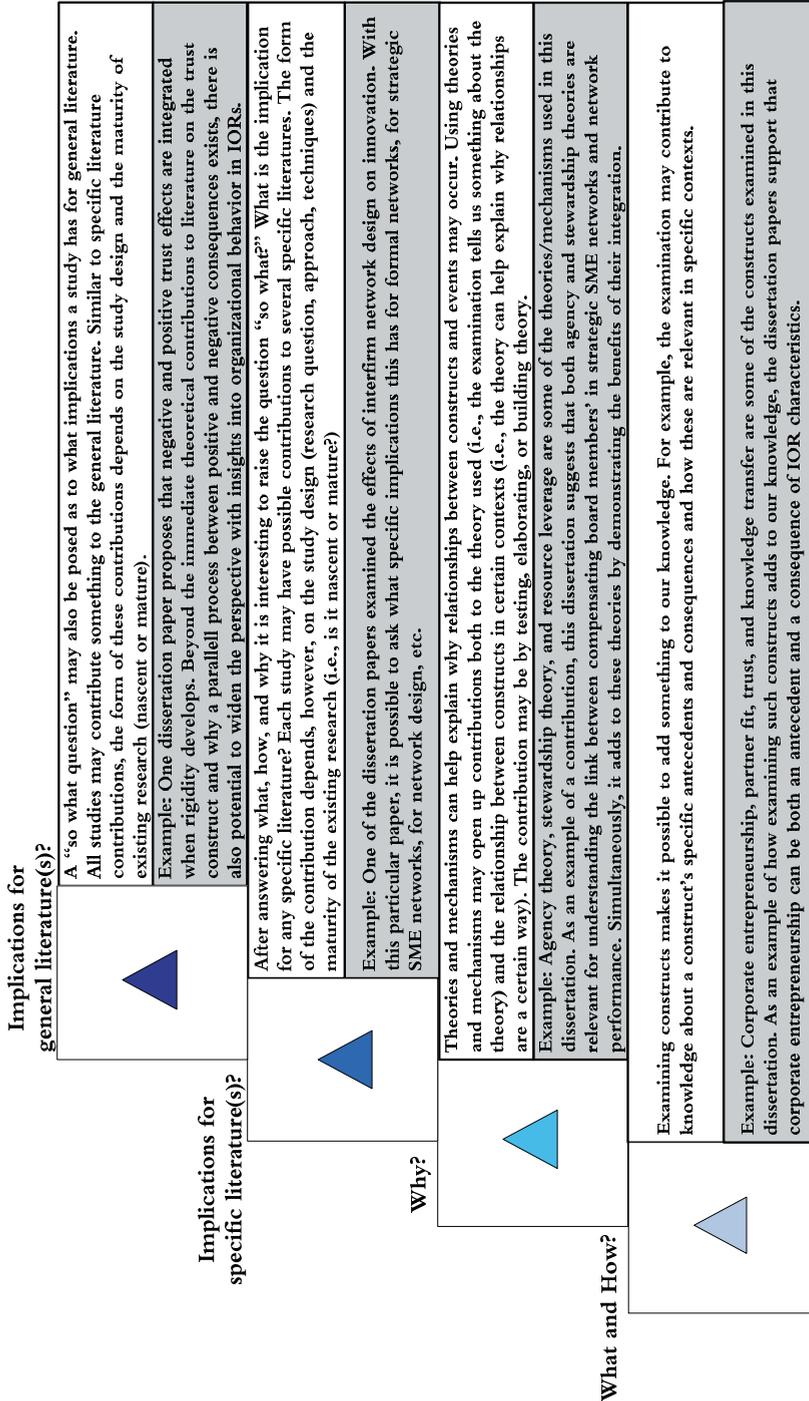


Figure 1. Identifying potential contributions through four steps.

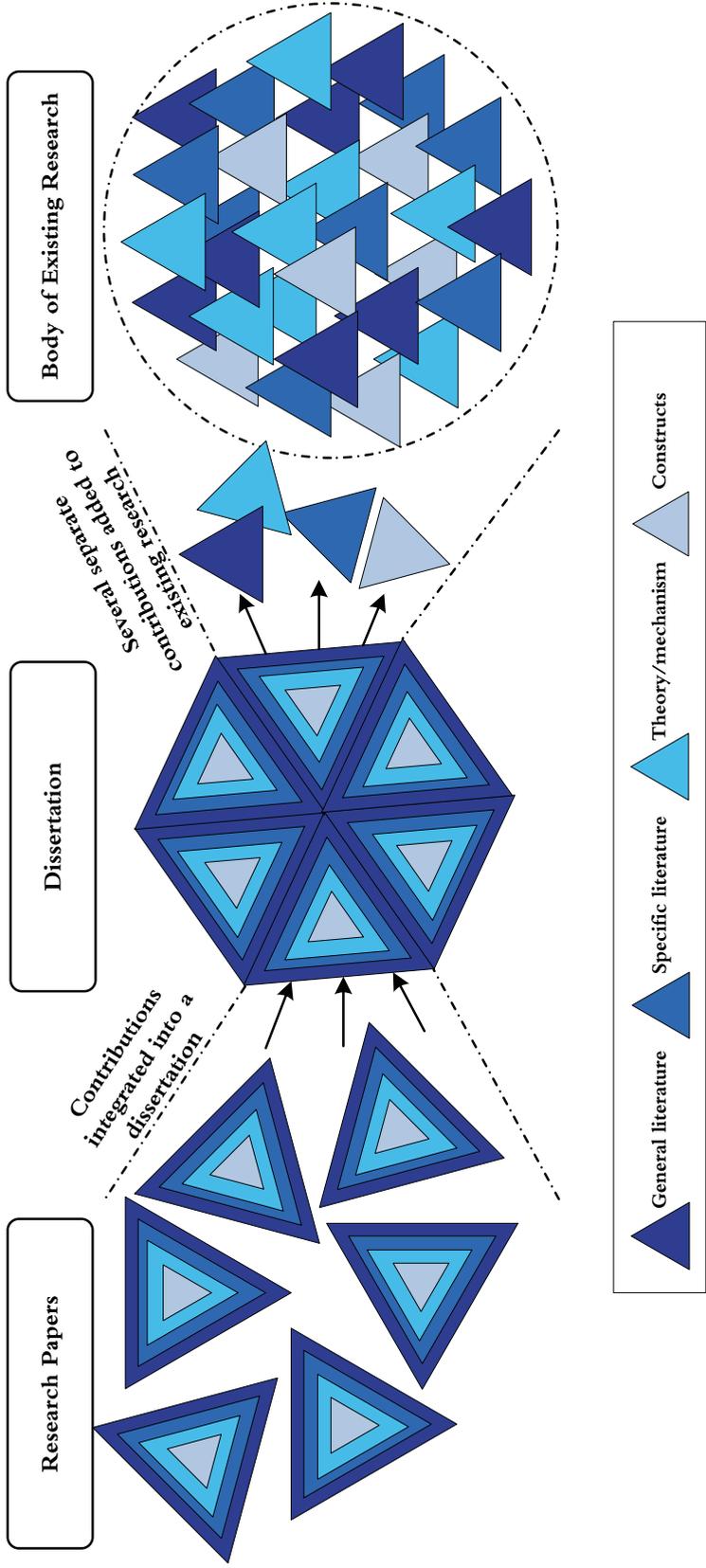
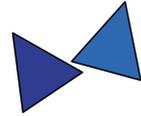


Figure 2. Separated (six research papers), combined (dissertation parts I and II), and diffused contributions (extant literature).

2.3 Literature and concepts highlighted in Part I and Part II

Based on the ideas proposed in Figures 1 and 2, Table 2 illustrates the locus of contributions associated with this dissertation.

Table 2. Locus of contributions

Contributions	Locus of elaboration
	<p>In Part I, the general literature highlighted relates to IORs. The specific literature relates to IORs for innovation.</p>
	<p>Theoretical contributions, including specific theories, mechanisms, and constructs are treated primarily in Part II rather than Part I.</p>
	<p>There may be several literature contributions that are not made visible in either Part I or Part II of this dissertation.</p>

Although much of Part I is devoted to IORs and prominent challenges in IORs for innovation, it is useful to first briefly introduce key constructs among the research papers and describe why they are central in this dissertation.

2.3.1 *Corporate entrepreneurship*

As a whole, this dissertation takes a broad view of innovation. To test theory and draw inferences based on the results it is important, however, that the research in the separate papers use innovation constructs that are specific and relevant to the examined context. When designing the studies reported in Paper II and Paper III, corporate entrepreneurship (CE) was considered the best innovation-related construct in the particular context studied in those papers. CE refers to firms' activities that stimulate innovation by scoring high on innovativeness, risk taking, and proactiveness (Zahra, Filatotchev, & Wright, 2009). CE takes a central role in this dissertation because many of the firms that engage in the kind of IORs examined in Paper II and Paper III do so to strengthen their CE. Still, almost no empirical research exists on how such IORs actually influence CE. Moreover,

the literature includes a traditional model on how CE develops, where internal variables such as organizational culture and external variables such as environmental dynamism are included (Greene, Brush, & Hart, 1999; Zahra, 1991). Only a small but growing body of research, however, acknowledges that IORs may also be valuable to enhance our understanding of CE (Teng, 2007). This dissertation thus adds to that stream of research.

2.3.2 Knowledge transfer

Knowledge differs from other commodities. It has been suggested that knowledge has the following characteristics (Dalkir, 2005: 2): “use of knowledge does not consume it; transferral of knowledge does not result in losing it; knowledge is abundant, but the ability to use it is scarce; [and] much of an organization’s valuable knowledge walks out the door at the end of the day”. It is important for firms to cultivate their knowledge base. One of the ideas behind engaging in cooperative IORs is that firms can gain access to other firms’ knowledge base to develop their own. This may be valuable in innovative work because innovation is much about new knowledge combinations (Schumpeter, 1961). Because of its characteristics, however, it is challenging to transfer knowledge between organizations. Knowledge is not transferred automatically just because organizations establish a relationship. For example, the knowledge source may be reluctant to share its knowledge; the potential recipient may have difficulties using knowledge shared; or the knowledge itself may be difficult to codify and thus transfer. Knowledge transfer is therefore central because it captures a process that may be essential for understanding how and why IORs can enhance innovation. Because knowledge transfer is of great interest in the IOR literature, it is discussed further in later sections of this introductory chapter.

2.3.3 Interorganizational trust

When organizations establish relationships with one another, the aim is typically to engage in an exchange between the organizations. In the contexts of innovation, the exchanged content is often some kind of knowledge. It can also be other things, however, such as access to new suppliers and customers, firm-specific assets, etc. To ensure that exchanges actually take place and that some organizations are not exploited, some IORs build on formal contracts that stipulate partners’ exact obligations to another. In innovative work it may sometimes be difficult, however, to control all exchanges through contracts. Organizations may need to believe that their partners conform to norms of

reciprocity, referring to the norm that actors help, and do not hurt, those that have helped them (Gouldner, 1960). This means that beyond any contracts, organizations must have faith that their contributions to the relationship will be reciprocated. Partners in the IORs examined in Part II of this dissertation cannot rely solely on formal contracts. Thus, an implicit reliance on reciprocity norms laid the foundation for some of the specific challenges highlighted in these research papers.

Due to the difficulties of relying on formal contracts, interorganizational trust is a key construct. Interorganizational trust refers to the organizations' perception of their network partners' willingness to keep promises and show commitment to the exchanges (Mayer, Davis, & Schoorman, 1995; Rousseau et al., 1998). This means that a risk exists in the relationship, but that there is also a willingness to accept this risk. The research papers acknowledge the centrality of interorganizational trust for exchanges among partners. Because much research on trust in the IOR literature has been conducted, this construct receives further attention in the literature background of this introductory chapter.

