SUCCESSFUL STRATEGY AND ALLIANCES

Gjalt de Jong
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Gjalt de Jong

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Visitors address
University of Groningen/Campus Fryslân
Sophialaan 1
8911 AE Leeuwarden
E-mail: campusfryslan@rug.nl
Telephone: 058 288 2132
www.rug.nl/cf/cse
ABOUT THE CSE MONOGRAPHS

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Research in the field of sustainable entrepreneurship is in its infancy. Research aims, questions, theoretical concepts, models, research methods and empirical evidence are being developed. This process benefits greatly from essential progress made thus far in all fields of science. The monograph series will focus on providing a robust and comprehensive forum for the growing scholarship on sustainable entrepreneurship. The volumes in the series will cover interdisciplinary and multi-method approaches dealing with the challenges of making the new business models of sustainable entrepreneurship successful.
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Gjalt de Jong, PhD
University of Groningen/Campus Fryslân

Series Editor
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BIOGRAPHY

Gjalt de Jong, PhD (Oentsjerk, 1968) is Director of the Centre for Sustainable Entrepreneurship at Campus Fryslân at the University of Groningen. He also is Associate Professor of Strategy at the Faculty of Economics and Business at the University of Groningen. He received his Master’s degree in Economics and a PhD degree in Business Administration from the same university. He is a senior member of the Faculty’s research institute. Prior to his current appointment, he served as a senior advisor at PricewaterhouseCoopers and KPMG.

De Jong has extensive experience in research into strategic issues. He publishes on key strategic issues related to leadership, organizational structures, inter-firm collaboration, globalization and public policy. His research is interdisciplinary, multi-level and multi-method.

De Jong has extensive experience in university education. He has developed and supervised virtually every conceivable form of educational activity for students of Bachelor’s and Master’s programmes and postgraduate studies. He has coordinated educational programmes for economics, business and management. He has managed both large international programmes and small national groups. He has coordinated thesis programmes for various departments and has supervised hundreds of research projects on strategy themes.

De Jong has extensive experience as a senior advisor in consultancy for the private and public sectors. He developed his consulting skills throughout his career with leading consultancy firms and their international clients. He provides strategy advice to leaders of international companies, but also to managers from small and medium-sized enterprises, universities, government and network organizations.

De Jong plays an active role in public debates. He combines his knowledge with research, education and advice in developing and challenging opinions on contemporary regional and national strategic issues. He regularly gives guest lectures and public presentations.
CHAPTER 1. INTRODUCTION

1.1 Introduction
This book is about successful strategy and alliances. It is the third monograph in the series of the Centre for Sustainable Entrepreneurship. The first monograph highlighted the foundations of strategy research offering historical perspectives of the field and a review of research philosophy. The first monograph explained how individual characteristics – such as personality traits and learning capacities – determine successful strategy. The second monograph introduced the organization as the unit of analysis for successful strategy. For example, the second monograph analysed the relation between corporate democracy, innovation and successful strategy, among others.

The third monograph discusses the relationship between interfirm alliances and successful strategy. Almost any question successful strategy is related to the fundamental ‘make-or-buy’ decision that each company is confronted with. Successful strategy is about being different, which is a dynamic process. The ongoing management of ‘being different’ requires companies to fundamentally think about the organization of their value chains. Companies continuously need to consider which parts of their value added chain are produced in-house and, consequently, which parts are outsourced to other companies. The ‘make-or-buy’ decision therefore is among the most important elements of successful strategy.

Companies often find collaborating with other firms challenging. At the same time, firms acknowledge that survival in ever-changing environments is virtually impossible without enduring partnerships. The aim of this book is to unravel all aspects that align with successful strategy and alliances. The book covers the entire life-cycle of alliances between firms, from the first start and the selection of new alliance partners, to successful alliance management and alliance termination. The book goes beyond mainstream economic thinking that inadequately explains the continuation and added value of alliances beyond cost efficiency and profit maximization. It presents interdisciplinary theoretical perspectives and multi-method empirical evidence of trust, contracts and third parties. In so doing, it offers managers, students and academics inspiration, education and many new research opportunities concerning the role of strategic alliances in successful strategies of corporations.

The monograph series of the Centre for Sustainable Entrepreneurship aims to trigger its readers to reflect on the particular theme and related strategy issues. This monograph takes the challenge to think about the added value of strategy consultancy and of future trends. Consultants are often invited involved in the design and implementation of successful strategy. The added value of consultants is a subject of an ongoing debate. Some managers appreciate their role whereas others deny their added value from
scratch. The behaviour and performance of the consultancy branch has contributed to this discussion. We need to define behavioural standards that differentiate sincere and valuable strategy consultancy from the gold diggers and opportunists. Section two presents a number of standards which can guide meaningful consultancy in the design and management of successful strategy.

Strategy is about predicting the future and anticipating contingencies. For example, alliances are designed to foster strategy success and in so doing the longevity of a company. Successful strategy accounts for future trends as best as possible. The third section will review notable trends that now characterize many industries, including information technology, the changing role of China in the world order, and the trends of sustainability, healthy aging and renewable energy.

The chapter concludes with the structure and outline of this monograph.

1.2 Strategy consultancy
An important goal of strategy is to enhance the competitiveness of companies where possible. This is for the benefit of business owners in the broad sense of the word, but also for employees and their families. Every organization will face its crises, regardless of the industry, the size of the company or the region where a company is located. Starting entrepreneurs (self-employed) but also age ing small or medium-sized enterprises (SMEs) or large, international companies; they all will face strategic challenges sooner or later.

Strategy is often related to multinational companies. This is in line with the choices made by these companies, such as entering new markets or taking over a competitor. For start-ups, strategy is seen as an important part of the business plan. That is understandable, especially since external investors provide the necessary financial capital on the basis of these business plans. Interestingly, however, strategy is often felt to be less relevant for SMEs. This is not correct. SMEs form the backbone of many economies. SMEs get into trouble in times of recession, precisely because they operate with an outdated strategy or without any strategy at all. Hence, strategy is generic and provides insights of interest to every company in every industry and at every point in its lifecycle. Strategically successful companies offer employees income and other psychological benefits such as colleagues, training and life structure. Poverty is the flipside. Poverty results in a lower standard of living in an economic and psychosocial sense. Obviously, it is not possible for everyone to do the work that best suits their skills and interests. From an international perspective, some jobs such as those done by children in the garment industry in Bangladesh are comparable to slave labour. For that matter, work and income are necessary but not sufficient conditions.
for prosperity in terms of happiness.

Outside expertise potentially helps companies to define and implement successful strategy. The added value of consultants, however, is often discussed triggering the question when consultancy is beneficial and has long-lasting added value. On the one hand, consultancy is regarded as an expensive management tool for incapable managers often used as a communication instrument for a re-organization including downsizing the number of employees. On the other hand, consultants are considered to be strategy experts offering firms escapes and growth opportunities due to their specific knowledge and competencies.

This section helps to differentiate valuable from useless consultancy activities. Sustainable consultancy aims to formulate and implement a new and potentially more successful strategy, or revise or strengthen an existing strategy such that employment is maintained and the survival of the company is fostered. The enhancing effect of sustainable strategic advice is therefore also relevant to regions. The Dutch economy, for example – like that of many other developed and developing countries – is to a large extent (sometimes up to eighty percent or more) made up of companies with fewer than fifty employees. Many SMEs are even smaller. In the Northern Netherlands, for example, most companies have an average of ten to fifteen employees. These companies are among the most important growth drivers of the Dutch economy, but are often vulnerable from a strategy perspective. For these companies, having an in-depth understanding of the causes and consequences of successful strategy is sometimes vital. Consultants can offer this expertise provided that they meet the standards of sustainable strategy advice. Four standards are important for valuable and sincere strategy consultancy, at least.

Openness is the first standard. It represents trust, empathy, altruism, authenticity and reliability. Sustainable strategic consultancy is impossible without an open relationship. Strategic questions involve fundamental decisions affecting a company’s legitimacy. This requires a clear understanding of each of any element of the company, including the background and the values of the leaders and the consultants themselves.

Vision is the second standard. A sustainable strategy consultant with a vision needs to first spend some time in a company to get to know it well. This also applies to that customer’s industry and region. A sustainable consultant then has the knowledge needed to map a company’s strategic problems and its environment, decisively providing a vision for the company to achieve solid solutions. Visioning is a critical skill for sustainable advice.
Boldness or decisiveness is the third standard. This represents communicating a convincing vision and opinion. A sustainable strategy consultant does not hesitate to read a client the proverbial riot act. This is not to say that consultants should groundlessly advocate visions and opinions. Indeed, a convincing vision is properly formed on the basis of insights rooted in scientific arguments. All strategic advice, and certainly every strategic decision, needs a thorough knowledge basis. This is accompanied by an analytical and systematic study of the strategic matter at issue for the specific customer.

Accountability is the fourth standard. Sustainable consultants are not afraid to justify themselves. In fact, they need to stand behind what they advise. Again, a scientific understanding of the advice roadmap for a new or revised strategy is indispensable – professional strategy consultants have powers of persuasion based on thoughtful and fundamental perspectives.

The specific weight of each of the four standards is basically the same. Each of the four standards can be learned by students and prospective consultants except perhaps for the first one. In advisory relationships, trust and the willingness to be open require sincere commitment. These are skills which are essential for sustainable strategy consultancy. This standard is the most fundamental and the most challenging to learn. Decisiveness, knowledge and attitudes are skills that advisors can learn either through personal pathways or through experience. Confidence – and closely related standards such as a service orientation and empathy – is of a different nature. These are personal traits which sort the wheat from the chaff among strategy consultants.

1.3 Future trends

Information, technology and new scientific revolutions

The first trend that can be observed is that of information and technology (IT) and of new scientific revolutions. A large part of businesses today operate in an outdated IT context. This has already led to substantial changes in many business models, for example the systematic shift in consumer behaviour away from local stores to the internet. There is little doubt that IT will be further re-versioned in the future. Overall, the IT revolution has been gradual, and companies have had the time to redesign their strategies or adapt them to the new IT reality. The IT revolution does, however, also move partly in spurts and will, for example, skip some stages.

Technology will be directly connected to businesses and consumers in many ways. Scientific revolutions will play a role here in product development – such as the role the new biotechnology played in medicine – but also in controlling and directing human behaviour in terms of eating habits and social connections. The current Facebook,
Google or Apple applications will probably be obsolete within a generation.

New IT capabilities will lead to self-reinforcing scientific revolutions. For instance, IT capabilities in neuroscience have rendered the neurophysiological structure of the human brain open to study and insight. This raises fascinating questions about how we view ourselves as human beings (such as the extent to which people independently make decisions and whether decision-making processes occur autonomously outside consciousness), but also whether and how a company’s ‘brain’ can be ‘technologized’, and how this relates to strategic success. Certain disciplines, such as marketing, have already shown that the cross-fertilization can result in new theories about buying behaviour. Companies in countries which can quickly realize this type of new scientific knowledge will have a strategic advantage over other companies: they will be able to respond quickly to new technological opportunities and threats and therefore distinguish themselves more quickly from their peers. Neuro-strategy as a discipline will be made possible by IT and the accompanying scientific revolutions.

In short, future technological possibilities will constantly question the legitimacy of organizations. In the future, the design of successful strategic choices will continue to determine organizational survival rates. Once acquired, distinctiveness in a market is not a given forever. It must be reinvented time and again, particularly when new technologies are introduced.

China and the new world order
The second trend involves changes in the world order, including current national boundaries, the ownership of companies and their financial and human capital. To some extent, a country is a sliding analysis unit. Most countries have relatively short histories. Maddison has already shown that the borders of many countries are often arbitrary and liable to change. This is certainly the case in Africa, but with the further Europeanization, these changes in borders will also arise in Europe.

Border changes carry with them a new world order, with China as an economic leader making its mark on the world. China’s entry to the modern world economy was delayed by environmental and population factors, but China will very soon create new strategic issues for the rest of the world. So far, China has increased its participation in Western countries and companies in virtual silence. China is playing a superior strategic game. It has learned from the failure of its predecessors on the world stage, including the Netherlands (for a long time the most important country in the world after the United Kingdom and the United States).

The coming dominance of China casts current business models and strategic choices in
The current industrial distribution and the corresponding distribution of wealth along current national lines of specialization and regional infrastructure will be brought into question by Chinese dominance. China’s desire to achieve optimal growth for its own economy is already giving rise to strategic choices which go far beyond its borders. This is reflected in China’s active participation in the African continent to meet its surging demand for fuel and raw materials.

The third trend is that of global crises. The world economy faces a crisis that cannot be ignored and which will have a decisive impact on many companies’ strategies, both for better and for worse.

The first crisis is the mismatch of interests leading to new trends of sustainability. As a result of the financial crisis, various corporate scandals (such as corruption at Siemens and Ahold) and the mounting reports on resource depletion, the People Planet Profit perspective has become a central theme in strategy. This challenges the strategic choices that companies make and the behaviour of their leaders concerning, for example, the distribution of profits. Until five years ago, sustainability was a theme for only a handful of companies which had positioned themselves as innovation leaders in their respective markets. Sustainability will be a criterion for more companies’ objectives, products, services and processes. The vast majority of businesses find it difficult or fail to take decisions in the area of sustainability. Those being able to successfully transform from a regular profit-driven company to a sustainable enterprise will survive the trends of global crises in the mismatch of interests.

Health and renewable energy are themes which align with sustainability. These are also issues which are likely to determine the public debate in the future. Health is linked to an ageing world population and to the challenge of keeping social care affordable. Countries differ in the age structure of their populations and how they finance care. In a sense, health is a national issue which requires a national strategy. This also applies to energy. The production and distribution of existing and new energy sources will be an important issue in the near future.

The impact of future trends on the strategy discipline
The three trends sketched above demonstrate the legitimacy of strategy as a scientific discipline in the future. The trends will make new demands on the managers and staff of the future: they will all need to be IT savvy, China-focused and willing and able to contribute to a solution for the various global crises. These are all avenues for the future development of strategy as a discipline.
The second monograph already identified five levels in strategy research: individuals, organization, alliances, context, and policy. The trends will affect all these domains in the field of strategy research. A brief summary is sufficient to highlight the impact of the future trends on strategy as a scientific discipline:

- In the future, striking a balance between leadership values due to IT revolutions or the presentation of Chinese management styles in Europe will be an ongoing game to play. The trends will make new demands on the managers and staff of the future: they will all need to be IT savvy, China-focused and willing and able to contribute to a solution for the various global crises.
- The trends will also change the existing organizational structures, if only because democracy from a Chinese perspective is different to the European view.
- The trends will alter the boundaries between organizations not only because the borders of many countries will be redefined in response to the coming changes to the world order, but also because IT will radically revise the organization of value chains.
- The trends will reshape the global business environment. On the one hand, cultural, geographical and cognitive distances will disappear. On the other hand, new distance dimensions will open up through the revolutions in IT, science and the world order. There will be a greater urgency to solve the social issues surrounding sustainability, ageing and energy and the strategic decisions needed to address them.
- The debate over new rules and regulatory institutions aligns with this too. Europe has already created a regulatory body and cross-country institutions that companies have to comply with. There will be many more supranational regulatory institutions with accompanying rules.

The trends also offer new opportunities for education in science and strategy consultancy. Universities are no longer immune to changes in their environment as their status as ivory towers disappears. Universities are hesitantly responding to these trends by developing new partnerships and, in so doing, anchoring universities in society and fostering their legitimacy. The boundaries between the university and the outside world will be redefined. Definitely IT will change current educational models comprehensively.

In short, strategy as a scientific discipline will change under the influence of IT revolutions, changes in the world order and the emergence of generic social issues. Strategy will be relevant to us all, more than ever before.

1.4 The structure and the content of the book
The quest for successful strategy studied in this book refers to a company’s boundaries. In a world of hyper-competition, many companies are increasingly opting to outsource
parts of their value chains to other companies. However, the success of such inter-firm alliances is quite variable. Some companies – such as the Japanese automotive manufacturers and their suppliers – are very successful in establishing and maintaining long-term relationships. In many other companies every alliance seems doomed to failure. The central question in the third part of this book is why some companies are so successful in strategic alliances and others are not.

Chapter 2 offers the foundation for this part of the book. The strategic success of inter-firm alliances is challenging to formulate and to measure. This chapter therefore offers an overview of performance indicators for international joint ventures. Chapter 2 also identifies the scope and content of international joint ventures, offering a count of the number of alliances for different regions in the world, highlighting the phenomenon’s cyclical nature. In so doing, it enables a review of the factors which contribute to the potential success or failure of alliances.

Chapter 3 analyses the first phase in the lifecycle of strategic alliances, that is, the selection of new alliance partners. The conditions in which new alliances are created are all crucial for later success. Chapter 3 argues that firms focus on specific criteria to varying degrees in the selection of new partners, such as the complementarity of resources and their willingness to share expertise. The propositions are tested using survey-based information from companies in high-tech industries.

The next chapters all relate to the management of strategic alliances. Selecting a new partner and starting a strategic alliance is one step; the successful management of existing partnerships an equally important second step. Partners have a few tools for the management of their alliances, including trust, contracts and third parties. The chapters share a similar survey-based database on strategic alliances in high-tech industries. Chapter 4 presents antecedents for and the performance effects of trust. The content and forms of trust is a source of ongoing debate in strategy research. Chapter 4 captures this debate through providing convincing evidence that relational characteristics build trust and that trust fosters alliance performance.

Chapters 5, 6 and 7 each investigate the role of contracts in the management of alliances. The design of a formal agreement is one of the most important strategic decisions for alliance partners. A contract is the only tangible instrument available to alliance partners to regulate inter-firm cooperation in the absence of a formal hierarchy. Chapter 5 focuses on the content of contracts. It addresses a commons wicked problem for formal alliance management tools: which clauses need to be addressed in a written contract and to what extent.
Chapter 6 complements the previous chapter by uncovering whether and how partners actively use formal contracts once their alliance begins. Chapter 6 studies the impact of three contingencies which offer an explanation for variations in ex post contract use including the contracting process, the need to safeguard spill-over risks and the existence of trust.

Chapter 7 builds on the previous chapters and disentangles the relationship between different contractual functions, partner cooperation and alliance success. The chapter offers many insights into whether and how contracts matter for alliance performance. For example, it discovers that the more important the contractual control function, the less likely it is that cooperative behaviour will emerge. The effects of particular contract functions on alliance success are stronger in particular situations than in others.

Chapter 8 offers an integrative perspective on informal and formal governance mechanisms. This chapter introduces organizational cultural differences and interdependence as important determinants of the use of contracts and trust in the management of strategic alliances. This chapter is among the few which explain when and why formal or informal governance is relevant in the management of strategic alliances.

