Collaboration within and between firms: Network structures, decision processes, and their impact on alliance performance

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St. Gallen, January 20, 2005

The President

Prof. Dr. Peter Gomez
For my parents –

my first and best teachers
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List of Abbreviations

- cf. compare (Latin: confer)
- ed. editor
- eds. editors
- e.g. for example; for instance (Latin: exempli gratia)
- et al. and others (Latin: et alii/alii)
- i.e. that is to say; in other words (Latin: id est)
Abstract and Key Words

Abstract

This dissertation is built on the foundation of information processing theory, which argues that a fit between information processing requirements facing an organization and its information processing capacity determines organizational performance (cf., Galbraith, 1973; Inkpen, 1998; Tushman & Nadler, 1978). Although structure is one device to facilitate the handling of information about the environment and to align the firm accordingly, the strategic decision-making process is another (Miller & Friesen, 1983). The former mode of reconciling a firm with its environment is addressed in the first part of my dissertation with the examination of network configurations (i.e., structure), whereas the latter mode is discussed with respect to alliance-related decision making (i.e., process).

Accordingly, the purpose of my dissertation is twofold. First, I extend and combine previous research on social capital and embeddedness by simultaneously considering the relationships of external and internal networks. These two types of relationships have so far been examined only in isolation. On the basis of previous research, I connect the two network types to reach an in-depth understanding of the whole process through which network structures translate into the acquisition and distribution of information and knowledge. In particular, I examine the influence of three dimensions of embeddedness on organizational learning, namely tie strength, density, and centrality, and I discuss their implications for the degree of information acquisition and knowledge distribution that a focal organization achieves. This focus will help to explain these processes as complex interrelationships that complement one another (Hansen, 1999). I show that on their own neither beneficial linkages to and among a firm’s alliance partners nor beneficial linkages of the corporate subunit engaged in the alliance with other subunits are sufficient for a focal organization to benefit from its alliance network. It is a combination of adequately structured inter- and intrafirm networks that enables a company to reap the full learning benefits provided by its alliance network.
Second, the management of strategic alliances is a significant challenge for organizations and at the same time an under-investigated phenomenon in research (Barringer & Harrison, 2000; Ireland, Hitt, & Vaidyanath, 2002). Understanding how alliances are successfully managed over time, however, requires a systematic study of the dynamic aspects of such collaborative agreements, i.e., alliance process research. To fill this gap, I empirically examine the strategic decision-making processes both within and between European high-technology firms with respect to their strategic alliances as a subgroup of alliance management. I relate these processes to the performance of a firm’s strategic collaborations. My empirical findings from 103 European high-tech firms engaged in strategic alliances confirm the necessity for a simultaneous consideration of strategy processes within and between firms. In particular, I found several significant and inverse interactions between the inter- and intrafirm decision-making characteristics rationality, speed, flexibility, politicality, and conflict, which suggest that at these two levels, certain decision-making processes have to be structured in a different and complementary way to facilitate organizational learning. My results thus confirm that only a combination of adequately structured inter- and intrafirm decision-making processes enables an organization to reap the full benefits of its strategic alliances. On the basis of these findings, I can provide alliance managers with normative guidelines for structuring their alliance-related decision processes both within their firm and with their alliance partner(s), and thus enable them to make full use of the potential of their cooperative agreements.

**Key Words**

Strategic alliances; alliance networks; intrafirm networks; organizational learning; strategy process; strategic decision making; alliance performance.
Acknowledgements

Something else an academic education will do for you. If you go along with it any considerable distance, it’ll begin to give you an idea what size mind you have. What it’ll fit and, maybe, what it won’t. After a while, you’ll have an idea what kind of thoughts your particular size mind should be wearing. For one thing, it may save you an extraordinary amount of time trying on ideas that don’t suit you, aren’t becoming to you. You’ll begin to know your true measurements and dress your mind accordingly.

J. D. Salinger, Catcher in the Rye

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JORGE WALTER   New York, February 2005
1 Introduction

Large-scale downsizing, vertical disaggregation and outsourcing, and elimination of layers of management have gutted the mighty multidivisional organizations of the 20th century. Replacing them are leaner, more flexible firms focused on a core technology and process, laced in a network of strategic alliances and partnerships with suppliers, distributors, and competitors. The magnitude of the socio-economic change that network organization portends may be as great as the Industrial Revolution.

Ravi S. Achrol (1997: 56-57, 61)

Not that long ago, the notion that firms can improve their performance by cooperating with competitors would have been viewed as a contradiction in terms (Rowley, Behrens, & Krackhardt, 2000). However, in fields where the expansion, complexity\(^1\), and intersectoral nature of knowledge increase rapidly, knowledge becomes increasingly dispersed, and it becomes more and more difficult for a single organization to capitalize on all the available knowledge (George, Zahra, Wheatley, & Khan, 2001; Hagedoorn, 1993; Lane, Koka, & Pathak, 2001). As a result, different organizations specialize in particular aspects of their field (Powell, Koput, & Smith-Doerr, 1996), and in view of increasingly complex and multidisciplinary corporate research activities even the largest organizations require information from beyond their boundaries (Veugelers, 1997). In other words, the locus of production lies no longer within the boundaries of a single firm, but instead at the nexus of relationships between a variety of parties that contribute to the production function (Schilling & Steensma, 2001). Even the boundaries between industries are blurring as the capabilities of information processing and data transmission technologies link together formerly disparate products (Harrigan, 1988).

There is a variety of empirical studies that confirm this tendency. Cohen and Levinthal (1994; 1990), for instance, find that outside sources of knowledge are often critical to the innovative performance of firms. Bierly and Chakrabarti (1996) emphasize that external learning is required for the firm to develop a broader

---

\(^1\) Complexity can be conceptualized as the number of elements and their interconnectedness (Rajagopalan, Rasheed, & Datta, 1993).
knowledge base and to keep abreast of cutting-edge technologies. Lastly, exploration beyond organizational boundaries is associated with higher impact on subsequent technological evolution (Rosenkopf & Nerkar, 2001).

As a result, the ability of a firm to make use of knowledge from its external environment plays a central role in competitiveness alongside innovation and the creation of proprietary firm knowledge (Matusik, 2000). Various scholars have therefore recognized that interorganizational learning is critical to competitive success, noting that organizations learn by collaborating with other firms as well as by observing and importing their practices (e.g., Inkpen, 1998; Lubatkin, Florin, & Lane, 2001; March & Simon, 1958; Powell et al., 1996; Veugelers, 1997). Darr, Argote and Epple’s (1995) study, for example, provides strong empirical evidence for the significance of interorganizational relationships to facilitate interorganizational learning. It has also been demonstrated empirically that the number of collaborative relationships a firm is engaged in is positively related to its innovation output (Shan, Walker, & Kogut, 1994). In conclusion, interorganizational learning seems to combine the best of both worlds: The benefit of accumulating knowledge without the cost of accumulating experience (Ingram, 2002).

Interfirm cooperation is not a new phenomenon. New, however, is its relative significance as an organizational form. The success of firms involved in such collaborative endeavors is increasingly being judged by each partner’s ability to generate innovation-led growth, by the range, depth, and closeness of the interaction between themselves and their cooperation partners, and by the effect that such collaborations are having on overall industrial performance (Dunning, 1995).

This in turn necessitates the development of mechanisms such as research partnerships to increase an individual firm’s capacity to absorb externally generated knowledge (Goes & Park, 1997; Hurry, Miller, & Bowman, 1992; Powell et al., 1996; Steensma & Corley, 2000; Veugelers, 1997). Strategic alliances have emerged as interorganizational designs that enable firms to cope with the increasing complexity of learning and of building new sources of competitive advantage in order to compete successfully in the global economy (Lei, Slocum, & Pitts, 1997). Parkhe (1993: 794) defined a strategic alliance as a “relatively enduring interfirm co-operative agreement, involving flows and linkages that use resources and/or governance structures from
autonomous organizations, for the joint accomplishment of individual goals linked to the corporate mission of each sponsoring firm”. In other words, strategic alliances are collaborative agreements between two or more firms that involve the exchange and sharing of multiple resources for co-development of technologies or products (Lofstrom, 2000). They can provide opportunities for firms to assimilate information, internalize skills, and develop new capabilities (Inkpen & Dinur, 1998). An alliance is strategic when it is the means by which a firm seeks to implement, in part or in whole, elements of management’s strategic intent (Hamel & Prahalad, 1989).

While there is recent empirical evidence that multinational companies outperform alliances in successful cross-border knowledge building (Almeida, Song, & Grant, 2002), the formation rate of interfirm collaborations has increased dramatically in recent years (Dyer, Kale, & Singh, 2001; Gulati, 1995; Simonin, 1997). For instance, the number of strategic alliances exploded to more than 10,200 in the year 2000 alone (Schifrin, 2001). It is estimated that US firms with revenues of two billion US dollars or more each formed an average of 138 alliances between 1996 and 1999 (Schifrin, 2001). Currently, the top 500 global business companies average 60 major strategic alliances each (Dyer et al., 2001). Shifrin’s (2001) study also found that 80 percent of the top-level executives surveyed consider strategic alliances to be primary growth vehicles and expect alliances to account for 25 percent of their company’s market value in 2005. As a result of this proliferation, most companies are now placed within a framework of interorganizational relationships that are crucial to their success and survival (Gulati, 1995). And more cooperative agreements will undoubtedly be launched, given the increasingly rapid rate of technological change, deregulation, and globalization (Harrigan, 1988).

As Powell (1998) observed, with increasing uncertainty organizations interact more, and not less, with external parties in order to access both knowledge and other resources. Accordingly, industries characterized by dynamic changes will witness a greater incidence of collaboration than industries with relatively stable environments.

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2 However, Almeida et al. (2002) also found that alliances, while inferior to firms, outperform the market in their knowledge-building ability.

3 Uncertainty is defined as the difference between the information needed to perform a task and the information available (Galbraith, 1973). It is therefore complicated to identify, measure, or predict critical variables, and cause-effect relationships are difficult to understand (Priem, Rasheed, & Kotulic, 1995).
(Koza & Lewin, 1998). Hagedoorn and Duysters (2002) found that in high-tech sectors, companies prefer strategic partnerships to mergers and acquisitions for the integration of external sources of innovation, whereas they found the reverse for low-tech sectors.

In contrast to the increasing popularity of alliances as a potentially value-creating option, however, several empirical studies find failure rates of alliances to lie between 50 and 80 percent (e.g., Bleeke & Ernst, 1991; Geringer & Hebert, 1991; Harrigan, 1988; Kogut, 1988, 1989; Park & Ungson, 1997; Spekman, Forbes III, Isabella, & MacAvoy, 1998; Yan & Zeng, 1999). These studies indicate that despite their important advantages, collaborative agreements may incur substantial coordination costs, risks of proprietary knowledge leakage, disproportional appropriation of rents, and free-rider problems (Balakrishnan & Koza, 1993; Hamel, 1991; Koh & Venkatraman, 1991).

This brief discussion of strategic alliance research and practice demonstrates that strategic alliances constitute perhaps the most adequate, but nevertheless challenging vehicle for internalizing other firms’ competencies (Simonin, 1999). By bringing together different firms with unique skills and capabilities, alliances can create powerful learning opportunities (Inkpen, 1998). Whereas it is individuals that create knowledge, organizations can design a context for individuals to create and amplify knowledge (Nonaka & Takeuchi, 1995). Without an adequate understanding of the learning processes taking place in alliances, however, many of these opportunities remain unexplored.

My dissertation responds to this gap in previous research by examining the joint impact of intra- and interfirm network structures and decision-making processes on organizational learning from alliances and on alliance performance. Organizational learning as a sublevel construct of alliance performance is defined here as consisting of two distinct processes (Huber, 1991). Acquisition refers to the process by which information is obtained, and distribution to the process by which knowledge from different sources is shared, i.e., used synergistically, and thereby leads to new information, understanding, or knowledge.4 Alliance performance is conceptualized as

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4 The term information is defined here as “data that give meaning by reducing ambiguity, equivocality, or uncertainty, or when referring to data which indicates that conditions are not as presupposed”, whereas
managerial assessments in terms of managers’ overall satisfaction with the alliance, or in terms of the extent to which an alliance has met its stated objectives (Mohr & Spekman, 1994; Parkhe, 1993; Saxton, 1997).

1.1 Information Processing Theory

This dissertation is built on the foundation of information processing theory, which argues that a fit between information processing requirements facing an organization and its information processing capacity determines organizational performance (Galbraith, 1973; Tushman & Nadler, 1978). Building on the open systems view of requisite variety, a key prediction of this perspective is that in highly turbulent environments characterized by complex information processing requirements, a firm needs organizational designs that allow for more real-time and faster information search, acquisition, and interpretation than in less turbulent environments (e.g., Eisenhardt, 1989; Tushman & Nadler, 1978). While strategic alliances can be a means to manage such environmental uncertainty, there is also considerable uncertainty associated with entering those cooperative agreements (Gulati & Gargiulo, 1999). Therefore I examine organizational and interorganizational designs that enable a firm to align itself successfully with its environment via collaborative agreements. Although structure is one device to facilitate the handling of information about the environment and to align the firm accordingly, the strategic decision-making process is another (Miller & Friesen, 1983). The former mode of reconciling a firm with its environment will be addressed in the first part of my dissertation with the examination of network configurations (i.e., structure), whereas the latter mode is discussed with respect to alliance-related decision making (i.e., process).
1.2 Multilevel Theorizing

By their very nature, strategic cooperations are a multilevel phenomenon. In the context of strategic alliances, individuals and/or groups within one organization interact with individuals and/or groups within another organization. Moreover, learning from the alliance partner as the predominant rationale for strategic cooperation happens at the individual, group (Argote & Ophir, 2002; Miller & Friesen, 1983), organizational (Huber, 1991; Schulz, 2002), and interorganizational level (Ingram, 2002).

According to Klein, Tosi, & Canella (1999: 243), multilevel theories “span the level of organizational behavior and performance, typically describing some combination of individuals, dyads, teams, businesses, corporations, and industries”. A multilevel approach clearly contributes to research on strategic alliances. Given the complex interpersonal, intergroup, and interfirm dynamics typically found in strategic cooperations, it is likely that more precise research findings will come to light when a multilevel approach is applied to this research area. Additionally, research in other areas such as trust (Currall & Inkpen, 2002; Zaheer, McEvily, & Perrone, 1998), creativity (Drazin, 1999), innovation (Drazin & Schoonhoven, 1996), and revolutionary change (Gersick, 1991) has demonstrated that there are important organizational phenomena that cannot be examined fruitfully without crossing levels of analysis.

My fundamental assumption guiding this dissertation is that it is important to recognize that a particular firm’s structures, processes, and outcomes associated with strategic alliances are defined and shaped by the structures and processes of its context (e.g., its alliance partner(s)). I therefore apply a multilevel perspective when examining the impact of alliance networks (structures) and decision-making characteristics (processes) on the performance of a firm’s strategic alliances. Concerning the former, the analysis of network structure has been recognized to be an inherently multilevel approach. As Tichy (1981) pointed out, “network data can be organized and analyzed to capture significant organizational processes at different levels of analysis”. Concerning the latter, interdependencies between alliance partners’
decision-making processes necessitate the examination of these processes at both firm-
level and alliance-level to achieve an in-depth understanding of their influence on
alliance performance.

1.3 Purpose of this Dissertation

In contrast to the majority of related research, I follow what has been deemed a
shift of focus in the study of strategic alliances from understanding alliance formation
to an appreciation of the problems inherent in alliance management (see Table 1).

1.3.1 Network Structures

The purpose of my dissertation is accordingly twofold. First, I extend and
combine previous research on social capital and embeddedness by simultaneously
considering the relationships of external and internal networks. These two types of
relationships have been examined only in isolation, with one line of research focusing
on external linkages (e.g., Gulati, 1998; Rowley et al., 2000) and the other focusing on
internal linkages (e.g., Hansen, 1999, 2002; Sparrowe, Liden, Wayne, & Kraimer,
2001; Tsai, 2000).5

Krackhardt and Brass (1994) reviewed the literature on intraorganizational
networks, none of which spanned the boundary between micro and macro levels of
analysis. Wassermann and Faust (1995) argued that in social network analysis, it is the
relationships among entities, rather than the entities themselves, that serve as the unit
of analysis, and that those entities can be individuals, units within an organization, or
even nation states. Intra- and interorganizational networks can thus be understood
within a single conceptual framework (Gittell & Weiss, 2004). On the basis of
previous research, I connect the two networks to reach an in-depth understanding of

5 Although both inter- and intraorganizational coordination are addressed in the organization literature,
they are typically addressed using distinct analytical frameworks. The phenomena of intra- and
interorganizational coordination are themselves more dynamic and interrelated than the approaches used to
address them (cf., Gittell & Weiss, 2004).
the whole process through which network structures translate into the acquisition and
distribution of information and knowledge.

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<td>What is the interplay between the business of the alliance and the relationship among the partners?</td>
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<td>Why do alliances succeed/fail?</td>
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Table 1: A shift of focus in the study of strategic alliances
Source: Adapted from Spekman et al. (1998: 748)

In particular, I examine three dimensions of embeddedness and their impact on
organizational learning, namely tie strength, density, and centrality, and I discuss their
implications for the degree of information acquisition and knowledge distribution that
a focal organization achieves. This focus will help to explain these processes as
complex interrelationships that complement one another (Hansen, 1999). I show that
on their own neither beneficial linkages to and among a firm’s alliance partners nor
beneficial linkages of the corporate subunit engaged in the alliance with other subunits
are sufficient for a focal organization to benefit from its alliance network. It is a
combination of adequately structured inter- and intrafirm networks that enables a
company to reap the full learning benefits of its alliance network. Since some
combinations are detrimental and others only partially advantageous, my argument is
pertinent to the search for optimal network combinations.

1.3.2 Decision-Making Processes

The formation of a strategic alliance cannot in itself ensure that its potential will
be realized. In addition to proactively structuring their external and internal networks,
managers must take explicit steps to capitalize on the alliance knowledge potential (Hamel, Doz, & Prahalad, 1989; Inkpen, 1998). Understanding how alliances are successfully managed requires a systematic study of alliance management processes. The second study therefore follows the tradition of strategy process research, which primarily focuses on asking the questions whether and how strategies are formed over time and the nature of their impact on firm performance (Lechner & Müller-Stewens, 2000).

To gain an in-depth insight into the ramifications of these management processes, I empirically examine the strategic decision-making processes of 103 European high-tech firms engaged in strategic alliances and their impact on the performance of these collaborative agreements. In particular, I investigate decision-making rationality, speed, flexibility, politicality, and conflict both within and between alliance partners as well as interactions between intra- and interfirm decision processes. My statistically powerful and partially counter-intuitive findings lead to explicit suggestions for improved managerial decision-making processes in the context of interfirm cooperations, and may help to reduce the high number of alliance failures.

1.4 Research Strategy and Method

It is a capital mistake to theorize before one has data. Insensibly, one begins to twist facts to suit theories instead of theories to fit facts.

Sir Arthur Conan Doyle, Sherlock Holmes

Although the current research project is following a deductive approach, and therefore the negative implications of the above quote are highly relevant, the researcher also faces another pitfall. The opposite problem is that the craft of manuscript writing is in danger of becoming an art of fitting concepts and arguments around what has been measured and discovered (Sutton & Staw, 1995). In order to avoid both pitfalls, this research project is broadly structured in two steps. First, the propositions and hypotheses presented below will be thoroughly grounded in theory and consistently combined in the presented theoretical models. Second, in order to
ensure that the research process is fully transparent, the methodology section gives a
detailed description of the chosen research strategy and method, the selection of the
sample, the data collection procedure, and the measures which have been deployed to
test the derived hypotheses.

1.4.1 Theory Building

A variety of research strategies and methods are used in the strategic
management area. These include experiments, surveys, archival analysis, case studies,
cartographic methods, ethnography, and action research. A further prevalent
distinction is made between qualitative and quantitative methods. Whereas quantitative
methods provide greater objectivity and reliability, they often ignore many important,
more complex organizational realities. As a result, much of the collected data lack the
richness and texture needed to build new theory or to interpret test results thoroughly
(Snow & Thomas, 1994). Nevertheless this research project follows a quantitative
approach, which is described in detail below, and eventually tests the developed
hypotheses with the aid of an on-line questionnaire and statistical methods, e.g.,
multiple linear regression analyses. Before going into the quantitative approach in
detail, some general aspects of theory building and testing are discussed.

Theory is defined as “an ordered set of assertions about a generic behavior or
structure assumed to hold throughout a significantly broad range of specific instances”
(Sutherland, 1975: 9). Theory construction is therefore defined as the concurrent
development of concepts, propositions that state a relationship between at least two
properties, and contingent propositions whose truth or falsity can be determined by
experience (Homans, 1964). Whereas data describe which empirical patterns were
observed, theory explains why empirical patterns are expected to be observed (Kaplan,
1964). Several academics have addressed the question of what constitutes good theory
(e.g., DiMaggio, 1995; Wacker, 1998; Whetten, 1989), and for this reason I will not go
into a detailed discussion about that here.

In general, theory can usually be developed through induction or deduction (e.g.,
Black, 1999). Induction is a process through which observations are made (possibly
causally at first), data are collected, general patterns are recognized, and relationships
are proposed. In contrast, *deduction* assumes that one can explain, or deduce an explanation, by inferring a specific situation from a more general one.

However, Weick (1989) criticizes these and other previous definitions as mechanistic, and proposes theory building as “disciplined imagination”, where “the “discipline” in theorizing comes from consistent application of selection criteria to trial-and-error thinking and the “imagination” in theorizing comes from deliberate diversity introduced into the problem statements, thought trials, and selection criteria that comprise that thinking” (Weick, 1989: 516). In any case the researcher has to ensure *verification* or *validation* of theory, defined as the “demonstration, beyond pure chance, that the ordered relationship predicted by a hypothesis exists and thereby lends support to the hypothesis” (Weick, 1989: 517).

<table>
<thead>
<tr>
<th>Purpose of this step</th>
<th>Common question</th>
<th>‘Good’ theory virtues emphasized</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definitions of variables</strong></td>
<td>Defines who and what are included and what is specifically excluded in the definition.</td>
<td>Who? What?</td>
</tr>
<tr>
<td><strong>Limiting the domain</strong></td>
<td>Observes and limits the conditions by when (antecedent event) and where the subsequent events are expected to occur.</td>
<td>When? Where?</td>
</tr>
<tr>
<td><strong>Relationship (model) building</strong></td>
<td>Logically assembles the reasoning for each relationship for internal consistency.</td>
<td>Why? How?</td>
</tr>
<tr>
<td><strong>Theory predictions and empirical support</strong></td>
<td>Gives specific predictions. Important for setting conditions where a theory predicts. Tests model criteria to give empirical verification for the theory. The riskiness of the test is an important consideration.</td>
<td>Could the event occur? Should the event occur? Would the event occur?</td>
</tr>
</tbody>
</table>

Table 2: A general procedure for theory building and the empirical support for theory


The theoretical part of this dissertation attempts to establish how and why the key variables are related (Whetten, 1989) and therefore focuses on explanation (cf., Table 2). Based on Snow and Thomas’s (1994) suggestions, the goals of the researcher at this stage are (1) to explore the nature and degree of association among major variables, (2) to decide if additional variables are needed to provide a more accurate description of the phenomenon, and (3) to offer theoretical explanations of observed
relationships, i.e., the underlying psychological, economic, and social assumptions. Additionally, the researcher must address the issue of causality among the discussed variables. During the theory development process, logic replaces data as the basis for evaluation (Whetten, 1989).

1.4.2 Theory Testing

After the theory has been assembled, it can be tested (cf., Figure 1, which also includes backtracking, reconsiderations, and modifications). As this explanatory dissertation will be well-grounded in theory, the associations between specific variables have already been proposed. However, there may be inadequate or conflicting arguments about the direction of the relationship or generalizability of the association across different settings. Thus a crucial requirement of this explanatory dissertation is a large sample size, coupled with hypothesis testing (Snow & Thomas, 1994).

Figure 1: Stages of designing and carrying out a study
Source: Adapted from Black (1999: 27)
1.5 Overview of the Dissertation

The dissertation presented here is broadly divided into five chapters (cf., Figure 2). These introductory comments (Chapter 1) are followed by a review of theoretical building blocks (Chapter 2), designed to provide the reader with an overview of the theoretical perspectives that underlie this dissertation. In Chapter 3, key concepts from the area of alliance, social capital, and social network research are combined and a theoretical model as well as a set of testable propositions are developed; these relate configurations of structural and relational network dimensions within and between firms to a firm’s ability to learn from its strategic cooperations. In Chapter 4, the focus of analysis shifts from structures to processes. In this chapter, I present an empirical investigation of strategic decision-making processes within and between alliance partners and examine their impact on the performance of these collaborative ventures. Implications for researchers and practitioners as well as limitations and questions for future research are also discussed in this chapter. In the concluding section, the conceptual umbrella that encompasses the two studies in this dissertation is outlined and the major conclusions from these studies are summarized (Chapter 5).
Figure 2: Structure of this dissertation
2 Theoretical Building Blocks

A central question in any theory construction is why one would expect a relationship between the various factors under consideration. In other words, what is the underlying logic of the propositions (Whetten, 1989)? Theory development requires more than just specifying the relationship between concepts A and B. Every theory is based on several underlying assumptions, which, at best, are explicitly stated or, at worse, only implicitly alluded to. Hence, in this section, I will explicitly outline the assumptions on which my propositions are based, in order to provide a theoretical foundation for developing those relationships.