2.3.4 Partner fit

Engaging in cooperative IORs opens opportunities for firms to combine strengths, achieve joint goals, and overcome individual weaknesses by gaining access to each other's resource bases. This means that IORs can create innovation by joint actions among partners, but also through the individual actions the exchanges enable. Independent of the means organizations employ to strengthen their innovation, partners' characteristics become very important. There must be some synergies in exchanging capabilities and partners must be able to work together. In this dissertation, two partner characteristics are given particular attention: partner complementarity and partner compatibility (e.g., Mowery, Oxley, & Silverman, 1996; Sarkar et al., 2001). The former represents the degree to which partners' capabilities overlap (i.e., if capabilities are dissimilar the partners are complementary), whereas the latter represents similarity among partners' organizational cultures, management, and operating styles (i.e., if partners are similar on these aspects they are compatible). When these two characteristics combine in one construct, it is called partner fit (Kale, Singh & Perlmutter, 2000). That is, when partners complement another and are also compatible, there is a high degree of partner fit. In Part II, the relationship between partner fit and innovation is recognized by testing the influence of partner fit on corporate entrepreneurship.

2.3.5 Network board compensation

Some of the IORs examined in Part II are formal networks. In relation to these types of networks, the construct of network board compensation takes a central role in this dissertation. The formal networks examined empirically are government-supported networks in which multiple firms participate as independent entities but with shared objectives and under a common trademark. The networks differ in size and some are formed upon the participants' initiative; others are formed upon the initiative of a third party such as government agencies. In these networks, firms form smaller groups on a voluntary basis to work on joint projects. The examined networks all have a network board that coordinates and supports network projects and activities. Thus, it is important that the members of the network board act in the best interest of the network and its members. Still, there is little theoretical knowledge on the link between network boards and network performance. Thus, compensation of network boards is one such central construct for examining network boards. Compensation is particularly relevant to examine because the size of these boards and the extent to which they represent network firms or representatives from public agencies differs among networks.

3. LITERATURE BACKGROUND

3.1 Interorganizational relationships

As cooperative IORs became more and more common in practice, researchers identified the relevance of studying them (e.g., Barringer & Harrison, 2000; Ring & Van de Ven, 1994). One of the most cited articles on cooperative IORs, authored by Dyer and Singh (1998), emphasized that critical resources are found outside firm boundaries. Thus, it is insufficient to include only an industry structure view or a resource-based view when explaining sources of competitive advantage. Indeed, IORs may also certainly be a source of sustaining one's market position. As there is a broad variety of opportunities for IORs, there is also a broad variety of forms of IORs (e.g., R&D consortia, joint ventures, strategic alliances and networks, trade associations, buyer-supplier relationships). Nevertheless, IOR studies are commonly differentiated by the level of analysis, whereas the IOR form is used as a context in which the study is carried out (cf. Gulati, 1998; Lavie, Lechner, & Singh, 2007).

The current literature answers a host of questions regarding IORs; therefore, we have a good understanding of what IORs are and why they are formed. Typically, cooperative IORs are non-hierarchical and the organizations maintain their autonomy. The type of connections, contents, and governance, however, may differ (Provan, Fish, & Sydow, 2007). For example, connections may be informal or formal and exchanged content could be knowledge, financial resources, or social support. Generally, IORs are formed because they enable organizations to minimize costs, share risks, fill resource gaps, reduce environmental uncertainty, obtain legitimacy, and contribute to learning (Barringer & Harrison, 2000). Thus, engagement and successful IORs can contribute to creating value for the firm because it provides opportunities for sharing knowledge, combining resources, and accessing new markets (for reviews of IORs, see Barringer & Harrison, 2000; Brass et al., 2004; Ritter & Gemünden, 2003).

Recent research on IORs suggests that the body of research on IORs has advanced from initially answering questions on why IORs are formed and how they develop. Current IOR research highlights issues such as factors influencing alliance termination (Pangarkar, 2009); the influence of negotiation strategies on interaction patterns (Ness, 2009); differences in how IORs develop, form,

operate, and perform (Das & Kumar, 2007); the influences of and differences between partner-specific experiences and general partner experiences among organizations involved in IORs (Gulati, Lavie, & Singh, 2009); and consequences on firm performance based on interactions between organizations' status (societal and network status) and IOR partners' resource complementarity (Zhiang, Haibin, & Bindu, 2009).

A large body of the IOR literature starts with a single (focal) organization and examines its IORs. Such studies can be on dyadic relationships as well as on focal firm networks. Dyads are relationships between two partners and are well represented in studies in which the research question focuses on partner characteristics (either of a focal firm or as a pair). Partner characteristics are a predictor variable to something related to the IOR, typically how IORs are formed or the value they create (for example studies see Gulati et al., 2009; Wang & Zajac, 2007). Research on focal firm networks still views IORs from the standpoint of a single organization, but focuses on relationships between more than two partners. The relationships can represent independent dyadic relationships (e.g., how a focal firm manages its network consisting of IORs to firms A, B, and C, which are not linked) or several relationships to other organizations, which in turn are interrelated (e.g., firms A, B, and C may have direct ties to the focal firm and may be interrelated). A focal firm perspective can be found, for example, in the literatures on multipartner alliances (e.g., Lavie et al., 2007) and alliance portfolios (e.g., Ozcan & Eisenhardt, 2009). Similar to studies on dyadic relationships, focal firm network studies are typically used to capture the effects of partner characteristics, but also answer research questions related to properties of multiple relationships, such as diversity of ties (e.g., Baum et al., 2000).

Another approach is to analyze a whole network of IORs, when the whole network and its structures and processes are of interest. Thus, the IORs are not viewed from any single organization's viewpoint. This is particularly useful when the research questions relate to structure, governance, and outcomes on a network level (for example studies see Human & Provan, 2000; Venkatraman & Lee, 2004). IOR research from a network perspective is still quite limited (for a review on whole networks, see Provan et al., 2007). This dissertation includes both focal firm studies and whole network studies.

3.2 Three challenging issues in IORs for innovation

When organizations join an IOR believing that the established relationships will place them into new strategic domains or alter the way they currently do business (Mone et al., 1998) it creates high expectations of partners, but also vulnerability and difficulties. As presented in the introduction, some of the most prominent risks are competitor creation risks, profitability risks, and dissolution risks (Helm & Kloyer, 2004; Singh & Mitchell, 1996). Because of such risks, the literature suggests that three issues may be particularly challenging in IORs for innovation: knowledge exchange, relational risk, and relationship stability (see e.g., Das & Teng, 2001; Dhanaraj & Parkhe, 2006). Following is a brief discussion of why these issues are particularly challenging in IORs for innovation, examples of prior research, and gaps that deserve further attention. This section's aim is not to develop an exhaustive literature review of these issues, but to illustrate some representative research. This will provide a foundation to understand how the research papers in Part II contribute to these conversations, even if it is not explicit in the papers. At the end of this section, Table 3 presents how the dissertation papers link to these issues and whether the studies are on a focal firm level or whole network level. How the papers contribute to these issues is presented later in Part I in the overview of dissertation papers and the general discussion.

3.2.1 Knowledge exchange

To innovate is an exercise in combining knowledge (Schumpeter, 1961). The rationale for using IORs is that they open organizations to new opportunities, primarily by creating access to new knowledge and favourable circumstances to exploit existing knowledge. In industries where knowledge is complex and expands among several sources, firms may gain access to this otherwise hard-to-get knowledge by engaging in IORs; in some industries the locus of innovation is even said to be in IORs themselves (see e.g., Etzkowitz & Klofsten, 2005; Powell et al., 1996; Ylinenpää, 2009). Empirical support also exists showing that the more cooperative relationships firms have, the greater its innovative output will be (Shan et al., 1994). Firms that have greater access to knowledge and acquire more of it demonstrate higher performance (Baum et al., 2000; Yli-Renko, Autio, & Sapienza, 2001). As knowledge is considered the most important resource shared and transferred in IORs for innovation, the issue of knowledge exchange takes a central role.

To transfer knowledge between organizations is challenging, however. First, the essential knowledge for innovation is often tacit, difficult to codify, not easily purchased, and dispersed among several sources (McEvily & Marcus, 2005; Powell et al., 1996; Simonin, 1999). The more ambiguous partners' knowledge is (i.e., the lack of clarity between causes and effects concerning partners' skills and resources), the more difficult it will be to transfer (Simonin, 1999). This complexity and dispersion of knowledge makes it difficult for partners to exchange and acquire essential knowledge. Second, there may be risk of leakage as partners may act opportunistically and use the exchanged knowledge only for own gains (e.g., Dickson, Weaver, & Hoy, 2006). Hence, there is also a risk that firms might be reluctant to share their knowledge with partners (Norman, 2002). The issue of knowledge exchange in IORs thus concerns both difficulties related to the knowledge itself and to partners' attitudes toward transferring knowledge as this involuntarily may create competitors.

Researchers address knowledge exchange in IORs using two main approaches: a structural approach and a relational approach. The stream of research taking a structural approach advances understanding of knowledge exchange by examining the role of network positions, network closure (Coleman, 1988), and structural holes (Burt, 1992). In the stream of structural research, Bell (2005) found taking a central position in a managerial network (consisting of informal ties of friendship, information, and advice between executives) enhanced innovativeness. The rationale is that the central position not only provides access to several sources of information and thus a rich flow of information, but it also provides the firm with an opportunity to assess the veracity of exchanged information which may make the difference between perceiving the innovation opportunity worth pursuing or not. In relation to network closure, Dyer and Nobeoka (2000) presented how establishing a common "network identity" and clear rules for knowledge sharing can act as a coordinating principle for effective knowledge management. They argued that such a cohesive network might be better suited to exploit existing knowledge than exploring new knowledge. Exploiting existing knowledge can be enhanced because the excess of knowledge makes it easier to identify what knowledge bears value, while the social capital created facilitates knowledge transfer. Dyer and Nobeoka (2000) noted, however, that there is risk that network effectiveness will decrease over time as knowledge diversity decreases. This is consistent with the idea that innovation depends upon combination of diverse knowledge. Ahuja (2000) demonstrated the advantages of a mixed structure by providing evidence that both direct and

indirect IORs are important for innovation. Whereas direct ties can enable knowledge sharing and economies of specialization and scale, indirect ties can constitute important channels of information and thus facilitate knowledge exchange. Extending the ideas of direct and indirect ties, Burt (1992) proposed that actors in sparse networks (i.e., networks where contacts are largely disconnected) could gain access to new information from contacts of contacts to be exploited for own purposes. Related to this, Zaheer and Bell (2005) found support for the explanation that firms that bridge structural holes could identify threats and opportunities more rapidly and develop more novel responses to trends than those that do not bridge structural holes.

Research taking a relational approach advances understanding of knowledge exchange by focusing on exchanged content, relationship and partner characteristics, partner interactions, organizational capacities, and behavior. Rodan and Galunic (2004) highlighted the importance of knowledge diversity among partners for innovation performance. Diverse knowledge was found to be more important for innovation performance than for overall performance. Further, this heterogeneous knowledge can be of several different kinds: technological, market, and managerial knowledge (Sammarra & Biggiero, 2008). The existence of heterogeneous knowledge may not necessarily mean, however, that knowledge is transferred. Pérez-Nordtvedt et al. (2008) demonstrated that the recipient's learning intent (i.e., motivation to learn from partners), the quality of the IOR (i.e., closeness, strength, and mutuality), and the source's attractiveness (i.e., exhibited performance) were all important characteristics for knowledge transfer. Faems, Janssens, and van Looy (2007) proposed that there are some distinct formal (e.g., equity structure and legal clauses), relational (e.g., partner expectations), and organizational conditions (e.g., resource and management similarities) that influence whether knowledge transfer will be initiated (i.e., whether there is a willingness to share and acquire knowledge). Still, even if a firm is motivated to learn from its partners, difficulties arise in transferring knowledge if the partners have not developed "collaborative know-how," capturing skills in identifying which firms are potential partners; negotiating partner agreements; managing the relationship; and knowing when it is time to terminate the IOR (Simonin, 1997). Firms experienced in working with IORs (e.g., Hewlett-Packard, Eli Lilly, and Philips Electronics) may even establish an alliance function that organizes the firm's IORs with the lessons learned from prior collaborations (Kale & Singh, 2009).