Chapters 9 and 10 highlight the potential importance of third parties in the management of strategic alliances. Chapter 9 sets the scene for this by developing a comprehensive framework illuminating how third parties can influence the initiation and application of structural and relational governance mechanisms. The roles of third parties vary from assisting in establishing the appropriate legal format to providing coordination, bridging cognitive distances, preventing the emergence of distrust during negotiations and minimizing the destructive effects of alliance termination.

Chapter 10 offers an empirical test of the potential roles of third parties in the management of high tech alliances. Building on the theoretical foundations of Chapter 9, this chapter specifies whether and how third parties can help to restore trust in formal and informal governance mechanisms. The chapter offers a multitude of key lessons for restoring public trust.

Chapter 11 provides an opportunity to study international differences in the dynamics of vertical strategic alliances. The chapter reviews relationships between car manufacturers and their suppliers in the automotive industries in Japan, the United States and Europe. An in-depth study of the underlying causal structure which determines the dynamics of inter-firm partnerships helps understand why some firms
are involved in ever-continuing collaborations and others break up prematurely. Self-reinforcing patterns between firm, partner and alliance characteristics offer an eye-opening perspective. As in the other chapters in this part of the book, this chapter also applies survey-based quantitative methods.
CHAPTER 2. EVOLUTION OF ALLIANCES

Summary
Joint ventures are almost indispensable for the realization of international ambitions. They offer many opportunities for organic growth – for example, because new knowledge and markets become available – but also have risks due to their specific organization form. This chapter offers two different perspectives on international joint ventures (IJVs). Firstly, we analyse the performance of IJVs in general. The performance of IJVs can be assessed in different ways. Based on the alliance literature we provide an overview of dimensions, measures and determinants. Secondly, for the period from 1985 to 2006 we map the Dutch practices of IJVs. Using unique data we characterise the start, control and termination of Dutch IJVs. Finally, we present propositions that offer a guideline for further research into the success of (Dutch) IJVs. This study is important for managers currently responsible for strategic alliances identifying the goals and conditions for success. Ambiguity about goals and critical success factors is often a reason for a premature dissolution of the alliance.

Keywords: international joint ventures, performance indicators, evolution, internationalization

2.1 Introduction
This study examines the economic and strategic foundations of international joint ventures (IJVs). The performance of IJVs varies greatly. Some IJVs generate much added value to the alliance partners. Other IJVs are mainly inefficient and terminate prematurely. This chapter aims to answer the following key questions. How can we measure the performance of IJVs? What factors determine the performance of IJVs? Are IJVs important for Dutch companies? The first two questions will be answered on the basis of the alliance literature. The third question is answered on the basis of a unique dataset that clarifies many characteristics of Dutch IJVs, that is, an IJV with at least one Dutch partner.

An IJV is a very specific way to organize the production of goods and services (Glaister, 2004; Inkpen, 2008). In an IJV at least two companies set up a new legal entity in order to achieve certain objectives. This is often accompanied by substantial investments in people, time and fixed assets and therefore it takes a certain lifetime to recoup these investments and capitalize the expected benefits. An IJV is a strategic way of cooperation that is initiated partly out of necessity and partly from the belief that an IJV is the key to success (Boersma and De Jong, 2006; Hyder and Ghauri, 2000). For an increasing number of firms innovation requires a combination of products, markets, technologies and organizational skills that most companies do not have in-house, so they have to cooperate with complementary specialists (De Jong and Klein Woolthuis, 2006; Volberda, 1998). Internationalization compels companies
to focus on their core competencies (De Jong and Nooteboom, 2000). Outsourcing of activities to suppliers – vertical alliances – provides specialization. Specialization not only leads to economies of scale, but also enhances the knowledge base of a firm that fosters the learning capacity of an organization. Horizontal alliances like IJVs are appealing for similar reasons (Nooteboom, 2004; Luo, 2008). They enable organic growth by developing new markets, products, and customers. They generate new strategic opportunities by enabling faster response times to unforeseen circumstances and improved market positions. They support production by sharing costs and risks, logistics and access to valuable information. These benefits are alliance-specific and are not or very difficult to achieve by an independent company or via a merger (Wang and Zajac, 2007; Das and Teng, 2008).¹

IJVs are attractive because they potentially offer long-term competitive advantages (Stuart, 2000). This is reflected in practice. Several studies suggest that in recent decades the number of new IJVs increased significantly (Dyer and Singh, 1998; Contractor and Lorange, 2002). But just as often evidence shows that IJVs fail and are terminated prematurely, that is, in the first five years of their existence and before the potential added value has materialized (Kale, Dyer and Singh, 2002; Lunnan and Haugland, 2008). These stylized facts are the reason for our first research questions. How can we measure the performance of IJVs and why do some IJVs perform better than others? We answer these questions in the second part of this paper. In line with this we formulate our third research question, namely, to what extent are IJVs important for Dutch companies? Macro data on IJVs are far and between and the available information largely relates to the American or the Asian context. In the alliance literature, an abundance of case studies or samples based on, among other, questionnaires are available. These micro data are not only difficult to compare, but also are cross-sectional and therefore lack a historical (longitudinal) perspective. In the third part of this chapter we therefore present a new database. Based on this database, we can visualize the evolution of Dutch IJVs in the period between 1985 and 2006. In the final paragraph of this chapter, we show how the insights from sections two and three can be combined. That is, we present several propositions that offer a guideline for future research into the success and failure of (Dutch) IJVs.

2.2 Performance of IJVs

Definition of IJVs

To answer our research questions, it is first necessary to give a definition of IJVs. In terms of transaction costs economics (Williamson, 1985), an IJV is a “hybrid

¹ Besides alliances, companies can also obtain insufficient competencies via a merger. International mergers are costly because (a) there are often legal restrictions, (b) the value of skills reduces after the merger, (c) the obtained competencies have lower added value than originally thought, (d) the merger brings unexpected challenges, or (e) because the new competencies do not fit to the original ones (Barney, 1999). These are also the main reasons why many mergers ultimately fail.
organization.” The production of the input is not purchased on the market or produced independently. Using an IJV the participating companies create a third, new legal entity to organize their cooperation. This joint venture distinguishes itself from other forms of cooperation such as (strategic) alliances. An alliance refers to all contractual relationships between companies such as licensing agreements. A joint venture is a partnership between at least two companies that provide products and services for a newly formed, legally independent company. Joint ventures are called “international” if at least one of the partner’s headquarters is outside the home country of the joint venture. The distinguishing feature of a joint venture is that each partner is co-owner in the new company. This ownership means that the participating companies have a direct interest in the performance of the joint venture because the profit it will produce directly contributes to the profits of the participating companies in question. Such a direct self-interest is less present in other forms of cooperation between companies. Of course, the share of ownership of the participating companies in the new company is an important aspect. It determines whether the partners have equal control (that is, the partners have an equal percentage of the shares), or whether a majority-JV is created (that is, one of the partners owns more than 50 percent of the shares in the new business). Based on the above, we define an IJV as an international partnership between two or more originally independent companies, which join tangible or intangible complementary production factors in a new legally independent organization (Boersma and De Jong, 2006).

Concepts and measures
The performance of an IJV is a multi-dimensional concept. This section offers an overview of dimensions, measures and determinants related to the performance of IJVs in general. Studies in the alliance literature use different dimensions for IJV-performance, as well as different indicators to measure these dimensions. Table 1 presents the five most important dimensions of IJV performance and their key measurements.

The first dimension of IJV-performance is duration. This dimension is directly related to the lifecycle of the IJV and is often measured by the (expected) age of the IJV from the perspective of the alliance partners.

The quality of the working relationship between the partnering companies in an IJV is the second dimension of IJV-performance. This dimension by definition relates to the perceptions of alliance managers concerning the behaviour of the other partner. It is therefore measured by means of questionnaire items that measure trust (with Likert-scaled statements such as “our partner is carefully and concerned with our problems”).
Table 1. Dimensions and measures of IJV-performance

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<thead>
<tr>
<th>Dimension</th>
<th>Measure</th>
<th>Sample References</th>
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<tbody>
<tr>
<td>1. IJV as expensive</td>
<td>expected duration of the IJV, age of the IJV, continuity of the IJV, viability of the IJV</td>
<td>Madhok (1995), Barkema et al. (1997)</td>
</tr>
<tr>
<td>3. IJV success</td>
<td>return on investment of the IJV, return on assets of the IJV, growth in sales in their own country, perceptions of profitability, payback periods and market share of the IJV</td>
<td>Lee and Beamish (1995), Luo (1995)</td>
</tr>
<tr>
<td>5. IJV stability</td>
<td>changes in equity ratios, important reorganisations, revisions of contracts, change in participating partners</td>
<td>Lyles and Salk (2006), Steensma et al. (2008)</td>
</tr>
</tbody>
</table>

IJV-success is the third dimension of IJV-performance. It is a synonym for the overall performance of the IJV or total joint success. The overlap between these dimensions is that they all report elements concerning the business performance of the IJV itself as observed by the partnering companies. Financial indicators such as the actual profitability or the payback period of investments in the IJV are example measurements for IJV-success.

Effectiveness is the fourth dimension of IJV-performance. This dimension is often measured by the degree of satisfaction of the IJV partners or the extent to which the initial objectives have been achieved. The advantage of these indicators is that they are directly related to the objectives of a specific joint venture. Hence, it is possible that, for example, profitability inaccurately measures IJV-performance because the companies have joined forces for other reasons such as, for example, to find out more about customers in other countries rather than to generate profits. The joint venture can be perceived as effective – and therefore to have an excellent performance – once the knowledge about a particular country is collected. The performance in such a case is excellent even when the joint venture is not profitable. Stability is the final dimension of IJV-performance. This dimension is often measured by changes in shareholding positions of the partners in the IJV or by the extent of revisions in the initial formal or informal agreements.
Determinants of IJV-performance

Based on the organization literature, we now focus on the antecedents of IJV-performance (Ozorhon et al., 2009; Lin and Wang, 2008). These determinants can either improve or deteriorate the performance of an IJV. The determinants are grouped into four categories, namely characteristics of the partner, the strategy of the partner, the structure of the IJV and the behaviour of the partner.

### Table 2. Determinants of IJV performance

<table>
<thead>
<tr>
<th>Determinant</th>
<th>Positive effect</th>
<th>Negative effect</th>
</tr>
</thead>
</table>
| 1. Characteristics of the partner | competencies of alliance partner (Shamdasani and Seth, 1995)  
Experience with IJVs (Barkema et al, 1997)  
previous collaboration (Madhok, 1995) | Cultural Diversity (Inkpen & Beamish, 1995)  
direct competition between partners (Park & Russo, 1996)  
differences in company size (Madhok, 2005) |
| 2. Business Strategy Partner | contiguous strategies (Fang & Zou, 2009)  
IJV linked to strategic intentions of companies (Spekman et al, 1996)  
common vision among partners about the direction of the IJV (Spekman et al, 1996) | differences in strategic directions (Parkhe, 1991) |
| 3. Structure of the IJV      | number of partners in the IJV (Park and Luo, 1996)  
control by foreign partner (Killing, 1983)  
common control (Beamish and Banks, 1987)  
extent of the IJV (Lyles and Baird, 1994) | renegotiate contract (Boersma and De Jong, 2006)  
unequal shares ratios (Blodget, 1991) |
| 4. Conduct                   | product quality of the IJV (Lyles and Baird, 1994)  
applying HRM practices of host within IJV (Zeira et al, 2004)  
quality of communication between alliance partners (Nootenboom, 2004)  
attitude and openness of alliance partners (Boersma and De Jong, 2006) | excessive legal structure (Ring and de Ven, 1994)  
escalation of conflicts (Nootenboom, 2004) |

The first set of antecedents consists of business characteristics of the alliance partner. These include industry activities, organizational culture, business scale and scope, and learning opportunities. In the alliance literature, for example, is suggested that
differences in industries among partnering firms decrease the performance of an IJV. Direct competition can lead to conflicts when both partners aim to increase their market share in similar industries. Differences in industries can also lead to a reduction of learning opportunities. The effects of learning are optimal when the subject of learning is related to what is already known. That is, the probability that one can learn from a partner through an international joint venture is greater if the partner is active in the same or in a closely related industry (Park and Russo, 1996; Cohen and Levinthal, 1990). Furthermore, learning also contributes to the performance of the joint venture when one of the partners already has experience with joint ventures or when the partners have previously worked together in another context.

The business strategies of the alliance partners themselves constitute a second driver of performance. In particular the partner selection criteria – such as product differentiation or market development – are considered as important determinants of IJV-performance in the alliance literature. The strategies of the participating companies may be different. For a viable IJV they should complement each other. A subsequent change in the initial strategies of the IJV partners can reduce the need for the IJV and lead to a situation where it is eventually dissolved. In other words, if the long-term strategies of the partners are aligned, this will have a positive influence on the performance of an IJV (or, conversely, a negative effect on the performance of an IJV when misalignment in strategies exists).

The structure of the IJV forms the third antecedent. Structure includes all formal and informal agreements that are used to manage the IJV, such as the content and role of a contract, the division of control or the degree of confidence. Among other things, the alliance literature shows that trust reduces the cost of contracts and control. Trust represents an open and honest collaboration and therefore improves troubleshooting. For these reasons, the performance of an IJV is affected by confidence and trust. Likewise, contracts may “make or break” an IJV. That is, a disappointing performance of an IJV is often not only the result of goal incongruence but also from the fact that the agreements are not clearly specified in a contract. Alliance managers are often informed by their lawyers who tend to focus on minimizing risks in contract negotiations. This can lead to distrust and conflicts and therefore to a premature end of the cooperation.

The final category that affects the performance of IJVs refers to the behaviour of the participants. This category can be divided into actions that are specific to the joint venture, actions relating to the interaction between the partners and the behaviour of an individual partner. The alliance literature has shown that opportunistic behaviour (such as hidden agreements with other parties), below average operating performance (such as delayed deliveries of low quality products by one of the partners) or a lack of
openness (such as withholding information that is essential for the success of an IJV) all can lead to conflicts that will negatively affect the performance of an IJV.

In summary, on the basis of the alliance literature, we have shown that the concept of “IJV-performance” has several dimensions, and that each dimension has its own set of measurements. In addition, we offered an overview of the most important determinants which can either improve or deteriorate the performance of an IJV.

2.3 The facts about Dutch IJVs
Research methods and data collection strategy
To the best of our knowledge, country-level historical data concerning the evolution of alliances in general and that for Dutch IJVs in particular are far and between. This chapter aims to fill this gap. Designing a database with historical evidence is laborious and time consuming. But it offers a unique opportunity to identify the characteristics of IJV activities of Dutch companies nationwide. As indicated above, alliance research is dominated by data collected via surveys or case studies. These methods and data usually offer a wealth of information about a particular alliance (notwithstanding differences in definitions, concepts, standards and research methods that may limit a direct comparison between survey and case study findings). We created a new country-level historical database. Note that in the following sections, the results relate to Dutch IJVs, that is, an international joint venture with at least one company from the Netherlands.

All data for the period from 1985 to 2006 were collected from a single source of information, namely the Dutch Financial Times (Financieele Dagblad, FD). The total population of IJVs in the Netherlands is unknown limiting conclusions about the representativeness of our data. Nevertheless, it is likely that any IJV of any importance, and that is of any interest for a Dutch company, is announced through a press release. Given the position of the FD in the Dutch business community, it is very likely that this press release is addressed by the FD. In line with our definition we used keywords (such as “international joint venture” or “international cooperation”) to search and select IJV information from the FD online database. Within our observation period an article from the FD was selected when (a) the start or the termination of an IJV was announced with (b) at least one Dutch and one non-Dutch partner. We counted 752 observations. Of these 752 IJVs, 139 IJVs were terminated during our window of observation.

2 Our research methods align with Beenakker and de Jong (2003) and the CATI database (Roijakkers and Hagedoorn, 2006). There are differences. The CATI database, for example, is not online available and has its focus on high-tech alliances only. Our databases complements the database of John Bell (1985-1989; see Jagersma and Bell, 1992) and Margreet Boersma (1989-1996). These databases are complemented with new information about the IJVs and the alliance partners. In so doing, we aligned these databases with the newly collected information for 1996-2006.
Based on these data, we are able to characterize the start, the ownership and the termination of Dutch IJVs. Although this analysis is mainly descriptive, it nevertheless provides a thorough overview of the evolution of Dutch IJVs during one of the most important periods in the history of the Dutch economy. During this period many international activities were developed and the transformation from a largely agricultural and production-based society to a service-oriented economy has been confiscated.

**Characteristics of new Dutch IJVs**

Ever since its first existence, international trade characterizes the Dutch economy. Internationalization through IJVs, however, is a relatively new phenomenon. The birth rate of Dutch IJVs is the point of departure. Figure 1 shows that the number of new IJVs per year fluctuates. To some extent there is a wave-like pattern: periods with an increase in the number of new venture activities are followed by periods in which the number of new internationalization declines.

*Figure 1. The evolution of Dutch IJVs (1985-2006)*
We can distinguish three different periods during our window of observation. The first period, from 1985 to 1989, can be characterized as the beginning of Dutch IJVs. A modest number of new IJVs is created giving Dutch companies opportunities to gain experience with this form of organization. In the second period, from 1990 to 1996, Dutch companies benefited from this initial experience. The birth rate of IJVs is growing rapidly, with a maximum in 1996. In the third period, from 1996 to 2006, IJVs as an organizational form matures. The number of new IJVs per year steadily decreases. This indicates saturation in this form of organization. It is interesting to observe that the saturation level stabilizes at the initial point of departure. This implies that the birth rate of Dutch IJVs stabilized at an average of about 20 new initiatives annually in our window of observation.

If we distribute the new IJVs over the Dutch parent companies, we conclude that the leading Dutch companies typically initiate most new IJVs. Table 3 shows that Philips dominated the start of new IJVs in the first years in our observation period. In the following years, the petrochemical sector was more active primarily through Shell, Akzo Nobel and DSM. At the end of the period, the Dutch financial sector (ING and the former Fortis) also entered into the international alliance domain.