2.1 Theoretical Perspectives on Strategic Alliances

Strategic alliances have been studied in a wide variety of literature streams, each of which has emphasized different effects (Gittell & Weiss, 2004; Powell et al., 1996). Given the vast number of studies, however, this section will only briefly review those aspects of the different theoretical perspectives that have direct relevance for this dissertation. For a more detailed overview of these theoretical paradigms, see e.g., Barringer and Harrison (2000), Gray and Wood (1991), and Smith, Carroll, and Ashford (1995).

2.1.1 Transaction Cost Theory

Put simply, the transaction cost argument claims that organizations choose their mode of transacting on the basis of how they can best minimize the sum of production and transaction costs (Williamson, 1975, 1985, 1991; 1993). Given uncertainties over appropriability and valuation, market contracts are typically inefficient means of transferring knowledge (Grant, 1996). Researchers in this area have argued that organizations respond to uncertainty by removing transactions from the market and placing them in a more hierarchical context (Podolny, 1994). In general, studies inspired by transaction cost theory concentrate on vertical, customer-supplier relations.
The logic of this perspective, however, can also be applied to horizontal strategic cooperations between companies.

Following this argumentation, strategic alliances are founded to compensate for market failure in valuing and structuring transactions (Hennart, 1988; Kogut, 1988; Mitchell & Singh, 1996). As an intermediate form of governance, strategic alliances use transactional reciprocity to mitigate the defects leading to market failures and help organizations overcome transaction problems by internalizing information exchange into some form of governance structure (Williamson, 1991). Strategic alliances overcome risks arising from opportunism, discourage the pursuit of subgoals through superior monitoring mechanisms, and create mutual incentives to reveal information and share technology (Kogut, 1988). Strategic alliances can also circumvent many of the administrative costs of hierarchical forms, while maintaining market efficiencies that flow from scale and scope economies and operational flexibility (Jarillo, 1988).

However, strategic alliances also exhibit transaction costs such as those concerned with negotiating and writing contingent contracts, monitoring partner performance relative to the contract, and dealing with any breaches of contractual commitments (Gulati, 1998). This is especially true for learning alliances that involve idiosyncratic, causally ambiguous, tacit, non-codified and/or complex knowledge (Dunning, 1995; Hennart, 1988; Inkpen & Dinur, 1998). Learning alliances are likely to have higher transaction costs than those that do not involve joint R&D, as the parties involved are not likely to be able to place an accurate assessment on the value of the knowledge being exchanged (Gulati, 1995), and because agency theory posits that there are concerns about opportunism resulting from poor monitoring possibilities in such exchanges exist (Balakrishnan & Koza, 1993). And in addition to the uncertainty concerns, parties experience “relational risk” about whether the desired cooperation is actually taking place (Das & Teng, 1998).

In spite of its intuitive appeal, many scholars have been critical of transaction cost economics and its ability to explain the formation and management of interorganizational relationships (Barringer & Harrison, 2000). Whereas transaction cost theory is restricted to the efficiency and cost-minimizing rationales, alliances may be formed for other reasons, such as learning and legitimacy. Hence there is a variety
of alliance-related phenomena that goes beyond the rationale of transaction cost theory.

### 2.1.2 Resource Dependency Theory

The resource dependency model (Aldrich, 1979; Blau, 1962; Child, 1972; Emerson, 1962; Pfeffer & Nowak, 1976; Pfeffer & Salancik, 1978) has been used as another rationale for the formation of strategic alliances. The basic principle of this paradigm is that organizations operate in turbulent and uncertain environments, over which they attempt to gain control. This perspective suggests that organizations are dependent on their task environment for inputs that are essential for the realization of their goals and objectives. As these resources tend to be scarce and are often controlled by other organizations, the resource dependency model focuses on interorganizational efforts to gain power and control over essential resources while minimizing threats to organizational autonomy (Cummings, 1984). Similar to transaction cost economics, resource dependence theorists assert that organizations manage transaction-related uncertainty by transforming exchange relations into power relations and thus implicitly removing them from the market context (Podolny, 1994). This perspective therefore suggests that firms will create ties with those organizations with whom they share the greatest interdependence (Pfeffer & Nowak, 1976). One common reason for the formation of interorganizational relationships that fits the resource dependence paradigm is, for example, that firms enter into partnerships to take advantage of complementary assets and to ensure a smooth and predictable flow of resources from other organizations. Extending this perspective to joint venture instabilities, Inkpen and Beamish (1997) argue that shifts in the balance of partner bargaining power are responsible for unplanned terminations. The merit of this perspective is, therefore, that it may be used to explain both the formation and termination of strategic alliances using the same logic.

A criticism that can be raised against this perspective is that it assumes an atomistic environment in which information about other organizations is widely available and freely accessible to all (Gulati, Dialdin, & Wang, 2002). Research has found, however, that previous ties create a social network that shapes the flow of
valuable information about new tie opportunities and the trustworthiness of these potential partners and therefore influences tie formation. Nonetheless, this perspective provides valuable insights into the rationales for collaborative relationships.

2.1.3 Organizational Learning and Innovation

Work on learning and innovation (e.g., Anand & Khanna, 2000; Child, 2001; Dyer & Nobeoka, 2000; Grant & Baden-Fuller, 1995; Gulati, 1999; Inkpen & Crossnan, 1995; Kale, Dyer, & Singh, 2002; Kale, Singh, & Perlmutter, 2000; Larsson, Bengtsson, Henricksson, & Sparks, 1998; Mowery, Oxley, & Silverman, 1996; Powell, 1990; Powell et al., 1996) argues that strategic collaboration can facilitate learning both in terms of knowledge sharing and the transfer of existing knowledge as well as the creation of new knowledge that neither of the collaborators previously possessed. Alliances thus enable firms to acquire resources and skills that cannot be produced internally, and also jointly to develop new products and processes that they need to survive in a highly competitive environment, the costs of which are, however, often beyond the financial and human resources of any single company (Lei et al., 1997). This might include the direct transfer of assets, the sharing of key equipment, intellectual property, or personnel, and the transfer of organizational knowledge (Dyer & Singh, 1998; Hamel et al., 1989).

An important variable that helps determine how much a firm can learn through its interorganizational relationships is its absorptive capacity (Cohen & Levinthal, 1990; George et al., 2001; Kumar & Nti, 1998). The latter researchers argue that while investment in research and development obviously generates innovations, it also enhances the ability of an organization to recognize the value of new external information. Over time, the firm develops processes, policies, and procedures which facilitate assimilating and sharing external knowledge internally, and becomes skilled at using that knowledge to forecast technological trends, create products and markets, and maneuver strategically. The organization therefore increases its ability to exploit external knowledge commercially. In essence, the substantial long-run cost of learning is borne by developing a stock of previous knowledge that determines the firm’s absorptive capacity.
Cohen and Levinthal (1990) acknowledge that – no matter how high a firm’s absorptive capacity is – certain types of knowledge are firm-specific and therefore cannot be bought and quickly integrated into the firm. Interactive learning, however, enables alliance partners to understand not only the objective and observable components of each other’s capabilities, but also the more tacit components (Lofstrom, 2000). And this type of learning depends on both partners’ relative or partner-specific absorptive capacity (Dyer & Singh, 1998; Lane & Lubatkin, 1998; Lane, Salk, & Lyles, 2001).

2.1.4 Social Network Theory

As Salancik (1995: 345) has so aptly formulated it, network analysis “corrects a tendency in organizational theory to focus on the trees rather than the forest, on the action of individual organizations rather than on the organization of their actions”. In contrast to classical and neo-classical economic theory, which views economic action as the product of autonomous, unitary, and self-interested actors, social network theory suggests that an organization’s strategic actions are affected by the social context in which they and the firm are embedded (Galaskiewicz & Zaheer, 1999; Gulati, 1999). This context consists of both inter- and intrafirm resource relationships (Madhok & Tallman, 1998). For an overview of the basic principles and assumptions of this perspective see Table 3. Related to social network theory, the relational perspective of the firm (Dyer & Singh, 1998; Gulati, 1998, 1999; Koza & Lewin, 1998; Lane & Lubatkin, 1998) posits that critical resources and value-creation activities span the boundaries of the firm and may be embedded in its interfirm relationships, e.g., strategic alliances (George et al., 2001).

I take the position in this research that managerial action can potentially shape networks so as to provide a favorable context for future action (cf., Galaskiewicz & Zaheer, 1999; cf., Madhavan, Koka, & Prescott, 1998). In other words, although the social networks examined are passive manifestations of earlier or exogenous actions, it is assumed that managers engage in strategic maneuvering to secure key positions in their industry network, such as entering into strategic alliances to ensure access to knowledge, key technologies, or other resources. Inter- and intrafirm networks can
thus be understood as strategic resources that managers purposefully design and develop over time to meet their objectives.

<table>
<thead>
<tr>
<th>Principles</th>
<th>Assumptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Behavior is interpreted in terms of structural constraints on activity rather than in terms of inner forces within units.</td>
<td>Actors and their actions are viewed as interdependent units.</td>
</tr>
<tr>
<td>Analyses focus on the relations between units.</td>
<td>Relational ties (linkages) between actors are channels for transfer of “flow” of resources.</td>
</tr>
<tr>
<td>A central consideration is how the pattern of relationships among multiple actors jointly affects network members’ behavior.</td>
<td>Network models focusing on individuals view the network structure environment as providing opportunities for and constraints on individual actions.</td>
</tr>
<tr>
<td>Analytical methods deal directly with the patterned relational nature of social structure.</td>
<td>Network models conceptualize structure (whether social, economic, political, and so forth) as enduring patterns of relations among actors.</td>
</tr>
</tbody>
</table>

Table 3: Network analysis principles and assumptions

Source: Adapted from Rowley (1997: 893)

2.1.5 Other Relevant Perspectives

2.1.5.1 Resource-Based Perspective

This line of research suggests that firms use strategic alliances to locate the optimal resource configuration in which the value of their resources is maximized relative to other possible combinations (Das & Teng, 2000). More specifically, the rationale for entering into strategic alliances is to aggregate, share, or exchange valuable resources with other firms that a firm is not able to create independently. Eisenhardt and Schoonhoven (1996), for example, found that alliances are often formed when companies are in need of strategic resources, or when they possess valuable resources to share. Extending that perspective, social network research has recently emphasized that a firm’s network can be thought of as creating inimitable and non-substitutable values and constraints by itself, and has regarded network structure, network membership, and tie modality as critical resources (Gulati, 1999; Gulati, Nohria, & Zaheer, 2000).
2.1.5.2 Knowledge-Based Perspective

Knowledge is increasingly recognized by modern organizations as their most important source of sustainable competitive advantage. Thus research in this perspective builds on the knowledge-based view of the firm, which depicts firms as repositories of knowledge and competencies (e.g., Grant, 1996, 1996; Kogut & Zander, 1996; Seufert, von Krogh, & Bach, 1999; Spender, 1996). Socially constructed by organizational actors, knowledge can be stored and moved throughout an organization’s different configurations, including its strategic alliances (Tsai, 2001). According to this view, the organizational advantage of firms over markets stems from their superior capability in creating and transferring knowledge. Knowledge is costly to exchange because of buyers’ uncertainty. A potential buyer cannot be told the exact characteristics of what he or she is buying prior to the purchase, because by revealing this information in order to educate the potential buyer the seller would be transferring the knowledge free of charge (Hennart, 1988). The patent system can hence be understood as an institution devised to solve that problem by granting the seller (i.e., the patent holder) a monopoly on the use and disclosure of the information.

2.1.5.3 Strategy Literature

Whereas transaction cost arguments are driven by cost-minimizing considerations, strategic motivations are driven by maximizing profitability through the improvement of a firm’s competitive position vis-à-vis its rivals, gaining market power, and extracting monopoly rents (Contractor & Lorange, 1988; Galaskiewicz & Zaheer, 1999; Kogut, 1988). This literature argues, for instance, that strategic alliances may be motivated by strategic behavior aimed at deterring entry or eroding competitors’ positions (e.g., Vickers, 1985).
2.1.6 Theoretical Perspectives in the Context of this Dissertation

These diverse perspectives provide the foundation for the whole body of theorizing within this dissertation and will continuously resonate in my theoretical arguments. Two brief examples can be cited to illustrate this point. For instance, work on strategic networks, on one hand, has been guided primarily by the two theoretical perspectives of transaction cost economics and resource dependence. In both of these perspectives, organizations engage in cooperative, interorganizational integration of activities when it appears that the advantages of such an arrangement, especially enhanced survival capacity, outweigh the costs of maintaining the relationship, including any potential loss of operating and decision autonomy (Provan & Milward, 1995). Second, my examination of network centrality (structure) and politicality in alliance-related decision-making (process) draws on the resource dependency perspective, since a social actor’s relative political strength depends on his or her power over others, and this potential or capacity to influence the behavior of other social actors can be viewed as the obverse of dependence (Emerson, 1962).

In conclusion, these perspectives on strategic alliances provide distinct – although sometimes overlapping – explanations for the formation and management of strategic alliances. As Kogut (1988) emphasized, these theories should be treated as complementary rather than as substitutes. Therefore after a brief overview of alliance research conducted so far, arguments and findings from these diverse perspectives are combined in order to prepare the ground for the development of the two theoretical models.

2.2 Overview of Alliance Research

In response to the challenges discussed in the introduction section, the area of strategic alliance research has attracted significant attention from management scholars over the last few years. Considerable progress can be observed within the diverse lines of research concerned with strategic alliances, and several normative implications for alliance practitioners have evolved. For instance, research has
examined the motives or determinants for collaboration (e.g., Beverland & Bretherton, 2001), the governance structure of alliances (e.g., Gulati, 1995; Zaheer & Venkatraman, 1995), as well as factors that lead to their success (e.g., Mohr & Spekman, 1994; Parkhe, 1993). As a comprehensive overview of studies on strategic alliances exceeds the scope of this dissertation, the interested reader is referred, for instance, to Ireland, Hitt, & Vaidyanath (2002). I will, however, in the following look in more details at two areas of previous research on strategic alliances which are particularly relevant for this dissertation: Motives for the formation of alliances and types of alliances. The former provide the basis for an assessment of alliance performance conceptualized as the fulfillment of initial goals, whereas the latter are an important contingency factor for theorizing about adequate network structures and decision processes.

2.2.1 Motives for the Formation of Strategic Alliances

Factors influencing the formation of collaborative agreements have received considerable scholarly attention, particularly at the dyadic level (e.g., Eisenhardt & Schoonhoven, 1996; Gulati, 1998; Hennart, 1988; Stuart, 2000; Walker, Kogut, & Shan, 1997). Different theories have been used to derive different rationales for the formation of strategic alliances. Varadarajan and Cunningham (1995) categorized these motives into eight key areas and briefly list the main motives in each area (cf., Table 4). Implicit in many of the motives is the idea that firms seek to control their environment by acquiring important resources, reducing uncertainty, securing a market advantage, and gaining needed knowledge. Most researchers agree that the rise in alliances has been a result of the changing nature of the economic environment in the last decade (Parkhe, 1993). Some authors have therefore argued that most of the literature maintains that firms are merely reacting to changes in their environment and gives less support to the idea that firms form alliances to actively seek out new opportunities through joint discovery and knowledge acquisition (Beverland & Bretherton, 2001; Varadarajan & Cunningham, 1995). This is consistent with the resource dependence theory, although with greater strategic discretion and choice than previous resource dependence models (Child, 1972; Pfeffer & Salancik, 1978).
Strategic alliances can also enable corporate restructuring aimed at a narrower business focus and higher investment return by helping firms divest of non-core business units or activities that are costly to retain (Dunning, 1995; Jarillo, 1988; Lei et al., 1997).

<table>
<thead>
<tr>
<th>Market entry and market position-related motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Gain access to new international markets</td>
</tr>
<tr>
<td>• Circumvent barriers to entering international markets posed by legal, regulatory, and/or political factors</td>
</tr>
<tr>
<td>• Defend market positions in present markets</td>
</tr>
<tr>
<td>• Enhance market position in present markets</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product-related motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fill gaps in present product line</td>
</tr>
<tr>
<td>• Broaden present product line</td>
</tr>
<tr>
<td>• Differentiate or add value to the product</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Product/market-related motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Enter new product/market domains</td>
</tr>
<tr>
<td>• Enter or maintain the option to enter into evolving industries whose product offerings may emerge as either substitutes for, or complements to, the firm’s product offerings</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Market structure modification-related motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Reduce potential threat of future competition</td>
</tr>
<tr>
<td>• Raise/erect entry barriers</td>
</tr>
<tr>
<td>• Alter the technological base of competition</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Market entry timing-related motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Accelerate pace of entry into new product-market domains by accelerating pace of R&amp;D, product development, and/or market entry</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource use efficiency-related motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Lower manufacturing costs</td>
</tr>
<tr>
<td>• Lower marketing costs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource extension- and risk reduction-related motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Pool resources in the light of large outlays required</td>
</tr>
<tr>
<td>• Lower risk in the face of large outlays required, technological uncertainties, market uncertainties, and/or other uncertainties</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Skill enhancement-related motives</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Learning new skills from alliance partners</td>
</tr>
<tr>
<td>• Enhancement of present skills by working with alliance partners</td>
</tr>
</tbody>
</table>

Table 4: Motives underlying strategic alliance formation
Source: Varadarajan & Cunningham (1995: 285)
Badaracco (1990) and Hamel (1991), in contrast, both pointed out that the desire to acquire and absorb new types of firm-specific knowledge is a primary driving force behind many alliances. In support of that, Hagedoorn (1993) claims that the goals of most strategic interfirm technology cooperation have been (1) to monitor the evolution of technologies, to gain access to new and complementary knowledge and technologies, and to reduce or share uncertainty in and costs of R&D, (2) to capture partners’ tacit knowledge of technology in concrete innovation projects as well as to speed up innovation or learning processes and shorten the product life cycle, and (3) to achieve internationalization, globalization, entry to foreign markets, and expansion of the product range.

Hagedoorn (1993) also demonstrated empirically that sectoral differences, in terms of the differing role technological development plays in various fields, have to be taken into account when assessing the importance of motives for strategic partnering. In his sample of strategic alliances, technology-related motives are dominant in high-tech sectors, while in mature industries, a broad spectrum of market-related objectives can be linked to technology partnering.

2.2.2 Types of Strategic Alliances

Table 5 provides an introductory description of the four predominant interorganizational forms together with the degree of organizational coupling. Child (2001) developed a two-dimensional framework which positions strategic alliances in relation to other forms of interorganizational cooperation (Figure 3). The first dimension is the extent to which the cooperation is managed through either formalized contractual provisions that are market-based or hierarchy-based or implicit relationships dependent on interpersonal trust. The second dimension is the extent of transactional reach involved in the cooperation between organizations, i.e., the extensiveness and spread of such transactions. Strategic alliances, which are the focus of this dissertation, exhibit a rather low transactional reach compared to other forms of cooperation, and span contractual (contract-based alliances) as well as trust-based cooperation (equity joint ventures).
<table>
<thead>
<tr>
<th>Interorganizational Form</th>
<th>Tightness of Coupling</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint venture</td>
<td>Tightly coupled</td>
<td>An entity that is created when two or more firms pool a portion of their resources to create a separate jointly owned organization.</td>
</tr>
<tr>
<td>Network</td>
<td>Tightly coupled</td>
<td>A hub-and-spoke configuration with a local firm at the hub organizing the interdependencies of a complex array of firms.</td>
</tr>
<tr>
<td>Consortium</td>
<td>Tightly coupled</td>
<td>Specialized joint venture encompassing many different arrangements. Consortia are often groupings of firms oriented towards problem solving and technology development, such as R&amp;D consortia like SEMATECH.</td>
</tr>
<tr>
<td>Alliance</td>
<td>Loosely coupled</td>
<td>An arrangement between two or more firms that establishes an exchange relationship but involves no joint ownership.</td>
</tr>
</tbody>
</table>

Table 5: Forms of interorganizational relationships
Source: Adapted from Barringer and Harrison (2000: 383)

The governance mechanisms of strategic alliances broadly denote two alliance types: (1) equity alliances, where either one party takes an equity stake in its partner (minority alliance), or both parties carry out an equity swap or create an equity joint venture; and (2) non-equity or contractual alliances, i.e., contractual agreements without any equity arrangements (Das & Teng, 1998; Gulati & Singh, 1998; Inkpen, 1998).

![Diagram](image_url)

Figure 3: Forms of interorganizational cooperation
Source: Child (2001: 658)
Research shows that equity alliances are more effective than contract-based alliances for the acquisition of knowledge associated with partner capabilities (Gulati & Singh, 1998; Inkpen, 1998; Inkpen & Dinur, 1998; Mowery et al., 1996). The equity relationship in a research alliance is often structured as an option (Kogut, 1988) whereby one partner obtains an equity option in return for investing capital in the discovery process (Liebeskind, Oliver, Zucker, & Brewer, 1996; Powell et al., 1996).

Some studies have examined advantages and disadvantages of certain types of interorganizational relationships. Hagedoorn (1993), for instance, empirically demonstrated that more complex interorganizational modes of strategic technology partnering such as joint ventures are applied by companies aiming at a wider set of objectives while less complex modes such as contractual agreements are more suitable for short-term technological achievements. The focus of this dissertation, however, is on strategic alliances, and I will therefore concentrate on this type of collaboration.

The following section is closely related to the motives for strategic collaborations discussed above. The literature has generally distinguished between business alliances, which maximize the utilization of complementary assets, and learning alliances, i.e., collaborative relationships in which partners hope to learn from each other about technologies, products, skills, and knowledge (Lei & Slocum, 1991). Based on the conceptualization developed by March (1991), a firm’s choice to enter an alliance can be differentiated in terms of its motivation to exploit an existing capability or to explore for new opportunities, and learning alliances represent the prototypical example of exploration alliances (Koza & Lewin, 1998). Using the same logic, Grant and Baden-Fuller (2004) distinguished between knowledge generation and knowledge application alliances. However, as breakthrough innovations are increasingly based on interdisciplinary and interindustry advances that are beyond the knowledge of a single firm (Lubatkin et al., 2001), the dominant motivation for alliances has shifted from the sharing of assets and markets to learning (Bartlett & Ghoshal, 1995; Grant & Baden-Fuller, 2004). Exploitation and exploration are associated with different time horizons. According to Levinthal and March (1993), exploitation is associated with current viability, while exploration is pursued to ensure future viability. Rothaermel and Deeds (2004) contributed to that discussion by empirically supporting a product development path beginning with exploration alliances predicting products under
development, which in turn determine exploitation alliances, and concluding with products on the market.

Concentrating on learning alliances, Lubatkin et al. (2001) differentiated between (1) vicarious learning alliances, defined as collaborative agreements that imply learning-by-watching processes to acquire relatively concrete and explicit sets of knowledge, (2) knowledge absorption alliances, based on a one-way transfer of abstract know-how in a learning-by-doing approach, and (3) knowledge grafting M&A, i.e., organizational learning through the acquisition of other organizations or units. Additionally, they identify an alternative learning alliance where the objective is knowledge creation, not knowledge acquisition or transfer (cf., Figure 4). This fourth type of alliance is called a reciprocal learning alliance, and is characterized by the blending of knowledge and skills in order to jointly develop new knowledge, capabilities, or products.

![Figure 4: Knowledge tacitness, governance difficulty, and learning alliances](image)

**Figure 4: Knowledge tacitness, governance difficulty, and learning alliances**

Source: Lubatkin et al. (2001: 1360)

Silverman and Baum (2002: 793) distinguished further between downstream alliances that “link firms in a technology-based industry to sources of complementary assets, commercialization knowledge, and capital outside of the existing industry boundaries”, upstream alliances, that “link technology-based firms to sources of
research knowledge”, and horizontal alliances, that “link firms to other firms in the same industry”.

2.2.3 Alliance Performance

Measurement of the performance of strategic alliances has been an important research question in this area (Geringer & Hebert, 1991). Alliance performance is complex and multidimensional, and the measurement of alliance performance has challenged alliance researchers for decades (Inkpen, 2001). Some scholars have even claimed that there is still no generally agreed definition of alliance performance in the literature (e.g., Yan & Zeng, 1999). Some researchers have used stability or longevity to define of alliance performance. However, these measures of alliance performance have attracted criticism for their limited ability to provide information about collaboration effectiveness (Kogut, 1989). What is even more problematic is that these measures fail to distinguish between alliances that fail and therefore die, and those that accomplish their objectives and thereby outlive their utility (Kale et al., 2002).

As each alliance partner will have different cooperative and competitive objectives and possess different abilities for appropriating alliance benefits, and as it is argued that the factors that best explain network outcomes appear to depend on whose effectiveness perspective is considered, the view taken in this dissertation is that the individual competitive (i.e., learning) benefits for the focal firm should be evaluated (cf., Hamel, 1991) – in contrast to overall network effectiveness (e.g., Provan & Milward, 1995).

The first study within this dissertation on network configurations (Chapter 3) concentrates on an organization’s ability to maximize its private and common learning benefits through its alliance network (Khanna, Gulati, & Nohria, 1998), where the learning outcome depends not only on the interfirm search for and acquisition of information, but also on the subsequent distribution of the created knowledge within the focal organization (Dyer et al., 2001; Holmqvist, 2003; Inkpen & Dinur, 1998). In the alliance context, knowledge useful to a parent can be viewed from three perspectives (Inkpen, 1998; Inkpen & Dinur, 1998). First, firms may acquire knowledge useful in the design and management of other alliances. Second, firms may
seek access to other companies’ knowledge and skills, but without necessarily wishing to internalize the knowledge in their own operations. Third, an alliance may generate knowledge that can be used by parent companies to enhance their own strategy and operations. The research focus of this dissertation pertains to that last kind of knowledge. Consequently, the success of a specific learning alliance is indicated by the achievement of its stated learning objectives, e.g., co-development of technologies or products.