Moreover, given that the knowledge is typically complex and difficult to codify, McEvily and Marcus (2005) showed how joint problem solving among partners could help firms acquire knowledge. Their explanation is that joint problem solving includes experimenting, observing, and demonstrating, which provide firms with more opportunities to increase their understanding of how they can effectively use their partner's knowledge. Such understanding may be crucial for being able to identify and act upon opportunities for innovation. In line with this, Hardy, Phillips, and Lawrence (2003) suggested that high involvement relationships (i.e., deep interactions and bilateral information flows) were a precondition to identify and transfer knowledge that, in fact, can enhance the partners' strategic advantage. This is consistent with the notion that social interaction (i.e. personal, social relationships between the firms) is positively related to acquiring knowledge because the exchanged information can be more intense and comprehensive under such conditions (Yli-Renko et al., 2001).

To address the problem of possible reluctance to share knowledge due to the risks of leakage and opportunism, Muthusamy and White (2005) demonstrated that reciprocal commitment among partners is important for an expanded range of exchanges in terms of new information, skills, and expertise, which are all important for innovation. Norms of reciprocity morally obligate partners who are reciprocally committed to repay exchanges. In contrast to economic exchanges, social exchanges do not specify what is required to fulfil an obligation. Because of norms of reciprocity, partners can try to fulfil the obligation by increasing its level and expanding its scope of contributions to the partnership (Muthusamy & White, 2005). Such aims to fulfil unspecified obligations may result, in turn, in transferring new information, skills, and expertise. The reluctance to share knowledge may also depend on whether the knowledge is explicit or tacit: transferring explicit knowledge may require a greater willingness to take risks, whereas transferring tacit knowledge may require a greater willingness to accept vulnerability (Becerra, Lunnan, & Huemer, 2008).

3.2.2 Relational risk

Relational risk exists in almost all types of IORs, but the perception of such risks may be particularly challenging in IORs for innovation because it can obstruct the kind of exchanges and interaction that create opportunities for innovation. Relational risk refers to the risk that the cooperation is unsatisfactory because of partners' opportunistic behavior (Das & Teng, 2001). When firms believe IORs

will result in innovation, it is important to form conditions that ensure the potential innovation profits from the IORs benefit those who contribute to creating innovation through joint activities and knowledge exchanges. The partners that engage in an IOR should be confident that they receive their share of benefits and that others do not exploit the relationship. In some IORs, it is relevant to use formal contracts to overcome relational risks (Dutta & Weiss, 1997; Oxley, 1997). There is, however, a risk that formal safeguards provoke a self-fulfilling prophecy (Ghoshal & Moran, 1996). The literature on IORs has suggested that social aspects such as trust and norms of reciprocity may be powerful in reducing perceived relational risks, which is typically denoted as social control (Larson, 1992). It has even been suggested that the ability to actively initiate trust-building actions in IORs can be seen as entrepreneurial capital (Nguyen & Rose, 2009). The rationale is based on the idea that “there is an element of trust in every transaction” (Arrow, 1973: 24). Thus, the governance of IORs is best understood by acknowledging social and economic determinants (Zaheer & Venkatraman, 1995).

Previous literature has aimed to advance knowledge on how trust is built and what factors stimulate creating positive expectations. It is claimed that trust is developed when it is perceived that the exchange relationship and procedures are fair and that the other party has taken risks and adapted to the relationship (Das & Teng, 1998; Luo, 2008a). Mayer et al. (1995) proposed that perceptions of partners’ ability (the partner’s competencies and skills); benevolence (the partner’s genuine care for the other party); and integrity (the partner’s consistency with its own principles) will determine the level of trust. Sheppard and Sherman (1998) suggested that other factors in the relationship could be important for the level of trust (such as discretion, reliability, predictability, and empathy) depending on the kind of interdependence (e.g., shallow, deep) that exists among partners. Further, Whitener et al. (1998) proposed that perceived trustworthiness could be enhanced through consistent behavior, control sharing, open and explanatory communication, and by showing concern. In the specific context of cooperation and entrepreneurship, Tillmar (2006) found that creating arenas that stimulate interaction between entrepreneurs could also be important for building trust.

Interorganizational trust has several positive consequences in IORs. Developing trust based on past interactions can substitute some formal contracting with informal psychological contracting (Ring & Van de Ven, 1994). McEvily,

Perrone, and Zaheer (2003) suggested trust could be an organizing principle to solve uncertainty problems by representing a heuristic for the link between information and subsequent behavior. Such heuristics may be particularly relevant in innovative work. Their argument was that positive partner expectations makes interpreting and acting upon information simpler because there is less need to question whether the provided information is presented to their advantage and whether their vulnerability will be exploited. Building on the same thoughts, Zaheer, McEvily, and Perrone (1998) demonstrated that trust could reduce negotiation costs and conflicts between partners. Partners can reach agreements more easily because positive expectations make partners more flexible in compromising and relying on norms of reciprocity. Krishnan, Martin, and Noorderhaven (2006) demonstrated that the type of uncertainty (i.e., whether the uncertainty is behavioral or environmental) conditions a positive association between trust and alliance performance. Under conditions of behavioral uncertainty, trust can make partners more willing to share knowledge and thus increase the trust benefits. Environmental uncertainty, however, reduces the trust benefits because there is a risk that information is not interpreted thoroughly enough to meet the demands required under such conditions.

3.2.3 Relationship stability

Relationship instability can take many forms. For example, partners may distance themselves from others or dissolve current IORs and establish competing IORs (Dhanaraj & Parkhe, 2006). The risk with instability is that it can reduce value creation within the IORs (Lorenzoni & Lipparini, 1999). Creating stable IORs has been found to be particularly valid under conditions of market uncertainty (Beckman, Haunschild, & Phillips, 2004). Thus, because of competitive pressures in innovative contexts), relationship stability is a challenging issue in IORs for innovation.

Prior research has identified and examined several factors related to relationship stability. Kim, Oh, and Swaminathan (2006) built a conceptual model of network inertia taking into account the organization's internal characteristics (age, size, prior network changes); the characteristics of dyadic relationships (duration, size, multiplexity); the network position (structural holes, status); and the external environment (competition, conformity pressure) to explain how networks can develop into stable systems. The importance of these conditions is also evident in prior research.

Levinthal and Fichman (1988) suggested that relationship duration could increase the stability of the IOR. They explained that a joint history develops the social dimension of the relationship—beneficial for acquiring knowledge—while the relationship’s duration creates inertia and thus less vulnerability to relationship threats. This is consistent with findings that a decreasing fit between partner resources can constitute pressure on relationship dissolution, whereas individual and structural attachments reduce the likelihood that the relationship will be dissolved (Seabright, Levinthal, & Fichman, 1992).

Economic integration between partners also contributes to relationship stability. Findings have suggested that this occurs both directly and indirectly. The positive direct effects may derive from sharing activities, collectiveness governance, and preventing transaction cost problems. The indirect effects may be a result of other coupling systems such as trust and justice that are more prioritized when partners are economically integrated (Luo, 2008b).

Investing in relation-specific assets is also used frequently to examine interdependence in IORs (e.g., Dyer & Singh, 1998; Ring & Van de Ven, 1994). This captures durable firm investments made in physical and human resources to adjust to the established IOR (Simonin, 1999). Because these relation-specific assets have their highest value within the IOR, the partner may be vulnerable if the IOR dissolves before investments have paid off. In innovative work where it can take long before investments give a return this can be particularly relevant. Research has shown that a firm’s intent to terminate an IOR may be lower when the investments are relation-specific (Weiss & Kurland, 1997).

The concept of “embeddedness” (i.e., firm behavior is embedded in social relationships; cf. Granovetter, 1985) has also been used to understand relationship stability. In IOR research, structural (relationship architecture), relational (relationship quality), and cognitive (meaning similarities) aspects of embeddedness have been of particular interest. Simsek, Lubatkin, and Floyd (2003) suggested that these three aspects of embeddedness in IORs are interrelated and co-evolve through sense-making processes. Embeddedness can thus be a stabilizing force in the network.

Environmental changes may also influence how a network evolves. Koka, Madhavan, and Prescott (2006) suggested that the combination of changes in

uncertainty (i.e., the cause-effect relationship between environmental events and one's own responses) and munificence (i.e., the amount of available resources in the environment) may influence whether the network will expand, shrink, churn, or strengthen because of subsequent changes in creating and deleting ties and portfolio size and range.

3.3 Links between dissertation papers and the literature

The literature above introduced the three issues of knowledge exchange, relational risk, and relationship stability. Table 3 provides an overview of which dissertation paper on a broad level touches upon which issue and whether the analysis is on a focal firm level or a whole network level.

Table 3. Links between dissertation papers and literature background

IOR issue	Level of analysis	
	Focal firms	Whole networks
Knowledge exchange	Paper I, Paper II Paper III, Paper VI	
Relational risk	Paper I, Paper III, Paper VI	
Relationship stability	Paper I, Paper VI	Paper IV, Paper V

The research papers in Part II address several gaps in relation to research on these three issues. In terms of knowledge exchange, this dissertation addresses that prior research has not thoroughly theorized how social aspects and relationship longevity influences knowledge exchange in IORs. In practice, it is common that firms work with innovation in joint projects (see e.g., Dahlgren & Söderlund, 2001). This dissertation identifies that in the literature covering knowledge exchange, there is limited consideration of the challenges with knowledge exchange and related solutions when firms work with the same partners in several innovative projects. Moreover, this dissertation acknowledges that in some formal networks, corporate entrepreneurship (CE) may be an adequate specification of innovation. Doing so, this dissertation also identifies the general lack of research on antecedents to CE and the interest in highlighting the reverse relationship. In other words, does it make a difference for knowledge exchange if firms score high on CE activities? Thus, the research papers in Part II address several gaps related to knowledge exchange.

What regard to relational risk, this dissertation emphasizes the concept of trust. The general trust literature is extensive and has provided some insight into what trust is, how firms can build trust, and the mechanisms that make it beneficial in relationships. To comprehensively understand perceptions of relational risk in IORs, which are largely socially controlled, prior research falls short, however. There is an extensive need for more specific research on the relationship between interorganizational trust and processes as well as outcomes in IORs for innovation. The risks and acceptance of vulnerability may be very different in innovative contexts where firms join than in other contexts (e.g., within organizations and in relationships for other than innovative purposes). This dissertation also addresses that prior research has neglected the time aspect. For example, there is limited research on the development of IORs for innovation over time and the possible effects long-term relationships may have on innovative processes (e.g., how unspecified exchanges, altruism, and open dialogues among partners develop over time). Moreover, interorganizational trust and closeness may be important because of their apparent benefits for facilitating conditions for exchange. In innovation contexts, however, it is also of particular importance that firms remain flexible and can act upon new business opportunities. A small, but growing body of research highlights the possible dark sides of trust related to difficulties to being flexible (see e.g., Gargiulo & Ertug, 2006; Zahra, Yavuz, & Ucbasaran, 2006). For a more comprehensive understanding of the issues of relational risk in IORs, this dissertation adds to this stream, particularly by proposing how these dark sides can be overcome. Moreover, the perception of relational risks may become a barrier for realizing potential partner synergies (i.e., the risk to be exploited makes partners reluctant to explore the potential of using one another's resources). Thus, this dissertation recognizes the relevance of research on how social and contractual control can unleash potential resource synergies.