Although large Dutch organizations on average initiate joint ventures more often than small firms, most joint ventures are created by small Dutch companies (see Figure 3). Of the 752 new IJVs between 1985 and 2006, a total of 273 IJVs were initiated by a Dutch company that was on the Global 500 list. Figure 3 shows that – despite the fact that large companies on average initiate more alliance activities than small firms – small firms also play a substantial role. In other words, both large and small companies do international business via IJVs.
Table 3. IJVs per companies (1985-2006)

<table>
<thead>
<tr>
<th>Year</th>
<th>Business</th>
<th>Number of new IJV's</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>Philips</td>
<td>8</td>
</tr>
<tr>
<td>1986</td>
<td>Philips</td>
<td>9</td>
</tr>
<tr>
<td>1987</td>
<td>Philips</td>
<td>7</td>
</tr>
<tr>
<td>1988</td>
<td>Philips</td>
<td>3</td>
</tr>
<tr>
<td>1989</td>
<td>AkzoNobel</td>
<td>2</td>
</tr>
<tr>
<td>1990</td>
<td>Philips</td>
<td>6</td>
</tr>
<tr>
<td>1991</td>
<td>DSM</td>
<td>3</td>
</tr>
<tr>
<td>1992</td>
<td>Philips</td>
<td>6</td>
</tr>
<tr>
<td>1993</td>
<td>Unilever</td>
<td>4</td>
</tr>
<tr>
<td>1994</td>
<td>Philips</td>
<td>7</td>
</tr>
<tr>
<td>1995</td>
<td>Akzo Nobel</td>
<td>7</td>
</tr>
<tr>
<td>1996</td>
<td>DSM, Shell</td>
<td>3</td>
</tr>
<tr>
<td>1997</td>
<td>DSM</td>
<td>6</td>
</tr>
<tr>
<td>1998</td>
<td>DSM, KPN, Shell</td>
<td>2</td>
</tr>
<tr>
<td>1999</td>
<td>DSM</td>
<td>4</td>
</tr>
<tr>
<td>2000</td>
<td>Hoogovens / Corus, Shell</td>
<td>3</td>
</tr>
<tr>
<td>2001</td>
<td>Shell</td>
<td>8</td>
</tr>
<tr>
<td>2002</td>
<td>ING</td>
<td>5</td>
</tr>
<tr>
<td>2003</td>
<td>Philips</td>
<td>4</td>
</tr>
<tr>
<td>2004</td>
<td>Fortis</td>
<td>2</td>
</tr>
<tr>
<td>2005</td>
<td>Shell</td>
<td>3</td>
</tr>
<tr>
<td>2006</td>
<td>Shell</td>
<td>3</td>
</tr>
</tbody>
</table>
The next feature is related to the geographical focus of the IJV activities. According to our data, most Dutch IJVs focus on Europe with a European partner (36.9 percent) or in Asia with an Asian partner (33.1 percent). Figure 4 represents this feature with respect to the continent of the foreign partner (a similar picture obtains for the continent of the IJV). We also have to differentiate the location of the IJV in terms of the economic development of the region and the country. It appears that a large part of the Dutch IJVs (about 60 percent) is located in industrialized countries. IJVs in developing countries are far and between. Taken together, our information shows that Dutch companies mainly engaged in IJVs in their geographic proximity or in an economic context that is strongly affiliated to that of the Dutch economy.
There is a particular interest for China. Since the end of the 1980s, China has reported impressive economic results and the country opened its economic borders. Hence, China received attention from almost all the Global 500 companies that anticipated the growth potential in this market. Dutch companies are no exception, especially because IJVs is one of the few legal ways to enter the Chinese market. Of all Asian IJVs in our database, more than 46 percent are located in China. However, Figure 5 also reports a wave-like pattern for Dutch IJVs in China similar to the waves observed for the overall birth rates of IJVs. After a slow start in the period 1985-1991, the number of new Dutch IJVs in China increases strongly, followed by periods of growth and decline in the Dutch-Chinese cooperation.
Using our database, the IJV operations can be divided into respective sectors. For this, we used the Standard Industrial Classification (SIC), which corresponds to the industry classification of the United Nations. It shows that the industry of the Dutch company, the industry of the foreign partner and that of the IJV are closely aligned. In other words, IJV activities mainly take place between partners in similar industries. About half of the IJVs are initiated in the secondary (54 percent) or in the tertiary sector (43 percent). There are virtually no IJV initiatives in the primary sector (3 percent). However, we see an interesting shift during our observation period. Figure 6 shows that in the second half of the 1990s, the Dutch IJV initiatives in the industrial sector dominated followed by IJVs in the tertiary sector.

Zooming in on the subsectors shows that until the end of the 1980s most IJVs were established in the electronics sector, followed by the chemical industry in the 1990s. Later, the relative number of IJV operations particularly increased in the financial, energy and telecommunication sectors. Accordingly it appears that production and sales is the main target for Dutch IJVs. In at least 60 percent of all cases these activities are announced as the main objective of the IJV. Service delivery (20 percent) and the development of new knowledge (15 percent) are also referred to, but usually
in conjunction with aforementioned activities.

*Figure 6. New Dutch IJVs per sector of the economy (1985-2006)*
Ownership of the Dutch IJVs
The ownership of the new company is one of the main features of IJVs. An IJV may consist of two or more participating companies. The vast majority of the Dutch IJVs, however, consisted of bilateral relations. In the 1985-2006 period only 13 percent of the IJVs included more than two partners (in 8.3 percent of these cases there were three partners and in 4.7 percent of the cases there were four or more partners).

Table 4. New Dutch IJVs per sector sectors (1985-2006)

<table>
<thead>
<tr>
<th>Year</th>
<th>chemical products</th>
<th>electronics and optical equipment</th>
<th>financial institutions</th>
<th>transport, storage and communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>4</td>
<td>8</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1986</td>
<td>5</td>
<td>10</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>1987</td>
<td>5</td>
<td>6</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>1988</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1989</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>1990</td>
<td>7</td>
<td>7</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>1991</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>1992</td>
<td>5</td>
<td>8</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>1993</td>
<td>6</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>1994</td>
<td>6</td>
<td>6</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>1995</td>
<td>17</td>
<td>5</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>1996</td>
<td>11</td>
<td>3</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>1997</td>
<td>9</td>
<td>7</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>1998</td>
<td>5</td>
<td>2</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>1999</td>
<td>7</td>
<td>3</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>2000</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>2001</td>
<td>0</td>
<td>5</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>2002</td>
<td>1</td>
<td>0</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>2003</td>
<td>1</td>
<td>4</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>2004</td>
<td>1</td>
<td>3</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>2005</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>2006</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
</tbody>
</table>
Figure 7 shows that the relative number of IJVs with more than two partners has remained approximately the same. These network IJVs are mainly located in non-industrialized countries.

*Figure 7. New Dutch IJVs: number of alliance partners (1985-2006)*

The majority of the Dutch IJVs refers to a situation with shared control. Figure 8 shows that only in a fraction of the total population an uneven situation of IJV control by more than two companies is relevant. In about 30 percent of all cases, the Dutch company has been in control and in 18 percent of cases the foreign partner took charges. During our window of observation, the number of Dutch IJVs where a foreign company has control is relatively stable. The number of IJVs with either Dutch or a shared control is more variable. During the 1990s, when many new Dutch IJVs were initiated, Dutch companies were more likely to control the new venture, while during the surrounding periods the opposite was the case. In the 1980s and during the beginning of the 21st century Dutch companies on average accepted minority positions.
The context of the host country seems to be an important determinant for Dutch companies to take control of the IJV. Table 5 shows that Dutch companies may prefer to have control over IJVs in less stable environments. Dutch IJVs located in industrialized countries or in newly industrialized countries often operate more with shared control than in other contexts. In 23 percent of the Dutch IJVs Dutch companies take control themselves when operating in industrialized countries, compared to 40 percent when operating in developing countries.
Table 5. Control of Dutch IJVs by Dutch company per country

<table>
<thead>
<tr>
<th></th>
<th>Ownership by Dutch company</th>
<th>Equal distribution of ownership</th>
<th>Unequal distribution of ownership</th>
<th>Ownership by foreign company</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrialised countries</td>
<td>23%</td>
<td>51%</td>
<td>7%</td>
<td>19%</td>
</tr>
<tr>
<td>Newly industrialized</td>
<td>30%</td>
<td>59%</td>
<td>4%</td>
<td>7%</td>
</tr>
<tr>
<td>countries</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Developing countries</td>
<td>40%</td>
<td>30%</td>
<td>11%</td>
<td>20%</td>
</tr>
<tr>
<td>Transition economy</td>
<td>44%</td>
<td>31%</td>
<td>13%</td>
<td>11%</td>
</tr>
</tbody>
</table>

Full control over the IJV is obtained when at least 50.1 percent of the shares is obtained. In many cases, however, the ownership of the shares increased as a result of, for example, increased (relative) investments. On average, Dutch companies obtained a higher percentage of the shares in the new IJV than non-Dutch partners (49.6 percent vs. 46.3 percent for Dutch and non-Dutch partners, respectively). Figure 9 shows that the average percentage of shares of Dutch companies fluctuates. During about half of this period – especially during the 1990s – Dutch companies acquired more than 50 percent of the shares.

Figure 9. Average percentage of shares by Dutch companies in Dutch IJVs (1985-2006)
Dutch companies acquired dominant positions in IJVs that were active in the secondary sector. In the chemical industry and the electronics sector the Dutch companies, for example, obtained on average 54.2 and 50.9 percent of the shares. The dominant position also relates to the size of the Dutch companies. Large Dutch companies – that is, companies listed in the Fortune 500 list – report higher average equity percentages than their foreign partners. This seems to indicate that these companies prefer to take the lead in the new Dutch joint venture.

Termination of Dutch IJVs
The question is how often and when new international initiatives are terminated. Figure 10 shows the number of terminated IJVs. Figure 11 shows the year in which the terminated IJVs were created (because of a lack of data, the observation period in this section differs slightly from that in the other sections). Figure 10 shows that the number of terminated IJVs peaked at the end of the 1990s and in the beginning of the new century, with an absolute maximum of 18 terminated IJVs in 2000. Figure 11 shows that many of these discontinued IJVs were initiated in the heydays of the Dutch IJV activities, namely in the 1990s. In the 1990-2006 period approximately one fifth (18.5 percent) of all new IJVs were stopped.

Figure 10 Number of terminated Dutch IJVs (1990-2006)
In only 7 percent of the discontinued cases, both or all partners left the IJV. Usually one of the partners left the IJV. Our information shows that, apart from a lack of financial targets (30 percent), ending an IJV is mainly caused by the need to focus more on core activities (25 percent), due to restructuring activities within the partnering company (9 percent) or a conflict of interest between the partners (3 percent). Our database also shows that more IJVs were stopped in industrialized countries than in non-industrialized economies (23 versus 12 percent), when foreign partners instead of Dutch companies have control (31 versus 18 percent), or when the IJV consists of networks instead of two parties (21 versus 14 percent). The number of terminations does not dependent on the industry. That is, the number of terminations is approximately equal in the primary (18.2 percent), secondary (20.3 percent) and the tertiary sector (19.7 percent).

2.4 Discussion

Conclusions
International joint ventures have a large potential to achieve organic growth. Due to the IJV, companies achieve economies of scale, obtain complementary expertise or
enter new markets. In other cases, it is simply a necessity to join IJVs. Globalization, for example, increases the turnover rate of new goods and services. Companies need produce and sell new products in shorter periods of time. Doing so requires knowledge and experience that many companies often lack.

Starting a new or participating in an existing IJV is one thing, making an IJV successful is different. Different economic and strategic interests need to be identified and aligned. Sharing company-specific knowledge in areas such production is a prerequisite for IJV success. This knowledge is often highly confidential, not only because it is the raison d'etre for the company, but also because the alliance partners in an IJV often are another ones direct competitors. This is especially true for multinational companies operating in multiple markets. In short, IJVs have a large potential but also share substantial risks.

This chapter presents two different perspectives of IJVs. Firstly, it is the question when IJVs perform well and how superior performance can be achieved. Based on the alliance literature we have identified five key dimensions of IJV performance: duration, the quality of the working relationship, joint venture success, effectiveness and stability. Each of these five dimensions provides a different perspective on the performance of an IJV. It is important to highlight the dimensions of IJV-performance of interest. Ambiguity about performance and its indicators may lead to confusion and conflicts. Based on the alliance literature, we also present four clusters of the most important determinants of IJV performance: characteristics of partner, characteristics of the partner strategy, IJV structure and partner behaviour. The overview is useful for alliance managers who want to enter a new alliance; it helps to clarify the viability or the success of a potential new venture. It helps managers to successfully create a new venture from the start by focusing on those factors that improve performance and by reducing the influence of potentially harmful features from scratch on.

The next question concerns the relevance of IJVs for the Dutch economy. It is a question whether or not IJVs are part of the Dutch economy at all. We present empirical evidence for two decades of IJV experience in the Netherlands to test this. Our data visualizes the evolution of Dutch IJVs. Our data show that IJVs formed a crucial element in the strategy of many Dutch companies. This applies to large companies – like Shell, Philips and ING – but also to companies that are not listed on the Fortune 500 list. In the 1985-2006 period, Dutch companies have initiated 752 IJVs, of which 139 (about one in five) were terminated at the end of our observation period. A comparison between the joint ventures in different periods provides some interesting differences (see Table 6).
During the first period (1985-1989) we observed 80 new IJVs in which Dutch companies mainly worked with American companies, and particularly in the electronics sector. In this first period, Dutch companies were usually in a minority position, with an average of 45.8 percent of the shares in the new company. In the second period (1990-1996), we observed a strong growth in international initiatives, with a total of 325 new IJVs. Dutch companies often had a majority position (with an average of 51 percent of the shares). In this period mainly large Dutch companies entered into joint ventures with Chinese companies and especially in the chemical sector. That is, most large companies (42.6%) work in this period with an Asian partner in Asia (that is, China), while small companies (43.7%) partnered with a European partner in Europe. The increase in the number of IJVs in this period can therefore be mainly attributed to the number of small businesses that join with a European partner in Europe, where they managed to acquire a majority position. In the third period (1997-2006), the growth in the number of Dutch IJVs levelled off, although the international ambitions of Dutch companies themselves did not disappear completely. In this period, we had 357 new joint ventures – with an emphasis on the financial sector and the logistics and communications sector – in which Dutch companies often accepted minority positions (on average 49.6 percent ownership of the shares).

**Future research**

Our research has particular limitations that offer opportunities for future research. The information for our database derives from secondary data, namely announcements by companies that are included in the FD. Despite all diligence when searching the FD, not all companies may have announced all of their new IJVs through a press
release. In addition, it is possible that the importance of IJVs is reducing over time implying that an IJV fades out in silence or that an IJV has an explicit end date. The termination of an IJV is not often communicated in press releases and this may lead to an underestimation of this event in our files.

Nonetheless the elements presented in this chapter offer sufficient opportunities for new research on IJVs in general and for Dutch IJVs in particular. A striking fact is the relative longevity of Dutch IJVs. Only one in five Dutch IJVs has been terminated in our observation period. That is considerably less than previous estimates of alliance failure. Other studies suggested that 30 to 50 percent of all alliances fail in the first five years of their existence. Understanding the lifecycle of an alliance is important because duration is closely related to other measures of success (Olk, 2002; Hagedoorn, 2002).

Future research can test various propositions regarding the duration of Dutch IJVs (Merschi and Riccio., 2009; Li and Zhou, 2008). First, differences in national values may play a role. Companies from countries with equal national cultures have a better understanding of each other, making the chance of misunderstandings and conflicts smaller. This allows for optimal communication between the alliance partners which translates into better performance. In other words, an optimal fit between the alliance partners in national values increases the expected duration of the IJV. Second, the ownership structure can have an all-determining value (this is closely related to the size of the participating parties). IJVs are accompanied by much uncertainty because the goal of the collaboration is yet to be realized. A clear management structure in which one of the partners owns the property of the IJV may reduce this uncertainty, which improves performance. In other words: a dominant partner will increase the lifetime of an IJV.
CHAPTER 3. NEW ALLIANCE PARTNER SELECTION

Summary
This study analyses whether a firm’s innovative nature affects its selection of a new alliance partner. The selection of an appropriate partner is a crucially important first step in the design of a successful strategic alliance. We argue that innovative firms focus on particular criteria in the selection of new partners – namely, complementarity of resources, absorptive capacity, innovative capabilities and willingness to share expertise. Data to empirically analyze the research hypotheses are collected from a survey of 51 Dutch firms operating in the Information and Communications Technology (ICT) sector. We control for characteristics of the focal organization, the alliance and the entrepreneur. The exploratory results provide support for our key proposition.

Key words: innovation, partner selection, absorptive capacity, complementary resources, organizational learning

3.1 Introduction
In this study we analyze new alliance partner selection by Information and Communications Technology (ICT) companies. More specifically, we seek to understand whether innovative firms select differently from their less innovative counterparts. Although it is well known that alliances are important for innovation (Das & Kumar, 2011a; Inkpen, 2008) and that appropriate partner selection determines alliance success (Dacin, Hitt, & Levitas, 1997; Das & He, 2006), the alliance literature largely remains silent on the combination of the two. In this paper, we consider innovation as a key intangible asset of a company, driving the selection process for new alliance partners.

Innovation has attracted the attention of scholars in various fields (Nooteboom, 2000). Innovation is a multidimensional concept and may include patent applications or R&D expenditures (Hagedoorn & Cloodt, 2003; de Jong & Klein Woolthuis, 2008). In our research, innovation by the focal firm concerns the number of new products or services the company introduced in the market. This conceptualization is appropriate for our research context. Companies in the Dutch ICT sector mainly are small and medium-size enterprises. Among others, these companies are less likely to, e.g., associate R&D expenditures with innovation because these companies typically do not have R&D budgets or departments, which might mask their innovative performance and thus bias results. We define a strategic alliance as an enduring cooperative agreement in which two or more separate organizations share input while maintaining their own corporate identities. Strategic alliances can have different governance structures – such as equity or non-equity joint ventures and licensing agreements – and targets such as cost reductions, market entry, sharing risks or the development of new products and services (Luo, 2008; Teng & Das, 2008; Tidd,
Bessant, & Pavit, 2001). For a number of years now, alliances have been considered as an important prerequisite for company success (Contractor & Lorange, 2002; Das & Kumar, 2010; Das & Kumar, 2011b; de Jong & Nooteboom, 2000; Sampson, 2005). Turnover and net profits can grow for many years in succession if companies join forces and manage to introduce new products or services into global consumer markets. Various empirical studies confirm the rent-generating effects of alliances for partnering firms (see Kumar & Das, 2011). In line with this, inter-firm collaboration has also gained in importance for the development of new knowledge, particularly for companies that operate in the ICT sector (Osborn & Hagedoorn, 1997). It is in these industries that innovation requires a combination of products, markets, technologies and organizational capabilities that most companies do not have in-house, and are therefore obliged to cooperate with complementary specialists.

However, despite the potential added value of a strategic alliance or the need to team up with other companies, approximately half of inter-firm collaborations fail (Das & Teng, 2004; Kale, Dyer, & Singh, 2002;). Relational features, such as a lack of trust or conflicts, and dispositional firm and alliance characteristics, such as size or cultural differentials, are some of the explanations put forward for alliance failure (Das & Kumar, 2010; de Jong & Klein Woolthuis, 2010; Gulati & Singh, 1998; Inkpen & Beamish, 1997; Roethaermel & Boeker, 2007). Recently, the ex ante incompatibility of alliance partners has gained renewed interest (Li, Eden, Hitt & Ireland, 2008; Shah & Swaminathan, 2008). For example, it has been argued that for innovation the proximity between partners matters because innovation is facilitated through face-to-face contact and requires optimal distance to ensure partners learn from each other and explore new opportunities. Hence, a lack of ex ante fit may explain ex post alliance failure. This makes the selection of an appropriate alliance partner centre stage (Ireland, Hitt, & Vaidyanath, 2002).