With strategic decision-making processes (Chapter 4), which form the focus of the second study in this dissertation, two distinct measures of alliance success dominate the literature: First, a subjective managerial assessment of the long-term alliance outcomes, i.e., the extent to which managers believe that their company has achieved its stated (learning) objectives (Geringer and Hebert, 1991; Saxton, 1997; Lane and Lubatkin, 1998; Dyer et al., 2001; Kale et al., 2001, 2002); and second, an external market-based measure of alliance success based on abnormal stock-market gains, which academics (Anand and Khanna, 2000; Merchant and Schendel, 2000; Kale et al., 2001, 2002) and practitioners (Ernst and Halevy, 2000) have begun using in recent years. In view of recent market developments, however, I focus on the first measure of alliance success, i.e., managerial assessment of alliance performance. For details on the measurement items see the methodology section (Chapter 4.5.2).
3 Inter- and Intrafirm Network Configurations

It is hardly possible to overrate the value [...] of placing human beings in contact with persons dissimilar to themselves, and with modes of thought and action unlike those with which they are familiar [...] Such communication has always been, and is peculiarly in the present age, one of the primary sources of progress.

John Stuart Mill

The surge of alliance formations in recent years suggests that competition increasingly occurs between sets of allied companies rather than individual firms. Much of the previous research on strategic alliances, however, represents an “undersocialized” account of firm behavior (Gulati, 1998). It is important to recognize that processes and outcomes associated with strategic alliances are defined and shaped by the social networks within which most firms are embedded. Recent studies have therefore extended the notion that firms are able to improve their performance by cooperating with and learning from other organizations from the dyadic to the network level (e.g., Doz, Olk, & Ring, 2000; Gulati, 1998; Kale et al., 2000; Liebeskind et al., 1996; Lofstrom, 2000; Powell et al., 1996; Rowley et al., 2000; Walker et al., 1997).

In general, a social network can be defined as “a specific set of linkages among a defined set of actors, with the additional property that the characteristics of these linkages as a whole may be used to interpret the social behavior of the actors involved” (Tichy, Tushman, & Fombrun, 1979: 507).

It has been argued that the manner in which a firm is embedded in its strategic alliance network is an important factor in influencing its behavior and performance (Gulati & Gargiulo, 1999; Nohria, 1992; Uzzi, 1996). Various scholars have recognized that participation in strategic alliances has implications for corporate competitiveness, provided that firms are favorably embedded in the web of strategic alliances in their industries (e.g., Inkpen, 1998; Lubatkin et al., 2001; Powell et al., 1996; Veugelers, 1997). These networks provide a vast number of opportunities for firms to learn from each other by gathering information and collecting new skills and

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6 This chapter is based on a paper that was presented in August 2003 at the Academy of Management (AOM) Annual Meeting in Seattle, WA.
knowledge (Inkpen & Dinur, 1998; Lofstrom, 2000). Empirical studies have supported this argument and demonstrated the impact of selected network dimensions, such as relational and structural embeddedness, on organizational learning and subsequent firm performance (Andersson, Forsgren, & Holm, 2002; Rowley et al., 2000).

Participation in a strategic alliance network is not a guarantee that a firm will actually realize this learning potential. While these external relationships permit a particular firm to access information possessed by its alliance partners, they have only limited relevance for the subsequent distribution of this knowledge within the organization. For example, as anecdotal evidence in the biotech and pharmaceutical industry suggests, large firms are often able to acquire new scientific and technical information through their alliance network, but these firms fail to achieve the internal transfer and application process across their functional units (Ernst & Young, 2003).

While access to external information is necessary, it is not the only component of a successful learning process. The organization must also create an appropriate internal context in order to capitalize on these opportunities (Hargadon & Sutton, 1997; Inkpen, 1998). Organizational subunits can learn from their own direct experience or from the experience of other units (Levitt & March, 1988), for instance by adopting a best practice (Szulanski, 1996). The organization must therefore additionally ensure that the acquired information is transferred, shared, combined with existing knowledge, and applied within its own boundaries in order for the firm to realize its full potential (Inkpen & Dinur, 1998). As units within a firm interact, collective knowledge structures evolve and result in a unique firm-level knowledge structure created and expanded through social interaction between units (Nonaka & Takeuchi, 1995) and embedded in the firm’s idiosyncratic social fabric (Reed & DeFillippi, 1990). For these reasons, the structure and quality of internal network relationships matter as well. For instance, Hansen (1999) proposed that research should analyze the various relationships between inter-group networking and intra-group communication to detect combinations and contingencies that explain effective knowledge search and transfer.

Thus it has been argued that the performance of firms is influenced both by the fabric of its external linkages to other firms and by its internal linkages among its units (Adler & Kwon, 2002; Hansen, 1999; Holmqvist, 2003; Sydow & Windeler, 1998). In
this connection, Inkpen (2001) identifies the theoretical linkages between the complementary alliance and social network literature as a field for promising research opportunities, although the specific effects of different elements of network structure on alliance and organizational performance remain unclear (Ahuja, 2000). McEvily and Zaheer (1999) also consider the finer-grained process through which network structure translates into the acquisition of competitive capabilities as an interesting and important area for future research. Put differently, we need to understand the influence of inter- and intrafirm network relationships simultaneously, as both are relevant for an organization’s ability to acquire information from its strategic alliance network, and to distribute it across its units. As a consequence, strategy researchers need to analyze the various combinations of these two kinds of network relationships in order to explain the actual degree of organizational learning (Ahuja, 2000; Hansen, 1999).

**Organizational learning** is characterized by the social production of organized rules, based on experience, that leads both to a permanent change in organizational knowledge (Cyert & March, 1963) and a permanent alteration in behavior. It comprises two distinct processes (Huber, 1991): *Acquisition* refers to how information is obtained, while *distribution* refers to how knowledge from different sources is shared (i.e., used synergistically), thereby leading to new information, understanding, or knowledge. According to Huber, *information* is defined as “data that give meaning by reducing ambiguity, equivocality, or uncertainty”, whereas *knowledge* refers to “more complex products of learning, such as interpretations of information, [or] beliefs about cause-effect relationships” (1991: 89). In this dissertation, I examine three dimensions of embeddedness affecting organizational learning: Tie strength, density, and centrality. I discuss their implications for the degree of information acquisition and knowledge distribution achieved by a focal organization and clarify the complex and complementary interrelationships of these processes.

Furthermore, as each alliance partner has different cooperative and competitive objectives and possesses different abilities for appropriating alliance benefits, I evaluate the individual benefits for the focal firm. I focus on an organization’s ability to maximize its private and common learning benefits through its alliance network.

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7 Various studies confirmed that there is a positive relationship between knowledge acquisition and the performance of collaborative agreements (e.g., Lyles & Salk, 1996).
(Khanna et al., 1998), where the learning outcome depends not only on the interfirm search for and acquisition of information, but also on the subsequent distribution of the created knowledge within the focal organization (Dyer et al., 2001; Inkpen & Dinur, 1998).

### 3.1 Transactional Content in Social Networks

Social networks can be developed for different content types, and a social unit’s position in the network may or may not vary. Complex organizations contain a multitude of networks arising from a variety of relationships. Although the transaction content of network connections may or may not overlap, the importance of content has been emphasized by various researchers.

Tichy, Tushman, & Fombrun (1979) distinguish between exchange of affect (liking, friendship), exchange of influence or power, exchange of information, and exchange of goods or services. Accordingly, Floyd and Wooldridge (2000) distinguish between work-flow networks (“reflects how the organization’s overall task is divided [… and] is created by the exchange of inputs and outputs among organizational members as work flows through the organization and by the resulting interdependencies that develop”), communication networks (“reflects interdependencies among organizational members created by the exchange of information”), and friendship networks (“[o]rganizational members are also tied together on the basis of friendship or affect”).

Ibarra (1993), on the other hand, distinguishes between communication networks (those “with whom you discuss what is going on in the organization”), advice networks (those “who are important sources of professional advice, whom you approach if you have a work-related problem or when you want advice on a decision you have to make”), support networks (those “that you know you can count on, whom you view as allies, who are dependable in times of crisis”), influence networks (those “that you have personally talked to over the last couple of years when you wanted to affect the outcome of an important decision”), and friendship networks (those “who are very good friends of yours, people whom you see socially outside of work”).
All these network types can be broadly grouped into instrumental network ties (e.g., influence and advice networks) that arise in the course of work-role performance and involve the exchange of job-related resources, and affective, expressive, or primary ties that primarily provide friendship and social support (e.g., friendship networks). It is important to add that affective and instrumental networks need not be the same (Burt, 1992).

In addition to these positive exchange relationships, some studies have examined networks relations characterized by negative exchanges such as avoidance (Labianca, Brass, & Gray, 1998) or hindrance (Sparrowe et al., 2001), or by adversarial relationships.

Research on interpersonal and intrafirm networks has explicitly assessed the content of networks and found it to interact with the structural characteristics to affect individual outcomes (Podolny & Baron, 1997). Labianca, Brass, & Gray (1998), for instance, analyzed both the communication and the interpersonal affect (i.e., friendship) networks and their influence on perceptions of intergroup conflict. In contrast, the current literature on strategic alliances mostly focuses, however, on the structural characteristics of organizational networks and ignores the content of information flowing through the network (Gulati et al., 2002). Notable exceptions are studies that examine multiplexity, i.e., relationships in which two or more types of exchange occur simultaneously (e.g., Kenis & Knoke, 2002).

### 3.2 Inter- and Intrafirm Networks

As organizations form and maintain alliances with each other, they weave a network of direct and indirect relationships that enables them to access information and distribute knowledge. Thus I define the strategic alliance network of an organization as its *interfirm* network\(^8\) of horizontal relationships (Adler & Kwon, 2002; Hansen, 1999; Rowley et al., 2000). Strategic alliance networks are conceptualized as a mode of organization that can deliberately be used by managers to

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\(^8\) Interfirm networks are “a select, persistent, and structured set of autonomous firms (as well as nonprofit agencies) engaged in creating products or services based on implicit and open-ended contracts to adapt to environmental contingencies and to coordinate and safeguard exchanges” (Jones, Hesterly, & Borgatti, 1997).
position their firms in a stronger competitive stance. Strategic networks are long-term, purposeful arrangements among distinct but related organizations that allow member firms to gain or sustain competitive advantage vis-à-vis their competitors outside the network (Jarillo, 1988).

Whereas the strategic alliance network constitutes the interfirm network of an organization, several authors have argued that the structure of a multi-unit organization can also be conceptualized as a network arrangement consisting of a set of relational ties linking together dispersed organizational units (e.g., Nohria & Eccles, 1992; Nohria & Ghoshal, 1997). Based on this conceptualization, interactions among different units of an organization can also be analyzed using a social network perspective. Accordingly, the *intrafirm network* relates to the relationships between the firm’s organizational units.

As Augier and Vendelø (1999: 253-254) note,

“within a firm, one can find islands of specialized knowledge possessed by organizational subunits. Such knowledge needs to be combined or cross-fertilized with knowledge from other subunits to stay viable and valuable for the firm and perhaps even more important prevent subunits from getting caught in competence traps. In turn, this implies that the character of the knowledge networks within a firm determine its ability to both exploit knowledge and explore new business opportunities, and thereby, its ability to cope with uncertainty and change.”

For knowledge in a strategic alliance network to spiral upwards (Nonaka, 1994) to the parent organization level, there must be knowledge connections between the various organizational levels. Knowledge connections occur through both formal and informal relationships between individuals and groups. These internal managerial relationships facilitate the sharing and communicating of new knowledge and provide a basis for transforming individual knowledge to organizational knowledge. These relationships also serve as the conduit for knowledge transfer to occur (Inkpen, 1998). The term “knowledge distribution” is used here, instead of “diffusion”, to emphasize that the movement of knowledge within the organization is a distinct experience, and not a gradual process of dissemination (Szulanski, 2000).
3.2.1 The Concept of Embeddedness

The basis for the theoretical examination of these network relationships is the sociological concept of embeddedness (e.g., Andersson et al., 2002; Dacin, Ventresca, & Beal, 1999; Gnyawali & Madhavan, 2001; Gulati & Gargiulo, 1999; Gulati et al., 2000; Rowley et al., 2000; Uzzi, 1996, 1997; Zukin & DiMaggio, 1990); the key to this concept is that the purposeful behavior of a social unit is influenced by the concrete and enduring social relationships in which the unit is embedded (Uzzi, 1996). It is assumed that the sum of actual and potential resources embedded within, available through, and derived from that network has a decisive impact on the social unit’s behavior and economic performance (Nahapiet & Ghoshal, 1998).

Three major dimensions of social embeddedness have been identified. Relational embeddedness stresses the significance of the type of relationships among social units in a network, especially the role of weak or strong ties as a mechanism for obtaining fine-grained information (Gulati, 1998; Rowley et al., 2000). Structural embeddedness refers to the structure of relations around the focal social unit and the configuration of relationships that make up the social unit’s network (Zukin & DiMaggio, 1990). This dimension highlights the extent to which social units are embedded in either dense or sparsely connected networks and emphasizes the informational value of such situations (Gulati, 1998). The frame of reference hereby shifts from the dyad to the triad, while the focus of analysis shifts from direct communication between social actors to indirect channels for information and reputation effects (Gulati & Gargiulo, 1999). Positional embeddedness refers to the position a particular unit occupies in the network and highlights the informational benefits that ensue for organizations from particular positions in the network. The degree of centrality that a social unit holds, as well as the information and control advantages that result from a central position, are important. In this dissertation, I therefore investigate the joint effects of inter- and intrafirm networks along these three dimensions. My theoretical model considers Powell’s (1990) caution that

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9 A fourth dimension that is relatively new to the network literature – and is not considered in this study – is cognitive embeddedness, conceptualized as similarity in representations, interpretations, and systems of meaning among firms (Bolino, Turnley, & Bloodgood, 2002; Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998).
embeddedness constructs may be too broad to develop refutable propositions. For this reason, I have selected tie strength to represent relational embeddedness, density to represent structural embeddedness, and centrality to represent positional embeddedness.

Previous research in this area has produced contradictory implications. In particular, there appears to be a fundamental disagreement about how a network structure determines the benefits of access to information and other resources on the one hand, and the coordination of social units’ collective conduct on the other hand (Gargiulo & Benassi, 2000; Leana & Van Buren III, 1999; Podolny & Baron, 1997). The traditional “closure view” stresses the positive effect of densely embedded networks of strong and cohesive social ties on the production of social norms and sanctions that facilitate exchange of information, creation of obligations and expectations, and imposition of sanctions on those who fail to meet their obligations, and that make it less risky for social units in the network to trust one another (Burt, 1987; Coleman, 1988; Das & Teng, 1998). In contrast, the “brokerage view” claims that the benefits from embeddedness result from the diversity of information and the brokerage opportunities created by the lack of connection (i.e., structural holes between separate clusters in a social network) (Burt, 1992, 1997, 2000, 2001; Gabbay & Zuckerman, 1998; Koka & Prescott, 2002). Marsden (1982: 202) defined brokers as intermediate actors that “facilitate transactions between other actors lacking access to or trust in one another”. Considerable analytic research has shown the power that accrues to brokers. Fernandez and Gould (1994) showed that organizations occupying brokerage positions in the national health policy domain were more likely to have greater perceived influence. Padgett and Ansell (1993) explained the rise to power of the Medici family in fifteenth-century Florence as the result of a network position spanning otherwise unconnected subgroups.

From a social network perspective, these positions have different, even contradictory, normative implications that require further clarification (Argote & Ophir, 2002; Walker et al., 1997). I attempt to resolve these discrepancies by jointly investigating the learning processes via inter- and intraorganizational networks.
3.2.2 Boundaries to Theorizing

Before discussing my theoretical model, I would like to draw attention to three important boundaries to my theorizing. Elements of an enabling social structure for one set of actions may well be disabling for other sets of actions (Podolny & Baron, 1997). The optimal type and degree of social capital is likely to be contingent on what actors seek to enable through it (Ahuja, 2000). The fundamental premise of my theory supporting specific network combinations for learning alliances is that the interfirm network should be structured to enhance information search and acquisition by providing network access to divergent sectors of the environment, whereas the intrafirm network should facilitate knowledge distribution by providing sufficient bandwidth for the transfer of complex and tacit knowledge. I realize that by focusing on learning-related alliances I exclude other important classes of alliances (e.g., alliances that increase market power).

I further assume that the benefits of internal knowledge transfer are contingent on the relatedness of the organizational subunits. Whereas a completely diversified organization may not benefit from other subunits beyond financial economies, increasing relatedness will make knowledge transfer among subunits more valuable and facilitate the creation of synergies.

Previous research has indicated that the relationship between relational and structural embeddedness and firm performance is contingent on industry context. Hagedoorn and Duysters (2002), for instance, have demonstrated empirically that in a dynamic environment “learning strategies” associated with exploratory networks appear to generate a greater impact on technological performance than “efficiency strategies” associated with exploitative networks. Other research has indicated that the influence of relational and structural embeddedness variables (such as tie strength and density) on firm performance is contingent on industry context (Rowley et al., 2000). I focus on learning alliance networks in dynamic high-tech environments, such as pharmaceuticals, medicine, computers, electronics, and telecommunications. In these industries, organizations are likely to form alliances to capitalize on both the rapid expansion and the complexity of knowledge (Lane et al., 2001), and alliances strongly impact performance (Hagedoorn & Duysters, 2002; Khanna et al., 1998). Thus, I limit
my theory building to organizations motivated to explore new opportunities with their external network rather than to exploit existing capabilities (Koza & Lewin, 1998).

3.2.3 Theoretical Network Combinations

My multilevel model explains the impact of several combinations of inter- and intrafirm network relationships on the acquisition and distribution of information and knowledge in these networks. I examine the ability of three selected network dimensions to either ease or hinder the organizational learning process, and I discuss whether specific inter- and intrafirm combinations of social embeddedness in this context are desirable or not.10

I examine combinations of tie strength in a firm’s inter- and intrafirm networks (e.g., Burt, 2000; Granovetter, 1973; Hansen, 1999; Kraatz, 1998; Tichy et al., 1979) and how such combinations influence a company’s ability to learn from its alliance network. Since tie strength deals with the characteristics of individual, dyadic connections, I further examine the overall configuration of ties within an organization and within an alliance network. I discuss the influence of structural holes (Burt, 2001) and the density of inter- and intrafirm networks on a firm’s ability to obtain benefits from its alliance network. I also focus on the impact of the centrality of a focal social unit in inter- and intrafirm networks; that is, the extent to which social units are indirectly connected via a central unit (Burt, 2000).

3.2.3.1 Combinations of Tie Strength in Inter- and Intrafirm Network Relationships

The strength of a tie is determined by a combination of the length and frequency of contacts, the emotional intensity, the intimacy (mutual confiding), and the reciprocal services associated with the tie (Granovetter, 1973). Strong ties are characterized by a high frequency of interaction between partners and their high level

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10 The traditional perspective underestimates the autonomy of units within organizations, while overestimating the autonomy of organizations from each other. Rather than portraying interactions within firms as dominated by hierarchy, and interactions among firms as dominated by markets, this evolving perspective suggests that both levels can be usefully characterized as relationships among interdependent parties (Gittell & Weiss, 2004).
of resource commitment to the relationship. *Weak ties* display relative infrequency of interaction between casual acquaintances (Granovetter, 1973). In common with other researchers (e.g., Granovetter, 1985; Krackhardt, 1992; Rowley et al., 2000), I treat strong and weak ties as separate, opposed constructs rather than degrees of one another, and thereby capture a richness in the concept which past researchers deem important in understanding network effects and firm behavior.

**Tie strength in interfirm network relationships.** The strength of interfirm ties can be assessed by examining the interaction frequency between partners and their level of resource commitment to the relationship (Powell, 1990; Rowley et al., 2000). Strong-tie alliances, such as equity arrangements, joint ventures, and R&D alliances, require higher investment and interaction than do weak-tie alliances, such as marketing, licensing, and patenting agreements. A network of strong ties is more likely to promote in-depth, two-way communication, which facilitates the exchange of detailed and more proprietary information between alliance partners (Uzzi, 1996), helps decipher implications of external threats, and helps evaluate potential responses (Kraatz, 1998). Over time, a strong-tie network generates dyad-level trust between firms, which in turn acts as a governance mechanism that further facilitates resource and information exchange and strengthens an organization’s ability to adapt to unforeseen problems in the relationship (Larson, 1992; Uzzi, 1996). Strong ties, however, are less likely to provide new information or insights because firms are much more likely to form strong ties with socially similar firms that tend to possess the same information and hold similar opinions (Burt, 2001; Granovetter, 1973). Weak ties, on the other hand, are valuable because they provide the organization with wide-ranging information and are more likely to introduce decision makers to fundamentally new and foreign ideas and insights (Granovetter, 1973; Rowley et al., 2000).

Strong ties incrementally promote and enhance mutual gain, reciprocity, and long-term perspective (Larson, 1992). As a result, interfirm tie strength significantly influences cooperation among members of the alliance network. Because strong ties are associated with reciprocal arrangements in which advice and help flow in both directions, however, alliance partners may end up spending a significant portion of their time helping their network partners instead of completing their own projects
(Uzzi, 1997). This tendency may have a negative impact when a firm operating in a turbulent environment faces a technological shock. Although the competitive advantage provided by its alliance network might be rendered obsolete by the shock, the firm remains (over)committed to its existing relationships (Afuah, 2000). Similarly, alliance partners share obligations to help each other, even in collective network rivalry, which may incur the opportunity cost of wasted effort and missed opportunities for collaboration (Adler & Kwon, 2002).

Building social capital requires considerable investment in establishing and maintaining relationships, and, as with any costly investment, strong ties may not always be cost-efficient (Adler & Kwon, 2002; Leana & Van Buren III, 1999; McFadyen & Cannella, forthcoming). A network dominated by strong ties not only requires more maintenance but also has fewer ties, resulting in lower levels of information (Kraatz, 1998; Rowley et al., 2000). As a result, a network of weak ties across firm boundaries is more cost-efficient and still provides significant search benefits. In support of that argument, Zaheer and Zaheer (1997) have found that the maintenance of multiple weak ties in a bank’s information network is positively related to its market influence.

I would like to point out that my argument does not contradict Uzzi’s (1996) findings (focusing on vertical supplier ties) that the most beneficial interfirm network is characterized by a mixture of arm’s length and embedded ties, since my focus is on horizontal alliance networks. In a more recent study, Uzzi and Lancaster (2003) have acknowledged that vertical networks predominate in industries characterized by a mixture of both an emerging and a stable knowledge base, which is less characteristic of the highly dynamic high-tech industries on which I focus my theory building.

**Tie strength in intrafirm network relationships.** Not only does the focal organization need access to the desired information through its alliance network, it also needs to disperse the relevant information from the subunits that acquired it to the other subunits that could benefit from the acquired information. The synergistic sharing and combining of newly acquired information with existing knowledge will eventually lead to organizational learning. A strong-tie network between subunits within the focal firm is beneficial for the recipients, who need multiple opportunities to
distribute the newly created non-codified (tacit) and complex knowledge (Hansen, 1999, 2002; Kale et al., 2002; Lofstrom, 2000; Szulanski, 2000). Strongly-tied subunits may even develop a relationship-specific heuristic to ease the transfer of non-codified knowledge between them, whereas the interactions necessary for transferring complex knowledge are absent in a weak-tie network between subunits (Hansen, 1999). Strong ties also make information and knowledge received from another subunit credible and interpretable, imbuing it with added value that facilitates intrafirm coordination and learning.

Existing theory and practice, however, show that intrafirm networks become increasingly established and bureaucratized over time. High social capital indicated by a strong-tie network between subunits may foster stable, but dysfunctional, power arrangements within the firm, leading to more internal focus and less willingness to adapt to the external environment (Leana & Van Buren III, 1999). Time spent maintaining and cultivating strong ties between subunits also results in opportunity costs. Frequent meetings with other subunits may distract a subunit from its own projects and from developing new ties (Hansen, 1999). On the other hand, several scholars also emphasize the positive effect of a strong-tie subunit network on the production of social norms and sanctions that facilitate dyad-level trust and cooperation within firms (e.g., Coleman, 1990; Krackhardt, 1992). The cooperative benefits of strong ties are especially obvious when an organization faces a major non-routine change, as advice on this critical issue is normally sought from trusted subunits and therefore via strong ties (Krackhardt, 1992).

**Interaction.** Whereas earlier research has focused exclusively on inter- or intraorganizational networks, my premise is that a beneficial combination of inter- and intraorganizational tie strength must exist for an organization to truly benefit from its alliance network. Figure 5 illustrates this interaction; I discuss the associated effects in the following paragraphs.

Many scholars have emphasized that the strength of a weak-tie network is the exploration of new opportunities and the acquisition of new information, whereas a strong-tie network is well suited for the distribution (exploitation) of existing knowledge (Dyer & Nobeoka, 2000; Rowley et al., 2000; Uzzi & Lancaster, 2003;
Since I focus on how a focal organization can learn from its alliances, the acquisition of new information from its outside network and the distribution of knowledge created with the new information within its internal network is of key concern to the organization. As discussed above, a weak-tie interfirm network would allow an organization to explore new alliance opportunities by searching comprehensively for novel information, thus diminishing the threat of the firm becoming over-embedded in its strong-tie relationships. The advantages of such a network outweigh its disadvantages for the transfer of non-codified and complex information. At the same time, a strong-tie intrafirm network enables the organization to transfer assimilated information from the acquiring subunit to the subunits where it can be further deployed and combined with existing knowledge to induce organizational learning. Thus, the advantages of strong ties for intrafirm knowledge transfer, cooperative behavior, and organizational learning outweigh development and maintenance costs.