Finally, there are also gaps in the research regarding relationship stability, which this dissertation addresses. Despite the importance of relationship stability, only a few aspects have been examined and little practical guidance is provided on how stability may, in fact, be achieved. It is also evident that most of the prior research has focused on dyadic relationships or informal networks, whereas little is known about stability issues in whole and formal networks. This is a shortcoming because the problems of instability may be particularly prominent in networks of where multiple firms are coupled only loosely. This dissertation recognizes that in practice it is common for formal networks to use a network

administrative function (typically a network board) to encourage, coordinate, and support joint activities and interests among the firms. A network board may be one way to stabilize the network.

This dissertation also identifies that the network design (how the network is configured, formed, and governed) and how network board members are motivated to act in the best interest of all network firms (i.e., whether network board members are pure agents who become motivated primarily by compensation) are issues that deserve particular research attention. Moreover, prior research assumes that stability is purely beneficial. Because of the somewhat unstable innovation context and required flexibility, this dissertation more specifically elaborates on the benefits and costs of stability (e.g., inflexibility) in an innovation context.

In summary, the six research papers together address gaps in the literature on the issues of knowledge exchange, relational risk, and relationship stability. The contributions they make to each issue are discussed in the section containing an overview of each paper and in the general discussion at the end of Part I.

4. METHODS

4.1 Philosophy of science

A short background to the philosophy of science will precede presentation of the specific methods used in the dissertation papers. Historically, research methods have been linked to specific scientific paradigms. A scientific paradigm can be viewed as “a conceptual model of a person’s worldview, with the assumptions that are associated with that view” (Merton, 2003: 139). Some consider positivism, post-positivism, critical theory, and constructivism to be the four major paradigms guiding scientific behavior (Guba & Lincoln, 1994). Others would rather make a distinction between positivists and relativists (Baum & Rowley, 2002) to analyze and understand “paradigm wars.” Moreover, in the context of organizational studies, the Burrell and Morgan (1979) matrix, which outlines the radical humanist, radical structuralist, interpretivist, and functionalist paradigms, is applied frequently to the discussion of philosophical underpinnings. No matter the terminology or categorization used, different paradigms have been thought to provide different responses to fundamental questions asked in relation to any research project, encompassing ontology and epistemology assumptions (for comparisons among paradigms, see French, 2009; Guba & Lincoln, 1994; Merton, 2003). Ontology refers to the form and nature of reality. Epistemology refers to a researcher’s assumptions about what one can know. Contemporary research dialogue, however, typically does not claim that specific research methods are uniformly linked to different paradigms (Bryman, 1984). Rather, the ontological and epistemological assumptions will influence how any one method or technique is implemented and evaluated based on the assumptions upon which it is founded (Sandelowski, 2003). For example, some researchers use criteria such as internal validity, construct validity, external validity, reliability, and analytical generalizability to assess qualitative research (e.g., Gibbert, Ruigrok, & Wicki, 2008; Yin, 2003). Other researchers would rather judge the quality of research conducted with qualitative methods using criteria such as trustworthiness and authenticity (Denzin & Lincoln, 1994) and speak of the possible transferability of findings (Corley & Gioia, 2004) and learning (Hjorth, 2007) to other contexts.

A closer inspection of organizational studies discourse, however, reveals an inconsistency in what people mean when using the above paradigm terms (see Baum & Rowley, 2002; Watson, 2006). These inconsistencies and suggested

misunderstandings among philosophical standpoints in contemporary organizational studies (Moldoveanu & Baum, 2002) speaks in favor of not claiming that this dissertation lies within a certain paradigm. Such self-categorization may cause the foundation of this dissertation to be misunderstood, instead of the intended clarification and positioning. As an alternative, the ontological and epistemological assumptions underlying the dissertation are outlined to illuminate its philosophical underpinnings.

Ontologically, this dissertation is founded on the idea that “there is a real world existing independently of our attempts to know it” (McKelvey, 2002a: 757). One of the central elements of organizational science is that terms in all three “realms” are included (see McKelvey, 2002a). Quoting McKelvey (2002b): “*Realm 1* entities are currently observable (number of employees in a firm); *Realm 2* entities are currently unobservable, but potentially detectable (process events in a firm); and *Realm 3* entities are metaphysical and beyond any conception of current science (psychological need, environmental uncertainty, underlying cause)” (p. 896). This dissertation also assumes that “organizations are real. They have form, structures, boundaries, purposes and goals, resources, and members whose behaviours result from structured relations among them.” (Dubin, 1982: 372). Epistemologically, this dissertation builds on the idea that this world is open for empirical investigation and that the researcher can thus gain knowledge of it (Azevedo, 2002).

These ontological and epistemological assumptions also have implications for how science is viewed. The aim of scientific theories becomes to discover mechanisms underlying phenomena in the world. This does, however, not mean that scientific theories will completely describe the world. This is because these assumptions also imply a fallible approach to science. This includes a belief that theoretical statements are not simply true or false; instead, they are more or less “a good approximation to the truth.” Based on these assumptions, objectivity, replicability, validity, and reliability are considered important aspects when evaluating research. Hence, in the progress toward a probable truth, a critical community must test the researcher’s objectivity and the methods and theories used because they are all fallible (see Azevedo, 2002). Over time, this also means that there is a natural selection of theories, where less plausible theories are winnowed out. For this dissertation, this means that the theories used are not considered a perfect reflection of the studied phenomena, but rather adequate considering current theoretical landscape. In addition, future researchers can

build upon the theories and results to make further progress. This also implies that whereas some of the explanations and propositions in this dissertation are considered a good approximation to the truth today, they will be developed and replaced as future research makes further progress and builds theories that are more sophisticated.

4.2 Research approaches and analysis techniques

Table 4 presents an overview of the methods used in the six research papers in Part II in terms of research questions, sample, and analyses. Papers I-V all refer to what Edmondson and McManus (2007) defined as field research: “systematic studies that rely on the collection of original data—qualitative or quantitative—in real organizations” (p. 1155). In contrast, Paper VI is a conceptual paper. That is, it does not rely on analyzing empirical data. Working conceptually instead of empirically allows new perspectives and ideas to open without being discovered from empirical data, as in grounded theory. Instead, by drawing from previous literature, evidence, and theoretical frameworks the relationships of interest can be subject of theorizing (Weick, 1995). Using this approach, Paper VI proposes a new conceptual model.

Table 4. Overview of research methods

Paper	Research questions	Level of analysis	Sample	Analyses
Paper I	How and why could it be beneficial for a firm to work with the same partners in multiple (different) innovative processes?	Firm	Firms using IORs for innovation	Thematic analyses
Paper II	What is the influence of relationship characteristics (knowledge transfer, interorganizational trust, and relationship diversity) on networking firms' corporate entrepreneurship?	Firm	Firms in strategic networks	SEM; reciprocal causality modeling
Paper III	What is the influence of partner fit on networking firms' corporate entrepreneurship?	Firm	Firms in strategic networks	SEM
Paper IV	What factors are important for innovative performance in firm networks?	Network	Strategic networks	SEM; latent growth modelling
Paper V	What is the influence of compensation of network board members on network performance?	Network	Strategic networks	Panel data analysis; generalized least square regression
Paper VI	How and why do negative trust effects in terms of rigidities develop already at low levels of trust and accumulate in parallel to the positive trust effects as trust builds stronger over time?	Firm	---	Conceptual

In the field research papers, the aim was to reach a fit between research questions, data collection, data analysis, and status of current theory. Based on the ideas of “methodological fit” proposed by Edmondson and McManus (2007), Figure 3 illustrates how the research elements in Papers I-V are combined and demonstrate internal consistency. The methodological approach taken in those papers were estimated to be most effective for studying the specific research questions.

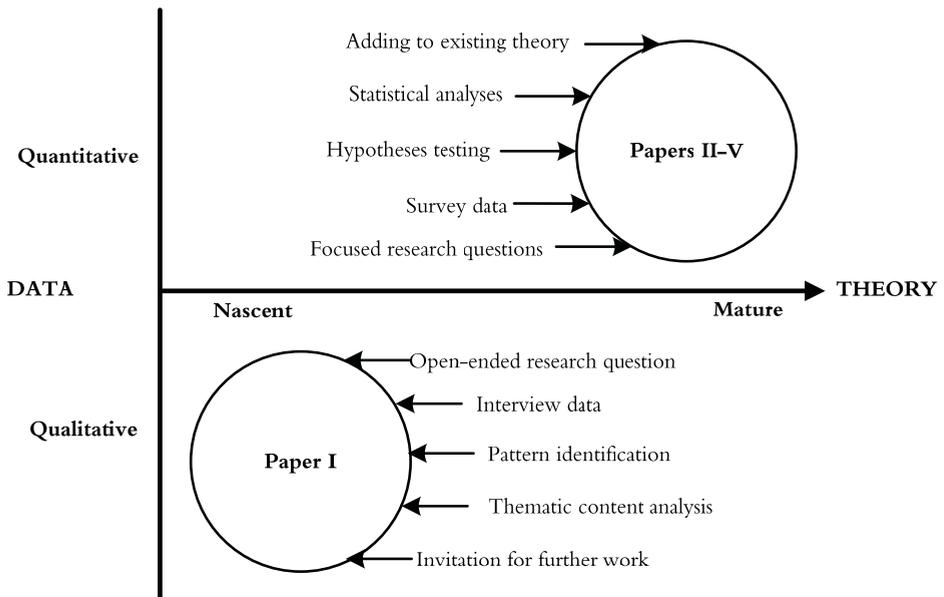


Figure 3. Combination of research elements in dissertation papers I – V.

The idea of methodological fit is also why these papers build on three different samples. For example, in Paper I, it was important to sample firms that all worked with innovation in IORs, but were still varied enough to provide an extensive understanding of the phenomenon.

In Papers II-III it was relevant to sample firms that were engaged in IORs for innovation and where it was possible to collect data on partner characteristics and follow this over time. As defined by Human and Provan (1997) these networks are “intentionally formed groups...in which the firms (1) are geographically proximate, (2) operate within the same industry, potentially sharing inputs and outputs, and (3) undertake direct interactions with each other for specific

business outcomes” (p. 372). In these networks, firms can choose other firms with which they want to partner to work on product, market, and production development. These networks build much on social exchanges. Because of these characteristics, firms participating in such networks are adequate to sample when the research questions concern the influence of relationship and partner characteristics on innovation. In Papers IV–V strategic networks as a specific kind of IORs for innovation figured prominently in the framing and problematization of the papers, which is also why such networks were sampled.

The idea of fit also applies to the approaches and analyses. The approach used in Paper I, in which themes were analytically developed, was inspired by grounded theory (Glaser & Strauss, 1967; Strauss & Corbin, 1998). This approach was adequate in answering an open-ended research question in an area of the literature where there was little previous theory; that is, the state of prior theory was nascent (see Edmondson & McManus, 2007; Glaser & Strauss, 1967; Martin & Turner, 1986). To aim for methodological fit, collected qualitative interview data was analyzed so that theory was discovered from data, rather than testing an existing theory. The aim was thus to provide fresh understandings about relationships and actors in a social world, not to provide truth statements (see Suddaby, 2006: 636). Consistent with this, the contribution in Paper I is a theoretical suggestion that opens up and invites further research on the examined topic.

The approach used in Papers II–V was deductive hypothesis testing, which was appropriate for the focused research questions relating to existing constructs in a mature area of theory (see Edmondson & McManus, 2007). Using such an approach, prior theory helped develop specific, testable hypotheses. This resulted in generating “variance theory” (Mohr, 1982) explanations (how independent variables can statistically explain variance in dependent variables) to the research questions. Hence, these papers relied on statistical analyses and inferences of quantitative data to test the theoretically deduced hypotheses. Papers II–V thus contribute in terms of adding to existing theory by introducing theory boundaries and theory specificity.