Previous research on strategic alliances has focused on partner selection issues (Das & He, 2006). These studies have focused on the importance of partner selection in general (Geringer, 1991; Lambe, Spekman, & Hunt, 2002; Shah & Swaminathan, 2008; Wuyst & Geyskens, 2005) and for different industrial and national contexts in particular (Dacin, Hitt, & Levitas, 1997; Glaister, 1996; Hoffman & Schlosser, 2001). However, there is surprisingly limited research on the role of innovation in new alliance partner selection. The primary thesis of this research is that partner selection is contingent on the innovative behavior of the focal firm. Firms that innovate will have other preferences for the selection of strategic partners than their less innovative counterparts. To the best of our knowledge, this relationship has not been addressed, at least not explicitly, in the alliance literature. Hence, the purpose of this article is to contribute to a better understanding of the formation process of a
strategic alliance by: (1) exploring the relationship between innovation and alliance partner selection criteria; and (2) presenting results of a survey-based study of 51 companies in the Dutch ICT sector. Hence, in comparison to existing studies, our research provides additional insights into the role of innovation and partner selection using new, exploratory data.

The outline of this paper is as follows. In the next section, the theoretical foundations of this study will be explained further and our hypotheses will be formulated. Subsequently, this paper’s research methods will be introduced. Following that, our empirical evidence will be presented. Finally, we conclude with an appraisal and present some opportunities for future research.

3.2 Theory and hypotheses
Firms can apply many criteria in the selection of new partners but for innovative firms, two features are of crucial importance, that is, access to resources and learning abilities of the partner firm (Das & Teng 2000a, 2000b). These two selection criteria follow from the main theoretical perspectives that provide the theoretical foundations for our study. The first theoretical perspective is the resource-based view of firms (Barney, 1991; Peteraf, 1993; Wernerfelt, 1984). The resource-based view sees strategy as driven by the resource and skills base of the firm (Glaister, 2004). The recognition of the need to fill a resource or competence gap on the part of a firm provides the strategic motive for alliance formation. Innovative firms have specific resource endowments but may need additional resources to be competitive in particular markets. Partners are selected from those firms which can provide the necessary competencies to enhance the strategic capability to compete. The second theoretical perspective is organizational learning (Senge, 1990). Innovative firms may also enter alliances not only to add but also to build new skills and capabilities. Below, we explore how the resource-based view and organizational learning can be applied and adapted in order to understand the impact of innovation on new alliance partner selection. Given that our study is one of the first of its kind, we focus on this pair of partner-specific selection criteria because they figure so prominently in the alliance literature, and because they will illustrate succinctly what our approach entails.1

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1 Another leading theory in the alliance literature is transaction cost economics (Williamson, 1985). Transaction cost economics has contributed greatly to the study of inter-organizational exchange because it specifies in detail the nature and extent of risks in transactions and it provides governance structures in such a way as to reduce risks (Nootboom, 2004). Williamson, however, assumes that there is a specialized partner for contracting out who offers value in terms of an ability to produce more efficiently. He emphasizes the cost economizing relevance of inter-organizational exchange and has little to say about the development of novel competences. As Williamson (1985, p. 143) concludes: ‘... the study of economic organization in a regime of rapid innovation poses much more difficult issues than those addressed here.'
Resource-Based View
The basic principle upon which the resource-based view builds is that firms are fundamentally heterogeneous in terms of the resources they possess or control (Mahoney & Pandian, 1992; Penrose, 1959). The aggregate ‘firm resources’ is a generic umbrella covering all the assets, capabilities and competencies controlled by a firm that enable the firm to conceive and implement strategies that improve its efficiency and effectiveness (Barney, 1991; Eisenhardt & Schoonhoven, 1996). Firms are able to generate sustainable competitive advantage by procuring or creating resources that are valuable, scarce, inimitable and non-substitutable (Dierickx & Cool, 1989; Norman, 2002; Reed & DeFillipi, 1990). Inter-firm cooperation is crucial for the acquisition of such resources because, among other things, it cumulates tacit knowledge the more so when innovation is the primary aim of the alliance.

When taking the resource-based view, it stands to reason that resource complementarity and absorptive capacity is key in the process of selecting a new alliance partner by innovative firms (Das & Teng, 2000b; Das & He, 2006). Collaboration is attractive when it provides desirable resources that a firm cannot develop within an acceptable time frame and cost structure by relying solely on its own capabilities. Resource complementarity is a structural source for alliance-specific rents, that is, advantages that are due to the particular interfirm collaboration (Madhok, 2000). Strategic alliances can be viewed as vehicles for bringing together mutually reinforcing skills and capabilities covering different aspects of up-to-date knowledge and expertise (Das & Teng, 2002). In the case of innovative firms, it is not the uniqueness of skills and capabilities but the complementarity of resources of the potential partner that will be important (Gulati & Zaheer, 2000). Complementarity enables innovation through differences – capabilities are complementary if they are different in a way that can be combined in order to create greater value. Partners that have overly similar resources will find it difficult to create new products or services because innovation requires differences in assets that embody knowledge and allow partners to build on. We therefore argue that innovative firms will in particular review the extra value of the potential resources to be obtained through the alliance–such as financial assets, unique competences or technical capabilities–in addition to what is already available within the focal company self but also the fit between the partners’ resources in particular. Hence, we arrive at:

Hypothesis 1 (H1): Innovation will be positively related to the complementarity of the resources of the potential partner firm.

Absorptive capacity is the second key concept deriving from the resource-based view. It concerns the firm’s ability to identify, assimilate and exploit knowledge (Cohen & Levinthal, 1990). An organization’s absorptive capacity tends to develop cumulatively,
is path dependent and builds on prior investments in its members’ individual absorptive capacity. For that reason, it involves inertia and cannot be changed in the short-run. In our particular research context, we focus on relative absorptive capacity that is the ability of a firm to learn from another firm in a student-teacher pairing (see Lane & Lubatkin, 1998). Relative absorptive capacity, therefore, is dependent on the student firm’s ability to recognize and value, and assimilate and exploit new knowledge. A lack of absorptive capacity with the recipient of knowledge will be an important barrier in inter-firm transfers of best practices (Szulanski, 1996). A recipient lacking in absorptive capacity will be less likely to recognize the value of new knowledge and be less motivated to recreate that knowledge, therefore less likely to apply it successfully (Stuart, 2000; Tsai, 2000). This may increase governance costs and compromise alliance success. This leads to:

Hypothesis 2 (H2): Innovation will be positively related to the absorptive capacity of the potential partner firm.

Organizational Learning
Our next two hypotheses follow from organizational learning. Organizational learning is a process by which a firm acquires information, knowledge, techniques and practices that lead to changes in its routines (Argyris & Schön, 1978; de Jong & Nooteboom, 2000; March, 1991; Nooteboom, 2000). These changes may improve the organization’s performance of its tasks or they may simply change the way those tasks are performed (Tippins & Sohi, 2003). Therefore, organizational knowledge is the product of organizational learning and is represented by the codes and routines that guide action in a firm. This particularly applies to high-tech companies where knowledge is a key asset for the development of new technology. Historically, organizational learning research has focused on various processes that firms can use to develop knowledge that enhances organizational performance (Li, Eden, Hitt, & Ireland, 2008). Some argue that organizational learning is essentially a rational process within the decision-making and choice domain (Cohen & Sproull, 1996). According to our view on this matter, innovative companies will initiate new strategic alliances provided they can learn from their potential partners and they are willing to share their expertise (see Ariño & de la Torre, 1998).

Strategic alliances are a primary vehicle in the development and materialization of new knowledge (Das & Kumar, 2007; Hamel, 1994; Inkpen, 1998; Kumar & Das, 2011). There are different levels of alliance learning. Single-loop learning occurs when error detection permits the organization to carry on with its current activities after correction of existing routines. It is a consolidation process—changes in the organization appear without really altering existing objectives, policies and routines. Double-loop learning is a transformation process. Changes in the organization
appear by collectively reframing problems and developing new objectives, policies and routines. In double-loop learning, the alliance actors have to be able to create ongoing dialogues. Triple-loop learning adds to the well-known categories of single-loop and double-loop learning. Triple-loop learning exploits and explores all partner competences and opportunities. It acts towards realizing the fullness of learning about the diversity of issues faced by linking the partner organizations in an overall learning infrastructure, as well as by developing the organizational competences and skills to use this infrastructure.

Strategic alliances have many features that promote single- and double-loop learning. By securing inter-firm collaboration, the focal firm’s resources can be redeveloped (single-loop learning), refined and refocused (double-loop learning), which enhances knowledge building and organizational competences. They also offer opportunities for triple-loop learning. It is a platform for extending intra-firm and inter-firm capabilities, because internal resources are increasingly and synergistically connected to those of the other enterprise. Although the different levels of learning take place once the linkages have been formed between strategic alliance partners, we expect that innovative firms anticipate this step during the selection process because each of them is important for the discovery process of new products and services. We therefore expect that innovative firms will assess the innovative capabilities of the potential partner in order to secure the most advanced learning levels. This logic suggests the following hypothesis:

Hypothesis 3 (H3): Innovation will be positively related to the innovative capabilities of the potential partner firm.

As part of the potential learning process, we also expect that innovative firms will review a prospect partner firm’s willingness to share expertise. The process of knowledge creation can be described as spiraling cycles of interactions between explicit and tacit knowledge pools across organizational boundaries (Nonaka & Takeuchi, 1995). Without the willingness to share expertise the interactions and the knowledge creating processes will not be initiated. The early alliances between Japanese firms and Western partners in the automotive industry are well-known examples of this (de Jong & Nooteboom, 2000). Japanese firms considered the willingness to share knowledge a pre-condition for innovation. Generic knowledge is available in the market—the innovative process requires the combination of firm-specific knowledge, which is often tacit (embedded in a company’s culture, routines and blue-prints) and the raison d’être for a company. It is therefore also an important indicator for trust (Das & Kumar, 2011b; de Jong & Klein Wooolthuis, 2008, 2010). Sharing confidential, firm-specific knowledge and skills is accompanied by spill-over risks, particularly when the potential partner is a competitor or works in a network of competitors
(Inkpen & Li, 1999). It may lead to undesired appropriation or imitation. Firms are therefore strongly inclined to mitigate these risks unless they trust their partners and are confident in the future business alliance. These arguments lead to the following hypothesis:

Hypothesis 4 (H4): Innovation will be positively related to the willingness to share expertise by the potential partner firm.

3.3 Research methodology

Research Context

Information was collected from firms operating in the Dutch ICT sector. The Dutch ICT sector can be divided into the ICT industries and ICT services sub sectors (Centraal Bureau voor de Statistiek, CBS, 2005). ICT industries mainly produce IT related commodities, such as chips, semi-conductors and mobile phones. Companies in the other sub sector mainly provide telecommunication services and services for software development. As elsewhere, the ICT sector provides an important contribution to Dutch national employment and gross domestic product. It employs about 4 percent of the total Dutch workforce and accounts for approximately 5 percent of the Dutch national gross value added. The sector consists of approximately 25,250 companies, the overwhelming majority of which are active in ICT services (24,000 against 1,250 companies in the ICT industries). The sector accounts for approximately 20 percent of the Dutch national R&D expenditure and is also known for its large number of strategic alliances. Hence, innovation and partner selection strategies are particularly likely to matter in the Dutch ICT sector. It therefore provides an appropriate context for our research.

Survey

For the design of our survey we used questions that are applied by other studies of partner selection criteria (Dacin et al., 1997; Hitt et al., 2000) and of innovation in the context of strategic alliances (Hagedoorn & Cloodt, 2003). This allows comparing some of our findings and it ensures the consistency, validity and reliability of our survey. All our variables used ex-post measures of executive perceptions of the relative values of variables at the time of partner selection and during alliance formation. Previous studies have shown that self-reporting is effective in identifying strategies (Hambrick, 1980) and that the information produced is reliable (Al-Khalifa & Peterson, 1999; Pearce, Robbins, & Robbinson, 1987). We used different scales for the items in the survey. The questionnaire was pre-tested by ten respondents from ICT companies and academics. This information was used to make a few adjustments to the survey to question sequence and questionnaire length. The pre-tests showed that it was desirable to use a relatively easy to understand measurement method. There are more accurate scales, such as the Thurnstone type, but these are more difficult
to apply and take time, which senior executives are short of. The final survey was presented on four pages to increase the response rates and included 35 questions. This included an appendix that explained the concepts. The item scales and order of the items were designed in such a way that general boredom by the respondents was prevented.

The respondents and their companies were identified from the website ‘www.persberichten.com’ that provides all press reports from Dutch and international ICT-related companies. Strategic alliances in the ICT sector are often intended to support innovation, not cost reductions or efficiency enhancements (Norman, 2002). Therefore, they are publicly announced, to support the reputation of the alliance partners (Saxton, 1997), among other things. By selecting press reports related to alliance formations including at least one Dutch partner we were able to identify the names of the companies and the responsible managers. The company addresses and telephone data were added using the companies’ web pages and on-line address databanks. The result was a database of 334 potential respondents.

The survey, accompanied by a letter, was send to all 334 respondents in September 2005. To facilitate the response rate, a freepost response envelope was enclosed. The respondents were ensured maximum confidentiality, in line with data collection procedures of the University. Respondents were given the opportunity to receive a confidential and personalized report that would allow them to benchmark their company against other participating firms. The questionnaires were numbered to support administrative processing and to provide an opportunity for non-response analysis. After one week, 26 usable surveys were returned (response rate 8.08%). Another 21 surveys were returned blank because the firm did not exist anymore or the respondent was no longer employed in the company. In October 2005 a telephone follow-up commenced. Respondents who had not responded were asked whether they had received the survey. Where the survey had not been received, it was mailed again via email. Fifty emails were sent. After having conducted 412 telephone calls and recalls in seven days, another 25 usable surveys were returned (response rate 7.49%). Statistical tests between early and late respondents report no significant differences for the items in the survey.

A total of 51 usable (i.e., complete) surveys were returned resulting in an effective overall response rate of 15.2% (or 16.2% compared to the net effective response rate of 313 respondents). The response rates to business mail surveys vary considerably. Norman’s (2002) study presents a comparable rate (13.6%, 61 usable questionnaires). Compared to the alliance selection study by Nielsen (2007)–6.5%, 120 usable questionnaires–we obtained a higher response rate, though less than
Chang’s (2003) study (41% and 162 usable questionnaires). In a Dutch context, the response rate is satisfactory. On average, business mail surveys in the Netherlands have a response rate of 8.5%. We used the Reach database to perform a non-response analysis. This database is constructed from information including that provided by Dutch companies to the national Chambers of Commerce. Employee numbers could measure size differences in 2004. Data was available in Reach for 222 of the 334 companies in our sample. As a result, company data were identified for 46 of our 51 key respondents. No significant company size difference was found (t-value = -0.47, p = 0.642). This supports the reliability of our data. We used Harman’s (1967) single factor test to assess whether or not our data feature significant common variance (Podsakoff & Organ, 1986). Unrotated factor analysis using the eigenvalue-greater-than-one criterion revealed five factors, with the first factor explaining only 17 per cent of the variance in the data. So, it is unlikely that the findings can be attributed to common-method bias.

**Measures and Methods**
The concepts and measures are presented in Table 1.

**Table 1. Concepts, Items, and Scales**

<table>
<thead>
<tr>
<th>Concept</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Focal firm innovation</td>
<td>Last year, how many new products or services did you introduce in the market?</td>
</tr>
<tr>
<td></td>
<td>Scale: the number of products</td>
</tr>
<tr>
<td>2. Partner selection criteria:</td>
<td>The complementarity of mutual capacities was important for the selection of this partner.</td>
</tr>
<tr>
<td>complementarity of resources</td>
<td>Scale: 1 = strongly disagree, 5 = strongly agree</td>
</tr>
<tr>
<td>3. Partner selection criteria:</td>
<td>The ability to appropriate specific knowledge from our organization was important for the selection of this partner.</td>
</tr>
<tr>
<td>absorptive capacity</td>
<td>Their willingness to share expertise was important for the selection of this partner.</td>
</tr>
<tr>
<td></td>
<td>Scale: 1 = strongly disagree, 5 = strongly agree</td>
</tr>
<tr>
<td>4. Partner selection criteria:</td>
<td>Their capabilities for the development of new products were important for the selection of this partner.</td>
</tr>
<tr>
<td>innovative capabilities</td>
<td>Their capabilities for the development of new processes were important for the selection of this partner.</td>
</tr>
<tr>
<td></td>
<td>Scale: 1 = strongly disagree, 5 = strongly agree</td>
</tr>
<tr>
<td>5. Partner selection criteria:</td>
<td>Their willingness to share expertise was important for the selection of this partner.</td>
</tr>
<tr>
<td>willingness to share expertise</td>
<td>Scale: 1 = strongly disagree, 5 = strongly agree</td>
</tr>
<tr>
<td>7. Size Focal Firm</td>
<td>How many persons are employed in your organization?</td>
</tr>
<tr>
<td></td>
<td>Scale: the number of employees (log)</td>
</tr>
<tr>
<td>8. Alliance Network Focal Firm</td>
<td>How many alliances are aligned with your organization in total?</td>
</tr>
<tr>
<td></td>
<td>Scale: the number of alliances</td>
</tr>
<tr>
<td>9. Scope of the Alliance</td>
<td>Dummy variable with 1 if respondents indicated that the target of the alliance is R&amp;D or the sharing of technology, and 0 otherwise.</td>
</tr>
<tr>
<td>10. Nationality of the Partner</td>
<td>Dummy variable with 1 if the partner originally is a Dutch organization, and 0 otherwise</td>
</tr>
<tr>
<td>11. Firm Tenure Alliance Manager</td>
<td>How long have you been employed in this organization?</td>
</tr>
<tr>
<td></td>
<td>Scale: the number of years</td>
</tr>
</tbody>
</table>
Secondary data on firm-level innovation are often not available in the Netherlands. Due to their size and legal status, many companies in the Netherlands are not required to publicly or otherwise report such company data. Tax authorities are not willing to share company files for the purpose of outside research. This lack of data makes a cross-validation of our primary innovation measures with secondary sources not possible. However, earlier work revealed that the correlation between objective and subjective measures tend to be high (Brouthers 2002). Moreover, in the business literature, it has been argued that enterprises form their strategy and competitive maps – in our case, the selection of a new alliance partner – on perceived information and events (Lang, Calantone, & Gudmundson, 1997). Both arguments imply that subjective perceptions like the once in our study are valid measures, being reliable and with material consequences.