Figure 5: Impact of inter- and intrafirm tie strength on organizational learning from alliances

Whereas the combination described above enables the focal organization to acquire learning benefits from its alliance network, other configurations can be considered inferior. For example, a combination of strong-tie inter- and intrafirm networks provides a firm with benefits for knowledge transfer and internal cooperation, but the organization as a whole may suffer from overembeddedness,
parochialism, and inertia. Alternatively, a combination of weak-tie inter- and intrafirm networks ensures access to novel information, but the lack of common social norms and cohesive strong ties may lead to a fractured organization. A configuration featuring a strong-tie network with alliance partners and a weak-tie network among internal subunits combines the disadvantages of an inability to access non-redundant information with those of a fractured organization, making it difficult for the organization to learn from its alliance network. My proposition therefore runs as follows:

Proposition 1: Interfirm and intrafirm network tie strength exhibit an interaction effect on a focal organization’s degree of learning from its alliance network. Specifically, I anticipate the highest degree of learning with a weak-tie interfirm and a strong-tie intrafirm network. Moderate degrees of learning are expected for interactions between either strong- or weak-tie inter- and intrafirm networks. The lowest degree of learning is associated with a strong-tie interfirm and a weak-tie intrafirm network.

3.2.3.2 Combinations of Density in Inter- and Intrafirm Network Relationships

Network density is defined as the proportion of existing dyadic ties to all potential ties in a network (Kenis & Knoke, 2002; Tichy et al., 1979). It is therefore directly related to the number of contacts that a social unit possesses and to the number of ties it has with each contact (Koka & Prescott, 2002). Network density, however, does not provide insights about the diversity of information that is exchanged, since an increase in redundant ties does not increase the effectiveness of the overall network (Degenne & Forse, 1999; Hagedoorn & Duysters, 2002). I investigate the information diversity aspect of the network above and beyond the mere number of ties by focusing on structural holes, which indicate a lack of connection between certain social units or clusters of units in the networks. Structural holes (chasms) present information opportunities and these are exploited by social units bridging (spanning) ties (McEvily & Zaheer, 1999).

Density in interfirm network relationships. Both the time required to transmit messages and the potential for distorted communication are less in high-density
interfirm networks with much shorter path lengths (Kenis & Knoke, 2002). Timing benefits may arise as well-connected firms have access to information at shorter distances (Burt, 1992). A variety of routes or pathways for information flows further increases network bandwidth and thus maximizes the speed and ease of information transfer (Dyer & Nobeoka, 2000). As a result, dense alliance networks may aid organizational learning, since information is obtained early and managers can exploit this information advantage. A further advantage of a dense alliance network, particularly in the face of technological uncertainty and change, is that firms have already allocated resources to maintain relationships with alternative partners, which represent options for dealing with environmental shocks (Afuah, 2000).

Forming and maintaining alliances also requires an investment of resources and time since ties that are not reinforced diminish over time (Cummings, 1991). Monitoring and managing alliances is also complex and costly and causes the firm’s effectiveness in managing its alliances to decline with the number of alliances maintained (Deeds & Hill, 1996).

A dense alliance network could, however, also drive the acquisition of indiscriminately large quantities of information that may be redundant and obsolete (Koka & Prescott, 2002). Due to information processing limitations and perceived confidence that all relevant information has been captured, a firm may limit its search horizon to its immediate network (Koka & Prescott, 2002), which, in turn, may lead to sole reliance on largely similar and obsolete information (Levinthal & March, 1993). A dense alliance network means that partnerships might be inherently unstable in that its members have the easy option to exit the alliance, as it is less costly for a firm to leave its current alliance partner(s) when it has existing linkages with alternative firms. As the interorganizational network becomes denser, the more efficient communication structure of the network forms a mechanism for collectively monitoring each organization, forming coalitions and coordinating pressure on each firm to match expectations. As a result, shared behavioral expectations among partner firms are established that might produce strong constraints on the focal organization’s actions (Rowley, 1997).

In situations where information diversity is essential, such as explorative learning, a dense network with high bandwidth (i.e., a high degree of redundant ties)
might not be sufficient. Here, ties bridging structural holes that increase network reach are likely to be superior (Ahuja, 2000; McEvily & Zaheer, 1999). A bridging tie is the sole path through which two firms (and their direct alliance partners) are joined in a network (McEvily & Zaheer, 1999). The firms on either side of the hole circulate in different flows of information. By spanning structural holes, network members with many non-redundant contacts can access a broader range of novel, unique, and non-overlapping sources of information (Burt, 1992; Koka & Prescott, 2002; McEvily & Zaheer, 1999). Thus firms can incorporate diverse perspectives (Koka & Prescott, 2002), extend the scope of organizational learning (Liebeskind et al., 1996), and positively influence their acquisition of competitive capabilities (McEvily & Zaheer, 1999). Silverman and Baum (2002), for instance, have found that the exit rate for biotechnology firms whose alliance networks provide access to a wide range of partners while limiting redundancy is significantly lower than that for firms whose alliance networks are comprised of redundant ties.

Density in intrafirm network relationships. Whereas structural holes among the external partners of the firm may be considered highly beneficial, structural holes within the firm may signal that some knowledge is shared inefficiently or is not widely available throughout the firm (Leana & Van Buren III, 1999). An intrafirm network full of structural holes may represent a fractured organization unable to work effectively toward a commonly shared goal. With goal incongruence, the task of integrating specialized knowledge across subunits and combining it with newly acquired information is problematic for organizations (Grant, 1996). If many subunits strive to have disconnected contacts, and structural holes multiply, the aggregate level of social closure reaches a point at which the stability of the organization itself is in jeopardy; the organization begins to lose its identity as a coherent structure and subunits refrain from investing in it (Gabbay & Zuckerman, 1998). As a result, structural holes within a firm weaken intrafirm communication and coordination, which in turn diminishes the firm’s ability to integrate the information and knowledge gained by the alliance network.

Network density, in contrast, provides the cohesiveness benefits of social capital within an organization, which enables the pursuit of collective goals (Adler & Kwon,
2002). Network density is thought to foster identification with the organization and mutual trust on the network level (in contrast to dyad-level trust due to tie strength) which facilitates knowledge exchange and collective action (Reagans & Zuckerman, 2001). Moreover, dense relations among its contacts provide a subunit with more reliable communication channels (Burt, 2000). As a result, with dense formal and informal connections in place, new knowledge has a higher probability of survival and integration into an organization’s knowledge base.

Dense intrafirm relations are important, as they decrease search time and costs by serving as direct-access channels through which flow both useful knowledge and information about opportunities for knowledge use (Hansen, 1999; Koka & Prescott, 2002). This access is crucial, as empirical evidence shows that a subunit’s level of innovation is positively associated with the extent of knowledge exchange with other subunits (Andersson et al., 2002; Tsai & Ghoshal, 1998). In addition, Hansen (2002) finds support for his hypothesis that the shorter the path length a subunit has for indirect relations in its knowledge network, the more knowledge it obtains from other subunits. Another advantage offered by high-density intrafirm networks is that they rapidly supply the subunit with large quantities of knowledge from numerous, perhaps redundant, sources that offer several alternative channels for filtering, assessing, and validating data quality and reliability. Dense intrafirm relations, however, need to be maintained and require their own set of costly and time-consuming activities (Hansen, 2002). An active intrafirm network may also interfere with the subunit’s internal coordination, as the introduction of external and diverse knowledge may upset the subunit’s consensus on making important strategic choices (Hansen, 1999).

**Interaction.** Whereas density in its intrafirm network provides social capital’s cohesiveness benefits within an organization, structural holes in the interfirm network provide cost-effective resources for competitive action (Adler & Kwon, 2002). Consequently, while brokerage across structural holes is the source of added value, closure (i.e., density) can be critical to realizing the value buried in the structural holes (Burt, 2001). This means that, while sparse interfirm networks rich in structural holes may provide a firm with access to diverse information about new opportunities, cohesive ties among densely connected intrafirm subunits are essential for the
organization to exploit opportunities arising out of the alliance network (Burt, 2000; Gargiulo & Benassi, 2000; Podolny & Baron, 1997). Figure 6 illustrates the interaction of network density and information diversity at the inter- and intraorganizational level.

Figure 6: Impact of inter- and intrafirm density on organizational learning from alliances

The remaining combinations fail to realize the advantages described above. A network combination characterized by low density (i.e., a high number of structural holes) in both its inter- and intrafirm networks will certainly provide a firm with a diverse set of perspectives, skills, and resources. Within the firm, however, low density weakens intrafirm communication and coordination, which decreases the firm’s ability to take advantage of the newly acquired information throughout the organization. In contrast, a configuration of high network density (i.e., a scarcity of structural holes) in a firm’s inter- and intrafirm networks may lead to a cohesive group of intrafirm subunits, as density eliminates structural holes within the firm and improves communication and coordination. At the interfirm level, it may, however, at the same time restrict the firm to acquiring only a single set of perspectives, skills, or resources. The last network combination, which consists of high interfirm density (i.e., a low number of structural holes) and low intrafirm density (i.e., a high number of structural holes), combines the disadvantages of a lack of integration and coordination within the organization and a lack of diverse perspectives, skills, and external resources. My proposition therefore runs as follows:
Proposition 2: Interfirm and intrafirm network density exhibit an interaction effect on a focal organization’s degree of learning from its alliance network. Specifically, I anticipate the highest degree of learning with low interfirm and high intrafirm network density. Moderate degrees of learning are expected for interactions either high or low in inter-and intrafirm network density. The lowest degree of learning is associated with high interfirm and low intrafirm network density.

3.2.3.3 Combinations of Centrality in Inter- and Intrafirm Network Relationships

Whereas density is a form of closure in which social units are equally connected, centrality is a form of closure in which a minority of social units stand apart as the source of closure (Burt, 2000). The degree of centrality of a network depends on the extent to which various resources flow to and from a social unit; therefore centrality characterizes a specific unit’s power relative to other network units (Freeman, 1979). Considered from the resource dependency perspective (Aldrich, 1979; Emerson, 1962; Pfeffer & Salancik, 1978), social units in a central network position have greater access to, and potential control over, relevant resources such as information and knowledge. Centrality is important because power is not so much a function of its direct control of resources, but rather, “the set of resources that actors [can] mobilize through their existing set of social relationships” (Galaskiewicz, 1979: 151). As an analytical class, centrality captures aspects of a social unit’s visibility or popularity, as indicated by the unit’s involvement in direct and indirect relations (Kenis & Knoke, 2002).

Previous research has acknowledged three distinct components of centrality (Brass & Burkhardt, 1993; Rowley, 1997). Degree centrality (i.e., a social unit’s number of direct ties to other units) means that units are well connected and have access to many alternative sources of information and resources. Closeness centrality (i.e., the sum of a social unit’s shortest paths [geodesic] to all other units) influences the unit’s independent access to different points in the network. Whereas closeness centrality represents avoiding the control of others, betweenness centrality (i.e., the frequency with which a social unit falls on the geodesic paths between pairs of other units) determines potential control over others, or the possibility of increasing the dependence of others on the unit. In particular, betweenness centrality determines the
extent to which a unit has control over other units’ access to various regions of the network. Because this last component is considered the most appropriate for assessing the ability of social units to control information and knowledge flows across networks (Freeman, 1979), it will be the focus of my discussion.

**Centrality in interfirm network relationships.** At the interfirm level, network centrality enables the central firm to acquire systemic power, access and control alternative information sources, obtain political support, and participate in coordinated collective actions (Kenis & Knoke, 2002). Central organizations can withhold, disclose, and modify information and, hence, influence other firms’ perceptions and attributes of the common environment. Network centrality also increases structural autonomy (i.e., the degree to which a firm is free to pursue its own goals) by increasing a central firm’s control over information flows (Floyd & Wooldridge, 1999).

A central firm in the alliance network may ideally become what is termed the *tertius gaudens*, or the “laughing third”, i.e., it benefits from brokering the connection between member firms that are otherwise disconnected. These benefits emerge because a centrally located firm generates a constituency for new ideas that it synthesizes from the diverse information clusters to which it has access (Burt, 2000). A centrally located firm that directs, concentrates, and legitimates information about itself which is received by others enjoys the advantage of having its interests represented in a positive light, at the right time, and in the right places. This information advantage is complemented by the higher visibility of central organizations that create more attention among advantageous partners in its alliance network. Allying with well-linked and, consequently, highly visible partners yields signaling benefits (Podolny, 1994; Podolny & Baron, 1997; Stuart, Hoang, & Hybels, 1999), making a central firm more attractive to a third party’s network. These attention and signaling effects in turn enhance the likelihood of the firm’s inclusion in new opportunities (Burt, 2000). In support of these arguments, Podolny (1994) found that, especially in situations characterized by uncertainty, organizations rely on structural position as a tangible basis for discriminating among transaction opportunities.
As a result, a central firm’s high network centrality implies a high position in status hierarchy and a high degree of access to valued resources and other network members. As network centrality increases a central company’s knowledge of its alliance network’s power distribution and the accuracy of its assessment of the political landscape, the firm is able to accomplish tasks and to exercise control over rewarding opportunities (Burt, 2000; Ibarra, 1993; Krackhardt, 1990). At the same time, centrality also reflects the total experience of the focal firm in cooperating with other companies. Therefore the more central a firm is, the more collaborative experience and the more capabilities it has to extract value from these cooperations (Gulati et al., 2002). Consequently, Powell et al. (1996) have empirically demonstrated that a central position in interfirm learning networks for biotechnology startups is related to their faster subsequent growth. Similarly, Zaheer and Zaheer (1997) have found that the degree of centrality of banks in their information networks is positively related to their market influence. In order to capitalize on these opportunities, a firm has to actively pursue a positional advantage either by forging links to gain a central position within the network or by aligning itself with a central member of the network. A central position in an alliance network, however, may not go uncontested. The greater the monopolistic situation, the higher the probability that the dependent firms will try to change the network structure in order to overcome the monopoly (Gnyawali & Madhavan, 2001).

Centrality in intrafirm network relationships. In the intrafirm setting, a subunit occupying a central network position may gain a competitive advantage in the marketplace because of its unique access to other subunits’ knowledge or practices. Tsai (2001) , for instance, found a significant and positive relationship between a subunit’s centrality in its intrafirm network and its innovative capability. A central subunit, moreover, is capable of dealing with complex relationships between subunits and is therefore likely to become an attractive partner to other subunits. This in turn increases the propensity of the subunit to form new intrafirm linkages, provides a modification of the existing social structure, and generates new opportunities for productive resource exchanges among subunits (Tsai, 2001).
Whereas intrafirm centrality has positive effects for the central subunit, these effects need to be re-evaluated in regard to an organization’s ability as a whole to benefit from the knowledge gained by its alliance network. Centrality is positively associated with higher subunit-level performance. On the organization level, however, centralization is negatively related to performance (Sparrowe et al., 2001). New information and knowledge may be acquired by one subunit of the organization, but could be more profitably deployed by another subunit; therefore knowledge must be shared if it is to be put to its most profitable use. One reason why organizations fail to leverage learning potential from their alliance networks is the inability of one subunit to mobilize internal resources to support its projects. Innovative subunits that do not occupy a central position may lack the organizational authority to access key resources necessary to ensure the success of their projects, as the resources and skills are located in different subunits around the company.

A high centrality of certain subunits in the intrafirm network may lead to an exclusive focus on explorative learning, thus exploiting one subunit’s knowledge at the expense of other subunits (Levinthal & March, 1993). The central subunit’s reputation may be enhanced by its strategic location in the intrafirm network. There is no guarantee, however, that this position leads to the inflow of the knowledge of most value to the subunit, let alone an outflow of the knowledge of most value to the broader organization and to the subunit most able to use it.

**Interaction.** A firm that is the central actor in its alliance network enjoys significant information and control benefits. According to Burt (1997), these benefits reinforce each other and accumulate together over time. At the intrafirm level, however, the advantages of network centrality for an organizational subunit that interacts with the alliance network may be outweighed by disadvantages for the firm as a whole, such as inefficiencies in resource allocation, lack of coordination, and failure to distribute the information and knowledge obtained. Particularly in the context of transferring non-codifiable and complex knowledge, researchers claim that central or hierarchical coordination between subunits fails (Grant, 1996). As a result, the configuration of high interfirm and low intrafirm centrality is positively associated with an organization’s ability to benefit from its alliance network.
Figure 7 illustrates the remaining interactions of inter- and intraorganizational centrality. Low interfirm and high intrafirm centrality combines the disadvantages of not being the central actor in the interfirm network and running the risk of inefficient intrafirm cooperation and coordination. A combination of high centrality in a firm’s inter- and intrafirm network may lead to a fractured organization of single subunits striving for individual benefits and thereby impairing organizational competitiveness. Lastly, a configuration characterized by low centrality in both networks ensures cooperative behavior among subunits, yet does not provide an organization with the advantages of centrality in its interfirm network. My proposition therefore runs as follows:

**Proposition 3:** Interfirm and intrafirm network centrality exhibit an interaction effect on a focal organization’s degree of learning from its alliance network. Specifically, I anticipate the highest degree of learning with high interfirm and low intrafirm network centrality. Moderate degrees of learning are expected for interactions either high or low in inter- and intrafirm network centrality. The lowest degree of learning is associated with low interfirm and high intrafirm network centrality.
3.3 Discussion

I have argued that the degree of learning that a focal organization gains from its participation in a strategic alliance network depends not only on the type and quality of its external relationships to other firms, but also on the internal relationships among its subunits. Both networks must be jointly taken into consideration for an adequate understanding of information acquisition, as well as subsequent knowledge distribution. Certain combinations of these two sets of relationships seem to be better suited for enabling this learning process than others. In particular, I have proposed that three combinations might generate the highest degree of learning from alliances: First, a weak-tie interfirm and a strong-tie intrafirm network; second, low inter- and high intrafirm network density; and third, high inter- and low intrafirm network centrality. These network combinations seem best-suited to generate sufficient diversity through the alliance network and at the same time to generate internal consensus through the intrafirm network in order to enable the collective learning of a focal organization (Fiol, 1994).

I conclude that it is critical to consider both networks together, rather than independently, to assess the outcome of learning from an alliance network. I stress that a beneficial network position for a single organizational subunit might be detrimental to the focal organization as a whole. Thus, in order for an organization to reap benefits from its alliance network, a common strategic agenda needs to be developed within an organization to encourage cross-functional cooperation (Lovas & Ghoshal, 2000). I am contributing to the growing body of multilevel research where two or more levels of analysis are theoretically linked in order to arrive at a better explanation of the relevant phenomena (e.g., Currrall & Inkpen, 2002; Drazin, 1999; Drazin & Schoonhoven, 1996; Klein et al., 1999).\textsuperscript{11} In addition to that, there are several implications that can be drawn.

\textsuperscript{11} As Rousseau (1985) and Gersick (1991) have demonstrated, there are important organizational phenomena that cannot fruitfully be examined without crossing levels of analysis.
3.3.1 Theoretical Implications

My framework continues efforts to reconcile the brokerage and closure views (e.g., Rowley et al., 2000) by differentiating between the two tasks of information acquisition and knowledge distribution. With regard to the former, a weak-tie network of low density seems to offer the highest benefit due to its providing access to a diversity of information and to a vast number of brokerage opportunities (Ahuja, 2000; Gargiulo & Benassi, 2000). Consequently, the brokerage view seems to be valid when organizations have to search for and obtain information beyond their knowledge domain. When it comes to knowledge distribution, however, the closure view prevails, as it stresses the significance of strong and cohesive social ties and the positive effects of densely embedded relationships (Koka & Prescott, 2002) as well as its advantages for the preservation and maintenance of resources (Lin, 2001). Any assessment of the validity of either the brokerage or the closure view has to be related to the clarification and specification of the dependent variable.

This duality also highlights the two perspectives of social capital and embeddedness on the relational level and the societal-group level (Lin, 2001). Whereas at the interfirm network level the focus of social capital is on the benefits for individual firms (i.e., how individual companies access and use resources embedded in social networks to gain returns in instrumental actions), at the intrafirm level the focus is on how subunits develop and maintain social capital as a collective asset.

My framework has implications for the exploration versus exploitation debate (Levinthal & March, 1993; March, 1991). The results indicate that firms engaged in explorative efforts through an alliance network must be careful not to extend their external mode of structuring relationships to their internal network as well (Rowley et al., 2000). The optimal network structure for exploration (in terms of new information acquisition) requires a different social setting than that for exploitation (in terms of distribution). Thus when it comes to alliance networks, exploration and exploitation are neither two mutually exclusive modes nor two modes that can be pursued independently of one another. Instead they must be jointly executed, albeit in varying relationship settings. If firms want to gain the greatest benefit from their learning
endeavors, they must organize their external and internal networks in a complementary pattern.

As this is unlikely to be an easy task due to potential role conflicts and the opposing requirements of both networks, my arguments follow Dyer et al. (2001) and Kale et al. (2001; 2002). These authors have identified firms’ investment in the creation of a dedicated alliance function as a major contribution to alliance success. This organizational subunit is charged with the responsibility of capturing, sharing, and disseminating the alliance management know-how derived from previous experience (Kale et al., 2001; 2002) and of supporting or coordinating the formation of the external and internal linkages of an organization. Such activities might even lead to the emergence of alliance-related routines, which again may transform into an alliance capability as a valuable, rent-generating factor (Khanna et al., 1998).12

My dissertation also contributes to the information processing perspective (Galbraith, 1973; Tushman & Nadler, 1978) by proposing how the necessary fit can be achieved between the information processing requirements facing an organization and the information processing capacity offered by a firm’s inter- and intrafirm network structures in order to enhance organizational performance.

Strategic alliances have been conceptualized as a “learning race” in which partners often engage in opportunistic attempts to outlearn each other (Hamel, 1991; Khanna et al., 1998). The firm that is able to learn faster than its alliance partner will most likely win this “collaborative competition” and reap the greatest benefits. The picture becomes more complex in multi-partner alliances and alliance networks, where the learning outcome is influenced not only by the speed of learning, but also by the actual learning opportunities and abilities of each firm. For example, if, due to occupying a less central position in a strategic alliance network, a firm has limited opportunity to acquire new information, then learning processes are only able to tap

12 The particular network in which the firm is embedded may itself serve as a unique and valuable resource, providing the firm with an enduring competitive advantage (Galaskiewicz & Zaheer, 1999). An organization’s ability to simultaneously learn from multiple sources such as internal development, external alliances, customer feedback, and supplier relations contributes to a unique capability base that becomes correspondingly more difficult for competitors to imitate (Lei et al., 1997). Lastly, the dynamic capabilities perspective (Kogut & Zander, 1996; Leonard-Barton, 1992; Teece, Pisano, & Shuen, 1997) posits that the competitive advantage of firms rests on distinctive internal technological, organizational, and managerial processes. A key contribution of the dynamic capabilities argument is the focus on the capacity to develop, renew, and recombine assets and competencies over time to achieve congruence with changing business environments.
into this limited reservoir. On the other hand, if the learning opportunities created by the external network position are great, then a slower learning process might be less detrimental, as it can be offset by a larger opportunity set. Firms might thus be able to neutralize relative disadvantages in their learning speed through a more central network position or vice versa. Speed and network position are dependent on each other and determine the final outcome in learning races.

### 3.3.2 Practical Implications

I take the position in this research that managerial action can potentially shape networks so as to provide a favorable context for future action (Coleman, 1990; Galaskiewicz & Zaheer, 1999; Madhavan et al., 1998). In other words, although the social networks examined are passive manifestations of earlier or exogenous actions, managers are able to engage in strategic maneuvering to secure key positions in their industry network, such as entering into strategic alliances to ensure access to knowledge, key technologies, or other resources. The two types of networks, however, differ in the degree of discretion they grant managers to actively influence network structures. In an intrafirm network, for example, connectivity can easily be established by hierarchical intervention or by units’ own initiatives. Many facets of organizational life such as bringing together people and their ideas and ongoing formal and informal conversations can be viewed as collective investment strategies for the institutional creation and maintenance of dense networks of social relationships (Nahapiet & Ghoshal, 1998). Connectivity in an interfirm network is not as easily established since it needs to be established across firm boundaries (Inkpen & Tsang, 2005).

In spite of these challenges, inter- and intrafirm networks can be understood as strategic resources that managers purposefully design and develop over time to meet their objectives. The practical and strategic implications of these propositions might therefore constitute a manual for those who wish to optimize their instrumental networks in a concrete business setting (Hagedoorn & Duysters, 2002). Both intra- and interfirm networks, however, require deliberate design interventions to create effective networks for knowledge transfer.
3.3.3 Limitations and Future Research

The limitations of my model offer new avenues for future research. I have concentrated on selected dimensions of research on embeddedness and outlined their effect on the degree of learning from strategic alliance networks. I have not, however, clarified the relative impact of these dimensions (and their combinations), as opposed to other factors. An information search through participation in alliance networks could be complemented by the participation of firms and their employees in cooperative endeavors such as technical committees (e.g., Rosenkopf, Metiu, & George, 2001; Rosenkopf & Tushman, 1998), professional associations (e.g., Swan, Newell, & Robertson, 1999), jointly authored technical papers (e.g., Liebeskind et al., 1996), informal resource exchanges (e.g., Bouty, 2000; Kreiner & Schultz, 1993), interlocking board directorships (e.g., Davis & Greve, 1997; Davis, Yoo, & Baker, 2003; Galaskiewicz & Wassermann, 1981; Geletkanycz & Hambrick, 1997; Haunschild, 1993; Zajac & Westphal, 1996), or ownership links (e.g., Kogut & Walker, 2001). Also the current literature on social networks rarely takes more than one network into consideration (Gulati, 1998). How these different networks interact, however, may affect firm performance. Gulati and Westphal (1999), for instance, found that board interlocks influenced the likelihood of alliance formation. It might be revealing for future research to examine the impact of multiple networks on organizational learning and firm performance.