Depending on the kind of hypotheses developed in Papers II–V, the most appropriate analysis techniques were employed to statistically test them. In Papers II–IV structural equation modelling (SEM) techniques were used to test the hypotheses. It has been suggested that SEM is particularly useful when the aim is

to understand complex phenomena with several variables (Schumacker & Lomax, 2004). Thus, SEM techniques suited Papers II-IV because the hypotheses in these studies were such that it was of interest to test how each independent variable was correlated with the dependent variable(s) and also if and how these variables were intercorrelated. Multiple regressions by structural equation techniques made it possible to disentangle the effects among the studied variables and advance the understanding of complex relationships.

In Paper V, the hypotheses were tested on panel data, where the data set consisted of a series of cross-sectional observations from the same units. The benefit of using a panel data set was that it allowed the control of unobserved characteristics and the study of possible lagged effects (Wooldridge, 2002). Because the Gauss-Markov theorem requires both homoskedasticity (i.e., errors have constant variance given any value of the independent variables) and serially uncorrelated errors, however, ordinary least square (OLS) estimation is no longer the best linear unbiased estimator (BLUE) in the presence of serial correlation. As a result, in the presence of heteroskedasticity the OLS t statistics does not have a t distribution (Wooldridge, 2002). Thus, as a means of obtaining BLUE, a generalized least square (GLS) estimator that accounted for serial correlation was used to test the hypotheses in Paper V.

In summary, the abovementioned variations in formulating research questions, samples, collected data, and data analyses within this dissertation uses a comprehensive methodological basis to contribute to increasing our understanding of value creation in IORs for innovation. The next section, which presents an overview of the six research papers in Part II, demonstrates this methodological richness. It also indicates the specific constructs, mechanisms and contexts on which each paper focuses.

5. OVERVIEW OF DISSERTATION PAPERS

This section reviews the six research papers presented in Part II. Each paper is described with the intent of capturing its core essence. Contributions explicit in the research papers and to any of the three issues presented in this introductory chapter (knowledge exchange, relational risk, and relationship stability) are highlighted.

Paper I: A glimpse of benefits of long-term relationships for innovation

Research on IORs and innovation spends much attention on the benefits of diverse ties and ideas related to the “strength of weak ties.” This kind of scholarly conversation may create the perception that forming new relationships is prominent for achieving required external knowledge. This paper takes a different approach by highlighting that many firms return to the same partners when starting up new innovative projects. The aim of Paper I is to offer new insights and understanding into *how and why it could be beneficial for a firm to work with the same partners in multiple (different) innovative processes.*

This study employed a qualitative research method. The aim was to build theory using inductive methods. The design was an exploratory, multiple case study where the firms constituted the cases. Firms in Sweden and Finland were sampled by maximum variation and criterion sampling techniques. Data was collected through interviews using open-ended questions. After an iterative processes of data analysis, five themes that provided insight into how and why it could be beneficial to work with the same partners were developed.

The study proposed several benefits can contribute to explaining why such a pattern may be observed among firms aiming for innovation through IORs. These benefits include:

- **Effective use of indirect links:** In innovation work, there are high demands on efficiency and effectiveness. By working with the same partners, the firm can gain access to diverse knowledge at a low relationship cost.
- **Better conditions for unspecified exchanges:** When working with innovation in IORs, it can be difficult to specify exchanges between one another in advance. By working with the same partners, exchanges even out over time.

- **Provision of a fast lane to essentialities via known values and firm characteristics:** Time is important in innovation work. By working with the same partners, more time could be spent on the innovation and less on building the IOR.
- **Improved dialogue and positive surprises:** In innovation work, there are several aspects of uncertainty. Working with the same partners may result in a higher-quality dialogue among partners.
- **Elicited partner enthusiasm guided by altruism:** In IORs, there are few guarantees that contributions to partners will actually be made. Working with the same partners may enhance motives to help one another.

This study thus contributes preliminary findings to be further examined in relation to challenges in IORs in multiple innovative processes. Relating to the extended literature background presented in this introductory chapter, this paper touches upon all three issues presented (knowledge exchange, relational risk, and relationship stability). Regarding knowledge exchange, the study suggests that by using the same partners for several innovative processes, firms can gain access to high-quality knowledge exchanges relatively easily and rapidly. Moreover, the trust built as the relationship develops over time may contribute to relational risk being perceived as lower. In terms of stability, consistent with prior research (e.g., Levinthal & Fichman, 1988) this study illustrates how the social dimension accompanying longevity may increase IOR stability.

Paper II: A cause-effect study of inter-firm networking and corporate entrepreneurship: Initial evidence of self-enforcing spirals

It has become increasingly popular for firms to join formally established firm networks in which independent firms cooperate. This is often because the interaction in such networks are considered to have the potential to enhance the networking firms' innovation, venturing, and strategic renewal, typically termed corporate entrepreneurship (CE). Research is underdeveloped in terms of what relationship characteristics can strengthen participating firms' CE. On a general IOR level, research has demonstrated the importance of trust, diversity, and knowledge transfer. This has not been broken down, however, to a level where the effects of these relationship characteristics have been tested on CE among networking firms. To this background, Paper II aims to examine *the influence of*

relationship characteristics (knowledge transfer, interorganizational trust, and relationship diversity) on networking firms' CE.

This study used a deductive hypothesis testing approach. Two strategic SME networks in Sweden were sampled. Quantitative data was collected with a survey among all the participating firms in those two networks. Longitudinal data was then analyzed using structural equation modelling (SEM) techniques. Because the developed hypotheses predicted a reciprocal influence between the relationship characteristics and CE (i.e., relationship characteristics influence CE and CE influences relationship characteristics) the hypothesized paths were tested with a reciprocal causality model.

Results support a reciprocal positive relationship between knowledge transfer and CE. There is also support for a positive relationship between relationship diversity and CE. These findings clearly contribute to the issue of knowledge exchange by indicating that IORs are important for understanding firms' CE, but also that firms' engagement in CE may influence how IORs are formed and managed. More specifically, the reciprocal links between knowledge transfer and CE may explain why some networks include entrepreneurially superior firms that manage to keep this position. The reason is that positive self-enforcing spirals may develop (CE spurs efficient knowledge transfer and vice versa) when the participating firms engage in CE activities, otherwise not.

Paper III: Unleashing synergies in strategic networks of SMEs: The influence of partner fit on corporate entrepreneurship

Paper III, as Paper II, also recognizes that firms increasingly join formally established firm networks to improve their corporate entrepreneurship (CE). The literature has suggested that "partner fit" (i.e., partners have different capabilities but similar organisational cultures, management, and operating styles) may be positive for IORs. Partner fit presents opportunities for firms to complement their weaknesses, which creates excess value. Thus, such fit generally motivates firms to engage in IORs. Despite the fact that networks are based on multilateral exchanges and interaction, prior research has not examined whether networking firms' CE is influenced by the degree of partner fit. Thus, Paper III aims to examine *the influence of partner fit on networking firms' CE*. Indirect effects are hypothesized between partner fit and CE through two paths

that acknowledge leveraging resources by accumulating and combining resources. In this network context, accumulating resources refers to how participating firms in the network gain access to partners' resources that they can internalize in their own firm. Combining resources refers to how the partners jointly merge their complementary skills and resources to create added value together.

The approach in Paper III was deductive hypothesis testing. The same data set used in Paper II was used in Paper III to test the hypotheses. That is, it consisted of a sample of networking firms in two strategic networks in Sweden, and quantitative data was collected using a survey targeting all the networking firms. Structural equation modelling (SEM) techniques were used to test the hypotheses.

The findings support predictions that partner fit can indirectly result in strengthened CE among networking firms. This is because partner fit triggers the two resource leveraging processes through which networking firms' resources are accumulated and combined. Accumulating own resources can be achieved by partner fit, triggering a long chain to CE through relational capital, interdependence, and knowledge transfer. Combining partners' resources can instead be achieved with a less complicated process, where partner fit triggers joint combinatory efforts that, in turn, positively influence CE.

Similar to Paper II, this paper concerns the central theme related to knowledge exchange. It shows that even if potential partner synergies could evidently be useful to realize, it might be necessary to develop relational capital and interdependence in the IOR before knowledge will be transferred. Related to the issue of relational risk, the study also indicates that formal mechanisms (e.g., contracts) and social mechanisms (e.g., trust) may stimulate behavior in the relationship where the relational risk otherwise may be a cooperative barrier.

Paper IV: Designing interorganizational networks for innovation: An empirical examination of network configuration, formation, and governance

Formal strategic networks are established increasingly to provide a forum for independent firms (especially SMEs) to work together with shared objectives. The idea is that these networks should produce innovation for their participants.

There is little research, however, to understand how such networks are designed, preferably for innovative performance. To address this, Paper IV examines *factors important for innovative performance in firm networks*. This is done by identifying broad areas of influential factors that have been mentioned in research so far and testing how important selecting such factors may be for innovative performance in strategic networks.

From a review of research on SME networks, three areas related to network design were considered contextually important: network configuration, formation, and governance. For each area, potentially important variables were selected: network size (configuration), bottom-up/top-down formation (formation), and the size of the administrative function (governance). This framework was then used to develop hypotheses for the link between the selected network design variables and innovative performance.

Hypotheses were tested with a quantitative survey on 53 Swedish strategic networks, with the networks as the units of analysis. The data was analyzed using latent-growth-modelling, which is a structural equation modelling (SEM) technique.

The study found that greater innovative performance could be achieved when there are many network members; when the network is formed on member initiatives; and when there is a large administrative function. The explanation is that when there are many network members, the network can establish a platform from which the firms can gain access to resources through a wide range of opportunities. There may be more support and resources in terms of capabilities and contacts from several firms, and the firms are given opportunities to build varied partner portfolios. Regarding the positive effect of a bottom-up network formation process, members' commitment and time devoted to the network is strengthened if the firms initiated the network, not policy makers. A large administrative function, such as a network board, may also have a positive influence on innovative performance because it may be more equipped to analyze the network and its environment, identify new ideas, and facilitate interaction.

Relating back to the literature background presented in this introductory chapter, Paper IV also adds to our knowledge about relationship stability. What can be understood generally from this study is that the examined variables are

important for understanding how stability is created in formal networks. This study suggests that some stability results by carefully configuring and forming the network. Along with governance design, these factors positively influence innovative performance.

Paper V: The importance of compensating strategic network board members for network performance: A contingency approach

In formal firm networks where member firms cooperate with shared objectives, it is common to use a network board (a group of individuals representing the network firms, industry experts, or representatives from public agencies) to encourage, coordinate, and support network activities. A board helps ensure that network objectives are met. In accordance with an agency perspective, network board members might need compensation to be motivated to take actions that benefit the network as a collective. The relationship between board members (potential agents) and network firms (potential principals), however, differs from those typically examined (i.e., manager-owner relationships). There is a need, therefore, to test empirically the effects of network board member compensation. Thus, Paper V aims to test *the influence of compensation of network board members on network performance*. It builds a framework for such testing by integrating stewardship theory with agency theory. In doing so, it proposes that contingency factors shape the board member – network firm relationship in a way that influences compensation. The logic is that contingencies can moderate the effects of compensation on network performance because they either stimulate board members to be agents (compensation more important) or stewards (compensation less important).

Hypotheses were developed from the framework integrating agency and stewardship theories. These hypotheses were tested using the same sample as was used in Paper IV (53 Swedish strategic networks). The hypotheses were tested using a generalized least squares (GLS) estimator when conducting panel data analysis.

Findings support that contingencies can moderate the effects of board compensation on network performance. A high level of funding provided for projects in the network is one contingency that makes board compensation more important. Compensation is also more relevant when a small proportion of the

board members represent member firms, and when the network is formed because of some external initiative (top-down formation).

Similar to Paper IV, this paper addresses the relationship stability issue by suggesting factors and conditions for how firms can overcome some of the challenges with instability in formal multiple-partner networks. To stabilize the network in terms of motivating the network board members to steer the entire network in the most efficient and effective direction, this study provides support for the moderating effects of the amount of funding (small/large); how well the members are represented on the network board (high/low); and on whose initiative the network was initially formed (bottom-up/top-down) on the link between board member compensation and network performance.