Innovation is a multidimensional concept that can be measured by different indicators such as R&D expenditures or patent applications (for an extensive discussion see, for example, Hagedoorn & Cloodt, 2003 or den Hartog & de Jong, 2007). Companies in the Dutch ICT sector mainly are small and medium-size enterprises. These companies are less likely to associate R&D expenditures with innovation because these companies do not think in terms of R&D (i.e., they do not have R&D budgets or departments), which might mask their innovative performance and thus bias results. Furthermore, R&D expenditures primarily measure the invention part of a firm’s overall innovation process. In other words, high investment in innovation through high R&D expenditure will not necessarily result in high innovative input. Similar arguments apply to patent applications. Patent applications are usually expensive and time-consuming processes and therefore, this opportunity is usually ignored by SMEs. In addition, patenting new products incorporates spill-over risks because competitors will obtain detailed information that can be used to their advantage. The pre-test of our survey showed that companies in the Dutch ICT sector report very low numbers of patent applications and R&D expenditures. They do indicate, however, that they introduce new products and concepts in the market, which is another used measure for innovative behavior (Hagedoorn & Cloodt, 2003). Therefore, innovation by the focal firm was measured by the number of new products or services the company introduced in the market.

Following Hitt et al. (2000), six items were used to measure our four key partner selection characteristics. The ‘innovative capabilities’ and ‘absorptive capacity’ selection characteristics were each measured by two items. The ‘sharing expertise’ and ‘complementarity’ selection characteristics were each measured by one item. We used the additive scales as a composite measure for the two-item constructs in the regression analysis (Baumgarten & Homburg, 1996). This was based on satisfactory factor analysis results (factor-loadings greater than 0.50 with t-values greater than
2.0) and Cronbach’s alpha values that exceed the common threshold value of 0.50 (Norman, 2002).

It is likely that the selection of a potential partner firm is not only determined by the innovative performance of the focal firm (Shah & Swaminathan, 2008). We therefore incorporate five variables recognized influencing the selection of partners by ICT firms, namely, the size of the focal firm, the size of the alliance network of the focal firm, the scope of the alliance, the nationality of the partner and the alliance manager’s firm tenure (Geringer, 1991; Lambe et al., 2002; Wuyts & Geyskens, 2005). Focal firm size is included as a variable in our model to control for resource base and innovative capabilities. Large firms have more resources and may therefore be more successful in stand-alone innovation than smaller firms. We measured the focal firm size using the employee numbers logarithm. Second, the size of the alliance network of the focal firm was assessed. Some firms carefully design and manage numerous bilateral alliances in a network of relationships whereas others do not have such an advanced alliance strategy and only occasionally work along shared partnership lines. A firm participating in a greater number of strategic alliances may seek out specialized alliance niches requiring different types of partners. The alliance network size is measured by the number of alliances of the focal firm. Third, the target of the alliance for the focal company was considered. Partner selection motivation differs from alliance entry motivation. Companies aiming for research and development will use other selection criteria than companies aiming for shared marketing activities or access to markets. The scope of the alliance for the focal firm is measured by a dummy variable taking the value of 1 for R&D or technology transfer and 0 otherwise. Fourth, national and international partners are differentiated to control for peculiarities such as communication and intercultural differences and to ensure that the results could be attributed to innovative behavior. A dummy variable was used for partner nationality, being 1 for a Dutch partner and 0 otherwise. The final control variable is the alliance manager’s firm tenure. Firm tenure is an oft-used proxy for risk-taking behavior, that is, the more time a person spends in the same firm, the more he or she becomes committed to established policies and practices. Long tenure may make managers overconfident, resulting in rigidity and resistance to reorientation. The alliance manager’s firm tenure was measured by the number of years the manager had been employed in the focal firm.

Due to the item scales deployed in this study PRELIS 8.5 was used to calculate the appropriate product moment correlation coefficients (Jöreskog & Sörbom, 1996). PRELIS calculates Pearson, polychoric or polyserial correlation coefficients contingent on the variable scales. This is the most appropriate solution for survey-based data that is based on items with different scales (Baumgarten & Homburg, 1996). LISREL 8.5
offers different methods to estimate structural models (Jöreskog & Sörbom, 1993). This study uses the maximum likelihood estimation procedure because it is the most robust for our type of correlation matrix (Hoogland & Boomsma, 1998).

### 3.4 Empirical results

**Sample Characteristics**

At the time the survey was conducted, most strategic alliances (68.6%) were less than two years old. All strategic alliances were still in existence at the time the questionnaire was mailed. The companies in our sample introduced on average 3.27 new products or services to the market (standard deviation 1.89). The sample companies possess substantial experience with alliance partners. On average they reported 5.25 alliances per company. The majority of the inter-firm collaborations (60.8%) are between two Dutch companies. Where there was an international partner, we verified that the respondent was employed at the Dutch participant. The average size of the sample companies is 145 employees. This accords with other information that the majority of companies operating in this industry are small or medium sized enterprises. Most of the respondents are the owners (58.8%) or in the upper management (21.6%) of their companies. On average, the respondents had worked 13.6 years in the industry and 6.2 years in their company.

Because we used the same criteria as in other studies, we are able to compare our findings. Table 2 presents the most important selection criteria that derive from our study and the most important selection criteria for Korean and U.S. executives.

**Table 2. Partner selection criteria in the Netherlands, Korea, and the United States**

<table>
<thead>
<tr>
<th>Dutch Executives</th>
<th>Korean Executives</th>
<th>U.S. Executives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Complementarity of capabilities</td>
<td>1. Technical capabilities</td>
<td>1. Financial assets</td>
</tr>
<tr>
<td>2. Industry attractiveness</td>
<td>2. Industry attractiveness</td>
<td>2. Managerial capabilities</td>
</tr>
<tr>
<td>3. Willingness to share expertise</td>
<td>3. Special learning skills</td>
<td>3. Quality of products and services</td>
</tr>
<tr>
<td>5. Quality of products and services</td>
<td>5. Capabilities to provide quality</td>
<td>5. Unique competencies</td>
</tr>
</tbody>
</table>

Source: present study for the Dutch sample and Dacin et al. (1997) for the Korean and the U.S. sample.
The degree to which the partner’s resources can be used in conjunction with those of the focal firm is the most important selection criteria for the Dutch managers in our sample. The willingness to share expertise is ranked third. We hypothesized that these selection criteria would be important for innovative firms and these results are a first indication that this indeed is the case. Additionally, Dutch managers find the market opportunities criterion important. This applies to the industry in which the potential partner currently operates (industry attractiveness, rank 4) as well as to its particular knowledge or access to markets (rank 2). The quality of products or services ranked fifth. Dutch managers’ behavior in the selection of a new partner for a new strategic alliance is different but comparable to Korean and U.S. managers. In their top five selection criteria, they share three criteria with Korean managers (industry attractiveness, willingness to share expertise and quality) and two with U.S. managers (quality and resource complementarity). U.S. managers find the financial assets of the potential partner and their managerial capabilities as the most important characteristics (these are ranked 8 and 9 for Dutch managers). Korean managers focus on technical capabilities (ranked 11 for Dutch managers). Therefore, selection criteria seem to be determined by a specific industrial and national context on the one hand, but on the other hand, this study shows that managers in different parts of the world share common values in selecting new partners for strategic alliances. Our analyses continue in the following section, and whether the innovative performance of the focal firm adds to the aforementioned general conclusion is evaluated.

**Regression Results**

The mean, standard deviation and correlation coefficients among the constructs are in Table 3. Table 4 presents the regression results. In preparation for the regression analyses, we performed the regular tests to obtain reliable estimates. The latter tests gave satisfactory results: neither heteroskedasticity nor nonnormality is an issue. We tested for possible biases caused by collinearity among variables by calculating the variance inflation factor (VIF) for each of the regression coefficients. All VIF values were well below the cut-off value of 10 recommended by Neter, Wasserman, & Kutner (1985).
Table 3. Means, Standard Deviations, and Correlations

Table 4. Innovation and new partner selection in Dutch ICT sectors

To test our hypotheses, four different models were estimated. Each model includes a specific partner selection criterion as the dependent variable. Focal firm innovation (measured in terms of new concepts or products introduced in the market) and the
control variables were included as covariates in each of the four models.\(^2\) According to hypothesis 1, innovation by the focal firm should be positively associated with the potential partner’s complementarity of resources. Model 1 in Table 4 provides empirical support for this hypothesis: the standardized parameter estimate for focal firm innovation and complementarity of resources as a partner selection criterion is positive and significant ($\beta = 0.27$, with $p < .05$). According to hypothesis 2, innovation by the focal firm should be positively associated with the potential partner’s absorptive capacity. Model 2 in Table 4 provides empirical support for this hypothesis: the standardized parameter estimate for focal firm innovation and absorptive capacity as a selection criterion is positive and significant ($\beta = 0.23$, with $p < .05$). Hypothesis 3 suggests that a focal firm’s innovation would be positively associated with the innovative capabilities of the potential alliance partner. Model 3 in Table 4 supports this hypothesis: the standardized parameter estimate for focal firm innovation and innovative capabilities of the potential partner as a selection criterion is positive and significant ($\beta = 0.22$, with $p < .05$). Hypothesis 4 argues that innovation would be positively related to a potential partner’s willingness to share expertise. In accordance with our empirical results this hypothesis was accepted. Model 4 in Table 4 shows that the standardized parameter estimate between focal firm innovation and sharing expertise as a selection criterion is positive and significant ($\beta = 0.24$, with $p < .05$). In summary, our results show that innovative firms in Dutch ICT industries select those partners that foster innovation, albeit that the significance level for the main effect is moderate in all four models. Nonetheless, the standardized parameter estimates for focal firm innovation on the selection criteria are roughly the same, implying that each has approximately the same weight in the selection process of a new partner.

We found support for our main hypotheses while controlling for a substantial number of organizational and entrepreneurial characteristics. By doing so, we eliminated potentially spurious relationships as well as alternative explanations for partner selection criteria. Among the control variables, Table 4 shows that the criteria for partner selection are significantly related to particular characteristics of the organization itself, the alliance and the alliance manager’s experience. The following three results are worthwhile mentioning. First, large firms in the ICT sector are very interested in the potential partner’s willingness to share expertise (Model 1: $\beta = 0.41$, with $p < .01$) and the complementarity of resources (Model 4: $\beta = 0.27$, with $p < .05$). They consider the potential partner’s innovative capabilities (Model 2: $\beta = -0.24$, with $p < .10$) and relative efficiency (Model 3: $\beta = -0.61$, with $p < .01$) as selection criteria less

\(^2\) Although we do not ground our model in transaction cost economics, our database included an item that measures the relative efficiency of the prospect partner. We estimated our model with this selection criterion as the dependent variable. The regression results show that innovation is negatively and significantly related to efficiency as a partner selection criterion ($\beta = -0.37$, with $p < .01$). The implication of this finding is that innovative firms do not select alliance partners on the basis of efficiency, as transaction cost economics would predict. This is in line with our theoretical perspectives and the empirical results that are reported in the main text.
important. Second, where the alliance is between Dutch companies, the focal firm only considers the complementarity of resources as an important selection criterion (Model 1: $\beta = 0.31$, with $p < .05$). Third, managers with long tenure emphasize innovative capabilities (Model 3: $\beta = 0.26$, with $p < .05$). Complementarity of resources (Model 1: $\beta = -0.34$, with $p < .01$), absorptive capacities (Model 2: $\beta = -0.19$, with $p < .01$) and the willingness to share expertise (Model 4: $\beta = -0.23$, with $p < .10$) are less important selection criteria for long-tenured managers.

3.5 Conclusions
Strategic alliance numbers continue to rise but so does their failure rate (Das & Teng, 2003; Dyer & Singh, 1998; Inkpen, 1998; de Jong & Klein Woolthuis, 2009). Many alliances break down within one or two years. Of course, an alliance’s longevity is not always a sign of success. If their aim is to execute a specific project, such as a marketing assignment, short duration may be a sign of success. In fact, strategic alliances should not be interminable. Inter-firm relations can become overly durable, with too much mutual identification and trust, yielding rigidities and a lack of the variety needed for learning and innovation (Nooteboom, 2000). Alliances should last long enough to recoup the investments necessary for high added value and to learn by interaction, but no longer. Nonetheless, many of the alliances that failed reported disappointing results with high levels of dissatisfaction (Das & Teng, 2003; de Jong & Klein Woolthuis, 2008; de Jong & Nooteboom, 2000; Lunnan & Haugland, 2008).

We argue that the selection of an alliance partner is an important requirement for alliance success. Alliance success – in terms of e.g. relational satisfaction or financial benefits – will of course also depend on, for instance, governance, conflict mediation and the cooperative qualities of managers (Das & Kumar, 2010; de Jong & Klein Woolthuis, 2010; Oxley & Sampson, 2004). Nonetheless, partner selection will remain an important matter, especially for companies in the ICT sector that actively develop new products and services. Our research aligns with those studies that suggest that alliance outcomes are directly related to initial conditions. Doz (1996), for example, argues that initial conditions play a key role in fostering or blocking alliance learning: early events at the start of an alliance have disproportionate importance in establishing, or not, a self-reinforcing cycle of joint sense making and greater flexibility and adaptability.

Alliance formation is a selection process (Das & He, 2006; Teng & Das, 2008). Organizational characteristics will influence the selection of alliance partners and thus the start of a new collaboration (Beckman, Haunschild & Philips, 2004; Powell, White, Koput & Owen-Smith, 2005). We argue that innovative firms differ from their less innovative counterparts in their activities, strategies and structures. We therefore expect that innovative companies focus on particular selection criteria in their choice
for a new alliance partner. The issue of innovative behavior in relation to partner selection criteria has to date received insufficient attention in the alliance literature. We address this knowledge gap in two-fold. First, based on the resource based view and organizational learning theory we hypothesize that innovative firms will use the complementarity of resources, absorptive capacity, innovative capabilities and the willingness to share expertise as key selection criteria for a new alliance partner. Second, in the setting of Dutch ICT industries we find that innovative firms indeed use these criteria in the process of new alliance partner selection. To the best of our knowledge, micro firm-level studies like ours are scarce. Hence, a database like ours is exceptional and shows that firm-level information on innovation and partner selection criteria can be collected by means of a carefully designed questionnaire and data-collection strategy.

Our study is not without limitations. First, the use of cross-sectional data from interfirm business relationships in the ICT sector of the Netherlands limits the generalizability of our results. Second, cross-sectional databases like ours prevent intertemporal, causal analysis of processes that determine the outcomes observed with the use of a questionnaire. Third, our sample size is comparable to other studies in the field but nonetheless small in absolute numbers and therefore contributes to an exploratory nature of our research. Fourth, only one respondent was interviewed for each inter-organizational alliance. Although our respondents were the best informed parties in that they were the relevant strategic alliance managers, this carries with it the fact that other perceptions of the partner selection process of the focal firm and the partner firm were not explored. Finally, we measure innovation of the focal firm by the number of new products or services that are introduced in the market. It is a question whether this measures radical innovation (in terms of completely new products or services to the company or to the market) or incremental innovation. The consequences of these two different forms of innovation may overlap but may not completely coincide.

Taking these limitations into account, we envisage the following opportunities for future research into partner selection by innovative firms. First, new samples with similar respondents would help to test the consistency of our findings over time. Testing our model with data from Asian countries (e.g., Luo, 1997) or the United States (e.g., Geringer, 1991) would provide opportunities for analyzing the effects of the institutional context on innovative performance and the selection of alliance partners. Second, new samples would also allow incorporating selection criteria that derive from other theories such as institutional and social exchange theory. From the institutional perspective, for instance, the identification of an alliance opportunity is the result of the ‘embeddedness’—the environment and the network of interrelated
alliances as a result of path-dependent processes of the organization (Gulati et al., 2000). The selection of a partner is determined by this framework, which works as a focusing device for the organization. Furthermore, although the selection of an alliance partner is an economic decision in a business sense, interpersonal fit or affinity between managers may also matter. Affection towards the potential partner, for example, or perceived reputation (loyalty) could be important antecedents for the selection of new partners. Third, and finally, new samples would allow to study whether our findings also hold for other (objective) measures of innovation such as patent applications or R&D expenditures. Even though subjective and objective measures will likely correlate, it is worthwhile the effort to analyze whether, and if so: how, this matters in the selection process of new alliance partners in ICT sectors and in other industries.

In conclusion, strategic alliances dominate world business and a thorough understanding of their success remains centre stage in strategy research. With the above limitations acknowledged, we are confident that this study makes an important contribution to this line of research by explaining how the relationships between innovation and various partner selection criteria varies.
CHAPTER 4. CAUSES AND CONSEQUENCES OF TRUST

Summary
In this study we investigate the institutional arrangements of innovation processes in high-tech alliances, focusing on the role of trust. A major strength of the research is the opportunity to address antecedents as well as performance effects of trust. The antecedents of interorganizational trust include a shared past, detailed interfirm contracts, relational openness and mutual dependence. We control for the size and cooperative culture of focal firm and the knowledge value of the partner firm. Data from a field study of 391 Dutch firms in high-tech industries generally support the research model. The results provide convincing evidence to support the value of interorganizational trust in durable business relationships that strive for the development of new technological knowledge.

Keywords: innovation, interorganizational trust, high-tech industries

4.1 Introduction
In this study we investigate the institutional arrangements of innovation processes in high-tech alliances. These arrangements concern the particular contractual and institutional set-up in an interfirm dyad (North & Thomas, 1973) that drive as well as facilitate interorganizational cooperation that aims for the development new knowledge. Our focus of research is on the role of trust. Without trust high-tech alliances would not be able to survive. We explain how partners to innovative collaboration develop trust and, in turn, how trust determines alliance performance.

In recent decades, interfirm collaboration has become increasingly important (Contractor & Lorange, 2002). This also applies to the development of new knowledge in high-tech industries (Duysters & de Man, 2003). In these industries, innovation requires a combination of products, markets, technologies and organizational capabilities that most companies do not have in-house, and therefore need to co-operate with complementary specialists. However, the management of high-tech alliances is a challenge that needs to balance between realizing benefits and safeguarding risks (Nooteboom, 2000; 2004). On the one hand, business relationships in high-tech industries may offer substantial future benefits. Turnover and net profits can grow for many years in succession if companies join forces and manage to introduce new products in global consumer markets. On the other hand, such relationships may involve risks. For example, the exchange of specialist knowledge is a prerequisite for the development of new knowledge. However, specialist knowledge is often highly confidential because it offers competitive advantages. Firms therefore have a strong incentive to manage the risks of spillover, particularly when the existing or potential partner firm is or could be a competitor.³ Many firms who are, or will soon be, involved

³ Up to half of the alliances in the Merit-Cati database involved competitors, according to the firms in the database (Hagendoorn & Duysters, 2002).
in high-tech collaborative efforts focus on the latter while often ignoring the former. It is one of the reasons why many high-tech alliances fail (cf. Inkpen & Beamish, 1997).