If the argument is valid that both external as well as internal relationships influence the success or failure of learning efforts, then the same logic might be extended to other related constructs. For example, if trust is an effective mechanism for reducing governance costs and improving cooperation between firms, what happens if a low degree of intraorganizational trust collides with a strong interfirm trust relationship? Or, looking at strategy process research, what impact would varying combinations of consensus or cognitive and affective conflict have on the outcome of alliance networks?
I have focused on learning alliances in dynamic high-tech environments, where the potential positive impact can be very pronounced (Hagedoorn & Duysters, 2002). I need to acknowledge, however, that the positive effects of weak external ties might be diminished in industries characterized by low dynamism, both because organizations are not likely to capture new innovations and because firms do not aggressively try to change the industry structure. A combination of strong inter- and intrafirm ties instead might be best suited to enabling a firm to reap the benefits of its participation in alliance networks. The positive effect of bridging structural holes may be less pronounced in industries characterized by relatively complete networks, where having non-redundant ties to relative isolates does not provide additional benefits (cf., Zaheer & Zaheer, 1997).

My analysis of the various combinations of inter- and intrafirm networks has been confined to an examination of the direct effect of these constructs on a focal organization’s ability to learn from alliance networks. I have not addressed the question of whether there are interrelationships between the different network dimensions. Some scholars indicate the existence of interrelationships among relational and structural network dimensions. For instance, Hansen (1999) has argued that even when strong non-redundant ties exist, weak non-redundant ties across subunit boundaries are more cost-efficient and still provide search benefits. Rowley et al. (2000) have also found weak empirical support for their hypothesis that dyadic-level trust due to tie strength and network-level norm creation due to network density might be viable governance mechanisms in interfirm alliances. The power balance inherent in different network combinations might be influenced simultaneously by more than one network characteristic. For example, whereas interfirm network density influences the ability of the alliance partners to constrain the focal firm, the firm’s centrality influences its ability to resists its partners’ constraints (Rowley, 1997). Although I have been careful not to frame my proposed relational and structural network combinations in apparent contradiction to one another, examining such

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13 Congruent with this argument, Hagedoorn and Schakenraad (1994) empirically demonstrate that the R&D inclination of a firm’s strategic linkages, i.e., companies attracting technology through their alliances and companies concentrating on R&D cooperation, is associated with higher economic performance.

14 For instance, when two relationships in a triad are strong, it is likely that the third relationship will be at least minimally, if not even strongly, connected (Granovetter, 1973). Therefore, a network combination
interrelations between the chosen network dimensions in future research may enrich the theoretical validity of my model.

A final limitation of my framework is its rather static view. It tends to ignore the evolutionary process through which the external and internal networks of a firm arise and the subsequent impact of this formation on the capabilities of an organization to acquire and diffuse information and knowledge (Tsai, 2000). The alliance activities of an organization, however, often go through a series of transitions and evolve in ways that are difficult to predict (Inkpen, 2001). For instance, various evidence of the gains associated with brokerage has been discussed above, but these benefits can be expected to disappear as more and more organizations build bridges across the same structural hole (Burt, 2000; Walker et al., 1997). Especially in cases where firms exploiting structural holes control information opportunistically is there an incentive for connected firms at the receiving end to forge links around the former (Gnyawali & Madhavan, 2001). This path to an equilibrium, where the value of bridging the hole is marginally higher than the cost, can be substantially lengthened if the industry is subject to continuous change. In this situation information quickly becomes out-of-date, and alliance networks of organizations with more structural holes possess an advantage in identifying and developing more rewarding opportunities (Burt, 2000). Firms that develop a reputation for being aggressive learners will probably not find it easy to form new alliances because substantial information and knowledge acquisition by one partner, may in time lead to a breakdown of the bargaining relationship between the partners (Hagedoorn & Duysters, 2002; Inkpen & Dinur, 1998).

3.4 Conclusion

While dyadic alliances pose a significant challenge for an organization, participation in a strategic alliance network considerably increases the demands of learning from others. Firms not only have to find a favorable position in their external network of cooperating organizations, but must also manage the fabric of internal characterized by strong linkages and numerous structural holes seems unlikely to occur or at least will not persist in the long run.
relationships between their subunits so that both relationships complement and support each other.

This challenging, managerial task opens up a broad set of opportunities that are otherwise beyond the reach of an organization. Furthermore, if firms are able to shape the composition of their external and internal relationships, then this capability might neither be easy to imitate nor substitute and thus become the foundation of a sustainable competitive advantage.
4 Inter- and Intrafirm Decision-Making Processes

The management of strategic alliances is a significant challenge for organizations and at the same time an under-investigated phenomenon in research (Barringer & Harrison, 2000; Ireland et al., 2002; Ring & Van de Ven, 1994; Spekman et al., 1998). Previous research on alliances suggests that perhaps the two most important factors in alliance success is previous (related) alliance experience (Anand & Khanna, 2000; Simonin, 1997) and a firm’s investment in a dedicated alliance function (Kale et al., 2002). The implicit assumption behind this argument is that there are learning effects that enable firms to develop a “relational” or “alliance capability” (Dyer & Singh, 1998) which in turn should be supported by the creation of a dedicated structure to coordinate and leverage that experience more effectively (Kale et al., 2002). Understanding how alliances are successfully managed over time, however, requires a systematic study of the dynamic aspects of such collaborative agreements, i.e., alliance process research. Therefore research should be directed towards enhancing our knowledge about the management of alliances should direct research and has the potential to contribute to a reduction in alliance failures through improved managerial practices (Barringer & Harrison, 2000).

So far, however, the way in which learning from alliances takes place remains unclear, and authors consequently point out the need for “data internal to each firm regarding the organization of their alliance management processes, possibly collected through surveys” (Anand & Khanna, 2000: 314). To date there has been comparatively little research in this area in sharp contrast to the predominant interest in content issues (e.g., alliance formation), and detailed studies about what exactly constitutes an alliance capability are virtually nonexistent (Barringer & Harrison, 2000; Gulati, 1998). With rare exceptions (e.g., Draulans, deMan, & Volberda, 2003; Subramani & Venkatraman, 2003), academic research has neglected concepts and measures that focus on alliance management processes as explanatory variables for alliance success (Spekman et al., 1998).

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15 This chapter is based in part on a paper that has been nominated for the Strategic Management Society (SMS) Best Conference Paper Prize at the SMS Annual International Conference in San Juan, Puerto Rico, 2004.
To fill this gap, I empirically examine the strategic decision-making processes within European high-tech firms with respect to their strategic alliances as a subgroup of alliance management. I relate these processes to the performance of a firm’s strategic collaborations. As each alliance partner will have different cooperative and competitive objectives as well as a distinct specific ability to appropriate alliance benefits, I evaluate the individual benefits for the focal firm. Since the complex and ambiguous context of strategic alliances forces firms to face the simultaneous and paradoxical need to plan carefully and analytically, but to move quickly and boldly (cf., Bourgeois & Eisenhardt, 1988), I investigate five constructs representing these apparently conflicting needs. I argue that rationality, speed, flexibility, politicality, and conflict both within an organization and with its alliance partner significantly influence the performance of its strategic collaborations. More specifically, I examine the interactions between these constructs at the intra- and interfirm level to account for interdependencies\textsuperscript{16} between alliance partners and the required coordination and integration of these processes between partners.

My empirical findings from 103 European high-tech firms engaged in strategic alliances largely confirm my argument that a rational-comprehensive and fast decision-making style – in contrast to a more flexible, incremental style – is the appropriate response to the challenges of strategic decision making with respect to collaborative agreements in dynamic industries. Politicality is found to have a particularly detrimental effect on alliance performance, which is even amplified when a high level of politicality is present at both the firm and alliance level. Conflict has a different influence on alliance performance at each level of analysis; it is beneficial at the firm level and detrimental at the alliance level. My empirical findings also indicate several significant interactions between intra- and interfirm decision-making, and therefore corroborate the necessity for simultaneous consideration of strategic processes within and between firms. My results thus confirm that only a combination of adequately structured intra- and interfirm decision-making processes enables an organization to reap the full benefits of its strategic alliances. On the basis of these findings, I can provide alliance managers with normative guidelines for structuring

\textsuperscript{16} Interdependency means that the interests of one party cannot be achieved without reliance upon another (Rousseau, Sitkin, Burt, & Camerer, 1998).
their alliance-related decision processes within their firm and with their alliance partner(s) and thus support their efforts to tap the full potential of their cooperative agreements.

I will proceed with a concise review of the relevant literature, which will lead to the development of my arguments for the main and moderating effects. An outline of my empirical study will be followed by the presentation of the results. I will conclude with a discussion of the findings, implications, and topics for future research.

4.1 Theoretical Background

Strategic decision making has long been considered an important function of management (Andrews, 1971; Ansoff, 1965). Organizational decision-making processes are characterized by novelty, complexity, open-endedness, and by the fact that organizations have only a vague idea of what a solution might be and how it will be evaluated when it is developed (Mintzberg, Raisinghani, & Théorêt, 1976; Schweiger, Sandberg, & Ragan, 1986). Strategic decisions have a significant expected effect on firm performance, are generally non-routine, involve multiple functional units, and commit significant financial, physical, or human resources or set important precedents (Bourgeois & Eisenhardt, 1988; Mintzberg, 1978; Narayanan & Fahey, 1982). Since alliance-related decisions are generally made at the top of the organization and often include the commitment of substantial resources – especially in the case of joint ventures – they certainly form part, if not necessarily a crucial one, of a firm’s strategic decision making.

There are two predominant views in the literature on how managers should make key decisions (Bourgeois, 1980; Bourgeois & Eisenhardt, 1988; Fredrickson & Mitchell, 1984; Mintzberg, 1973; Schwenk, 1995). The “rational-comprehensive” or “synoptic” approach assumes that managers can agree on goal priorities, search thoroughly for alternatives, and then develop a comprehensive plan to integrate the optimal choice into existing strategy (Andrews, 1971; Ansoff, 1965). In contrast to this highly rational, proactive process, the alternative approach is based on “incrementalism”, in which there is not necessarily an a priori goal consensus
(Mintzberg, 1973; Quinn, 1978), search is probabilistic and constrained (Cyert & March, 1963), and choice is either satisficing (Simon, 1957) or delayed (Quinn, 1980). Under this approach, strategy is made piecemeal, adaptively, and in small increments, rather than comprehensively and in large, purposeful chunks. As Bourgeois and Eisenhardt (1988) pointed out, the dilemma is that the literature could suggest either approach – rational or incremental – as the appropriate choice for alliance decision makers.

It is a fundamental premise of information-processing theory, however, that a fit between the information-processing requirements facing an organization and its information-processing capacity determines organizational performance (Galbraith, 1973; Tushman & Nadler, 1978). In highly dynamic environments characterized by complex information-processing requirements, for instance, a firm needs organizational designs and processes that allow for more real-time and faster information search, acquisition, and interpretation than in less turbulent environments (Eisenhardt, 1989). Bearing this in mind, I focus my investigation of strategic decision-making processes on the context of high-tech alliances in dynamic industries.

**4.1.1 Strategic Decision Making in the Context of Strategic Alliances**

Alliance management has different requirements compared to the management of intraorganizational functions such as a functional unit or business (Spekman et al., 1998). Due to the simultaneous cooperation and competition between interdependent alliance partners, decision making with respect to strategic alliances is characterized by high uncertainty and complexity. In addition to entertaining uncertainty concerns regarding future environmental developments, partners experience “relational risk” about whether the desired cooperation is actually taking place (Das & Teng, 1998; Ring & Van de Ven, 1994). This is especially true for decisions concerning learning.

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Environmental dynamism refers to the rate of change, absence of pattern, and unpredictability of the environment (Dess & Beard, 1984). It is manifested in the rate of market and industry change and in the level of uncertainty about disruptive forces that are beyond the control of individual businesses (Baum & Wally, 2003). The concept of dynamism (i.e., unpredictability) is a component of environmental velocity (i.e., unpredictability and rapid growth), in which “changes in demand, competition, and technology are so rapid and discontinuous that information is often inaccurate, unavailable, or obsolete” (Bourgeois & Eisenhardt, 1988: 816). Such environments are particularly challenging since information is scarce and unreliable, mistakes are costly, and recovery from missed opportunities is difficult (Eisenhardt, 1989).
alliances that involve idiosyncratic, causally ambiguous, tacit, noncodified and/or complex knowledge (Dyer et al., 2001; Hennart, 1988; Inkpen & Dinur, 1998). Organizations involved in a collaboration of this nature face an information asymmetry between partners, and the existing lack of knowledge about a partner is often aggravated by the lack of information sharing (Borys & Jemison, 1989; Mohr & Spekman, 1994). Hence, it is difficult to prespecify the contingencies that arise in alliance-related decision making (Anand & Khanna, 2000). In contrast to strategic decision making in general, alliance-related decision making also has to take the idiosyncrasies of the partner into consideration. A high degree of interrelation between the firm’s and the partner’s decision processes forces additional demands and constraints on alliance-related decision making. In this novel context, previous experiences and habits of a firm may provide only limited guidance. To cope with these challenges, alliance-related strategic decision making within a focal organization is of paramount importance for the benefits of the firm’s strategic alliances to materialize.

To account for interdependencies between alliance partners’ processes as well as for the inherently multilevel nature of cooperative ventures, I investigate decision-making processes at both firm and alliance levels. At the firm level, a multitude of studies on group processes provide the foundation for assessing the influence of decision-making dimensions on alliance performance in dynamic industries. At the interfirm level, the specific characteristics of cooperative agreements lead to the decision-making dimensions having a distinct influence on alliance performance, which sometimes runs contrary to their influence at firm level.

Given the information-processing requirements of the high-tech firms involved in strategic collaborations in my sample industries, I propose that a rational-comprehensive and speedy approach to alliance-related decision making is the appropriate response to such a dynamic environment. Tradeoffs between decision quality and speed are less accessible to alliance managers in high-tech industries. It is rather the case that executives must attain both of them simultaneously. In the next sections I therefore derive and test a set of hypotheses related to the interactive influence exerted by the five predominant decision factors within and between firms on the performance of their strategic alliances. I selected those factors that are central
to the decision-making literature, which are logically and empirically distinct, and which are considered to be of particular importance for inter- and intrafirm decision making in dynamic environments (e.g., Eisenhardt, 1989; Rajagopalan et al., 1993; Schwenk, 1995; Sharfman & Dean, 1997). These factors are rationality, speed, flexibility, politicality, and conflict.

4.1.2 Decision-Making Characteristics

Decision-making rationality. Decision-making rationality in strategic decision making is defined as the “extent to which the decision process involves the collection of information relevant to the decision and the reliance upon analysis of this information in making the choice” (Dean & Sharfman, 1996: 373). It is characterized by systematic and comprehensive scanning for problems and opportunities, intensive analysis in decision making, long-range planning, and formal codification of strategies (Fredrickson, 1986; Miller, 1987).

Firm-level research between rationality and performance in dynamic environments has produced conflicting empirical results. Fredrickson and his colleagues have argued that there is a negative relationship between rationality in the decision-making process and firm performance in a dynamic environment (Fredrickson, 1984; Fredrickson & Iaquinto, 1989; Fredrickson & Mitchell, 1984). According to this view, managers’ information-processing pathologies as well as resource scarcity and time pressures make the incremental approach the superior, and often the only feasible, decision-making style in a dynamic environment. On the one hand, high environmental complexity may lead to cognitive simplification processes such as selective perception, heuristics and biases, and the use of analogies (Schwenk, 1984). Managers facing the challenges of a dynamic environment are therefore forced to “perform limited search in their assessment of the environmental situation, develop solutions by taking concrete actions quickly, and attempt less integration of various emergent responses” (Li & Simerly, 1998: 171). Decision-making rationality, on the other hand, is doomed to failure in a dynamic or uncertain environment since the necessary data are not available, cause-and-effect relationships are not obvious, and the future is not predictable. As a result, incremental processes have been considered
more effective in this environment as such processes have greater speed and flexibility.

Later studies have confirmed that the relationship between rationality and firm performance is contingent on the degree of environmental stability. In contrast, however, these studies have supported a positive relationship between rationality and firm performance in dynamic environments (Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989; Glick, Miller, & Huber, 1993; Goll & Rasheed, 1997; Judge & Miller, 1991; Miller & Friesen, 1983; Priem et al., 1995). Despite these differences, rationality is considered an important dimension of strategic decision making. The inclusion of decision-making rationality is therefore essential for an examination of effective alliance management processes.

**Decision-making speed.** Especially in dynamic environments there is pressure for both a high-quality decision process and a rapid one. How these apparently incompatible requirements (Fredrickson & Mitchell, 1984; Janis, 1982; Schweiger et al., 1986) could be fulfilled simultaneously was empirically demonstrated in Eisenhardt’s (1989) and Wally and Baum’s (1994) studies. In modern organizations with sophisticated planning systems and information technology, rationality and comprehensiveness may not necessarily require more time. Fast decision making therefore may not necessarily diminish decision quality (Wally & Baum, 1994).

The literature on decision-making speed appears to face similar dissent as that on decision-making rationality. More than a decade after Bourgeois and Eisenhardt’s (1988) initial study, there is still no consensus among researchers about the impact of decision speed on organizational outcomes. Various studies have found that decision-making speed positively relates to firm performance (e.g., Baum & Wally, 2003; Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989; Judge & Miller, 1991) and subsequent firm growth (Baum & Wally, 2003), at least in high-velocity environments. However, some studies found no support for this relationship (Forbes, 2001) or even a negative relationship for low-velocity environments (Judge & Miller, 1991). In spite of the above-mentioned inconsistencies in empirical findings, decision-making speed is considered imperative, especially with respect to organizational learning (Baum &
Wally, 2003; Eisenhardt, 1989). For these reasons, it is included in my analysis as a determinant of alliance performance.

**Decision-making flexibility.** Decision-making flexibility has also been considered a crucial characteristic of strategic decision-making processes (Nutt, 1993; Sharfman & Dean, 1997). Flexibility refers to the “extent to which decision makers explore new ideas and assumptions about the firm and its strategic context” (Sharfman & Dean, 1997: 192) and consists of two subdimensions, openness and recursiveness. Whereas openness is conceptualized as the “extent to which decision makers are open to new ideas, information sources, and roles”, recursiveness is defined as the “tendency of decision makers to cycle back in order to re-examine key assumptions” (Sharfman & Dean, 1997: 194-195). Although there have been considerably less studies on decision-making flexibility than on the former two dimensions, the novel and ambiguous context of high-tech alliances necessitates the inclusion of this dimension in my examination.

**Decision-making politicality.** According to the political model of organizations, strategic decisions are arenas where organizational actors compete to satisfy their interests (Dean & Sharfman, 1993; Drory & Romm, 1990; Narayanan & Fahey, 1982; Tushman, 1977). Decisions are assumed to follow the desires and subsequent choices of the most powerful organizational members (Salancik & Pfeffer, 1974). In addition, decision makers may attempt to change the power structure by engaging in political tactics such as coalition formation, lobbying, co-optation, control of agendas, and strategic use of information (Eisenhardt & Zbaracki, 1992). Politics can hence be conceptualized as intentional acts of influence to enhance or protect the self-interest of individuals or groups. They are observable – but often indirect and covert – actions by which executives enhance their power to influence decision making (Eisenhardt & Bourgeois, 1988).

Building on this literature, I focus on the decision-making characteristic of politicality (Hickson, Wilson, Cray, Mallory, & Butler, 1986; Lyles, 1987). Politicality is assumed to be especially prevalent in strategic alliances since decision makers’ preferences are based on individual and firm goals, rather than on collaborative goals.
Decision making in environments of high uncertainty or ambiguity (Fandt & Ferris, 1990; Papadakis, Lioukas, & Chambers, 1998; Pfeffer & Salancik, 1974) and in situations in which rules and regulations are not available to govern actions (Drory & Romm, 1990; Fandt & Ferris, 1990) has been found to be particularly susceptible to political influence. Additionally, in alliance-related decision making characterized by task interdependency and the sharing of joint resources, decision-making politicality has the most relevance (cf., Tushman, 1977). For these reasons, I have included decision-making politicality as the fourth determinant of alliance performance.

**Decision-making conflict.** Although there is widespread agreement among researchers that conflict has a significant influence on strategic decision-making processes (e.g., Hickson et al., 1986; Janis, 1982; Mintzberg et al., 1976; Schweiger et al., 1986), conflict is not yet well understood (Eisenhardt & Zbaracki, 1992). Conflict appears to be important for high-quality decision making, yet it also appears to be an impediment to consensus and affective acceptance (Amason, 1996).

Empirical evidence in the literature on group conflict has produced at least partly equivocal findings. On the one hand, the absence of conflict within decision-making groups has been related to increased economic performance (Bourgeois, 1980). On the other hand, conflict within groups has been found to improve decision quality and strategic planning, financial performance, and organizational growth (Bourgeois, 1985; Papadakis et al., 1998). Later studies have attempted to consolidate these ambiguous findings by disentangling the conflict construct into mostly detrimental affective or relationship conflict and widely beneficial cognitive or task conflict (e.g., Amason & Schweiger, 1994; Jehn, 1995, 1997). The former can be defined as “emotional and focused on personal incompatibilities or disputes”, the latter as “functional, [...] generally task oriented and focused on judgmental differences about how best to achieve common objectives” (Amason, 1996: 127-129). Given that a certain amount of conflict is expected, how such conflict is managed is important (Borys & Jemison, 1989; Parkhe, 1993).

Due to the high correlations between relationship and cognitive conflict (for a review see De Dreu & Weingart, 2003; Simons & Peterson, 2000), however, the empirical validity of the distinction between cognitive and relationship conflict
remains doubtful. Moreover, I am less interested in the influence of conflict at the group level – where most studies were conducted and the distinction between cognitive and affective conflict was developed (e.g., Amason, 1996; Jehn, 1995, 1997) – and more on the distinct influences of firm-level and alliance-level conflict. Whereas most studies about conflict between alliance partners examined conflict management techniques (e.g., Kale et al., 2000; Mohr & Spekman, 1994), I follow previous research on interfirm conflict (e.g., Bucklin & Sengupta, 1993; Zaheer et al., 1998) and examine the impact of conflict as a whole on the performance of strategic alliances. I have therefore included conflict as my final determinant of alliance performance.

4.2 Hypotheses

In the following sections, I will build on the literature cited above and derive specific hypotheses relating these five decision-making dimensions to the performance of a firm’s strategic collaborations.

4.2.1 Decision-Making Rationality

Although Hough and White’s (2003) study of a simulated decision environment recently reported empirical evidence for a positive relationship in a stable environment and no relationship in moderate and dynamic environments, there is, on balance, growing empirical support for the idea that rational decision processes will be positively associated with firm performance in dynamic environments (Mueller, Mone, & Barker, 2000). This view suggests that decision makers in dynamic environments actually accelerate their cognitive processing, and thus fulfill the analytical requirements of rational decision making by using more information, considering more alternatives, and seeking greater amounts of advice. Additionally, comprehensive decision makers are apparently more effective in their assessment of which changes should be ignored as transient and which should be addressed (Glick et al., 1993). Other authors have also found empirical support for the positive relationship between
rationality and decision effectiveness (Dean & Sharfman, 1996), creativity in managerial decisions (Ford & Gioia, 2000), organizational performance (Papadakis et al., 1998; Smith, Gannon, Grimm, & Mitchell, 1988), and organizational effectiveness (Jones, Jacobs, & van't Spijker, 1992), but have not been able to confirm that a dynamic environment has a moderating influence.

Particularly in the challenging context of strategic alliances, effective alliance managers deal with uncertainty and complexity by structuring it, guided by a thorough, analytic process (cf., Bourgeois & Eisenhardt, 1988). A systematic and comprehensive search process will be far-reaching and unbiased by previous experiences and habits which might be misleading in the novel context of a cooperative relationship. In contrast to incrementalism, a comprehensive search for strategic alternatives involves the generation of options with major variation to the existing strategy (Jones et al., 1992) and thus enhances creativity (Ford & Gioia, 2000). The resulting behavioral alternatives generated by decision-making rationality can not only reconcile an organization with its environmental reality, but also align it with the idiosyncrasies of its alliance partner. Lastly, a rational process will generate alternative or fallback options in case the chosen option unexpectedly proves to be infeasible or ineffective. My hypothesis would therefore be that rationality within a firm has a positive effect on alliance performance. In formal terms:

Hypothesis 1a: High rationality in alliance-related decision-making within a firm is positively associated with the performance of the strategic alliance.

The collective and simultaneous analysis of multiple alternatives not only allows quick and intelligent responses to fast-moving environments, but also provides alliance managers with options for mutual gains, which are required particularly in the context of these cooperative agreements.

In addition to being comprehensive in making individual strategic decisions (i.e., analytical comprehensiveness), decision makers have to integrate these decisions into a consistent whole (i.e., integrative comprehensiveness). In order to enable alliance managers to “integrate the decisions that compose the overall strategy to insure that they reinforce each other” (Fredrickson & Mitchell, 1984: 402), a willingness to
cooperate and share the relevant information is required from both alliance partners if their respective alliance strategies are to be successfully aligned. The collective preparation of carefully developed long-term plans provides reliable anchors and guidelines for both alliance partners’ decision processes. Therefore:

**Hypothesis 1b:** High rationality in alliance-related decision-making between alliance partners is positively associated with the performance of the strategic alliance.