Paper VI: Interorganizational trust: Origins and regulation of rigidities

An extensive body of research has examined the positive effects of building trust in IORs; for example, it reduces negotiation costs, risk of betrayal, transaction costs, and search costs. Only recently have researchers paid attention to the possible costs and risks that interorganizational trust may bring. Some of the negative effects are lack of objectivity and considering of alternatives, inhibited creativity, overconfidence and ignoring of evidence speaking against one's partners' trustworthiness. Recommendations on how the negative effects can be mitigated are, however, few. The suggested solution is primarily to create an optimal level of trust. This means that while firms keep the negative effects at an acceptable level, the positive effects that a higher level of trust would generate may be missed. Such positive trust effects may be particularly important in IORs for innovation, such as R&D alliances. In such alliances, turbulence and time constraints can require the effects (e.g., smoother exchanges) to be generated at a higher level of trust than what theory suggests is "optimal" because of the risks and costs it may bring. Paradoxically, therefore, trust enables effective and efficient exchanges, but may also contribute to organizations questioning whether being involved in the IOR is worthwhile. The current solution of creating an "optimal" level of trust may thus not be an option in all kinds of IORs.

Paper VI provides insight into *how and why negative effects in terms of rigidity develop already at low levels of trust and accumulate in parallel to the positive trust effects as trust*

builds stronger over time. Further, in doing so it opens opportunities for finding an alternative to solve the situation that paradoxical trust creates.

Paper VI is a conceptual paper that draws on inertia literature to theorize how there are two parallel processes where trust creates exchange-facilitating conditions in one process (considered positive in all kinds of IORs) and in another process creates resource and routine rigidities (considered negative in some IORs such as R&D alliances). Moreover, this paper examines feedback loops from these processes back to trust, meaning that the more rigidity, the more trust will develop, which strengthens both the negative and positive trust effects.

Paper VI next proposes how organizations involved in an IOR can regulate the positive and negative effects separately, even if their development paths are integrated. Drawing on the conflict-handling literature, this paper proposes how different handling tactics (competing, accommodating, avoiding, collaborating, and compromising) can regulate the positive and negative effects. Thus, this study complements the idea of an “optimal level of trust” by proposing that firms can manage high trust problems without decreasing the level of trust.

This paper touches upon all three issues presented in the theoretical framework (knowledge exchange, relational risk, and relationship stability). The study acknowledges how interorganizational trust lubricates IORs in such a way that knowledge might be transferred more easily. Further, it highlights how social aspects such as trust and closeness can be valuable to mitigate relational risk. The study also more closely inspects the other side of the coin, however. The closeness trust develops also might develop stabilizing factors in terms of rigidities in the IOR. Whereas rigidities can be useful in some IORs, this study shows the potential risk with IOR rigidities when partners join for innovation purposes. This study suggests a solution for how firms might still foster conditions that create a stable relationship where knowledge transfers easily and perceived relational risks are mitigated. They can do this without making a trade-off between the benefits and costs associated with high levels of interorganizational trust.

6. GENERAL DISCUSSION AND CONCLUSIONS

6.1 Contributions to literature on challenging issues in IORs for innovation

Part I of this dissertation acknowledges that the combination of papers allows for highlighting additional contributions to those made explicit within the separate papers (see Figures 1 and 2 in Section 2.2). More specifically, viewing the dissertation within a frame of IORs for innovation and challenging issues expands the understanding for how the dissertation contributes to existing research. Thus, the general discussion below is designed to present contributions that this dissertation as a whole makes to research on IORs for innovation, organized around the issues of knowledge exchange, relational risk, and relationship stability. Further discussions of how each paper specifically contributes to theory and the literature were summarized in the overview of dissertation papers and are presented in more detail within the papers themselves.

6.1.1 Implications for knowledge exchange

Prior research has acknowledged the importance of combining knowledge for innovation (e.g., Schumpeter, 1961). IORs create access to new knowledge and open opportunities for new knowledge combinations. Nothing, however, guarantees that simply because an IOR is established, knowledge will be transferred among partners. Quite the contrary; scholarly consensus indicates that it may be difficult to transfer knowledge. How challenging this process is depends on the source of knowledge (does it have the possibility and willingness to share knowledge?); the potential knowledge recipient (are there possibilities and motivation to absorb knowledge?); and the knowledge itself (to what extent is the knowledge possible to codify?). Knowledge exchange is thus central in IORs for innovation (Dhanaraj & Parkhe, 2006).

Research addressing the issue of knowledge exchange can be categorized into two types: those taking a structural approach, such as examining the role of network positions, network closure, and structural holes (Ahuja, 2000; Burt, 1992; Dyer & Nobeoka, 2000; Zaheer & Bell, 2005); and those taking a relational approach, such as examining exchanged content, relationship and partner characteristics, partner interaction, organizational capacities and behaviour (Faems et al., 2007; McEvily & Marcus, 2005; Rodan & Galunic, 2004; Simonin, 1999). Despite quite a number of articles in these streams of

research, the theorizing is still presented at a rather general level. Research needs much more specificity and contextualization to provide a strong foundation for the theoretical and practical implications regarding knowledge exchange in IORs for innovation.

This dissertation focuses on partner and relationship characteristics to add some specificity and contextualization to existing research touching upon the issue of knowledge exchange. More specifically, it approaches the issue of knowledge exchange by focusing on relationship and partner characteristics. This dissertation's main contribution to this issue is the added insight into antecedents and consequences of knowledge transfer in IORs for innovation. Because corporate entrepreneurship (CE) is a specific innovation-related construct that is particularly relevant in formal networks where firms join to become more innovative, CE is selected as a specific indicator of innovation among networking firms. This dissertation likely represents the first attempt to examine the relationship between knowledge transfer in IORs and firms' CE. A reciprocal causality between knowledge transfer and CE is hypothesized. The proposed logic for knowledge transfer to positively influence CE is that extensive transferring of knowledge opens more opportunities to create new combinations of the knowledge firms already possess and the knowledge to which they gain access through the IOR. This influx of new knowledge may make it easier to develop new products and processes, expand markets, and engage in renewal.

This dissertation also predicts the reverse causality, that CE is not only a consequence of knowledge transfer, but also an antecedent to it. The logic that CE positively influences knowledge transfer is that firms scoring high on CE activities will be particularly motivated to build and maintain IORs that exhibit strong knowledge transfer so that they can fill some of the resource gaps that the CE creates. These predictions of reciprocal causality were supported. Thus, this dissertation demonstrates that there is a reciprocal relationship between knowledge transfer and CE. This reciprocal relationship means that firms active in CE may gain more and more from IORs because valuable knowledge will become more and more mobile among partners. This dissertation thus confirms the central role of knowledge exchange for understanding innovation in IORs, and specifically the value of examining the concept of knowledge transfer.

Knowledge transfer also constitutes an important element for understanding the influence of partner fit (i.e., partners have different capabilities, but similar

organizational cultures, management, and operating styles) on CE. Prior research has explained the effects of partner fit on how dyadic alliances are formed and perform. This dissertation takes the concept of partner fit to multipartner networks and tests its effects on the networking firms' CE. Two processes are proposed to explain how partner fit positively affects CE by leveraging resources: an accumulation process and a combination process. It is within the accumulation process that knowledge transfer plays a central role. The accumulation process refers to how firms access partners' resources and internalize them (Hamel & Prahalad, 1993). For the accumulation process, it is predicted that there is an indirect chain from partner fit to relational capital, to interdependence, to knowledge transfer, which finally positively influences CE. Knowledge transfer is thus a consequence of social mechanisms allowing firms to identify and access partners' resources that may be valuable for the own firm. The combination process, on the other hand, emphasizes the joint combination of knowledge instead of accumulating knowledge from separate firms' existing resource bases. As such, partner fit may also result in CE through another process where knowledge transfer is not in focus, but instead combining joint knowledge. Thus, this dissertation has highlighted how partner fit may have an indirect positive effect on CE. Even if partner fit bears potential to transfer complementary knowledge, this dissertation suggests that it might be necessary that relational capital and interdependence develop in the relationship before knowledge transfer will actually take place. Moreover, knowledge might be transferred for positive CE effects as well as combined through joint efforts without explicit transferring.

In sum, this dissertation's main contributions to research on the issue of knowledge exchange are that it demonstrates both antecedents and consequences of knowledge transfer in IORs for innovation. In terms of antecedents, it explains why partner fit has an indirect effect on knowledge transfer and why CE has a direct effect on knowledge transfer. In terms of consequences, it explains why knowledge transfer positively influences CE. On a more general level, this dissertation sheds light on the relevance of considering processes in discussions about knowledge exchange. Prior research on knowledge exchange (e.g., Norman, 2002; Simonin, 1999) has focused on characteristics such as the knowledge itself (e.g., to what extent it is possible to codify) and the exchanging partners' attitude toward exchange. Such a theoretical approach relegates the partners into rather passive roles. As the research in this area matures, a logical next step in developing theory is to "activate" the partners and acknowledge

processes that can contribute to increasing our understanding of knowledge exchange issues. This dissertation adds to this development by specifically highlighting the importance of social processes for knowledge exchanges. It also shows that it may be worthwhile to integrate partner characteristics (in this dissertation represented by partner fit and CE) with processes identified as important for knowledge exchange. For example, this dissertation theorizes on how partner fit integrates with a process of friendship and closeness, turning it into interdependence, which is ultimately associated with the degree of knowledge transfer. Thus, this dissertation suggests that to develop research on knowledge exchange further it could be fruitful to integrate other kinds of characteristics with a process-thinking in mind. In other words, if we have a specific kind of partner or knowledge characteristics, what might happen over time and what will the effect of those processes be on knowledge exchange?

6.1.2 Implications for relational risk

In IORs for innovation, research has emphasized that it is important that innovation profits benefit those who contributed to creating such profits, meaning the creators can appropriate the innovation. Still, firms that engage in IORs take a relational risk that their partners may exploit them. Reducing such risks can be achieved through formal contracting and social control (Larson, 1992; Oxley, 1997), where the latter is considered powerful in IORs for innovation (Dhanaraj & Parkhe, 2006). This dissertation confirms that both formal contracts and social control may be important for creating a well-functioning appropriability regime. Whereas formal contracting may lay the foundation for some kinds of interactions and exchanges (e.g. joint combinatory efforts), social control may trigger other processes (e.g. knowledge transfer). Each of these may be aspects of a regime in which the firms perceive that partners will not exploit them, but instead earn their share of profits from what engaging in the IOR generates.

Interorganizational trust is one of the key concepts examined in the stream of research on social control. Trust captures one's willingness to accept risk in the relationship because of positive partner expectations (Rousseau et al., 1998). Despite the extensive literature on trust providing insight into what trust is, how it can be built and be beneficial, the literature on interorganizational trust is, however, not as extensive. Moreover, it does not provide a comprehensive understanding of trust in IORs for innovation. This is a shortcoming because accepting vulnerability may be different for IORs with other than innovative

purposes. Thus, there is a gap regarding interorganizational trust in IORs for innovation.