Much of the literature on interfirm collaboration has focused on governance mechanisms that reduce risk, and consider trust as one of them. In this paper we intend to move away from this point of view as we are not mainly interested in how partners prevent opportunism and failure, but in the prerequisites that lead to success: which governance mechanisms actually contribute to the successful performance of interorganizational relationships? After all, the goal of collaborating is value creation and not all governance mechanisms that firms apply may equally contribute to that. Firms in an alliance can use different ‘mechanisms’ to manage the relationship such as shared ownership, power or contracts (Bachmann, 2001). Often, a combination of these will be applied because each has advantages and disadvantages. For example, the use of power in alliances is omnipresent particularly when there are differences in size or dependence. Power may solve short-term issues but the misuse of power can be harmful in the long-term – a misused partner may attempt to revenge when conditions eventually change. Also, the design, implementation and maintenance of contracts might prevent relationship failure but might also be a time-consuming effort that distracts attention away from value creation and reaping benefits due to the alliance.

This paper intends to contribute to the understanding of the effects of governance mechanisms on the performance of high-tech alliances. More in particular, we focus on interorganizational trust. Interorganizational trust is the level of trust placed in the partner organization by an alliance manager of a focal organization. For alliances in general, and high-tech collaboration in particular, the behaviour and performance of the partner organization rather than an individual is often the object of reference. Managers perceive to have an alliance with another firm that is supported but not determined by the accompanying manager from that firm. It is the partner firm that needs to show its competencies, sign the contract and keep the agreements.

Another contribution concerns our empirical analysis of Dutch high-tech alliances. From a population of 572 business managers we obtained 391 usable responses, giving an effective response rate of 68.5 percent. This rate is considerably higher than those observed in prior studies on interfirm relationships (Poppo & Zenger 2002, Subramani & Venkatraman 2003). Business relationships in high-tech industries are characterized by uncertainty and interdependence (cf. Hagedoorn & Duysters, 2002). It is especially under these circumstances that trust has been argued to be meaningful because here a leap of faith has to be made, that is, risk has to be accepted. Uncertainty is not only inherent to the innovation process, also to the relationship risk. Innovation requires
durable relationships that will result in interdependence, changing expectations and conflicting interests. As none of the partners has formal authority over the other, the collaborating firms may need to rethink and renegotiate contested issues during the relationship. This requires trust in the others intentions and competences to reach good agreement. Also, a free and timely exchange of ideas and information is crucial for innovation, which openness can only be achieved if trust is present.

A case in point is the Netherlands. The Dutch business culture is often stereotyped as a Rhineland model. It is characterized by a stakeholder economy with a focus on sustainability and coordination involving risk-avoiding behaviour and government interventions. Unlike Anglo-Saxon countries (cf. Sako, 1992; Fukuyama, 1995), it is this institutional environment were interorganizational trust might work. Hence, our data allows us to evaluate the fostering of interorganizational trust in Dutch high-tech alliances with uncertain circumstances in a Rhineland context, and, in turn, how interorganizational trust affects interfirm performance. This contributes to insights into the antecedents and workings of trust in situations where it matters most.

The research is rooted in the many studies on trust in the organization literature (for an excellent and recent review, see Nooteboom, 2002). It is widely acknowledged that interpersonal trust works as a lubricant in economic transactions by smoothing relations between actors and reducing transaction costs relating to control. Prior studies, for example, have found that interpersonal trust facilitates joint action (Zaheer, McEvilly & Perrone, 1998), reduces the need for hierarchical control (Gulati, 1995) and solves conflicts (Larson, 1992). Also, interpersonal trust is identified as a key condition for the development of new knowledge and learning within (Herting, 2002; Smid, Bijlsema-Frankema, Derksen & Bernaert, 2005) and between organizations. Recent studies include related concepts such as social trust to understand dynamics of networks and clusters (Lorenzen, 2002).

The present paper does not deny the importance of these studies but takes another perspective. Our level of analysis is the interfirm alliance. For that reason, we focus on interorganizational trust, its antecedents in terms of characteristics of the interfirm relationship and alliance performance in terms of relational satisfaction. The measurement of dyadic performance in terms of objective, financial indicators is challenging because the period of payoffs and the underlying goals may vary (cf. Olk, 2002). We therefore focus not so much on ultimate outcomes of high-tech alliances – which tend to be hidden in the future and are difficult to determine – but on the perceived satisfaction of the relation that is indicative of positive future outcomes.

4 We exclude information on the respondent, such as personality traits, in terms of the inclination to trust. Aside from our focus on the interfirm and organizational level, these personality traits are inherently unstable and very sensitive to recent experiences of the respondent.
Our approach also circumvents a multi-level issue that hinders a clear analysis of trust and performance.

The outline of this paper is as follows. In the next section, we will be explaining further the theoretical foundations of our study. Subsequently, we will then introduce this paper’s research methods. Following that, we will present our empirical evidence. Finally, we will concede with an appraisal and offer opportunities for future research.

4.2 Theory and hypotheses

Defining Interorganizational Trust

Before we continue, we need to find a working definition of interorganizational trust. Over the years, the number of studies on interpersonal and interorganizational trust has mushroomed (Nooteboom, 2002).

A key challenge is the applicability of the concept of ‘trust’ to different contexts and levels of analysis, which easily creates confusion (Inkpen & Curall, 2003). Hence, the first issue to be considered in developing a working definition of trust is the level of analysis, given that the referent of trust may vary (Dirks & Ferrin, 2002). For this paper, the distinction between interpersonal and interorganizational trust is relevant. Dyer and Chu (2003), following Zaheer et al. (1998), explain this as follows. Trust is a micro-level phenomenon and has its basis in individuals. Organizations, as such, are not able to trust each other. Nevertheless, interorganizational trust is not a tautological use of a psychological phenomenon to organizations. It clearly goes beyond that. One individual can place trust in another individual, or in a group of individuals such as a team within a firm or a partner organization. Interorganizational trust describes the extent to which the members of an organization have a collectively held trust orientation towards the partner firm. Therefore, by interorganizational trust we mean that a person from organization A (the trustor) trusts partner organization B (the trustee) or, in other words, the level of trust placed in the partner organization by the member of a focal organization (see Figure 1).

5 In addition to the key articles referred to throughout this paper, the organizational literature on trust now includes several edited volumes of papers (e.g. Bijlsema-Frankema & Klein Woolthuis, 2005; Gambetta, 1988; Kramer & Tyler, 1996; Lane & Bachmann, 1998; and Nooteboom & Six, 2003), dedicated journal editions (e.g. Rousseau, Sitkin, Burt & Camarer, 1998; Bachmann, Knights & Sydow, 2001; and McEvily, Perrone & Zaheer,).
The reason for choosing the subject of interorganizational trust is threefold. First, it directly aligns with the context of interfirm alliances, which is the key focus of our research. Second, although interpersonal trust has a long history, from a comparative perspective, little is known about interorganizational trust and we aim to contribute to this lack of knowledge (cf. Dyer & Chu, 2003). Third, Zaheer et al. (1998) show that there is a strong correlation between interpersonal and interorganizational trust and that, although conceptually different, it is the latter in particular that improves interfirm performance. The implication is that the measurement of interorganizational trust should include the partner firm as the referent or objective to trust.

Our working definition of interorganizational trust defines it as a positive perception of the partner’s behaviour, that is, the perception by the respondent of the focal firm that a partner organization will not engage in opportunistic behaviour, even in the face of opportunities and incentives to do so (cf. Hosmer, 1995). We can expect this confidence or perception (trust) to emerge in situations where (1) the trustee in the business relationship shows forbearance from opportunism and (2) is known to behave carefully and with concern (integrity, goodwill, and benevolence), (3) the trustor shows a lack of monitoring behaviour. Hence, our definition characterizes interorganizational trust as a multi-component construct based on three related components: forbearance from opportunism, care and concern, and lack of monitoring.
Two remarks should be made. First, our conceptualization of interorganizational trust explicitly denominates interorganizational trust as a relational rather than a dispositional feature. Relational trust is likely to be based on experience and interaction with a particular exchange partner. Some researchers consider trust to be a personality trait that reflects expectancies about the trustworthiness of others in general. The characteristics of individuals are outside the scope of this paper, given our unit of analysis. Second, in this study we consider the trust between partners in high-tech industries. This is a good research setting because alliances in high-tech industries are characterized by high levels of environmental uncertainty and therefore offer a context in which trust might be important. The need for trust only arises in an uncertain, that is, risky, situation.6

Antecedents of Interorganizational Trust
The possible antecedents or determinants of trust can be categorized in different ways, such as micro-level and macro-level factors (Lane & Bachmann, 1998), individual, relational and organizational factors (Whitener, Brodt, Korsgaard & Werner, 1998), or dispositional, interpersonal and situational factors (Payne & Clark, 2003). In line with our unit of analysis, we classify our antecedents of interorganizational trust into characteristics that mark stages in a business relationship: a shared past, detailed contracts, interfirm openness and mutual dependence (cf. Sheppard & Sherman, 1998; Das & Teng, 1998).7

Our first antecedent of interorganizational trust concerns the shared past between the business partners of the interfirm alliance. Interorganizational trust may result from past experience or prior successful, common relationships. Trust earned from prior engagement serves as evidence for justifying subsequent risky steps beyond the accumulated experience (Ariño, de la Torre & Ring, 2001). In this case, interorganizational trust is the result of a rational extrapolation of trustworthy behaviour and competences in previous relationships. It comes close to the concept of cognition-based trust (McAllister, 1995). Cognition-based trust follows from knowledge of the other party’s capability to perform the negotiated tasks (Larson, 1992; Mayer, Davis & Schoorman, 1995). This can be based on previous experience or familiarity with the partner in which the capabilities of the other party have become evident, on the reputation of the partner, or on institutional indicators such as certification. The knowledge may include information with respect to competences as well as the partner’s goodwill or intentions. Larson (1992) indicates that prior experience plays

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6 Trust is often related to risk, but it is not the same. Trust increases the willingness to become vulnerable, i.e. to take risks (Mayer et al., 1995). This risk is a result of uncertainty with regard to potential opportunism, relationship characteristics and contingencies. Trust is meaningless if these risks are absent. If opportunism can be eliminated, and/or if actors are completely rational and fully informed, trust would not be necessary because all future circumstances can be predicted with great certainty.

7 For presentation purposes, we present the antecedents in a chronological sequence in line with common knowledge of business relationships. Of course, this sequence is open to debate.
an important role in the first stages of the relationship, i.e. when partners are selected and initial agreements are established. This brings us to our first hypothesis:

Hypothesis 1: A shared past between business partners of the interfirm alliance will have a positive effect on interorganizational trust.

The development and signing of a detailed interfirm contract is our second antecedent of interorganizational trust (cf. Klein Woolthuis, Hildebrand & Nooteboom, 2005). Formal contracts are written and legally binding agreements between the business partners of the interfirm alliance. They form a basis on which to fall back in the event of difficulties (Six, 2004). Contract theory (Hart, 1995) and transaction-cost economics (Williamson, 1996) focus on formal contracts as a mechanism for mitigating opportunistic behaviour. Indeed, there is a rich empirical literature that supports the negative relationship between the use (Batenburg, Raub & Snijders, 2003), completeness (Blumberg, 2001) and explicitness (Allen & Lueck, 1992) of formal contracts and opportunism. Specifying the agreements in a written document, supported by a legal system, removes the incentives and scope for opportunism. Therefore, contracts are a rational basis for interorganizational trust (Zucker, 1986).

Additionally, by negotiating and specifying e.g. tasks, investments, responsibilities, planned outcomes, timeframes and accountability, the partners obtain information on each other’s competences and intentions by which process the development of trust and detailed contracts will go hand-in-hand. This brings us to following hypothesis:

Hypothesis 2: Detailed interfirm contracts will have a positive effect on interorganizational trust.

Relational openness is the third antecedent of interorganizational trust. Once the partner is selected and an agreement has been signed, trust will be furthered and tested. Open and honest communication is the cement that holds together the channel of exchange. Relational openness goes beyond the exchange of information per se – it includes the sharing of relevant, comprehensive, accurate and timely information and an open environment for sharing ideas, comments and criticism. This feature has been identified as a prerequisite for successful relationships in general, and for interfirm collaboration in particular (Anderson & Narus, 1990; Luo, 2002; Zand, 1972). The effect of relational openness is that it deepens interorganizational trust (Lane & Beamish, 1990). Developing an alliance involves a search and identification process with the business partner, whereby differences and complementarities need to be recognized and articulated. Different perspectives do not necessarily lead to conflict and the subsequent dismantling of trust, but this is more likely if there is a lack of openness between the partners. Relational openness fosters trust because it helps to resolve disputes and align perceptions and expectations. Partners in a business alliance who adopt an open approach expose themselves more readily to risk (Six,
2004) and have less of a need to control the other party (Sabel, 1993). It is therefore less likely that they will misinterpret each other’s behaviour. As a result, problems are more likely to be identified and openly examined, and solutions are more likely to be appropriate and creative. We therefore hypothesize as follows:

Hypothesis 3: A high level of relational openness will have a positive effect on interorganizational trust.

Interdependence is characteristic for an alliance because the goals of one partner can only be obtained depending on the cooperating partner’s choice of means. Resource dependence theory suggests that the extent to which a firm is dependent on another firm influences the nature of interorganizational relationships and, therefore, is also likely to be influential in determining the nature of governance mechanisms and alliance performance (Pfeffer & Salancik, 1978). Thus, a focal firm’s dependence on the knowledge of a partner firm is likely to influence the focal firm’s governance choices within the relationship. This also implies that a lack of dependence makes firms less vulnerable to opportunistic behaviour, thereby rendering trust (and other interfirm features such as contracts) unnecessary or even meaningless. When both partners are highly dependent on each other, it may become difficult for firms to replace one another (Berger, Noorderhaven & Nooteboom, 1995). The outcome of both parties depends upon the actions of each other leaving little opportunities than to trust. The ‘deterrent’ of mutual dependence also has beneficial aspects: mutual dependence will induce co-operation because of the mutuality of interests (Kumar, Scheer & Steenkamp, 1985; Aulakh & Madhok, 2002). When both parties are highly dependent on each other, they have an incentive to make the relationship work (Ring & Van de Ven, 1994). They are likely to interact more and build a mutual understanding with regard to obligations and outcomes. Firms that are more dependent are more sensitive to each other’s needs and preferences, and demonstrate greater forbearance from opportunism. Thus, the importance of interorganizational trust stems from the interdependence of cooperating partners. This leads to the following hypothesis:

Hypothesis 4: Mutual dependence will have a positive effect on interorganizational trust.

To summarize, we hypothesize that four antecedents are important for the fostering of interorganizational trust in high-tech alliances: prior relationship, contract, openness and mutual dependence. Contracts and dependence can be characterized as antecedents of trust that work through deterrence: they prevent opportunism, either by private or legal ordering. Prior relationships and openness are antecedents that work more through the direct relationship between actors: parties that know each other, establish durable relationships and share ideas and information in an open atmosphere. Next, we address the relationship between trust and performance.
Interorganizational Trust and Alliance Performance

Despite the ‘obvious’ advantages of interfirm alliances, many of these have limited success (Beamish & Delios, 1997). The literature suggests that the degree of trust is one of the most critical factors in determining alliance performance (Madhok, 1995; Inkpen & Beamish, 1997). That is, the key obstruction to alliance success is the lack of trust (Nielsen, 2004). Trust has been shown to increase co-operation, improve flexibility, lower the cost of co-ordinating activities and increase the level of knowledge transfer. However, only a few studies deal explicitly with the antecedents of interorganizational trust in conjunction with alliance performance (the notable exceptions to this are Aulakh, Kotabe & Sahay, 1996; Dyer & Chu, 2002; Lane, Salk & Lyles, 2001; and Zaheer et al., 1998).

Despite the persistent hesitation of some economists (e.g. Williamson, 1993), researchers who favour trust often point to the economic (i.e., transaction cost minimizing and efficiency enhancing) value of trust. In this respect, Dyer and Chu (2003) argue that trust lowers transaction costs. For example, when there is a high level of trust, transactors will spend less time on ex-ante contracting because they are confident that payoffs will be fairly divided. Moreover, the arguments in favour of trust usually include the claim that trust allows for greater flexibility in responding to changing market conditions, and facilitates investments in transaction or relation-specific assets that enhance productivity (Nooteboom, Berger & Noorderhaven, 1997).

Research on the performance of business relationships generally focuses on two types of indicator: objective and affective (Bensaou & Venkatraman, 1995). In this paper we use the affective indicator because, as argued previously, objective indicators of alliance performance are difficult to establish, particularly when the form of the alliance is intangible. The affective indicator we use is the level of satisfaction with the interfirm relationship that resembles whether the relationship was satisfactory, whether it has improved over time and whether the partners intend to continue their collaborative efforts in the future. We hypothesize that interorganizational trust improves alliance performance as trust promotes the belief that the partner will not take advantage of the vulnerability of the focal firm; that an exchange partner actually cares about the relationship and is attentive to the needs of the partner. Trust therefore enhances co-operation and goal congruence that leads to better alliance performance, which is reflected in greater satisfaction regarding the relationship (Lewicki & Bunker, 1996; Fryxell, Dooley & Vryza, 2002). Thus, we hypothesize:

Hypothesis 5: Greater interorganizational trust will result in improved alliance performance.

8 It is likely that both sets of performance indicators are correlated and, likewise, may be difficult to disentangle by business partners in a high-tech alliance. We expect that high levels of relational satisfaction go together with a high level of economic performance, whereas the opposites are difficult to understand (low levels of satisfaction with high levels of economic performance or vice versa).
Control Variables
Any model with a set of focused relationships requires that rival hypotheses be discounted. We therefore incorporate three variables that are recognized as having an influence on interorganizational trust and relationship performance, i.e. the size of the focal firm, the co-operative culture of the focal firm and the value of the business partner. We include focal firm size as a variable in our model to control for extraneous factors such as bargaining power and resource base. These factors may influence the governance and performance of business relationships. Large firms have more resources and may be more successful in directly extracting hostages than smaller firms. Therefore, they will be less dependent on bilateral governance mechanisms such as trust to protect their confidential, proprietary knowledge and their business interests. Second, we assess the co-operative culture of the focal firm. Individuals (such as our respondents) do not operate in a vacuum. They are influenced by shared values and beliefs about what works within an organization and the approaches used to reach their goals. Some organizations have a strong ‘outward’ orientation and inclination towards interfirm co-operation. Others have a more ‘inward’ orientation and prefer a stand-alone business model. Third, we consider the value of the business partner or more specifically the value that the focal firm places on the knowledge that the partner firm has to offer. Knowledge is a key asset for high-tech companies for which technology development is a core activity. The purpose of a business relationship is to benefit from this firm-specific, path-dependent competencies and resources as it complements the firm’s own specialist knowledge and know-how (Nooteboom, 1999).