Given the existence of an information asymmetry between partners and the lack of knowledge about a partner (Borys & Jemison, 1989; Mohr & Spekman, 1994), however, both alliance partners are dependent on each other’s information and knowledge. In other words, the comprehensive collection of information relevant to a particular decision at the intrafirm level is only feasible if both alliance partners adopt procedural rationality in their decision processes and share their respective information and knowledge at the interfirm level. Otherwise the firm-level decision may be reached in a rational manner, but will be based on inadequate or even misleading information from the alliance partner. I therefore propose an interaction effect of intra- and interfirm rationality. In formally terms,

**Hypothesis 1c:** Interfirm and intrafirm decision-making rationality will exhibit an interaction effect on a focal organization’s alliance performance. Specifically, the positive effect of high intrafirm rationality will be diminished if there is low interfirm rationality.

### 4.2.2 Decision-Making Speed

There are three main reasons for the importance of high decision-making speed with respect to collaborative agreements between firms. First, alliance managers, like any other executives, learn by making decisions, and if they make few decisions – as slow decision makers tend to do – they learn very little. This, in turn, impedes the development of an alliance capability. Second, the opportunities which interfirm collaborations provide move quickly in uncertain and dynamic environments, and technical change places a premium on rapid decision making. Slow decision making is
considered inappropriate in technologically disrupted markets as delay does not yield useful information (Baum & Wally, 2003). Fast alliance-related decision processes, in contrast, enable firms to preempt their competitors’ moves and keep pace with the environment, which is one of the major reasons for the formation of collaborative agreements in the first place (Bierly & Chakrabarti, 1996). And third, decision-making speed facilitates early adoption of a partner’s successful new products, business models, and process technologies, which in turn may yield valuable organizational learning from alliances and provide subsequent competitive advantages (Baum & Wally, 2003; Bourgeois, 1985). Since this positive influence of high decision-making speed on alliance performance is equally effective at both the firm and the alliance level, my hypotheses run as follows:

Hypothesis 2a: High speed in alliance-related decision making within a firm is positively associated with the performance of the strategic alliance.

Hypothesis 2b: High speed in alliance-related decision making between alliance partners is positively associated with the performance of the strategic alliance.

Task interdependencies between alliance partners may require a partner’s inputs into the firm’s decision processes (cf., Jehn, 1995; Tushman & Nadler, 1978). Alliance partners generally rely on each other to perform and complete their individual duties as specified by their cooperative agreement. Slow decision-making processes in one firm may thus significantly impede progress in its partner’s decision making. Therefore I propose the existence of an interaction effect between intra- and interfirm decision-making speed. In formal terms,

Hypothesis 2c: Interfirm and intrafirm decision-making speed will exhibit an interaction effect on a focal organization’s alliance performance. Specifically, the positive effect of high intrafirm decision speed will be diminished if there is low interfirm decision speed.
4.2.3 Decision-Making Flexibility

Whereas previous research has argued that decision-making flexibility is positively related to decision outcomes in a variety of areas (Nutt, 1993; Sharfman & Dean, 1997) and few studies have empirically verified these arguments (e.g., Ford & Gioia, 2000), such flexibility may have negative effects that outweigh its benefits in the specific context of alliance management. A flexible decision-making process that is open to new ideas, roles, and increased participation to contribute may attract diverse – and potentially incompatible – interests that compete for organizational attention and resources. The permanent re-examination of key assumptions and constant refinement of plans may confront the alliance partner with the increasingly difficult challenge to align its decisions with these changing guidelines, which in turn would negatively affect alliance performance.

Support for a negative influence of decision-making flexibility on alliance performance can also be drawn from the literature on resource accumulation (Dierickx & Cool, 1989). Strategic alliances can be regarded as resource accumulation decisions, which need time and consistency to develop the desired benefits (cf., Kellermanns & Floyd, forthcoming). Permanent reconsideration and reversal of decisions will prohibit the needed consistency in resource flows and endanger the learning process. Therefore:

Hypothesis 3a: High flexibility in alliance-related decision making within a firm is negatively associated with the performance of the strategic alliance.

At the interfirm level, a flexible decision-making process may, however, provide the needed adaptability to successfully combine the firm-level decision processes. Flexible alliance-level decision processes are open to diverse information sources inside and outside the alliance, which may be particularly valuable given the novel and uncertain character of these cooperative decisions. Also, participants from both partners are encouraged to contribute to the decision-making process in ways that might not match their job descriptions. Since previous experiences and habits of managers that have been codified in their job descriptions may provide only limited
guidance for strategic decision making in non-routine situations such as collaborations, an engagement of managers above and beyond their formal responsibilities might be beneficial for successfully dealing with such situations.

A flexible process may further enable alliance managers to adapt to changing circumstances and opportunities and allows them to re-allocate resources to exploit new opportunities. Since alliances are long-term investments with changing and evolving goals, and since it is difficult to prespecify the contingencies that arise in alliance-related decision making (Anand & Khanna, 2000), this may have a positive impact on their performance. These benefits may be further enhanced since added flexibility increases creativity in managerial decision making (Ford & Gioia, 2000) and leads to the sort of novel choices that firms need for adaptation and change (Sharfman & Dean, 1997).

Alliance managers with a flexible style are also more aggressive decision makers and more immune to the distractions arising from the uncertainty and ambiguity (cf., Nutt, 1993) which typically accompany collaborative ventures. They might consider recursive processes as a potential opportunity for creativity and adaptation, rather than as frustrating instances of indecisiveness (Ford & Gioia, 2000). Increasing levels of relational flexibility encourage greater sharing of information and greater exploration of opportunities to maximize joint outcomes (Dyer, 1996). Thus, the ability of alliance managers to cycle between formulation and implementation may improve the flexibility and adaptiveness of the decision process at the alliance level. In line with this argumentation, Lyles and Salk (1996) found that the flexibility of joint ventures is a significant predictor of their performance. Therefore:

_Hypothesis 3b: High flexibility in alliance-related decision making between alliance partners is positively associated with the performance of the strategic alliance._

Alliance partners with flexible decision-making processes may be able to react to a constant revision of plans and a re-examination of key assumptions by one partner.

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18 Relational flexibility is defined as the bilateral expectation that changes will be made to a collaborative agreement to redress hardship when either party is adversely affected by changing circumstances in the exchange (Subramani & Venkatraman, 2003).
This may prevent premature commitments to irreversible action and thus provides a behavioral adaptation mechanism (Bourgeois & Eisenhardt, 1988) for any kind of contingencies arising from one partner’s changes. In contrast to the sequential decision making of a formal planning process, alliance managers may find ways to take a few tentative steps and then constantly refine their plans according to the feedback they receive. Therefore:

*Hypothesis 3c: Interfirm and intrafirm flexibility will exhibit an interaction effect on a focal organization’s alliance performance. Specifically, the negative effect of high intrafirm flexibility will be diminished if there is high interfirm flexibility.*

### 4.2.4 Decision-Making Politicality

Politicality is generally found to have a negative influence on decision-making effectiveness (Dean & Sharfman, 1993, 1996), particularly in highly dynamic environments (Eisenhardt & Bourgeois, 1988). There are four main reasons for this negative influence of decision-making politicality in alliance-related decision making. First, decision-making politicality stands in contrast to straightforward influence tactics such as open discussion and full sharing of information; it distorts and restricts information flow. This in turn forces alliance managers to engage in a more complicated and lengthy information-gathering process to obtain the relevant facts for an educated decision, which is particularly detrimental in dynamic environments where a premium is placed on timely and accurate information.

Second, decision-making politicality diverts time and other resources and dissipates decision makers’ attention and energy from their functional and alliance-related responsibilities. In processes characterized by politicality, attention is focused on interests, power bases, and jockeying for positions inside the organization, rather than on the opportunities and constraints that the alliance partner or the external environment provide. It is time-consuming to engage in politics, and coalition formation, lobbying, and negotiation may significantly delay the decision process (Bourgeois & Eisenhardt, 1988).
Third, in politically influenced decision-making processes, commitment to a strategic decision begins to evolve during the early phases and may lead to a conscious or unconscious distortion of information and promotion and suppression of alternatives (Narayanan & Fahey, 1982). Information is used solely to support one’s own position and to discredit or oppress opponents’ arguments.

Finally – and most relevant to alliance-related decision making – Whereas effective decisions must be based on organizational or collaborative goals, political decision processes are organized around the self-interests of certain individuals, groups, or one alliance partner only. If these interests are in conflict with those of the organization or the alliance partner, political activity will make it less likely that a decision outcome will serve organizational and/or collaborative interests (Dean & Sharfman, 1996). For instance, diverse criteria used by managers representing different constituencies may rule out alternatives that might be valuable under less contentious circumstances (Ford & Gioia, 2000). Moreover, a promising strategic alternative or potentially valuable fallback option may be eliminated due to the opposition of a powerful individual or group. Politicality is therefore generally found to have a negative influence on decision-making effectiveness (Dean & Sharfman, 1993, 1996). With respect to alliance-related decision making, my hypothesis runs as follows:

Hypothesis 4a: High politicality in alliance-related decision making within a firm is negatively associated with the performance of the strategic alliance.

As Drory and Romm (1990) pointed out, organizational politics need not be restricted to the action of individuals alone. Organizational groups within one alliance partner or the alliance partner as a whole may behave in a political manner based on some mutual consensus. The negative implications of politicality at the intrafirm level are likely to be amplified at the interfirm level, where there are even more conflicting interests and preferences between partners (Hamel, 1991). Decision-making politicality creates rigid barriers to communication – within and particularly between alliance partners – and thereby constrains the range of alternatives considered (Eisenhardt & Bourgeois, 1988). Additionally, Eisenhardt and Bourgeois (1988) found
that due to the lack of information flow and managers’ attempts to disguise their intentions, decision makers engaged in politics were often incorrect in their perceptions of each others’ opinions and only poorly communicated with each other, thereby limiting their ability to form coalitions of interest and effectively collaborate with colleagues. This is particularly detrimental for the cooperation of managers from both alliance partners who often do not share a common work history and therefore face a knowledge asymmetry concerning each others’ motives and intentions. Therefore my hypothesis runs as follows:

_Hypothesis 4b: High politicality in alliance-related decision making between alliance partners is negatively associated with the performance of the strategic alliance._

The opportunistic pursuit of individual interests at the firm level will be even more detrimental for alliance performance when it is confronted with politicality at the alliance level. Under these circumstances, it will no longer be possible to reach a common agreement on collaborative goals and means. Hence, alliance-related decision-making will become a stalemate of incompatible political interests at the firm level and alliance level, and the alliance will lose its ability to function. Only a cohesive and unified position within the firm that is free of politicality will be able to alleviate the negative influence of high politicality at the alliance level. Therefore:

_Hypothesis 4c: Interfirm and intrafirm politicality will exhibit an interaction effect on a focal organization’s alliance performance. Specifically, the negative effect of high intrafirm politicality will be stronger if there is high interfirm politicality._

### 4.2.5 Decision-Making Conflict

Research on group conflict suggests that the synthesis that emerges from contesting diverse perspectives is generally superior to the individual perspectives themselves (e.g., Schweiger & Sandberg, 1989; Schweiger et al., 1986). Norms supporting constructive conflict lead to the discussion of diverse perspectives and subsequently to alliance managers’ accurate assessment and understanding of the
environmental context (cf., Fiol, 1994; cf., Sharfman & Dean, 1997). Conflict within the firm might therefore help to provide a clearer understanding of the partner’s goals, expectations, and behaviors and to enhance affective acceptance of and commitment to a decision, which in turn increases performance (cf., Amason, 1996).

The increased cognitive flexibility (Sharfman & Dean, 1997) that conflict tends to induce in decision makers is particularly valuable in complex, non-routine situations like strategic alliances. Especially in this context, where the relationships between resources and competitive advantage are ambiguous (Reed & DeFillippi, 1990), conflict improves the ability of managers to scrutinize alliance issues, engage in deep and deliberate processing of alliance-relevant information, identify and differentiate between multiple dimensions of an issue and to generate alternative approaches, and thus reduce the ambiguity of alliance-related decisions.

Moreover, constructive conflict is said to create a culture where decision making is based on arguments rather than hierarchy (Burgelman, 1994). Such a culture is particularly useful for alliance-related decision making, since central or hierarchical coordination within firms fails in the context of the transfer of non-codifiable and complex knowledge (cf., Grant, 1996) which is inherent – at least to some extent – in all interfirm relationships. Therefore:

\[ \text{Hypothesis 5a: High conflict in alliance-related decision making within a firm is positively associated with the performance of the strategic alliance.} \]

Several authors have argued that a critical aspect of any partnership is the potential for conflict between the alliance partners and how they deal with it. Interfirm conflict is likely to occur for two reasons (Das & Teng, 2000). First, the diversity of alliance partners creates problems for cooperative activities (Parkhe, 1991). Alliance partners have difficulties working together if they are too different in their organizational cultures, managerial practices, and technological systems (Park & Ungson, 1997). And second, because alliance partners’ objectives are rarely identical, competing interests between alliance partners may lead to divergent and incompatible goals, unforeseen contingencies in day-to-day relationships, disagreements concerning resource allocation, and opportunistic behavior. Research suggests that even the
relationship between task conflict and performance is likely to be negative when
decision makers perceive competitive rather than cooperative goal interdependence
(Alper, Tjosvold, & Law, 2000).

Support for a negative association between interfirm conflict and alliance
performance can be drawn from two distinct perspectives: The information processing
perspective and research on intergroup conflict. According to the information
processing perspective, intensified conflict leads to a shutdown of the cognitive
systems and impedes information processing. Conflict and misunderstandings can thus
minimize the flows of information and learning (Parkhe, 1993). This perspective
makes no distinction between task and relationship conflict and expects a negative
correlation with decision-making quality for both conflict types. The negative effects
are even stronger for more uncertain and complex tasks, which in turn are common in
alliance-related decision making. De Dreu & Weingart’s (2003) recent meta-analysis
on conflict provided support for the information processing perspective.

Following early research on group membership and intergroup competition (e.g.,
Coser, 1956), conflict between alliance partners may lead to perceptual biases and
negative images of the partner. An in-group/out-group bias develops, which is
characterized by a tendency to favor one’s own firm and a tendency to look
unfavorably on the alliance partner and its managers, procedures, culture, and
products. This in turn will have a negative impact on the cooperation between alliance
partners and subsequently on alliance performance.

As a result, there is widespread agreement among researchers that interfirm
conflicts and their resolution affect alliance performance (e.g., Dymsza, 1988; Kogut,
1988). The inability of alliance managers to limit the amount of conflict, regardless of
its source, is likely to reflect ineffective leadership and aggravate any power
imbalances (Bucklin & Sengupta, 1993). Moreover, conflict in interfirm decision-
making processes erodes trust, increases the potential for opportunistic behavior, and
reduces the likelihood of partners dedicating necessary idiosyncratic assets to the
relationship (Cullen, Johnson, & Sakano, 1995). Bucklin & Sengupta (1993), in
support of the above argumentation, found a negative relation between interfirm
conflict and the effectiveness of cooperative relationships. Moreover, Lyles and Salk
(1996) found that conflicts in shared management joint ventures were negatively
related to both knowledge acquisition and general assessment of joint venture performance. Therefore my hypothesis runs as follows:

_Hypothesis 5b: High conflict in alliance-related decision making between alliance partners is negatively associated with the performance of the strategic alliance._

Conflict tends to exist in alliance relationships on account of the inherent interdependencies in both partners’ decision-making processes. This mutual dependence of alliance partners requires joint coordination and effective problem solving (e.g., Kale _et al._, 2000; Mohr & Spekman, 1994). Whereas firm-level conflict may lead to high-quality decisions, conflict at the alliance level may thus erode the value of such an approach to decision making. In more formal terms:

_Hypothesis 5c: Interfirm and intrafirm conflict will exhibit an interaction effect on a focal organization’s alliance performance. Specifically, the positive effect of high intrafirm conflict will be diminished if there is high interfirm conflict._

### 4.3 Methodology

#### 4.3.1 Sampling Procedures

To obtain my initial sample, I used the Securities Data Company’s (SDC) Platinum Database, which obtains data from publicly available sources, including SEC filings, trade publications and international counterparts, and news and wire sources. Although the database clearly would not track all deals entered into by companies over the 1995-2002 sample period, it is a sensible starting point for empirical analysis since it is among the most comprehensive sources of information of such deals (Anand & Khanna, 2000). However, as Das and Teng (2000: 96-97) pointed out, “the difficulty lies in the relative scarcity of alliance databases and, also, the fact that they often contain sketchy information about the alliances”. Therefore I supplemented the SDC data with industry-specific data sources about strategic alliances from the telecommunications, computers, and services industry, such as industry associations.
Lastly, executive education programs at the University of St. Gallen for managers from high-tech firms were used to approach executives who are involved in alliance-related activities in my sample industries.

Due to the moderating influence of industry dynamism on the relationship between decision-making processes and outcome variables (e.g., Bourgeois & Eisenhardt, 1988; Goll & Rasheed, 1997; Hough & White, 2003; Judge & Miller, 1991), the choice of industries was of particular importance in this study. My sample included strategic alliances from the pharmaceuticals, medical, computers (hardware and software), electronics, telecommunications, energy technologies, and related services sectors, which is similar to other studies in the high-tech industry (e.g., Andersson et al., 2002; Dyer et al., 2001; Gulati, 1995, 1999; Gulati & Singh, 1998; Kale et al., 2001, 2002; Kale et al., 2000; Lane & Lubatkin, 1998; Luo, 2002; Mowery et al., 1996; Reuer, Zollo, & Singh, 2002; Rowley et al., 2000; Simonin, 1997, 1999; Veugelers, 1997). In these industries, alliances are generally considered an important element of firm strategy (Alliance Analyst, 1996; Culpan & Costelac, 1993), and are preferred as the main mechanism for acquiring external innovative capabilities (Hagedoorn & Duysters, 2002). Additionally, these industries are characterized by a significant degree of dynamism (Baum & Wally, 2003), which means they constitute an excellent context for the current study. In line with other researchers (e.g., Saxton, 1997), I limit my study to dyadic alliances (i.e., those with only two partners) which enables me to capture and measure key strategic variables. Since any type of alliance may provide a path for information search and acquisition, and as previous studies indicate that the breadth of an alliance’s true activity is often much greater than formal reports suggest (Powell et al., 1996), I have included all alliance types in my analysis.

My initial dataset consisted of 1,026 firms involved in strategic alliances in my sample industries. After excluding partners from countries outside Germany, Austria, Switzerland, and France I ended up with 837 sample firms. 16 sample firms involved in multi-partner alliances also had to be excluded. For 565 of the remaining firms, a complete address and contact person knowledgeable about the specific strategic alliance were still available at the time of data collection. As Zollo et al. (2002) pointed out, it is reasonable to expect such a significant loss of contacts, given the high mortality rate, the acquisition activity, and the small size of many of the companies
sampled. An initial inquiry led to a loss of a further 35 companies which informed me that, contrary to the reported information, they had not engaged in the cooperative agreement. My final dataset thus comprised 530 firms involved in strategic alliances.

### 4.3.1.1 Questionnaire

The survey I designed was pre-tested using business school faculty members and doctoral students (cf., Parkhe, 1993; Pearce, 2001; Reuer et al., 2002; cf., Zollo et al., 2002). They completed and critiqued the draft survey and I refined the questionnaire in line with respondents’ suggestions. Following these modifications, the four-page questionnaire was emailed or faxed to the contact people at the targeted sample of firms. An accompanying letter explained the study’s aims and promised a report on the principal findings. This letter also requested that the questionnaire be forwarded to the individual who was most knowledgeable about the agreement indicated on the survey. Since the experience of one strategic alliance might be very different from another, and since it would be difficult for the respondent to generalize, I asked the respondents to assess solely the alliance indicated in the questionnaire (Tsang, 2002).

After two rounds of follow-up calls and emails, 103 firms completed usable questionnaires, which corresponds to a 19.4 percent (103/530) response rate. This response rate was considered satisfactory given the seniority of respondents as well as the heavy surveying activity in the targeted industries. It was also in line with other studies of strategic alliances (e.g., Tsang, 2002) and with recent processes-related studies (Ray, Barney, & Muhanna, 2004).

### 4.3.1.2 Respondents

To ensure a high quality of the responses, the surveys were addressed to upper-echelon executives who were familiar with the alliance-related activities of their firms. As a result, the majority of my respondents were executives holding positions such as

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19 Three of the 106 questionnaires received had to be excluded as the respondents only filled out the questionnaire for the firm level and not for the alliance level.
chairman, president, chief executive officer, managing director, general manager, or department head. Moreover, of the respondents that indicated their length of service on the questionnaire, more than half had been with their firms for five or more years, and more than a third for 10 or more years. Hence, most of my respondents not only had an in-depth understanding of the management systems and strategic thinking of their firms but were also probably the most qualified people to provide information on specific strategic alliances (Eisenhardt & Schoonhoven, 1996; Geringer & Hebert, 1991; Tsang, 2002). Being executives, they were also able to observe and to determine the impacts of a particular alliance on the rest of the organization (Parkhe, 1993; Simonin, 1997, 1999).

4.3.2 Measures

Where available, I used measurement instruments from the existing literature to operationalize the theoretical constructs. A detailed description of the measurement items for my control, independent, and dependent variables is provided in Table 6.

4.3.2.1 Independent Variables

All my independent variables were measured on 5-point Likert-type scales. Some items were slightly modified to reflect the specific context of the study. In particular, I combined Sharfman and Dean’s (1997) openness and recursiveness constructs into one, namely decision-making flexibility. I performed a factor analysis that confirmed the validity of this combination. In the unrotated factor analysis, openness and recursiveness clearly loaded on one factor which explained 66.24 percent of variance at the firm level, and 66.13 percent of variance at the alliance level (all factor loadings were above .73). I also combined Jehn and Mannix’s (2001) measures of relationship and cognitive conflict. The high correlation between task and relationship conflict in my study (.80 at firm level; .83 at alliance level; both p < .01) is consistent with recent meta-analyses (e.g., De Dreu & Weingart, 2003) and corroborates the validity of combining the two types of conflict. Again, I performed an unrotated factor analysis
that confirmed this combination. In this case, the combined conflict measure explained 72.65 percent of variance at the firm level and 74.15 percent at the alliance level (all factor loadings were above .80).

### 4.3.2.2 Dependent Variable

In this study, I have chosen a measurement type that has been successfully deployed in recent alliance studies: The managerial assessment of alliance performance. However, managerial assessments received some initial criticism on the grounds of bias and inaccuracy. This was especially true until several authors (e.g., Dess & Robinson, 1984; Geringer & Hebert, 1989, 1991; Hansen & Wernerfelt, 1989; Kale et al., 2002) empirically demonstrated the existence of a high correlation between subjective assessments of performance with more objective measures based on accounting data and abnormal stock market gains. Hence there is an emerging consensus among scholars that managerial assessments (if properly conducted) are a reasonable way to assess alliance performance (Anderson, 1990; Anderson & Weitz, 1989; Cullen et al., 1995; Das & Teng, 2000). Previous research on strategic decision making has also found subjective performance measures to be useful (e.g., Priem et al., 1995).