This dissertation sheds light on the challenge of building interorganizational trust to create a regime where partners do not believe they will be exploited, while still maintaining flexibility to act upon new business opportunities. There has been a scholarly notion that trust does indeed have a dark side, where flexibility is affected by lack of considering alternatives and inhibited creativity (e.g., Jeffries & Reed, 2000; Patzelt & Shepherd, 2008; Zahra et al., 2006). Researchers have argued that this dark side appears at a certain level of trust, and can thus be avoided by keeping trust at an “optimal level” (e.g., Gargiulo & Ertug, 2006; Wicks, Berman & Jones, 1999). This dissertation diverges from this idea, proposing that the dysfunctional side develops as a parallel process to processes producing positive trust effects. More specifically, it is known that interorganizational trust results in interorganizational closeness, which creates exchange-facilitating conditions (i.e., positive trust effects). Positive trust effects, in turn, result in higher interorganizational trust. This dissertation proposes that the interorganizational closeness trust creates also results in resource and routine rigidities where current structures are preserved (effects that can be negative in IORs for innovation). Moreover, this dissertation proposes that once such rigidities have started to develop, even higher levels of experienced trust in partners will result. This, in turn, will lead to even stronger rigidities. Thus, rigidities in the IOR are proposed to be both an outcome and an antecedent to interorganizational trust, and these processes are largely integrated with and occurring parallel to a positive path surrounding trust and exchange-facilitating conditions.

Taking as its starting point that interorganizational trust has a dysfunctional side that is integrated with and develops on a parallel path with positive trust processes, this dissertation also posits how the negative path can be broken without necessarily breaking the positive path. This is achieved by identifying and discussing the regulatory potential of several handling tactics that firms involved in IORs for innovation can use when developed rigidities are particularly problematic. This is likely the first time the dark side of interorganizational trust is approached with an alternative solution to creating an “optimal trust level,” which also reduces negative trust effects while maintaining positive trust effects.

Thus, this dissertation's main contribution to relational risk is this: when partners try to create conditions where they do not believe they might be exploited, there is a risk that rigidities in resources and routines develop. Partners may be comforted to such an extent that the developed rigidities cause difficulties in responding to environmental changes and opportunities quickly. Hence, there is a risk that when partners try to ensure they can appropriate innovations from the IOR, the innovation profits may not develop because opportunities for innovation are not acted upon. This dissertation thus contributes new insights to the issue of relational risk by theorizing how the dark side of interorganizational trust is closely integrated with its bright side. Indeed, there might be alternative solutions to reducing the negative effects other than reducing the level of interorganizational trust. By applying the notion of negative aspects of trust emerging in the general trust literature (Gargiulo & Ertug, 2006; Wicks et al., 1999) to the literature of IORs, this dissertation adds to an expanded view of social control, more specifically trust, in IORs. The IOR literature has neglected the possible drawbacks of developing trust (for exceptions see Jeffries & Reed, 2000; Patzelt & Shepherd, 2008; Zahra et al., 2006). Rather, the focus among researchers has been on how to overcome difficulties in developing trust among partners. The literature merely indicates an implicit assumption that trust is purely beneficial. The theorizing in this dissertation suggests that such a naïve picture might bias the results, however. Thus, while recognizing literature suggesting that social aspects such as trust may be powerful in reducing perceived relational risks (Larson, 1992), research takes a biased path if it does not also properly acknowledge the risks and costs associated with social control.

6.1.3 Implications for relationship stability

Partners distancing themselves from one another, dissolving current IORs, establishing competing IORs, or not remaining loyal or committed to their IORs, indicates that the network lacks stability. Instability in IORs can reduce value creation (Lorenzoni & Lipparini, 1999), and Dhanaraj and Parkhe (2006) proposed that the competitive pressures in innovation contexts may worsen instability. A research interest thus exists to find what can cause and maintain stability (e.g., Kim et al., 2006; Koka et al., 2006). Despite the importance of relationship stability, this issue has not been examined extensively in prior research. Furthermore, the focus has more or less been on dyadic relationships or informal networks. Little is known about stability issues in formal, multipartner networks. This is remarkable because the stability issue in such IORs may be

particularly prominent, especially considering that firms maintain their identity and independence even if they are somehow attached.

This dissertation contributes insight into how stability can be infused into formal networks. First, it demonstrates that building formal networks through a bottom-up process with several firms participating in the network creates value. This is because the bottom-up formation strengthens the firms' commitment and time devoted to the network. This results in a group of firms that are highly motivated to work together for innovative purposes. A large group of participating firms makes it possible to run several parallel innovation projects, which together constitute a platform from which the member firms can gain access to various resources. Moreover, with more participating firms, more people will be dedicated to support the network with capabilities and external contacts that are valuable for innovation.

Second, this dissertation emphasizes the role and relevance of examining network boards. Formal networks commonly use an administrative function, typically a network board, to encourage, coordinate, and support joint activities and interests among the participating firms. Prior research has neglected these network boards when it comes to understanding relationship stability. This dissertation explains why a larger network board creates value; it will be better equipped to accomplish the task of serving the entire network. Moreover, it explains why compensating board members may be more important for creating value under certain circumstances: (1) when there is a high level of funding provided for projects in the network; (2) when only a small proportion of the board members represent member firms; and (3) when the network is formed because of an external initiative. Such conditions stimulate agency behaviour among board members.

This dissertation thus shows that design aspects, such as how the network is formed, configured, and governed, as well as compensating network board members affect network performance. An extension of these results suggests that the network design may impact the extent to which challenges with independent firms in formal networks are overcome and thus how well the network can perform.

This dissertation also provides insight into stability in IORs beyond firms in formal networks. It supports prior literature (e.g., Levinthal & Fichman, 1988) in

that the social dimension of the IOR may contribute to stability. It proposes, however, that rigidities caused by stability enhancing factors are, in fact, negative in some innovative contexts. Thus, even if the stability is undoubtedly important for creating value, the stability issue may be more complex in innovative contexts than in other IOR contexts.

Combined, the contribution of this dissertation to relationship stability is that it identifies mechanisms and factors that may influence both the stability in formal networks and the possible negative sides of stability. It highlights the relevance of acknowledging how the network is designed and details surrounding network boards to increase understanding of stability in formal networks. In general terms, this adds to the ongoing research dialogue on the relationship between flexibility and stability in IORs. While the research has proposed stability is beneficial, the literature has also suggested that flexibility is important for the success of IORs (e.g., Niederkofler, 1991). There is also a possible trade-off between stability and flexibility; whereas the literature has suggested that dependence enhances stability (Weiss & Kurland, 1997), it might simultaneously reduce flexibility (Young-Ybarra & Wiersema, 1999). The kind of flexibility discussed in this dialogue is typically strategic flexibility: the ability to modify the relationship and the ability to terminate the relationship when needed. This dissertation suggests that other dimensions of flexibility can contribute to enrich this dialogue. More specifically, the findings of this dissertation suggest that exchange flexibility, that is, how flexible the partners are in what they exchange and when they do this, may also be relevant. In other words, in discussing stability and flexibility it could be valuable to distinguish among different kinds of flexibility, because their associations with stability may differ.

6.2 Overall limitations

Like all research, this dissertation has some limitations, which open avenues for further research. The quantitative papers (Papers II-IV) examine a specific kind of formal network. The networks studied consist of multiple horizontal partners, focus on innovation, and include firms that remain independent entities. Other research will have to assess whether the theorizing holds for other types of networks (cf. Varamäki & Vesalainen, 2003). Moreover, the empirical data on these specific networks was collected from Swedish firms; researchers may wish to examine firms in other cultural contexts. Further, Papers IV and V focused on several industries, while Papers II and III relied on data from one industry (i.e.,

the wood industry). Thus, further research is encouraged to test networks in other empirical settings.

By focusing Part I of this dissertation on three specific challenges in IORs for innovation, there might consequently be latent contributions to other literatures that neither this introductory chapter nor the research papers have discussed. For example, it would have been possible to construct this introductory chapter around the literatures of innovation management or knowledge management. Innovation management literature focuses, however, mainly on generating new concepts for creating new business; by doing so, it emphasizes idea generation, technology development, and manufacturing (Cooper & Kleinschmidt, 1995; Pisano, 1997). The innovation literature also highlights specific types of innovation: product, process, organizational, management, production, marketing, service, etc. (Trott, 2008). The literature on knowledge management has focused on how knowledge can be created and shared for organizational learning. This literature emphasizes coordinating people, technology, and processes and how this coordination can create value (Dalkir, 2005; Nonaka & Takeuchi, 1995).

This dissertation has highlighted literature on IORs before any other literature, however, because it emphasizes challenges with exchange relationships. This is more in line with the specific questions the research papers raised, and which have a greater focus on exchanges among partners than on innovation or knowledge. It should, however, be acknowledged that the literatures of interorganizational relationships, innovation management, and knowledge management do not have clear-cut boundaries. They build upon one another. Nevertheless, the idea in Part I is to bring the relationships and exchanges into focus, not knowledge or innovation per se. This does imply, however, that the focus has been on mechanisms behind knowledge exchange and the consequences for innovation, not on the concepts of knowledge or innovation. Hence, knowledge and innovation are treated in a rather general manner. To complement this dissertation's findings, more focus on knowledge and innovation is warranted in future research addressing adjacent questions to those posed in this dissertation.

Each of the six research questions were addressed using either quantitative or qualitative methods. Although the methods used were considered the best fit for the posed research questions, a mixed methodology approach may have

increased the confidence in inferences drawn from findings. For example, Paper V examines the influence of compensating network board members on network performance. To address this question, a quantitative method was most suitable. Employing qualitative methods, however, such as collecting and interpreting rich data on board decisions and activities, may have benefited the study (cf. Brundin & Nordqvist, 2008). For example, by observing and interviewing board members, this dissertation could have potentially provided an even more comprehensive picture of network board members' motivation and actions on behalf of the network. Similarly, quantitative data may have added value to Paper I, which addressed how and why a firm could benefit from working with the same partners in multiple (different) innovative processes. Triangulation with quantitative data on the innovative processes may have enabled a more thorough critique and test of whether the benefits of long-term relationships were, in fact, beneficial for innovation.

6.3 Future directions

This dissertation opens intriguing questions for further research beyond those posed above. Figure 4 outlines some of the questions that would be interesting to investigate further. For example, regarding knowledge exchange it would be interesting to integrate the partner and relationship characteristics (e.g., partner fit, interorganizational trust) with structural concepts (e.g., network centrality, spanning structural holes) to understand their effects on innovation. Regarding relational risk, this dissertation has argued that interorganizational trust may be important for creating value in IORs for innovation. It would thus be worthwhile to investigate in detail how organizations in IORs build trust when social control is prominent. A multilevel perspective might be useful in such investigations. Turning to relationship stability, it would be interesting to further develop theory on how stability and rigidities are integrated in IORs, and outline how the consequences differ between IORs in innovative contexts and other IORs.