Research Model
Our research model is shown in Figure 2.

We acknowledge that the direction of causality between our antecedents, trust and performance is open to debate (cf. Dyer & Chu, 2003). Our theoretical model is predicated on the assumption that interorganizational trust directly affects relationship performance. Although most scholars perceive trust as a determinant rather than a consequence of performance (e.g. Anderson & Narus, 1994; Claro, Hagelaar & Omta, 2003), alliance performance might also influence interorganizational trust.

Ring and Van de Ven (1994) emphasize that interfirm collaboration is a process in which feedback mechanisms play a crucial role. They argue that performance and trust are continuously evaluated against norms of fair dealing and efficiency. The more successful a relationship is in terms of satisfaction, the more each partner appreciates the other’s fairness, trustworthiness and competencies. Additionally,
4.3 Methods and results

**Data Collection and Sample**

This study focuses on business relationships between two or more firms and/or research institutes that operate in high-tech industries (biotechnology, new material development, information technology, maritime technologies and environmental technology). The lifecycle of R&D in these industries is very short. Much of the new
technological knowledge quickly becomes outdated, often even before it has been incorporated in new products and/or services. In addition, R&D activities require substantial investments that are almost impossible to cover by an individual firm. Hence, in the high-tech industries in particular, we find many collaborative efforts between firms, including rival firms. Furthermore, given environmental uncertainty, we expect interorganizational trust to operate in this context.

In the preparatory phase of the fieldwork, we conducted twenty-five semi-structured interviews with consultants who had been involved in R&D alliances. This provided us with a wealth of information on the high-tech industries, interfirm relationships and the development of new technological knowledge. We used this information to design our survey and select the respondents. The survey was field-tested using a sample of ten companies involved in R&D alliances. This resulted in a number of modifications to the questionnaire. A research team conducted telephone interviews with 572 business managers. Prior to these interviews, all managers received an explanatory letter inviting them to participate. We briefed the team on the features of R&D, high-tech industries and interfirm relationships. The answers were all measured on a five-point Likert scale. During the interview main topics such as the history and purpose of the alliance as well as contracts, power, investments, industry dynamics and third party mediation were discussed. Some open questions were added to enliven the interview and to enable the respondents to tell their own story to some extent. In total 50 main questions (often divided in several sub questions) were asked. An outcome of this was that the interviews that were designed to take half an hour would sometimes take up to one hour depending on the respondent. The team made three attempts to identify and interview the selected respondents. The case firms were identified from a database of Dutch interfirm high-technology alliances published by the Dutch Ministry of Economic Affairs. This database enabled us to identify the business managers who were responsible for interfacing with the partner firms. They were considered to be the most knowledgeable informants about the interfirm relationships. One of the first questions required the respondents to identify the business partner in the alliance in question. We used this information to cross-validate the information from the database. Because high-tech alliances are typically concerned with specific projects and goals, we also asked the respondents to identify one project that was the most important to the interfirm alliance. By focusing on interfirm collaboration within one sector (high-tech industries), we reduced the range of extraneous variations that might influence the constructs of interest.

We obtained 391 usable responses, giving an effective response rate of 68.5 percent (see Table 1). This rate is considerably higher than those observed in prior studies on interfirm relationships (Poppo & Zenger 2002, Subramani & Venkatraman 2003).9

9 The average response rate for business surveys via (e-)mail or the Internet in the Netherlands is 5-8 percent. This means that large
The non-response is low (31.6 percent) especially considering that only 10.5 percent actually refused to be interviewed. 20.1 Percent could not be contacted within the 3 attempts that the interviewers used to try to get in touch with the respondent. To investigate whether the non-response incurs a bias, the non-cooperating respondents (10.5 percent) were asked for their reasons not to participate. The reasons for refusal were on the one hand a lack of time and interest (I have not time, I am not interested, I do not feel like it, I am too busy), and on the other hand, irritation because they had recently cooperated in another telephone survey. Although these reasons can hide their true motive for not cooperating (such as an unsuccessful cooperation), the low non-response and the reasons given for non-cooperation do not raise serious doubts on the implications of non-response.

**Operational Measures**
The design of our survey was inspired by related studies (McAllister, 1995; Nooteboom et al., 1997; Anderson & Narus, 1990; Heide & John, 1992) and our questionnaire included similar items that were adapted to our research context, i.e. in line with our unit of analysis (interfirm alliances), firm-level antecedents and control variables. Table 2 gives an overview of the items we used for a particular construct. Without discussing these at length, we ensured that the content of each item – the wording and phrasing of the particular question in the survey – directly relates to the construct it is designed to measure (‘face validity’).

We used five items to measure interorganizational trust. Two items measure the benevolence component of trust, two items measure forbearance from opportunism and one item measures the lack of control. We used three items to measure the shared past between the interfirm partners. Apart from a neutral statement, this includes two items that capture the possible affective nature of the past relationship. The measure for interfirm contracts was developed using the knowledge and advice research populations need to be available (which is often not the case) or other methods such as telephone or personal interviews need to be used in order to obtain a sufficiently large sample. Following
of legal experts on R&D agreements. This resulted in thirteen contractual clauses that together comprise a complete contract for interfirm relations in high-tech industries. We used three items to measure relational openness, relating not only to the actual exchange of information, but also to the context and nature of the communication process. We used two items to measure mutual dependence – one item refers to the position of the focal firm and the other refers to the partner’s position. Alliance performance was measured using three items that all indicate the level of the satisfaction with the interfirm relationship. Two items were used to measure the size of the focal firm, i.e. the number of employees and annual turnover. We used three items to measure the co-operative culture of the focal firm. The value of the partner to the focal firm was measured by one item that directly relates to the sharing of knowledge.

The scales and the Cronbach alpha of the different constructs are shown in Table 2. We tested the unidimensionality of each construct by conducting an exploratory factor analysis (EFA) using SPSS. The results of the EFA indicated that the items underlying a single construct loaded on the same factor. The EFA results are included in Table 2. We also performed a confirmatory factor analysis (CFA) using LISREL 8, i.e. we estimated the measurement models for the different variables of our study. The constructs displayed statistically significant item loadings (t-values > 2) that exceeded the threshold value for CFA (factor-loadings > 0.60). The composite reliability for each construct is above the critical value of 0.60 (Bagozzi & Yi, 1988) except for ‘mutual dependence’. Nevertheless, given the satisfactory EFA results – that were in turn confirmed by CFA – we decided to retain this construct in our analysis.
Table 2. Constructs, Items and Scales (a)

<table>
<thead>
<tr>
<th>Constructs, items and scales</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interorganizational Trust, alpha = 0.78</td>
<td></td>
</tr>
<tr>
<td>1. We did not feel that we constantly had to keep an eye on [name partner].</td>
<td>0.76</td>
</tr>
<tr>
<td>2. During the relationship, [name partner] treated our problems constructively and with care.</td>
<td>0.76</td>
</tr>
<tr>
<td>3. I never had the feeling of being misled by [name partner].</td>
<td>0.77</td>
</tr>
<tr>
<td>4. [Name partner] tried to reap disproportional gains from the cooperation relative to its input.</td>
<td>0.71</td>
</tr>
<tr>
<td>5. [Name partner] withholding important information from us.</td>
<td>0.74</td>
</tr>
<tr>
<td>(1 = strongly disagree, 5 = strongly agree)</td>
<td></td>
</tr>
<tr>
<td>Relational Satisfaction, alpha = 0.79</td>
<td></td>
</tr>
<tr>
<td>1. Can you indicate how satisfied you are with the working relationship with [name partner].</td>
<td>0.79</td>
</tr>
<tr>
<td>(1 = strongly dissatisfied, 5 = strongly satisfied)</td>
<td></td>
</tr>
<tr>
<td>2. Over the course of time, the relationship with [name partner] has improved and become more intense.</td>
<td>0.77</td>
</tr>
<tr>
<td>(1 = strongly disagree, 5 = strongly agree)</td>
<td></td>
</tr>
<tr>
<td>3. Do you think you will continue your cooperation with [name partner] in the future.</td>
<td>0.80</td>
</tr>
<tr>
<td>(1 = yes, definitely, 5 = definitely not)</td>
<td></td>
</tr>
<tr>
<td>Shared Past, alpha = 0.81</td>
<td></td>
</tr>
<tr>
<td>1. Our current alliance is a continuation of a previous, long-term relationship.</td>
<td>0.92</td>
</tr>
<tr>
<td>2. We only knew each other for a short while but thought we could manage the alliance together.</td>
<td>0.87</td>
</tr>
<tr>
<td>3. Before this alliance a friendly relationship had already been established.</td>
<td>0.77</td>
</tr>
<tr>
<td>(1 = strongly disagree, 5 = strongly agree)</td>
<td></td>
</tr>
<tr>
<td>Interfirm Contract</td>
<td></td>
</tr>
<tr>
<td>Please indicate whether one or more of the following arrangements are present in the contract with your partner.</td>
<td>n.a.</td>
</tr>
<tr>
<td>1. Goal and outcomes of the relationship</td>
<td></td>
</tr>
<tr>
<td>2. Duration of the relationship</td>
<td></td>
</tr>
<tr>
<td>3. Project plan (with sequential steps)</td>
<td></td>
</tr>
<tr>
<td>4. Investments by all parties (human, material and financial resources)</td>
<td></td>
</tr>
<tr>
<td>5. Accountability for risks (internally as well as externally to possible customers)</td>
<td></td>
</tr>
<tr>
<td>6. Project management (responsibility, communication)</td>
<td></td>
</tr>
<tr>
<td>7. Confidentiality</td>
<td></td>
</tr>
<tr>
<td>8. Ownership of the product or technology</td>
<td></td>
</tr>
<tr>
<td>9. Ownership of the method</td>
<td></td>
</tr>
<tr>
<td>10. License agreement</td>
<td></td>
</tr>
<tr>
<td>11. Patent rights</td>
<td></td>
</tr>
<tr>
<td>12. Arrangement for relationship adjustments or termination</td>
<td></td>
</tr>
<tr>
<td>13. Arrangement for conflict resolution (for example, via a third party)</td>
<td></td>
</tr>
<tr>
<td>(1 = no arrangement indicated, 13 = all arrangements indicated)</td>
<td></td>
</tr>
</tbody>
</table>

(a) The original questions are presented in the table. Prior to the empirical analyses, the scales for items 4 and 5 for interorganizational trust, item 3 for relational satisfaction and item 2 for cooperative culture have been reversed to maintain construct consistency.
Tests of the Hypotheses
We used PRELIS 8 to calculate the appropriate product-moment correlation coefficients between the constructs and the maximum likelihood procedure of LISREL 8 to estimate the research model (Jöreskog & Sörbom, 1993; 1996). The means, standard deviations and correlations among composite indicators are shown in Table 3. Table 4 presents the fit estimates as well as the parameter estimates for the structural model.
Table 3. Descriptive Statistics and Correlations (a)

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean</th>
<th>s.d.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interorganizational Trust</td>
<td>22.37</td>
<td>3.67</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Relational Satisfaction</td>
<td>12.55</td>
<td>2.58</td>
<td>.57</td>
<td>**</td>
<td>.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Shared Past</td>
<td>11.17</td>
<td>3.98</td>
<td>.13</td>
<td>**</td>
<td>.14</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Interfirm Contract</td>
<td>9.81</td>
<td>3.22</td>
<td>-.04</td>
<td></td>
<td>.05</td>
<td>-.05</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Relational Openness</td>
<td>14.04</td>
<td>1.59</td>
<td>.29</td>
<td>**</td>
<td>.20</td>
<td>.01</td>
<td>.10</td>
<td>**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Mutual Dependence</td>
<td>5.16</td>
<td>2.71</td>
<td>-.07</td>
<td>*</td>
<td>-.13</td>
<td>.03</td>
<td>-.15</td>
<td>**</td>
<td>-.08</td>
<td>*</td>
</tr>
<tr>
<td>7. Size</td>
<td>6.71</td>
<td>2.29</td>
<td>.02</td>
<td></td>
<td>-.03</td>
<td>.03</td>
<td>.13</td>
<td>**</td>
<td>.01</td>
<td>.01</td>
</tr>
<tr>
<td>8. Cooperative Culture</td>
<td>7.87</td>
<td>2.40</td>
<td>.12</td>
<td>**</td>
<td>.09</td>
<td>-.01</td>
<td>.08</td>
<td>.23</td>
<td>**</td>
<td>-.13</td>
</tr>
<tr>
<td>9. Value of the Partner</td>
<td>3.80</td>
<td>1.39</td>
<td>.16</td>
<td>**</td>
<td>.15</td>
<td>-.01</td>
<td>.12</td>
<td>.09</td>
<td>-2.1</td>
<td>.10</td>
</tr>
</tbody>
</table>

*a n = 391, * p < .05, ** p < .01

Table 4. Results for the Research Model a

<table>
<thead>
<tr>
<th>Path</th>
<th>Hypothesis (path)</th>
<th>Path coefficient</th>
<th>t-value</th>
<th>sign.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past Relationship → Interorganizational Trust</td>
<td>1 (γ11)</td>
<td>0.08</td>
<td>1.80</td>
<td>*</td>
</tr>
<tr>
<td>Detailed Contracts → Interorganizational Trust</td>
<td>2 (γ12)</td>
<td>-0.11</td>
<td>-2.51</td>
<td>**</td>
</tr>
<tr>
<td>Interfirm Openness → Interorganizational Trust</td>
<td>3 (γ13)</td>
<td>0.54</td>
<td>12.67</td>
<td>**</td>
</tr>
<tr>
<td>Mutual Dependence → Interorganizational Trust</td>
<td>4 (γ14)</td>
<td>-0.01</td>
<td>-0.21</td>
<td></td>
</tr>
<tr>
<td>Interorganizational Trust → Alliance Performance</td>
<td>5 (β21)</td>
<td>0.55</td>
<td>13.04</td>
<td>**</td>
</tr>
<tr>
<td>Size Focal Firm → Interorganizational Trust</td>
<td>(γ15)</td>
<td>0.01</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>Size Focal Firm → Alliance Performance</td>
<td>(β22)</td>
<td>-0.04</td>
<td>-0.95</td>
<td></td>
</tr>
<tr>
<td>Cooperative Culture → Interorganizational Trust</td>
<td>(γ16)</td>
<td>0.09</td>
<td>2.22</td>
<td>**</td>
</tr>
<tr>
<td>Cooperative Culture → Alliance Performance</td>
<td>(β23)</td>
<td>0.07</td>
<td>1.55</td>
<td></td>
</tr>
<tr>
<td>Value Partner → Interorganizational Trust</td>
<td>(γ17)</td>
<td>0.12</td>
<td>2.79</td>
<td>**</td>
</tr>
<tr>
<td>Value Partner → Alliance Performance</td>
<td>(β24)</td>
<td>0.06</td>
<td>1.40</td>
<td></td>
</tr>
</tbody>
</table>

Modelχ² (p-value) 13.70 (0.01)
GFI .992
AGFI .914
CFI .973
NNFI .965
RMSEA .079

*a n = 391, * p < .05, ** p < .01
The LISREL 8 results of the research model suggest acceptable model specification. Values for the goodness-of-fit index (GFI) and the adjusted goodness-of-fit index (AGFI) are 0.992 and 0.914 respectively. The value of the comparative fit index (CFI) is 0.973, and that of the normed fit index (NFI) is 0.965. These values suggest that the data support the research model because they are all above the threshold value of 0.900 (Jaros, Jermier, Koehler & Sincich, 1993). The value of the chi-square statistic is significant, indicating a less optimal fit ($\chi^2 = 13.70, p = 0.01$).\(^1\) The root-mean-square error of approximation (RMSEA) is 0.079 is just below 0.080 and therefore indicates a good fit (Bagozzi & Yi, 1988; Browne & Cudeck, 1992). The findings from the tests of the hypotheses follow.

First, Table 4 shows that the estimate of the path coefficient between interorganizational trust and relationship satisfaction is positive and significant ($\beta_{21} = 0.55, t = 13.04, p < 0.01$). The sample thereby confirms the fifth key hypothesis from our study. This provides evidence for the value of interorganizational trust in durable business relationships that strive for the development of new technological knowledge. As predicted, a shared past between business partners is positively related to interorganizational trust. The estimate of the path coefficient between shared past and trust is positive and significant ($\gamma_{11} = 0.08, t = 1.80, p < 0.05$). The first hypothesis is thus accepted. Contrary to our predictions, interfirm contracts do not foster trust. On the contrary, the estimate of the path coefficient between contracts and trust is negative and significant ($\gamma_{12} = -0.11, t = -2.51, p < 0.01$). This result suggests that a more detailed contract between partners in an interfirm relationship dismantles interorganizational trust. Hypothesis 2 is therefore rejected. Table 4 shows that the estimate of the path coefficient between relational openness and interorganizational trust is positive and significant ($\gamma_{13} = 0.55, t = 12.67, p < 0.01$). Our third hypothesis is thus accepted. The estimate of the path coefficient between mutual dependence and trust is negative but non-significant ($\gamma_{14} = -0.01, t = -0.21, n.s.$). Hypothesis 4 is rejected.

We obtained mixed results with regard to the control variables. The size of the focal firm seems to be irrelevant for the relationships between trust, its antecedents and performance. The estimates of the path coefficients between size and trust, and between size and relational satisfaction, are non-significant ($\gamma_{15} = 0.01, t = 0.02, n.s.$; and $\beta_{22} = -0.04, t = -0.95, n.s.$). This suggests that the research model works irrespective of the size of the focal firm. That is, the core relationship between trust, its antecedents and performance is the same for small, medium and large firms. The other two control variables do have implications for high-tech alliances. Interestingly, the implications are stronger for trust than for performance. The results in Table 4

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\(^1\) The $\chi^2$, however, is very sensitive to sample sizes, especially in cases where the sample size exceeds 200 respondents: large samples produce large $\chi^2$ values and thus 'bad' fit, and small samples produce small $\chi^2$ values and thus 'good' fit (Boomsma, 1996).
show that the value of the partner – in terms of providing access to technological knowledge – has a positive and significant effect on trust ($\gamma_{17} = 0.12, t = 2.79, p < 0.01$) and a positive but non-significant effect on relational satisfaction ($\beta_{24} = 0.06, t = 1.40, \text{n.s.}$). The same applies to the co-operative culture of the focal firm: the effect on trust is positive and significant ($\gamma_{16} = 0.09, t = 2.22, p < 0.01$) and the effect on relational satisfaction is positive but non-significant ($\gamma_{27} = 0.07, t = 1.55, \text{n.s.}$). What we learn from the results for the control variables is that interorganizational trust plays a pivotal role in the management of relational performance. The direct effects on performance of all three control variables are non-significant, whereas (except for size) the effects on trust are positive and significant. Given the strong relationship between trust and performance, the results suggest that, via interorganizational trust, the value of the partner and a co-operative culture have an indirect effect on performance.