Managers and practitioners often measure long-term alliance performance by examining the extent to which alliance objectives have been met (Das & Teng, 2000; Geringer & Hebert, 1991; Lane & Lubatkin, 1998; Lin & Germain, 1998; Parkhe, 1993; Saxton, 1997). However, Arino (2003) found that goal fulfillment on the one hand, and overall performance satisfaction and net spillover effects on the other hand, do not measure the same construct. Whereas goal fulfillment captures only outcome performance, an assessment of overall alliance performance should capture both outcome and process performance, i.e., how far the pattern of interaction is acceptable to both partners. In line with this argument, I employed an *alliance performance* measure based on Dyer et al. (2001) and Kale et al. (2001), using on a 7-point Likert-type scale, which is described in detail in Table 6.
<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>Scale</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Firm performance</td>
<td>How would you rate your company's current performance as compared to your competitors on the following dimensions?</td>
<td>1 = much worse, 2 = about the same, 3 = much better</td>
<td>(Dess &amp; Robinson, 1984)</td>
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<td></td>
<td>· Growth in sales</td>
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<td></td>
<td>· Growth in market share</td>
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<td></td>
<td>· Growth in number of employees</td>
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<td></td>
<td>· Growth in profitability</td>
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<tr>
<td></td>
<td>· Profit margin on sales</td>
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<td></td>
<td>· Return on equity</td>
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<td></td>
<td>· Return on total assets</td>
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<td></td>
<td>· Ability to fund growth from profits</td>
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<td>Slack</td>
<td>How difficult would it currently be to get approval for a medium-sized capital project related to the alliance that is worth doing?</td>
<td>1 = very difficult, 5 = not at all difficult</td>
<td>(Sharfman &amp; Dean, 1997)</td>
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<tr>
<td></td>
<td>· Businesses often go through cycles in the availability of money. Sometimes it is very tight, and other times very loose. How would you describe your current situation related to the alliance?</td>
<td>1 = very tight, 5 = very loose</td>
<td></td>
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<tr>
<td>Rationality</td>
<td>How extensively did you look for information in making alliance-related decisions?</td>
<td>1 = not at all, 5 = extensively/highly</td>
<td>(Dean &amp; Sharfman, 1996)</td>
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<tr>
<td></td>
<td>· How extensively did you analyze the relevant information before making an alliance-related decision?</td>
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<td></td>
<td>· How important were quantitative analytic techniques (such as net present value or discounted cash flow analysis, etc.) in making alliance-related decisions?</td>
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<td></td>
<td>· In general, how effective were you at focusing your attention on crucial alliance-related information and ignoring irrelevant information?</td>
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<td></td>
<td>· How would you describe the decision processes that had most influence on alliance-related decisions?</td>
<td>1 = mostly intuitive, 5 = mostly analytical</td>
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</table>

Table 6: List of measurement items
<table>
<thead>
<tr>
<th>Variables</th>
<th>Items</th>
<th>Scale</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Decision-making speed</strong></td>
<td>• When we see a business opportunity related to the alliance, we can move faster than our competitors.</td>
<td>1 = strongly disagree, 5 = strongly agree</td>
<td>(Wally &amp; Baum, 1994)</td>
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<tr>
<td>(5-point Likert-type scale)</td>
<td>• In the context of this alliance, our competitors consider us fast in responding to their actions.</td>
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<td></td>
<td>• From start to finish, we respond faster than our competitors to alliance-related problems.</td>
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<td><strong>Flexibility</strong></td>
<td>• How often did you rely on new sources of information in making alliance-related decisions?</td>
<td>1 = not at all, 5 = very often/a great deal</td>
<td>(Sharfman &amp; Dean, 1997)</td>
</tr>
<tr>
<td>(5-point Likert-type scale)</td>
<td>• How often were novel or original ideas presented during alliance-related discussions?</td>
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<tr>
<td></td>
<td>• To what extent were these novel or original ideas seriously considered?</td>
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<td></td>
<td>• To what degree were people able to contribute to the alliance-related decision in ways that did not strictly match their job description or level of authority?</td>
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<td></td>
<td>• To what extent did you reconsider any choices made during decision-making processes?</td>
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<td></td>
<td>• How often did individuals change their minds during decision-making processes?</td>
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<tr>
<td><strong>Politicality</strong></td>
<td>• In alliance-related decisions, were people primarily concerned with their own goals or with the goals of their organizations?</td>
<td>1 = own goals completely, 5 = organizational goals completely (reverse-scaled in analysis)</td>
<td>(Dean &amp; Sharfman, 1996)</td>
</tr>
<tr>
<td>(5-point Likert-type scale)</td>
<td>• To what extent were people open with each other about their interests and preferences in alliance-related decisions?</td>
<td>1 = not at all, 5 = completely (reverse-scaled in analysis)</td>
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<tr>
<td></td>
<td>• To what extent were alliance-related decisions affected by the use of power and influence among people?</td>
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<tr>
<td></td>
<td>• To what extent were alliance-related decisions affected by negotiation among people?</td>
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</tr>
</tbody>
</table>

Table 6 cont’d: List of measurement items
### Conflict (5-point Likert-type scale)

- How much **tension between people** was there in alliance-related strategy processes? 1 = none/not at all, 5 = a great deal/very often (Jehn & Mannix, 2001)

- How often did people get **angry** during alliance-related strategy processes?

- How much **emotional conflict** was there related to the alliance?

- How much **conflict of ideas** related to the alliance was there?

- How frequently did you have **disagreements about task-fulfillment** within the scope of the alliance project you were working on?

- How often did people have **conflicting opinions about the alliance project** you were working on?

### Alliance performance (7-point Likert-type scale)

- **This alliance** is characterized by a strong and harmonious **relationship** between the alliance partners. 1 = strongly disagree, 7 = strongly agree (Kale et al., 2002)

- Our **company** has achieved its primary **objective(s)** in forming this alliance.

- Our **company’s competitive position** has been greatly enhanced due to this alliance.

- Our **company** has been successful in **learning** some critical skill(s) or capabilities from its alliance partner.

- Please give an **overall assessment of this alliance**, based on all the above dimensions. 1 = unsatisfactory/failure, 7 = satisfactory/success

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**Table 6 cont’d: List of measurement items**
4.3.2.3 Control Variables

I incorporated three firm-specific and one alliance-specific control variables. *Firm size* has been recognized as a key variable affecting interorganizational collaboration (Hagedoorn & Schakenraad, 1994; Simonin, 1997). In particular, the size of the firm may influence knowledge acquisition and exploitation (Autio, Sapienza, & Almeida, 2000), as larger firms may have more resources to enhance the probability of alliance success. Large firms are also more likely to have more alliance experience because of more opportunities to engage in alliances, which in turn affects the success rate (Kale *et al.*, 2002). Similar to previous studies (e.g., George *et al.*, 2001; Hagedoorn & Duysters, 2002; Kale *et al.*, 2002; McEvily & Marcus, 2000; McEvily & Zaheer, 1999; Powell *et al.*, 1996; Stuart, 1998; Tsang, 2002; Veugelers, 1997; Yli-Renko *et al.*, 2001), firm size is included as a control variable and measured as the logarithm of the number of employees.

The second control variable is *current firm performance*. Firm performance indicates an organization’s degree of success in the marketplace. Whereas poor performers may seek alliances to improve their performance, good performers may enter into a partnership to leverage some of their successes (Gulati, 1995). And this, in turn, may have a significant influence on their assessment of alliance performance, which is why I included firm performance in my analysis. Respondents were therefore asked firm performance questions based on Dess and Robinson’s (1984) study. More specific, they were requested to rate their firm’s performance compared to similar firms as regards sales growth, after tax return on sales and total assets, and overall performance/success. These ratings were also converted so that higher scores represent higher performance. Subjective, self-reported performance measures have been found to show a high degree of correlation with objective measures of firm performance (Dess & Robinson, 1984; Robinson & Pearce, 1988; Venkatraman & Ramanujam, 1987), and can therefore be considered an adequate proxy for measuring the performance of an organization.

The third control variable is *firm-level slack*, defined as “that cushion of actual or potential resources which allows an organization to adapt successfully to internal
pressures for adjustment or to external pressures for change in policy, as well as to initiate changes in strategy with respect to the external environment” (Bourgeois, 1981: 30). There are two contrasting perspectives in the literature about the role of slack in organizational adaptation. The first views slack as a buffer that shields organizations from external contingencies (Cyert & March, 1963; Galbraith, 1973). Thus, slack may slow down decision makers’ reactions to competitors’ moves or environmental changes and it may induce decision makers to satisfice, i.e., to reduce the criteria by which an alternative is considered feasible (Simon, 1957). The second perspective views the presence of slack as a means which allows organizations to experiment with creative and innovative new strategies (Hambrick & Snow, 1977; Singh, 1986). Firms with slack demonstrate more flexibility in their strategic decision making (Sharfman & Dean, 1997) and are more likely to respond aggressively to shifting environmental demands than those without slack (Cheng & Kesner, 1997). When resources are tight, decision makers spend more time forming coalitions and bargaining for their share of resources, whereas in the presence of slack, more time can be spent coordinating across functions and divisions in an effort to capitalize on strategic opportunities (Cheng & Kesner, 1997; Moch & Pondy, 1977). In firms without slack, managerial attention is likely to be focused on short-term rather than on more uncertain innovative projects (Nohria & Gulati, 1996), which would in turn substantially penalize strategic alliance projects. Lastly, in a learning organization, there must be slack in the form of time for reflection and analysis. If conditions beneficial for learning are to be created, organizations must not be threatened by the apparent inefficiency of the time involved (Lawson, 2001). For these reasons, I included firm-level slack as a control variable.

The fourth control variable included in my analysis is alliance duration, i.e., the logarithm of the number of years from the alliance being formed until it was dissolved or until the year 2003. The argument behind its inclusion is that the longer the duration of the alliance, the greater the collaborative benefits acquired from the alliance partner are likely to be. At the same time, a longer duration would also increase the likelihood of losing one’s proprietary assets to the partner firm (Kale et al., 2000).
4.4 Analysis

Given the problems associated with the use of questionnaires (e.g., Salancik & Pfeffer, 1977), it was particularly necessary to ensure the methodological adequacy of the questionnaire-based measures by verifying their reliability and validity. The scales for each variable were exposed to principal component and reliability analysis (see their respective Cronbach Alphas in Table 7). All factor loadings were above .40, a common threshold for acceptance. Also, the components associated with the highest condition indices did not contribute substantially to the variance of two or more variables, further indicating that collinearity was not a problem. My constructs have also high inter-item reliabilities, with all but firm-level politicality (.69) having alphas above .80, the average being .87. My control variable firm-level slack had an alpha of .81. Then I totaled the scores across items for each construct. These constructs were used as the main building blocks of the subsequent data analysis. No variable was significantly skewed, so all variables were sufficiently close to a normal distribution to justify assumptions of normality.

4.4.1 Examination of Potential Biases

I tested for several biases that might distort the results. First, as all studied variables emerged from the same survey instrument, the risk of a common method bias or consistency artefacts is addressed. Common method variance can artificially inflate bivariate correlations. To prevent that bias, questionnaire items were arranged so that the dependent variable followed, rather than preceded, the independent variables (Salancik & Pfeffer, 1977). Similar to other studies on strategic alliances (e.g., Simonin, 1997; Tsang, 2002; Zollo et al., 2002), the possibility of a common method bias was eliminated by Harman’s (1967) single-factor test using the procedure suggested by Podsakoff and Organ (1986). This test is based on the assumption that if there is a substantial amount of common method variance, then a single factor will emerge from a principal component analysis, and this factor will account for the majority of the covariance in the independent and dependent variables. To address this bias, I performed an unrotated factor analysis using the Eigenvalue-greater-than-one
criterion. I found that no single factor was able to explain more than 30 percent of the variance, a threshold which is commonly used as an indication of common method bias; the first factor captured only 19.32 percent of the variance in the data.

To avoid the problem associated with a social desirability bias (Zerbe & Paulhus, 1987) and to make the respondent feel more comfortable in disclosing sensitive company information, the surveys were returned anonymously by the respondents. Moreover, the complex data relationships shown by the predicted interaction effects will not easily be explained by the common method (Brockner, Siegel, Daly, Tyler, & Martin, 1997), because respondents are hardly likely to guess the researchers’ hypotheses or to respond in a socially desirable manner that would lead to spurious findings.

Incomplete recall and retrospective rationalization may confound results of surveys based upon executives’ recall of past events (Golden, 1992). We took several means to ensure a high quality response. Virtually all respondents were top executives, and steps were taken to ensure that they had been involved in the respective decision-making processes. With respect to survey design, the items that constitute a specific construct were separated from each other in an attempt to limit consistency bias and to reduce any sense of repetitiveness. Additionally, some measures were composed of reverse-coded items (see Table 6).

To address potential multicollinearity between main effects and interaction terms, I centered the variables prior to calculating the interaction analyses, a procedure recommended by Cronbach (1987). This was done by subtracting the mean of the scores for each predictor from each individual score for that predictor. In contrast to the independent variables, the dependent variable was included in the regression in its original scale. Changing the scaling of the independent variable has no effect on regression coefficients in equations containing interactions. Leaving the dependent variable in its original form, however, conveniently results in predicted scores being in the original scale (Aiken & West, 1991), which helps researchers to interpret the results more easily. In order to detect possible multicollinearity, I not only investigated the correlation between the variables (Table 7), but also calculated condition indices for my regression model. These condition indices were far below the suggested warning level of 20 for mild multicollinearity, thus indicating that collinearity was not
a problem. In addition, I also regressed each independent variable on all the other independent variables. The advantage of this procedure over the frequent practice of examining bivariate correlations among the independent variables is that it takes into account the relationships between all independent variables and an independent variable. In other words, “it is possible […] to find no large bivariate correlations, although one of the independent variables is a nearly perfect linear combination of the remaining independent variables” (Lewis-Beck, 1993: 52). This test showed that no significant multicollinearity was detected, as none of the other regressions used for checking multicollinearity in the analysis produced R²'s above .16.²⁰

4.4.2 Statistical Power of this Study

In order to ascertain the statistical power²¹ of my findings, I calculated and assessed the effect size, i.e., the degree to which the phenomenon is present in the population of alliances (Cohen, 1977; Mazen et al., 1987). On the basis of the scientific convention that failure to find a relationship is less serious than finding what does not exist in a population, Cohen (1977) suggested that Type I error (erroneously concluding the presence of a phenomenon in a population) is four times more serious than Type II (mistakenly sustaining the null hypothesis). Since the risk of the former is conventionally set at α = .05, Cohen (1977) offered .2 as a conventional Type II error rate (β), thereby setting conventional power at .8. In general, the larger the sample size, the smaller the error, and hence the more accurately the phenomenon under investigation can be represented. Additionally, the larger the sample, the smaller the effect it can detect (Mazen et al., 1987).

A power analysis revealed that a total of 68 alliances was needed to yield a power coefficient of .8. This number is based on the assumption of a large effect size of f² = .35 and the utilization of fifteen predictors (cf., Cohen, 1977). This study would therefore require a minimum of 68 alliances in the sample. With my sample of 103 alliances, the calculated statistical power is .97. Similar studies in strategy process

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²⁰ R²'s close to 1.0 are considered to reveal a high degree of multicollinearity (Lewis-Beck, 1993).
²¹ Statistical power can be defined as the “the a priori probability of rejecting H₀. A test is powerful if, when wearing the ‘glasses’ of the test, one can infer from a sample what truly exists in its population” (Mazen, Hemmasi, & Lewis, 1987: 404).
research operating with this unit of analysis had similar or smaller sample sizes. The mean power for strategy process studies has been .23 for small, .61 for medium, and .83 for large effect sizes (Mazen et al., 1987). As the effect size of this study is very large – and given the high reliability of the scales employed – one can safely conclude that the empirical findings presented above are statistically powerful.

Due to the fact that I approached some respondents up to three times before receiving their responses, I had to test for biases caused by early and late responses. Following suggestions by Armstrong and Overton (1977), I formed two groups to address this issue. In the first group, I clustered the responses of all informants who had completed the survey first, and in the second group, I clustered the responses of the people who answered last. Then I performed t-tests on these groups and found no significant differences in the responses from early and late respondents at the .05 level, thus indicating that the respondents did not differ significantly with regard to their assessment.

4.5 Hypotheses Tests

To test my hypothesized relationships, I performed a stepwise hierarchical regression analysis. The descriptive statistics are displayed in Table 7, and the regression results are displayed in Table 8. The variables were entered into the regression equation in seven steps. Model 1 shows the estimates for control variables and their influence on alliance performance.

Model 2 includes all independent variables in addition to the controls, and these variables together explained 60.0 percent of the variance of the dependent variable. In Models 3 to 7, I tested the interaction effects separately, which is common for smaller sample sizes (e.g., Gulati, 1995; McGrath, 2001). When entered separately, two interaction terms failed to obtain a significant change in $R^2$; the three interaction effects that yielded a significant change are in Models 4, 6, and 7.

---

22 Hierarchical regression means that each of the models, except for the most complex model (i.e., that one containing the largest number of regression coefficients), can be obtained as a special case of the most complex model by setting one or more regression coefficients equal to zero (Kleinbaum, Kupper, Muller, & Nizam, 1998).
<table>
<thead>
<tr>
<th>Variables</th>
<th>Mean</th>
<th>s.d.</th>
<th>Alpha</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<td>1. Firm size (log)</td>
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<td>.343**</td>
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<td>.118</td>
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<td>.373**</td>
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<td>-.066</td>
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<td>-.201*</td>
<td>.102</td>
<td>-.282**</td>
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<td>.039</td>
<td>.289**</td>
<td>.008</td>
<td>.357**</td>
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N = 103; ** p < .01; * p < .05 (2-tailed)

Table 7: Descriptive statistics and correlation matrix
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<th>12</th>
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<td>4. Alliance duration (log)</td>
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<td></td>
<td></td>
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<tr>
<td>5. Rationality (firm level)</td>
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<td></td>
<td></td>
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<tr>
<td>6. (alliance level)</td>
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<td>7. Speed (firm level)</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>8. (alliance level)</td>
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<td>9. Flexibility (firm level)</td>
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<td>10. (alliance level)</td>
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<td>0.444**</td>
<td>-0.251*</td>
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<td>11. Politicality (firm level)</td>
<td>-0.280**</td>
<td>-0.193</td>
<td>-0.195*</td>
<td>-0.008</td>
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<td></td>
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</tr>
<tr>
<td>12. (alliance level)</td>
<td>0.062</td>
<td>-0.409**</td>
<td>0.070</td>
<td>-0.222**</td>
<td>0.264**</td>
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<tr>
<td>13. Conflict (firm level)</td>
<td>-0.189</td>
<td>-0.079</td>
<td>-0.138</td>
<td>0.223*</td>
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<td>14. (alliance level)</td>
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<td>-0.105</td>
<td>0.060</td>
<td>0.406**</td>
<td>0.230*</td>
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<tr>
<td>15. Alliance performance</td>
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<td>0.478**</td>
<td>-0.315**</td>
<td>0.423**</td>
<td>-0.249*</td>
<td>-0.410**</td>
<td>0.029</td>
<td>-0.357**</td>
</tr>
</tbody>
</table>

N = 103; ** p < .01; * p < .05 (2-tailed)

**Table 7 cont’d: Descriptive statistics and correlation matrix**
Hypotheses 1a and 1b propose a positive relationship between firm-level and alliance-level rationality and alliance performance. The direct-effects model (Model 2) shows that whereas rationality was positively related to alliance performance at both intra- and interfirm level, only the alliance-level relationship was significant (p < .05). Therefore Hypothesis 1a was not supported, whereas Hypothesis 1b was supported. Hypothesis 1c states that the positive effect of high intrafirm rationality will be diminished if there is low interfirm rationality. The interaction effect was not significant (Model 3), which means that Hypothesis 1c was not supported.

Hypotheses 2a and 2b postulate a positive relationship between speed and alliance performance at both intra- and interfirm level. Whereas in the direct-effects model (Model 2) speed was positively and significantly related to alliance performance at the intrafirm level (p < .001), the relationship was also positive but not significant at the alliance level. Therefore Hypothesis 2a was supported and Hypothesis 2b was not supported. However, the interaction term for speed was both significant and negative (Model 4, p < .05, $\Delta R^2 = .026$). To explore the nature of this interaction, I plotted it in a graph (Figure 8a). The slope of the regression line for alliance performance as a function of intrafirm decision-making speed is conditional on a single value of the moderator, e.g., interfirm decision-making speed. Since there are no theoretically meaningful breakpoints in the moderating variable of alliance-level speed, I follow Cohen and Cohen’s (1983) suggestion that one standard deviation above and one standard deviation below the mean of the respective moderator variable should be used as values to generate the two simple regression lines (labeled “high” and “low” respectively). Since the graph shows that the positive effect of high intrafirm decision speed will be greater if there is low interfirm decision speed (the line describing this relationship has a steeper upward slope), Hypothesis 2c was not supported.

My next hypotheses state that flexibility is negatively related to alliance performance at the intrafirm level (Hypothesis 3a) and positively at the interfirm level (Hypothesis 3b). Model 2 shows that flexibility was negatively related to alliance performance.
performance at the intrafirm level (p < .01) and positively at the alliance level (p < .01). Therefore both hypotheses were supported. The interaction effect, however, was not significant (Model 5). Therefore Hypothesis 3c was not supported.

Providing support for Hypotheses 4a and 4b, the direct effects of intrafirm (p < .05) and interfirm politicality (p < .10) on alliance performance were both negative and significant (Model 2). The interaction term was also marginally significant (Model 6, p < .10, ∆R² = .012). Figure 8b visualizes that interaction and indicates that the negative influence of intrafirm politicality on alliance performance was enhanced by high interfirm politicality (the line describing this relationship has a steeper downward slope). Therefore Hypothesis 4c was supported.

The direct-effects model (Model 2) shows that whereas conflict was positively related to alliance performance at the intrafirm level (p < .05), the relationship was negative at the alliance level (p < .05). Therefore Hypotheses 5a and 5b were supported. Hypothesis 5c states that high levels of interfirm conflict will diminish the positive influence of intrafirm conflict on alliance performance. The interaction effect was negative and significant (Model 7, p < .05, ∆R² = .029). Exploring that interaction, Figure 8c shows that the positive influence of intrafirm conflict on alliance performance was diminished by high interfirm conflict (the line describing this relationship has a flatter upward slope). Therefore Hypothesis 5c was supported.

4.7 Discussion

4.7.1 Discussion of Findings

Overall, I found at least partial support for my argument that successful alliance-related decision making in high-tech industries is characterized by decision-making rationality and speed rather than flexible incrementalism. Although not significant at the firm level, rationality within the firm and with the alliance partner is positively correlated with alliance performance, as hypothesized.
<table>
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<tr>
<th>Independent variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
</tr>
</thead>
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<td><strong>Step 1: Control variables</strong></td>
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<tr>
<td>Firm size (log)</td>
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<td>-.114</td>
<td>-.131†</td>
<td>-.165*</td>
<td>-.135†</td>
<td>-.134†</td>
<td>-.167*</td>
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<tr>
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<td>.016</td>
<td>.003</td>
<td>.032</td>
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<td>.015</td>
<td>.008</td>
</tr>
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<td>Slack (firm-level)</td>
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<td>.195**</td>
<td>.204**</td>
<td>.207**</td>
<td>.188*</td>
<td>.202**</td>
<td>.186*</td>
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<td>Alliance duration (log)</td>
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<td>.194**</td>
<td>.189**</td>
<td>.201**</td>
<td>.202**</td>
<td>.234**</td>
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<td><strong>Step 2: Main effects</strong></td>
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<td>.317***</td>
<td>.308***</td>
<td>.289**</td>
<td>.302***</td>
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<td>.114</td>
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<td>-.195*</td>
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<td><strong>Step 3: Interactions</strong></td>
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<td>Flexibility (firm) × flexibility (alliance)</td>
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<td>Politicality (firm) × politicality (alliance)</td>
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<td>Conflict (firm) × conflict (alliance)</td>
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<td>.005</td>
<td>.012</td>
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<td>.626</td>
<td>.605</td>
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N = 103. All standardized regression coefficients are from the final step in the hierarchical regression. Two-tailed tests were used for interaction effects.

*** p < .001; ** p < .01; * p < .05; † p < .10

Table 8: Results of stepwise hierarchical regression analysis
Figure 8: Effects of interaction between firm-level and alliance-level decision-making constructs on alliance performance
My findings also support the usefulness of a speedy decision-making style within an organization for the success of strategic collaborations in high-tech industries. These results are in line with previous studies on strategic decision making and its influence on firm performance (Baum & Wally, 2003; Goll & Rasheed, 1997; Judge & Miller, 1991; Priem et al., 1995), and extend these to the context of interfirm cooperations. The high uncertainty and ambiguity of strategic alliances in dynamic industries seem to demand high levels of decision-making rationality and speed to assess and act upon opportunities. In fact, if decisions are evaluated carefully and organizations act quickly and consistently upon alliance-related opportunities, it seems natural that benefits can be realized.

Contrary to our hypothesis, however, if decision speed at the firm level interacts with decision speed a at the alliance level, a low alliance-level decision speed seems to more beneficial for alliance performance. One might speculate that fast decision speed at the firm level ensures that the organization is able to quickly react to alliance-related changes and may thereby compensate for the slower alliance-level decision speed. In these circumstances, high decision speed at the alliance level may simply cease to be a major influence on alliance performance.

While Sharfman and Dean’s (1997) study empirically examined antecedents of decision-making flexibility, my study has extended their work and linked flexibility to an outcome variable, i.e., alliance performance. I found that flexibility in the decision-making process within a firm was negatively associated with alliance performance, whereas flexibility at the alliance level was positive. On the basis of these findings one might question the fundamental assumption of Sharfman and Dean (1997) that flexibility in firm-level decision-making processes is a necessary condition for organizational adaptation. In the context of strategic alliances, the benefits arising from firm-level consensus, consistency, and reliability seem to outweigh the advantages of increased flexibility. At the alliance level, however, flexible decision processes that are open to novel alternatives, information sources, and roles seem more likely to produce innovative decisions that facilitate organizational adaptation. In contrast to Sharfman and Dean (1997), I was not able to empirically distinguish the

---

23 Organizational adaptation is defined as the ability to make incremental adjustments (Lyles, 1988).
two dimensions of flexibility. In the context of interfirm cooperations, recursiveness and openness exert a combined influence and not a distinct one on alliance performance.

The influence of politicality in the decision-making process was according to the proposed direction. I found that decision-making politicality exerts a negative influence on alliance performance both at the firm and alliance level. The negative effects of politicality seem to outweigh the advantages for effective change and adaptation (Pfeffer, 1992; Quinn, 1980). Whereas Mintzberg (1985: 148) argued that politicality can be imperative to “correct certain deficiencies and dysfunctions in other, legitimate, systems of influence – to provide for certain forms of flexibility that these others deny”, the specific context of alliance-related decision making seems to be too vulnerable to politically motivated disruptions to benefit from this added flexibility. My findings also indicate that the negative effects are amplified when the decision-making process is characterized by high politicality at both levels for the above-mentioned reasons. High politicality at the alliance level seems to have negative repercussions for the firm-level decision process since political influence attempts at the alliance level might encourage detrimental political influence attempts at the firm level, and collectively deteriorate alliance performance.

Concerning the impact of conflict, I was not able to differentiate empirically between task and relationship conflict. My results showed, however, that conflict as a whole had a distinct and contrary influence at firm and alliance level. This suggests that the positive effects of conflict within the firm are not sustainable in the context of interfirm cooperation, in which diversity and competing interests seem to emphasize the negative effects of relationship conflict rather than the positive effects of task conflict.