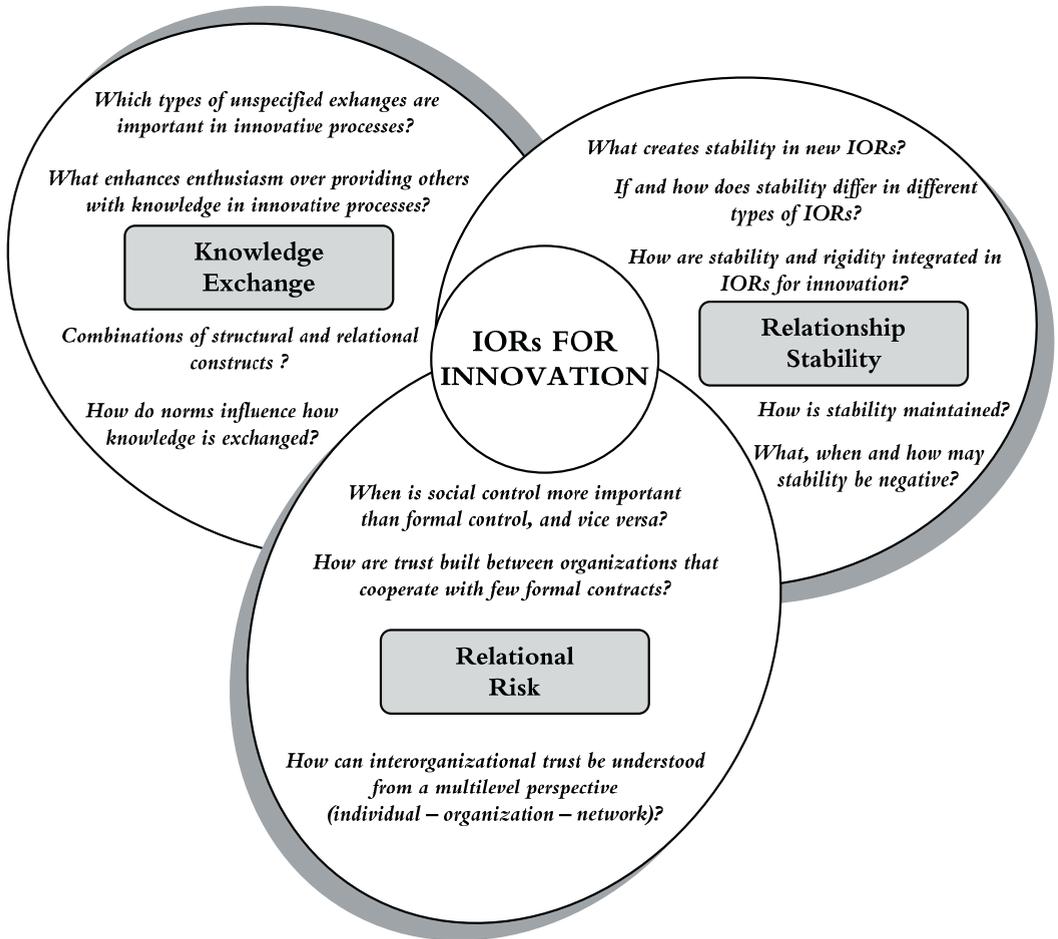


Figure 4. Examples of questions relevant for future research.

6.4 Practical recommendations

This dissertation suggests several practical implications that can be converted into recommendations. First, there are recommendations from a focal firm perspective for firms that already work with or are interested in working with IORs to strengthen their innovation. Second, there are recommendations from a whole network perspective aimed for those in a position or role to have an impact on the design of whole networks, especially strategic SME networks.

6.4.1 Recommendations from a focal firm perspective

- **Select partners that fit your firm's resources and management style.** In most IOR settings, firms can select the partners with which they want to be involved. This is among the most important decisions that determines whether the IOR will hold and perform well (see Sadowski & Duysters, 2008). Prior research has proven that partner fit (i.e., partners with different capabilities but similar organizational cultures, management, and operating styles) is important for alliance performance (Kale & Singh, 2009). This dissertation demonstrates that fit among partners also provides synergies for innovation among networking firms. Thus, firms should be careful when selecting partners. If there are several firms between which your firm may choose, it may be useful to select those whose capabilities are not too similar to those your firm already possesses, but still have a management style similar to yours.
- **Select experienced partners.** If your firm aims to strengthen corporate entrepreneurship through IORs, select partners that are already strong in terms of corporate entrepreneurship activities, even if your firm is not. This is in line with prior research showing that firms with experienced partners gain the most learning (e.g., Powell et al., 1996).
- **Be open to re-using "old" partners.** Innovation means combining new knowledge (Schumpeter, 1961), and there is a stream of research highlighting the importance of building a portfolio of diverse relationships and mixed network structure (Ahuja, 2000). Because of this emphasis, managers might think it is unwise to return to the same partners for several different innovative processes. In this dissertation there are indications, however, that when firms work with innovation in IORs they should be open to the benefits of returning to partners with which they have already worked in other innovative processes. This can

contribute to exchange efficiency and effectiveness valuable in innovative processes.

- **Evaluate the design of formal networks before deciding to participate.** As the literature discusses the importance of selecting the “right” partners, firms might forget other parameters that may be important if they are interested in joining a formal network. Any firm interested in joining a network that is already up and running should carefully consider participating if the network is small and without an administrative function. Such conditions are not generally the best for a network aiming to produce innovation for its members. Moreover, it is important to reflect upon the possible consequences if the network is formed in a top-down fashion. How will this likely impact the commitment and behavior within the network? Base any decision to join a formal network on evaluating the network design in terms of formation, configuration, and governance.
- **Make an effort to ease knowledge transfer.** Knowledge transfer is one of the keys for innovation from IORs. Just because an IOR is established, however, does not guarantee that knowledge will be transferred in the relationship. Thus, in IORs for innovation, it is important to create conditions such that knowledge transfers easily from one partner to another. By doing so, the firms create new knowledge combinations. Firms should consider how they could enable knowledge transfer between themselves and their partners. One possible starting point might be to use tools prompting partners to agree upon a communication infrastructure (Kale & Singh, 2009).
- **Develop the social dimension of your IORs.** A growing body of research emphasizes the relational quality as both an input and output in successful IORs (e.g., Ariño, Torre, & Ring, 2001). There are several advantages of a developed social dimension (e.g., trust and friendship) in an IOR. For example, this dissertation shows that the social dimension is one way to create conditions facilitating knowledge transfer. Firms should thus consider what kind of behavior will cause their partners to trust them, care for their firm development, and be willing to share their resources. Finding partners that fit your firm in terms of compatibility and complementarity may be one option.
- **Identify possible costs of developing the social dimension of your IORs.** Even if developing a social dimension of IORs evidently is important, recent research attempts have shown that it may not be purely

beneficial (e.g., Gargiulo & Ertug, 2006; Zahra et al., 2006). This dissertation shows that the negative and positive effects of developing trust among partners may be integrated. That is, as the positive effects increase, so too do the negative effects. There is a risk that the negative effects may be masked because of their parallel positive effects. Thus, be sensitive to signals conveying that your firm misses opportunities because of diminishing flexibility related to a highly developed social dimension in current IORs.

- **Regulate positive and negative trust effects separately.** If a firm detects signals that they will lose some of their flexibility to act upon opportunities because the social dimension of the IOR is developing, there is not necessarily a need to reduce interorganizational trust to what is typically termed “an optimal level” of trust (Wicks et al., 1999). This is because the negative effects of high trust (higher trust than considered optimal) can be regulated separately from the positive effects. If your firm tries to act upon a win-win motto when participating in the IOR, this will create the greatest advantage for positive effects compared to negative effects from trust among partners.
- **Think beyond the obvious to gain innovation from the IOR.** There may be several alternative processes through which your firm can gain innovation from IORs (cf. Barringer & Harrison, 2000). This dissertation highlights that resources may be leveraged through processes of both accumulation and combination. Be aware that even if you and your partners have decided you will work with one another in a specified way, there may still be room for other ways in which your firm can gain from the relationship. Be creative and find those alternative processes and logics.
- **Benefit from your long-term partners’ partners.** Research of network structure has recognized the benefits for innovation of spanning several relationships (cf. Burt, 1992). To detect alternative paths to becoming innovative through IORs, firms should be alert to the partners that one’s partners has. Do they possess any resources to which the firm can gain access and from which they can benefit by its long-term IOR? Identify your partners’ partners and evaluate whether your firm could benefit from such joint associations.

6.4.2 Recommendations from a whole network perspective

- **Raise awareness of strategic networks.** Even if many formal networks have employed individuals (often called network brokers) who are publicly funded and trained to market and negotiate network arrangements (Hanna & Walsh, 2002), many firms may still be unaware that strategic networks exist and hold opportunities. Policy makers should promote work in formal strategic networks so that firms in the same region and industry perceive the benefits of reciprocal business interactions. As a next step, they should stimulate the firms to be active in forming a strategic network in which they can work together with shared objectives.
- **Encourage active member firms.** Some prior research has included normative suggestions for how policy makers should form and evolve formal networks (e.g., Major & Cordey-Hayes, 2000), whereas others have emphasized the role of active member firms in the formation phase (e.g., Biggiero, 2001). This dissertation demonstrates that in formal networks, it is a good idea to let the member firms be active in initiating and setting the network's agenda. This will facilitate the progress in the network.
- **Create large and growing network boards.** Literature has suggested that a central node is important for effectiveness in networks (e.g., Zeleny, 2001). This dissertation shows that it is good to let such a central node of formal strategic networks, typically a network board, be large from start and expand over time. This will provide resources and conditions that contribute to achieving shared network objectives.
- **See network board members as more than pure agents.** Members of network boards (representing network firms, industry experts, or public agencies) should encourage and coordinate joint network activities with the entire network's interests in mind (Provan et al., 2007). The question, however, is how to motivate them to take such actions. This dissertation indicates that network board members may have features of both agents and stewards. This has implications for how board members should be treated. Compensation, which is associated with motivating agents, may not be the only means.
- **Adapt network board compensation to the situation.** Formal networks are not designed equally. Some of the major differences, constituting contingencies, are exemplified by board size; member firms

represented on the board; to what extent the network is funded; and how the network was initially formed. Compensating network board members may be more relevant when contingencies strengthen agency conditions; when large amounts of money are injected into the network; when the network is formed through a top-down process; and when there are few member firms represented on the network board. Thus, if there are limited opportunities to compensate network board members, it is still possible to create conditions that make compensation less relevant.

6.5 Conclusion

The overall aim of this dissertation was to increase understanding of value creation in IORs for innovation. Both research and practice will benefit from understanding the conditions under which IORs for innovation are managed effectively as well as the forces that may contribute to such effectiveness. Findings point to the importance of considering influences identified with a focal firm perspective and a whole network perspective. From a focal firm perspective, this dissertation suggests that creating value is influenced by the selection of partners and how the IOR is maintained and develops (particularly the social dimension of the relationship). From a whole network perspective, findings suggest that value creation is also influenced by how the whole network is designed and how network actors are motivated to create value for the whole network, not only to a few selected network firms. As the dissertation joins the research dialogue on IORs for innovation, there is a hope that the findings add new insights and specification to what is known about the subject and that other researchers will draw upon this work for further research. Future research is encouraged to look into the issues of knowledge exchange (e.g., focusing more specifically on different kinds of knowledge); relational risk (e.g., detailed studies on how trust is built in IORs for innovation); and relationship stability (e.g., comparisons of stability issues in IORs in general and in IORs for innovation). Thus, this dissertation has contributed to our knowledge of prominent issues in IORs for innovation, but there are still several interesting questions to be answered in this promising research area.

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END NOTE

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PART II

– RESEARCH PAPERS

Because of copyright issues the six research papers are not included in the electronic version of this dissertation. The published papers can be retrieved online. For a copy of the unpublished papers, please contact the author (sara.thorgren@ltu.se).

Published papers

Paper I: Thorgren, S. (2007). A glimpse of benefits of long-term relationships for innovation. *International Journal of Globalisation and Small Business*, 2(1): 34-46.
DOI: 10.1504/IJGSB.2007.014186

Paper II: Thorgren, S., Wincent, J. & Örtqvist, D. (2009). A cause-effect study of inter-firm networking and corporate entrepreneurship: Initial evidence of self-enforcing spirals. *Journal of Developmental Entrepreneurship*, 14(4): 1-18.
DOI: 10.1142/S1084946709001363

Paper IV: Thorgren, S., Wincent, J. & Örtqvist, D. (2009). Designing interorganizational networks for innovation: An empirical examination of network configuration, formation and governance. *Journal of Engineering and Technology Management*, 26(3): 148-166.
DOI: 10.1016/j.jengtecman.2009.06.006

Paper V: Thorgren, S., Wincent, J., & Anokhin, S. (2010). The importance of compensating strategic network board members for network performance: A contingency approach. *British Journal of Management*, 21(1): 131-151.
DOI: 10.1111/j.1467-8551.2009.00674.x

Unpublished papers

Paper III: Thorgren, S., Wincent, J. & Örtqvist, D. Unleashing synergies in strategic networks of SMEs: The influence of partner fit on corporate entrepreneurship. Accepted for publication in *International Small Business Journal*.

Paper VI: Thorgren, S., Wincent, J. Interorganizational trust: Origins and regulation of rigidities. Under review with an academic journal.