As mentioned above, only three of the hypothesized moderations were significant separately. I would like to point out, however, that my inability to detect the two remaining interaction terms could have been due to any number of reasons and not necessarily to a lack of sound theoretical reasoning (e.g., Aguinis & Stone-Romero, 1997; McClelland & Judd, 1993), since finding and or replicating moderation effects is extremely difficult (Smith & Sechrest, 1991). In spite of these empirical challenges, the significant interactions corroborate the necessity for simultaneous consideration of
strategic processes within and between firms. My results thus confirm that only a combination of adequately structured intra- and interfirm decision-making processes enables an organization to reap the full benefits of its strategic alliances.

### 4.7.2 Contributions

With this study I am contributing to the strategy process literature by showing that the strategic decision-making process of a focal organization has important implications for the success of its strategic alliances. Not only did I extend the field of strategy process into the new domain of interfirm collaborations, but I also reinforced the notion that decision process variables have context-specific effects (e.g., Baum & Wally, 2003; Eisenhardt, 1989; Goll & Rasheed, 1997; Judge & Miller, 1991; Priem et al., 1995). Overall, my findings support the superiority of a rational and speedy decision-making approach for dynamic industries in comparison to a flexible, incremental approach.

This study significantly contributes to alliance research and, in particular, to research on the underinvestigated phenomenon of effective alliance-management processes. The findings of my empirical analysis of decision-making processes as a subgroup of alliance management are expected both to guide future research and to assist practitioners. I have conceptualized strategic decision-making processes as a crucial part of an “alliance capability” (Draulans et al., 2003; Kale et al., 2002), and have developed explicit suggestions for improved managerial practices.

My findings further underscore the importance of an organization’s absorptive capacity (Cohen & Levinthal, 1990). If organizational processes are not in place to manage the alliance benefits, a potential fruitful partnership can quickly run dry. Future research must thus not only investigate further processes that facilitate the building of an alliance capability, but also create intraorganizational processes that enable the organization to reap the benefits of a well-managed alliance by sharing information within the organization (Zahra & Nielsen, 1998).

My study also has implications for the growing literature on strategic renewal. Typically, strategic renewal is defined as an iterative process of belief, action, and learning that leads to the organization’s gradual alignment with its environment (Huff,
Huff, & Thomas, 1992; Johnson, 1988). Strategic collaborations provide valuable opportunities for environmental alignment by enabling interfirm resource and knowledge exchange and interfirm learning. My findings suggest that alliance-related strategic decision-making processes – if adequately designed – are a crucial mechanism for reconciling a firm both with its dynamic external environment as well as with its alliance partner and therefore enhance its capacity for strategic renewal.

With this study I am also contributing to the growing body of multilevel research where two or more levels of analysis are theoretically linked in order to arrive at a better explanation of the relevant phenomena (e.g., Klein et al., 1999; Rousseau, 1985). Whereas the literature on multilevel research is dominated by a focus on the two levels of individuals and organizations (Klein et al., 1999), my study broadens this focus to encompass the organizational level (“firm level”) and the interorganizational dyad level (“alliance level”). My study has combined the features of cross-level and mixed-determinants models (Klein, Dansereau, & Hall, 1994; Rousseau, 1985). On the one hand, decision-making characteristics at the intra- and interfirm level are discussed as predictors of alliance performance (direct-effects model), which would constitute a mixed-determinants model. On the other hand, my propositions explicitly deal with the interaction of intra- and interfirm characteristics (interaction models). This moderating effect of higher-level variables by lower-level variables is typical for cross-level models.

To my knowledge, most of the decision-making characteristics such as rationality, speed, flexibility, and politicality have not been examined at the interfirm level before. Given that the direct effects of some characteristics at the interfirm level are significantly different from their respective intrafirm effects, this study clearly corroborates the usefulness of including these higher-level variables in the assessment of alliance performance. Moreover, for some of the decision-making dimensions that exhibit empirically distinct sub-dimensions at the group level, such as flexibility and conflict, I found no evidence for the existence of such sub-dimensions at the firm and alliance levels. This can be considered an indication of the fact that the same constructs exhibit different characteristics for different levels of analysis and a simple translation of relationships from one level of analysis to another is often not feasible.
4.7.3 Limitations

I also need to mention a few limitations of my study. This research was conducted with a single-respondent design. I asked the potential respondent to fill out the questionnaire only if he or she was familiar with the indicated alliance, or to forward the questionnaire to the individual who was most knowledgeable about the specific alliance. Various studies (e.g., Geringer & Hebert, 1991) have shown support for the use of a single respondent per alliance and have argued that it allows researchers to obtain fairly reliable and efficient data for overall alliance performance. Therefore the appropriateness of using a single respondent for collecting performance data was deemed a justifiable option for this study, since my respondents represent the partner company executive with direct responsibility for the alliance.

Obtaining direct input from both alliance partners might have been ideal. Mjoen and Tallman (1997: 265) admit that the use of respondents from only one partner might be a limitation of their study, but “surveying the local partners and foreign-based IJVs was not practicable given the size of the sample and the anonymity of the IJVs.” Additionally, Geringer and Hebert (1991) showed that organizations have generally accurate pictures of their partner’s position. In line with other studies (e.g., Bowman & Ambrosini, 1997; Tsang, 2002; Young-Ybarra & Wiersma, 1999), I followed Heide and John (1990) in their argumentation that the quality of information from key informants is sufficiently rich for building theories that address complex organizational phenomena, despite the problems inherent in relying on single respondents.

Although the use of subjective, self-reported performance data is increasingly acknowledged as a reasonable way to assess alliance performance (e.g., Das & Teng, 2000; Geringer & Hebert, 1991; Lane & Lubatkin, 1998; Lin & Germain, 1998; Parkhe, 1993; Saxton, 1997), an objective measure would have been desirable. To further alleviate these concerns, I used two additional perceptual indicators of alliance performance to cross-validate the performance implications of alliances for partner firms. In such cases, managers in the company usually provide a subjective assessment of the extent to which their company has achieved its stated alliance objectives, whatever they may be. To assess the long-term performance of the alliance, I collected
survey data on the primary reasons why each of the alliances was formed (based on Barringer & Harrison, 2000; Hatfield, Pearce, Sleeth, & Pitts, 1998). Then I asked managers to evaluate their alliance with respect to each of these dimensions. Specifically, the managers were asked to assess two constructs: Importance (1 = none, 3 = moderate, 5 = critical) and performance (1 = far short of plan, 3 = about at plan, 5 = far exceeds plan) of the alliance on a 5-point Likert-type scale for each of the following dimensions: market or product expansion, product or technology development/acquisition, profit, market entry, acquisition of technical knowledge/skills, revenue, economies of scale or product efficiency, spreading financial risk, managing competition, increasing available capital, vertical integration, overcoming government barriers, and others. My first additional alliance performance measure, *alliance goal achievement*, is the sum of the alliance goal achievement performance items. For my second additional measure, *weighted alliance goal achievement*, each of the alliance goal achievement performance items was multiplied by its corresponding importance item before adding them up. My results were robust when I analyzed alternative subjective performance data based on the achievement of alliance objectives (cf., Barringer & Harrison, 2000; Hatfield *et al.*, 1998) that were included in my survey but not reported in this dissertation.

The remaining limitations of this study at the same time offer avenues for future research. First, my findings specifically relate to alliance capabilities pertaining to strategic alliances in high-tech industries. Future research needs to assess the generalizability of my findings for different alliance types as well as for different industries and environmental contingencies.

A further limitation is that I have not considered interaction effects between independent variables of one particular level of analysis. Previous findings suggest that decision-making politicality, in addition to having a direct effect on alliance performance, may at the firm level also moderate the relationships of the other decision-making characteristics (Walter, Lechner, & Kellermanns, 2004). The positive impact of rationality on alliance performance, for instance, is dependent on the reliability of data, but “the collection, evaluation, and utilization of such data are highly problematic from a political perspective” (Narayanan & Fahey, 1982: 32). Information restriction and distortion, the use of apparently rational analyses for
persuasion purposes only (cf., Dean & Sharfman, 1993; Fandt & Ferris, 1990; cf., Mueller et al., 2000), as well as incompatible interests and opportunistic pursuit of individual political agendas diminish the positive influence of rationality on alliance performance. Similarly flexibility, such as increased participation in decision making and the ability to cycle back and forth between formulation and implementation, makes the decision-making process particularly vulnerable to political influence tactics (cf., Pfeffer & Salancik, 1974). And lastly, conflict has consistently been related to politicality in the literature since conflict arises as a response to self-serving political behavior (e.g., Mintzberg, 1985; Tushman, 1977). Future research could develop a more in-depth picture of the effect of decision-making processes on alliance performance by taking such interactions into account.

Lastly, my sample is comprised of European high-tech firms. Due to the cultural variations across countries (e.g., Hofstede, 2001), these results might not be generalizable to other countries, such as the United States. Thus future research could extend my current study by conducting cross-cultural comparisons. Such a study has the potential to validate my partially counter-intuitive results and establish contingencies based on country differences.

### 4.8 Conclusion

In conclusion, this is – to my knowledge – the first study to conduct an empirical investigation into the influence of alliance-related strategic decision-making processes on the performance of these collaborative agreements. My results clearly demonstrate that this is an important contribution to the research on alliance capabilities of firms and provide a basis on which future alliance-process research can build. I have also developed explicit suggestions for improved managerial practices that are expected to guide alliance managers in their attempt to meet the challenges that accompany interfirm collaborations and may eventually lead to a reduction in alliance failures.
5 General Discussion

In this dissertation, I examined how organizations can align themselves with their environment and profit from external sources of knowledge by adequately structuring both their internal and external networks and decision-making processes. In the first study, strategic alliances were discussed as vehicles for the acquisition of information and distribution of knowledge. I identified those combinations of internal and external network characteristics that are potentially beneficial for organizational learning from alliances and derived normative implications for managerial action.

In the second study, I examined strategic decision-making processes within and between alliance partners, and conducted an empirical analysis of 103 strategic alliances in European high-tech industries to assess the impact of five predominant decision-making characteristics on the performance of collaborative agreements. Similar to the propositions of the first study, several significant interaction terms corroborate the need to simultaneously examine decision processes within and between alliance partners in order to gain in-depth knowledge about their impact on strategic alliances.

As a conclusion, it is a combination of adequately designed internal and external structures and processes that enables a company to reap fully the learning benefits provided by its collaborative agreements. Only when structures and processes on these two levels are shaped in a complementary manner will organizations be able to improve the currently unsatisfying success rates of strategic alliances, and the upcoming years could really become, as some researchers have proclaimed, the age of “alliance capitalism” (Dunning, 1995).
6 References


## 7 Appendix

### 7.1 Appendix 1: Time Schedule

![Time Schedule Diagram]

**Figure 9: Time schedule of this dissertation project**
7.2 Appendix 2: Questionnaire

QUESTIONNAIRE

For the International Research Project
“Social Networks, Decision Making, and the Performance of Strategic Alliances”

Prof. Dr. Günter Müller-Stewens,
Dr. Christoph Lechner,
Lic. oec. Jorge Walter
(University of St. Gallen)

Prof. Franz Willi Kellermanns
(Mississippi State University)

WELCOME!
This questionnaire is a crucial part of an international research project jointly conducted by the University of St. Gallen, Switzerland, and the Mississippi State University, USA. We kindly ask you to go through the questionnaire, answer all the questions, and return it to us. The questions below have no right or wrong answers – we are interested in your opinion. Your response will assist in the further development of strategic alliance research and understanding. All responses will be kept strictly confidential. For the whole process you will need about 25 minutes. As soon as we have analyzed the data, we will send you a report of our findings.

WHAT DO WE EXPLORE?
This research project in the area of strategic management explores the decision-, behavior-, and social-oriented dimensions of the strategy processes that occur in the context of strategic alliances. To this end, we ask you to identify a specific strategic alliance your firm participates in and kindly request you to assess it in this questionnaire. The questions will ask you to evaluate certain aspects both from the perspective of your own firm (“firm level”) and from the perspective of your cooperative relationship with your alliance partner (“alliance level”).

HOW CAN YOU PARTICIPATE?
We would greatly appreciate it if you would complete this questionnaire. You can check the boxes in the electronic document directly by clicking on the boxes with the left mouse button, saving the document under a new name, and then sending it back as an e-mail attachment. You can also fill it out in a printed version and return the copy by mail or by fax to the University of St. Gallen, Switzerland, Fax: +41 – 71 224 23 55.

Contact Address:
Jorge Walter, Institute of Management, University of St. Gallen
Dufourstrasse 48, CH - 9000 St. Gallen, Switzerland
Tel. +49 8106 247 701, Fax +41 71 224 23 55

All information will be kept strictly confidential and only be used for research purposes.

University of St. Gallen
A. FIRM AND ALLIANCE INFORMATION

Name and designation of the firm you are affiliated with:
_____

Name and designation of the strategic alliance you are evaluating with this questionnaire:
Strategic Co-Operation with ______

B. DECISION-ORIENTED DIMENSION

In this section, we are interested in criteria related to the decision-making process (such as rationality, speed, and flexibility). We ask you to assess these criteria in each question (1) on the level of your firm, and (2) on the level of your alliance.

Question 1 (Rationality):

<table>
<thead>
<tr>
<th>How extensively did you look for information in making alliance-related decisions?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensively/ highly</td>
<td>Extensively/ highly</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How extensively did you analyze the relevant information before making an alliance-related decision?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensively/ highly</td>
<td>Extensively/ highly</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How important were quantitative analytic techniques (such as net present value or discounted cash flow analysis, etc.) in making alliance-related decisions?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensively/ highly</td>
<td>Extensively/ highly</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In general, how effective were you at focusing your attention on crucial alliance-related information and ignoring irrelevant information?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mostly intuitive</td>
<td>Mostly intuitive</td>
<td></td>
</tr>
</tbody>
</table>

| Mostly analytical | Mostly analytical |

<table>
<thead>
<tr>
<th>How would you describe the decision processes that had most influence on alliance-related decisions?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mostly intuitive</td>
</tr>
</tbody>
</table>

Question 2 (Speed):

Please indicate your level of agreement with each of the statements below.

<table>
<thead>
<tr>
<th>When we see a business opportunity related to the alliance, we can move faster than our competitors.</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>Strongly agree</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>In the context of this alliance, our competitors consider us fast in responding to their actions.</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>Strongly agree</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>From start to finish, we respond faster than our competitors to alliance-related problems.</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strongly disagree</td>
<td>Strongly agree</td>
<td></td>
</tr>
</tbody>
</table>

Question 3 (Flexibility):

<table>
<thead>
<tr>
<th>How often did you rely on new sources of information in making alliance-related decisions?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Very often/ a great deal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How often were novel or original ideas presented during alliance-related discussions?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Very often/ a great deal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To what extent were these novel or original ideas seriously considered?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Very often/ a great deal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To what degree were people able to contribute to the alliance-related decision in ways that did not strictly match their job description or level of authority?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Very often/ a great deal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>To what extent did you reconsider any choices made during decision-making processes?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Very often/ a great deal</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How often did individuals change their minds during decision-making processes?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not at all</td>
<td>Very often/ a great deal</td>
<td></td>
</tr>
</tbody>
</table>

| Mostly intuitive | Mostly analytical | Mostly intuitive | Mostly analytical |
C. BEHAVIOR-ORIENTED DIMENSION

In this section, we are interested in the behavior-oriented criteria related to the decision-making process (such as political behavior and conflict). We ask you to assess these criteria in each question (1) on the level of your firm, and (2) on the level of your alliance. Please keep in mind that politics and conflict are not necessarily bad.

Question 1 (Political Behavior):
Please indicate your level of agreement with each of the statements below.

<table>
<thead>
<tr>
<th>In alliance-related decisions, were people primarily concerned with their own goals or with the goals of their organizations?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>not at all completely</td>
<td></td>
<td></td>
</tr>
<tr>
<td>not at all completely</td>
<td></td>
<td></td>
</tr>
<tr>
<td>totally</td>
<td></td>
<td></td>
</tr>
<tr>
<td>totally</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To what extent were people open with each other about their interests and preferences in alliance-related decisions?

To what extent were alliance-related decisions affected by the use of power and influence among people?

To what extent were alliance-related decisions affected by negotiation among people?

Question 2 (Conflict):

<table>
<thead>
<tr>
<th>How much tension between people was there in alliance-related strategy processes?</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>None/not at all</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None/not at all</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A great deal/very often</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A great deal/very often</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How often did people get angry during alliance-related strategy processes?

How much emotional conflict was there related to the alliance?

How much conflict of ideas related to the alliance was there?

How frequently did you have disagreements about task-fulfillment within the scope of the alliance project you were working on?

How often did people have conflicting opinions about the alliance project you were working on?

D. SOCIAL DIMENSION

In this section, we are interested in the level and type of social interaction (such as tie strength and trust). We ask you to assess these criteria in each question (1) on the level of your firm, and (2) on the level of your alliance.

Question 1 (Tie Strength):
How frequently did people interact for issues related to the alliance on average over the past two years...

<table>
<thead>
<tr>
<th>How close was the working relationship…</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distant, like an arm’s-length relationship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fairly close, like discussing and solving issues together</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Very close, practically like being close colleagues</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How frequently did people interact for social support (either for giving or receiving confidences about personal problems) on average over the past two years...

How close was the working relationship…
Question 2 (Trust):
Please indicate your level of agreement with each of the statements below.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other people can be trusted to make sensible alliance-related decisions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other people would not be prepared to gain advantage by deceiving us.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People can rely on each other to abide by the alliance management agreement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>We are not reluctant to make alliance-related resource commitments even when specifications are ambiguous.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People always stand by their word even when this is not in their own best interest.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>People never use opportunities that arise out of alliance activities to profit at our expense.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other people are flexible when we cannot keep a specific alliance-related promise due to unexpected change in the business environment.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

E. CONTEXT FACTORS

In this section, we are interested in the level of slack (that is the surplus of financial resources). We ask you to assess these criteria in each question (1) on the level of your firm, and (2) on the level of your alliance.

Question 1 (Slack, i.e. surplus of financial resources):

<table>
<thead>
<tr>
<th>Question</th>
<th>Firm level</th>
<th>Alliance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>How difficult would it currently be to get approval for a medium-sized capital project related to the alliance that is worth doing?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Businesses often go through cycles in the availability of money. Sometimes it is very tight, and other times very loose. How would you describe your current situation related to the alliance?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

F. PERFORMANCE MEASURES

In this section, we are interested in the performance of the alliance as well as of your own firm.

Question 1 (Alliance Performance):
Please assess the performance of the alliance by indicating your level of agreement with each of the statements below.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Strongly disagree</th>
<th>Strongly agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>This alliance is characterized by a strong and harmonious relationship between the alliance partners.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our company has achieved its primary objective(s) in forming this alliance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our company's competitive position has been greatly enhanced due to this alliance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Our company has been successful in learning some critical skill(s) or capabilities from its alliance partner.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Please give an overall assessment of this alliance, based on all the above dimensions.</td>
<td>Unsatisfactory/failure</td>
<td>Satisfactory/successful</td>
</tr>
</tbody>
</table>
Question 2 (Alliance Goal Achievement):
Please assess (1) the **importance** of each alliance goal, and (2) the **performance** of the alliance on each dimension:

<table>
<thead>
<tr>
<th>Importance</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>Far short of plan</td>
</tr>
<tr>
<td>Moderate</td>
<td>About at plan</td>
</tr>
<tr>
<td>Critical</td>
<td>Far exceeds plan</td>
</tr>
</tbody>
</table>

- Market or product expansion
- Product or technology development/acquisition
- Profit
- Market entry
- Acquisition of technical knowledge/skills
- Revenue
- Economies of scale or product efficiency
- Spreading financial risk
- Managing competition
- Increasing available capital
- Vertical integration
- Overcoming government barriers
- Others

Question 3 (Firm Performance):
How would you rate your company’s **performance as compared to your competitors** on the following dimensions?

<table>
<thead>
<tr>
<th>Current</th>
<th>Past three Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Much worse</td>
<td>About the same</td>
</tr>
<tr>
<td>Much worse</td>
<td>About the same</td>
</tr>
</tbody>
</table>

- Growth in sales
- Growth in market share
- Growth in number of employees
- Growth in profitability
- Profit margin on sales
- Return on equity
- Return on total assets
- Ability to fund growth from profits

G. BACKGROUND INFORMATION

**Question 1: Alliance-Specific Information:**
When was the alliance agreement signed (year)? ...
Is the alliance still operating? Yes □ No □
If not, when did the alliance end (year)? ...

**Question 2: Personal Information**
Please describe yourself by filling in the blanks and checking the appropriate box.

Your **functional background** ...

You have been **working** in your firm **since** ...

Your **position** within your firm ...

Your **position** within the alliance ...

Male □ Female □ Age (____ years)
After we have received your questionnaire, the following information will be detached from the questionnaire in order to keep your information confidential, and will solely be used to provide you with a report of our findings.

Name: 

Position: 

E-mail: 

Telephone: 
(purely for clarifying any questions we might have)

Thank you very much
for your cooperation and support!
7.3 Curriculum Vitae

JORGE WALTER
Ludwig-Festl-Strasse 20
D – 85604 Zorneding
Germany
Phone +49 8106 247 700
jorge.walter@alumni.unisg.ch

EDUCATION

2004 – New York University (NYU), Leonard N. Stern School of Business, USA
Visiting researcher, Department of Management & Organizations,
chair of Prof. Dr. Melissa A. Schilling

2003–2004 University of Pennsylvania (UPenn), Wharton School, USA
Visiting doctoral student, Management Department, chair of Prof. Dr. Harbir Singh

2001–2005 University of St. Gallen (HSG), Switzerland
Doctoral studies in strategic management, chair of Prof. Dr. Günter Müller–Stewens;
dothoral thesis titled: ‘Collaboration within and between firms: Network structures, decision
processes, and their impact on alliance performance’, awarded in April 2005

1999–2001 University of St. Gallen (HSG), Switzerland
3 semesters graduate studies in business administration; Major: International management

1999 Copenhagen Business School (CBS), Denmark, 1 CEMS exchange semester
Majors: Innovation management, international business strategy

1996–1999 University of St. Gallen (HSG), Switzerland
4 semesters undergraduate studies in business administration

1996 Ludwig–Maximilians–University Munich (LMU), Germany
1 semester undergraduate studies in business administration

WORK EXPERIENCE

2001–2003 Institute of Management, University of St. Gallen (HSG), Switzerland, 2 years
Research associate at the chair of Prof. Dr. Günter Müller–Stewens

2000 L.E.K. Consulting, Munich, Germany, 11 weeks
Strategic management consulting, private equity

2000 Dresdner Kleinwort Benson, London, Great Britain, 8 weeks
Mergers and acquisitions, corporate finance

1999–2000 Project with Gemini Consulting, St. Gallen, Switzerland, 12 weeks
Development of a teaching tool for value–based management

1998 Siemens Electromechanical Components, Munich, Germany, 8 weeks
Development of the international financial planning system for EC distribution centers

1997–1999 Institute for Media and Communications Management, University of St. Gallen (HSG), 2 years
Scientific assistant for the research and consulting project Logistics and Electronic Commerce
(CCEM)

1997 Siemens Business Services, Munich, Germany, 6 weeks
Automation of the reporting system on the basis of MS Excel macros
TEACHING EXPERIENCE

2004–2005 University of St. Gallen (HSG), St. Gallen, Switzerland, 5 months
   Teaching Assistant, doctoral course: Research Issues in Strat. Mgmt.; graduate–level course:
   Alliances & Networks

2002 Swiss Virtual Business School, St. Gallen, Switzerland, 12 weeks
   Tutor of the general management e–learning course for executives

2001–2003 University of St. Gallen (HSG), St. Gallen, Switzerland, 2 years
   Teaching Assistant, doctoral course: Research Issues in Strat. Mgmt.; graduate–level courses:
   Intro. to Mgmt., Perspectives on Mgmt., Training in Strat. & Org., Mergers & Acquisitions

HONORS AND AWARDS

2005–2006 Fellowship from Deutsche Forschungsgemeinschaft (DFG) (competitive fellowship)

2004 Nomination for the 2004 Strategic Management Society (SMS) Best Conference Paper Prize

2004 Doctoral Consortium, TIM division, Academy of Management (AOM)

2004 Doctoral Consortium, Eastern Academy of Management (EAM)

2003–2004 Fellowship from Swiss National Fund (SNF) (competitive fellowship)

2003 Doctoral Consortium, BPS division, Academy of Management (AOM)

2000 Nomination for the Rehau Prize for an outstanding master thesis

1999 Fellowship from ERASMUS (competitive academic scholarship)

PROFESSIONAL SERVICE AND MEMBERSHIPS

Reviewing

2005– Reviewer, Eastern Academy of Management (EAM) Conference

2004– Ad hoc reviewer, Journal of Management

2003– Reviewer, BPS Division at Academy of Management (AOM) Annual Meetings

2001–2003 Member of the pre–jury for the 32nd and 33rd ISC Wings of Excellence Award, St. Gallen, Switzerland

1996–1997 Member of the board for the organization of the 1997 annual ball at the University of St. Gallen (HSG), Switzerland

1996 Member of the student initiative Marketing zwischen Theorie und Praxis e. V. (MTP), Germany
   Organization of the Münchner Marktwirtschaft 1996, promoting links between students and industry

1995–1996 Community service (Zivildienst) at the District Hospital Haar, Germany, 1 year

1992–1995 Member of the pupils’ representative council of the Comprehensive Secondary School
   (Gymnasium) Vaterstetten, Germany

Professional Societies

2004– Eastern Academy of Management (EAM)

2003– Academy of Management (AOM)

2003– Strategic Management Society (SMS)