4.4 Discussion and conclusions

Conclusions
The aim of this research is to test the hypothesis whether and how interorganizational trust contributes to the performance of high-tech alliances in the Netherlands. We do not deny the importance of personal relationships between managers of collaborating organizations but take into account that personal relationships may end whereas the interfirm alliance continues. This particularly applies to high tech industries, at least in the Netherlands, where the average turn-over of managers and specialized personnel is much higher than in other sectors of the economy. As a result, many different persons are involved in high-tech innovation between organizations over the years. For that reason, the interfirm context becomes important and the partner organization the object of reference. We therefore take this as our unit of analysis.

Our research incorporates high-tech alliances. They are different from other forms of alliances such as supply relationships in the automobile industry that incorporate the purchase and delivery of parts. Although these components are often customized, they are also often produced and delivered in batches. Purchase alliances are usually driven by cost-efficiency motives. High-tech alliances, on the other hand, do not produce and deliver standard products; they time and again create and invent new knowledge that may or may not be embedded in patented products. By definition, much is unknown and these alliances have high levels of uncertainty. These conditions allow interorganizational trust to work.

In general, our results are consistent with the theoretical predictions. Interorganizational trust fosters the performance of high-tech alliances in terms of relational satisfaction. Our model also allows to identify antecedents of interorganizational trust. It appears
that a shared past and an open relationship are particularly important for building trust. Additionally, a valuable partner and a corporate culture that embraces interfirm co-operation help to build and sustain trust and, albeit indirectly, improve the level of satisfaction with the relationship. We therefore contribute to the understanding of how high-tech business partners can develop and use interorganizational trust to improve the performance of an alliance.

The contradictory and non-significant findings are also notable and offer valuable information. First and foremost, why do interfirm contracts dismantle interorganizational trust? We interpret this result as follows. It is possible that our measurement of interfirm contracts is too crude. Contracts may serve different functions, some of which might induce trust while others may harm it (Poppo & Zenger, 2002). Business partners have certain intentions and motives when negotiating and drawing a contract. These intentions become visible in the proposed clauses that in turn will be interpreted and acted upon during the alliance. If, for instance, a partner focuses most on safeguarding clauses such as conflict resolution, the other party may interpret this as a signal of distrust. If partners focus on clauses that ensure good collaboration such as project management, this might elevate trust (Klein Woolthuis et al., 2005). Hence, our construct measures the overall outcome of a negotiating process, but does not reflect the process itself. Apparently, this negotiating process yielded unwanted side-effects – such as disputes (Goshall & Moran, 1996) and defensive behaviour (Lyons & Metha, 1997) – that for this sample resulted in a negative effect on interorganizational trust.

Second, why is interdependence and size of the focal firm not important, given the lack of significant support for their estimated path coefficients (despite the fact that the signs of the path coefficients are in line with our predictions)? To some extent, the lack of significant support may have a statistical explanation. This may apply to our ‘mutual dependence’ construct, for which we reported a low Cronbach alpha. Nevertheless, it may also mean that, a priori, we overestimated the value of interdependence as a resource for interorganizational trust. Alliance partners may take interdependence as a given, and that interdependence consequently ceases to foster trust. Partners may therefore rather respond to asymmetrical differences in dependence. The same applies to the lack of support for size of the focal firm. Again, size as such may be too crude a measure for the hypothesized reasons as to why size should matter in the management of interfirm relationships. In that respect, more work should incorporate the ‘fit’ between partners in terms of differentials of size, cognition or culture (cf. Nooteboom, 1996). Size may also have an indirect effect, for example, via contracts: the larger the firm, the more detailed the contracts are.
Limitations
We would emphasize that many improvements could and should be made in future empirical research that aims to understand the role of interorganizational trust in the management of interfirm alliances and performance. Some of the limitations of our research are generic, and have also been identified in other, related organization research. We collected cross-sectional data from business relationships in high-tech alliances in the Netherlands. This choice limits the generalizability of our results. Also, we interviewed one respondent for each interfirm collaboration. Although our respondents were the best-informed parties because they were the managers of the business relationship, this means that we did not explore other perceptions of the relationship from the perspective of the focal firm and the partner firm.

Other limitations are more specific to our research setting. Of course, in line with common preferences in research into businesses organizations, we prefer to use scales that are either statistically validated (in large-scale samples with appropriate sets of respondents) or have been used in similar research settings. Although some convergence in terms of constructs and scales within the recent trust research can be observed, the heterogeneous nature of empirical research prevails. This makes any choice of items and scales subject to debate. The usual solutions that we report in this paper warrant a safeguard – albeit a minimal one – against confusing the conclusions from empirical research that applies relatively new scales. In addition, we used our survey to measure all constructs for our research model because no other sources of information were available. A self-reporting bias may therefore exist (Podsakoff, MacKenzie, Podsakoff & Lee, 2003).

A final limitation concerns the dynamic nature of interfirm alliances versus the analysis thereof using cross-sectional databases. It is well known that cross-sectional databases prevent intertemporal, causal analysis of processes that determine the outcomes observed with the use of a questionnaire (Blossfeld & Rohwer, 2002). A cross-sectional sample may or may not provide a substantial ‘picture’ of a substantive process. Therefore, the current research design must assume that the process that determines the relationship between the antecedents, interorganizational trust and alliance performance is in some kind of statistical equilibrium. Although this might be valid – in the sense that we currently measure a Nash equilibrium and that hence, alliances are more inert than generally is claimed – a dynamic approach towards trust and alliances is interesting by itself. Given the robust empirical results, our model offers an important point of departure for this.

Future Research
Taking these limitations into account, we envisage the following opportunities for future
research into interorganizational trust. First, given the lack of empirical research on interorganizational trust, any new sample study would add to our understanding of this increasingly important phenomenon. There are various related opportunities for this. A replication of our study with similar data from the same sample of high-tech alliances would help to test the consistency of our findings over time. Although the age of our data per se does not bring methodological implications – they meet the econometric requirements to test our theoretical model – it might be that the Dutch institutional context changes. Moreover, such a new Dutch sample enables panel data regressions. Of course, the construction of time-series for our theoretical constructs offers the best opportunity for a dynamic analysis. This, however, is beyond the scope of regular alliance research. Nonetheless, a second and more recent dataset is a first step towards disentangling dynamics in the theoretical framework. In line with this, an international setting would allow an explicit study of variations in the institutional context. Testing our model with data from Anglo-Saxon countries such as the United Kingdom or the United States would provide opportunities for analysing the effects of institutions on the creation and maintenance of interorganizational trust. These data may cover separate samples of alliances in different industries – to determine industry-specific effects – or, in the vein of Hofstede’s (2001) seminal work, a single multinational company. The latter would allow to cover many nations and by doing so, determine, with the help of one dataset, whether and how international performance differences of interorganizational trust exist.

Second, following Powell (1990) and Hodgson (1998), a key premise of our research is that interfirm alliances create incentives for innovation. That is, social interactions facilitate learning and the creation of collective knowledge in firms and industries. This knowledge creation process is driven in part by interorganizational trust in particular when this form of trust becomes routinized. Here, the proximity between alliance partners matters – both cognitively (Nooteboom, 2000) and spatially (Maskell & Malmberg, 1999) – because innovation is facilitated through face-to-face contact and when there is a shorter cultural distance between agents. Future research needs to address the important relation between interorganizational trust, alliance performance and innovation (Lorenzen & Foss, 2002). We predict that interorganizational trust directly will influence innovation because it ensures the predictability of a business partner and because it provides a reliable mechanism for transmitting and receiving various forms of information (cf. Murphy, 2002).

Third, any theoretical model is, at best, a (biased) representation of reality, and our model is no exception. Nonetheless, more variables can be added to our research model. Also, other measurements such as objective indicators for alliance performance need to taken into account. Whether relational satisfaction really equates with, for example, superior financial performance is a debate that will continue. The current controversies in the studies of contracts in alliances plea for more in-depth research.
into the exact content and functions of contracts, and the subsequent effect on trust development and relationship outcomes. Our study only partly addresses intrinsic motivations as antecedents of interorganizational trust. Like personal relationships, affection towards a partner firm may be an important antecedent of interorganizational trust. Affection in this respect may be based on kinship or similarity: the more similar partner firms are, the more likely it is that they will intuitively understand each other and be confident in their expectations of each other’s behaviour.
CHAPTER 5. CONTENT OF CONTRACTS

Summary
In this study we investigate the governance structure of innovation processes in high-tech alliances, focusing on the content and role of formal contracts. The design of a formal agreement is one of the most important strategic decisions for alliance partners. Drawing upon transaction cost arguments and social exchange theory, we study the determinants of contractual detail of collaborative agreements in the Dutch high tech industry. The findings confirm important roles for transactional and relational characteristics. We also show that contracts have multiple functions: they are important to safeguard risks but are also used to co-ordinate alliance activities and show commitment; or to safeguard external contingencies. Each of these different dimensions has unique antecedents.

Key words: contract clauses; contract functions; trust; high tech alliances

5.1 Introduction
This study investigates the governance of high-tech alliances. The governance of high-tech alliances, through legal, private, and relational ordering, is a challenge as it needs to balance between realizing benefits and safeguarding risks (Dodgson et al. 2008; Dodgson 2000; Nooteboom 2004). Our focus is on the role of legal ordering, or formal contracts, in this process. Formal contracts are written, legally binding agreements between two or more parties (Lyons & Metha 1997). They are important instruments for the governance of exchange relations between economic actors because they represent promises or obligations to perform particular actions in the future (Mayer & Argyres 2004). However, empirical research on interfirm contracts is sparse because they are often subject to confidentiality and therefore rarely published. This hampers the understanding of the content and role of alliance contracts. In this article, we report an in-depth study of 391 contracts of Dutch high-tech alliances. By doing so, we intend to fill the aforementioned research gap.

Traditionally, contract studies have considered a contract as a static, legal document and have therefore paid little or no attention to the active role contracts may play in interorganizational alliances (Lyons 1996). Transaction cost theory (Williamson 1985) has contributed greatly to the study of interorganizational exchange because it specifies in detail the nature and extent of risk in transactions and provides indications that allow the construction of schemes for ‘governing’ transactions in such a way that risks are reduced (Brousseau & Glachant 2002). Various alliance scholars (e.g. Ariño & Reuer 2004; Parkhe 1993; Crocker & Reynolds 1993) provide evidence that complex formal contracts or contracts with many clauses that are strictly specified allow mitigating the risk of opportunistic behaviour. Nevertheless, there are also empirical contradictions (David & Han 2004) and theoretical limitations to transaction
cost economics (Dodgson 1993; Nooteboom 1996).

Most importantly, the available evidence suggests that the level of detail of alliance contracts varies greatly. Very simple contracts seem to be able to regulate very complex collaborations. Empirical research of economists on contract clauses in innovation alliances show that in stead of entering into details about future activities, contracts tend to focus on a few core issues (Grandori 2006). This brings many questions. Which provisions do high-tech alliance partners specify in their contract? Does the number of clauses in formal contracts of high-tech collaboration vary and if so, why? What is the role or function of a contract? The key objective of this paper is to answer these questions.

Our research concerning the antecedents of contract details aligns with transaction cost economics but complements this with insights that derive from social exchange theory. We argue that the behavioural assumption of opportunism is one of the theoretical limitations in transaction cost economics that may explain the empirical anomalies (cf. Nooteboom 2002). More in particular, we suggest that fear of opportunistic behaviour by a potential or actual partner and a willingness to trust and reciprocate may be mutually considered by those designing and implementing contracts to manage interfirm alliances.

The study of contracts seems to ignore the human aspects of economic transactions, in particular the development of trust (Dodgson 1992, 1993). Hence, we argue that for a thorough understanding of the content and role of contracts in high-tech alliances we need to account for the development of trust as well as for the safeguarding of positions.

The cooperative nature of the interfirm relationships under study presents an interesting arena for the study of contracts. Contract studies often focus on vertical relationships such as procurement relationships where prices, quantities and qualities can be established and agreed upon (Crocker & Reynolds 2006; Anderson & Dekker 2005).

There have been few studies of contracts in high-tech cooperative relationships, where parties have no hierarchical relationship and outcomes cannot be predetermined (notable exceptions are Robinson & Stuart 2004; and Ryall & Sampson 2006). Our sample is interesting as the relationships focus on the development of new knowledge (intangible assets); prices and budgets might be difficult to set ex ante and the verifiability of tasks and performance are likely to be low (e.g. man hours are specified but the result is still unknown). These differences in relationship characteristics and
context, as compared with other contract studies, can encourage new insights into the study of contracts and interfirm relationships.

The outline of this paper is as follows. In the next section, we will further explain the theoretical foundations of our study. We draw upon transaction cost economics and social exchange theory to identify key theoretical drivers of the choices that firms make when they design their interfirm agreement. A discussion of the research methodology and our empirical results will follow. We conclude with implications for managers and suggest avenues for future research.

5.2 Theoretical foundations

Dedicated assets

Dedicated assets is our first antecedent for the level of contractual detail. Dedicated assets are crucially important for the governance of strategic alliances (Poppo & Zenger 2002; Reuer & Ariño 2007; Joskow 1988). Transaction cost economics argues that particularly in conditions of asset specificity, alliance parties should safeguard to the maximum, but at the same time it acknowledges that this might be impossible due to bounded rationality and uncertainty (Williamson 1985). Dedicated assets are the result of dedicated investments and are required to support the focal alliance. They have, in contrast to general purpose assets, little or no salvage value outside the relationship. That is, when asset specificity is low, resources can be easy deployed to other relationships and continuity of the alliance is therefore not important.

However, when a firm makes transaction-specific investments, it creates dedicated assets, which increase its switching costs and makes the focal firm more dependent. The more dependent the focal firm, the more difficult it is to replace the alliance partner and the more vulnerable it will be to opportunistic behaviour. An alliance manager will find it beneficial to negotiate a more detailed contract when the potential value of loss due to hold-up behaviour exceeds the costs of negotiating safeguards. Therefore we suggest

Hypothesis 1: Asset specificity will result in a more detailed alliance contract.

Spill-over risks

Our second antecedent concerns the risk of spill-over (Inkpen 2000). Knowledge is a key asset for high-tech companies for which technology development is a core activity. The purpose of a business relationship is to benefit from this firm-specific, path-dependent competencies and resources as it complements the firm’s own specialist knowledge and know-how (Nooteboom 2004). The exchange of specialist knowledge is a prerequisite for the development of new knowledge. However, specialist knowledge is often highly confidential because it is part of the core competence of the firm and
therefore offers sustainable competitive advantages.

Spill-over is not the same as the loss of a resource (like the risk of dedicated assets). Under spill-over the company still owns the knowledge but it is no longer exclusive. In the setting of high-tech alliances contracts are designed to govern spill-over risks associated with the knowledge exchange essential to innovation. As this specialist knowledge is often the basis of future competitive advantages, firms have a strong incentive to manage risks of spill-over, particularly when the existing or potential partner firm is or could be a competitor. This gives Hypothesis 2: Spill-over risks will result in a more detailed alliance contract.

Trust

By bringing trust into the equation of contracting behaviour, we align our research with the ongoing discussion concerning formal and relational governance (Lane & Bachman 1998; Nooteboom 2002). Transaction cost economics denies the importance of trust as a meaningful governance mechanism (Williamson 1993), but this is in conflict with empirical evidence showing that in interfirm alliances trust exists and has value (Nooteboom 1996): it facilitates joint action, reduces the need for hierarchical control, and is a key condition for the development of new knowledge within and between organizations.

In this study we focus on interorganizational trust (Dyer & Chu 2003; De Jong & Klein Woolthuis 2008) defined as a positive perception of the partner’s behaviour, that is, the perception by the respondent of the focal firm that a partner organization will not engage in opportunistic behaviour even in the face of opportunities and incentives to do so. We can expect this confidence or perception (trust) where the partner firm a) shows forbearance from opportunism, and b) acts with care and concern, and c) the focal firm hence shows a lack of monitoring. Zaheer et al. (1998) show that there is a strong correlation between interpersonal and interorganizational trust and that, although conceptually different, it is the latter in particular that improves interfirm performance.

Trust and contracts are generally viewed as substitutes (Poppo & Zenger 2002; Reuer et al. 2003). There are two important arguments why trust and formal contracts can be considered as substitutes. First, trust economizes on costly contracts. Alliance managers who trust each other have less inclinations and need to impose control on others. Trust reduces the need to negotiate and specify e.g. tasks, investments, responsibilities, planned outcomes and accountability. Second, it has been argued that detailed contracts may destroy trust, for example by creating suspicion. Fehr and Schmidt (2002), for instance, argue that contracts should remain less detailed because this is closer to the implicit and explicit norms and values of human interaction,
represented by their behavioural preferences. We therefore expect the following hypothesis:

**Hypothesis 3:** Interorganizational trust will result in a less detailed alliance contract.

**Control variables**

We included four control variables in our analysis concerning the antecedents of alliance contract details. We include focal firm size as a variable in our model to control for extraneous factors such as bargaining power and resource base (Ariño & Reuer 2004). These factors may influence the governance because large firms have more legal resources, experience and staff, and may be more successful in directly extracting hostages than smaller firms. Secondly, we assess the strategic importance of the interfirm project (Reuer et al. 2003). Companies will design more detailed contracts for alliances that involve strategically important projects because they are more exposed to the hazards of the interfirm alliance. A similar argument applies to the complexity of interfirm projects. IT literature suggests that contracts are more detailed according to an increasing complexity of projects because of a need to avoid ambiguity and a need for coordination among alliance partners (Anderson & Dekker 2005). Our final control variable is risk avoidance, that is, the willingness to take risks differs among firms and this is reflected by the level of detail of formal contracts (Nooteboom 1996).

**5.3 Methods**

**Data collection and sample**

This study focuses on business relationships between two or more firms and/or research institutes that operate in high-tech industries (biotechnology, new material development, information technology, maritime technologies and environmental technology). The lifecycle of R&D in these industries is usually very short. Much of the new technological knowledge quickly becomes outdated, often even before it has been incorporated in new products and/or services. Hence, in the high-tech industries in particular, we find many collaborative efforts between firms, including rival firms. Furthermore, given environmental uncertainty, we expect contracts to operate in this context.

Our research proceeded in three stages. In the preparatory phase of the fieldwork, we conducted 25 semi-structured interviews with consultants of the Dutch Ministry of Economic Affairs that were involved in policy programmes to stimulate interfirm collaboration on innovation. Additionally, the consultants selected 20 cases (ten successful and ten less successful ones) that we studied in great detail to obtain in-depth knowledge of the high-tech collaboration.

Case research is suitable for exploratory research where understanding is the primary
objective (Yin 2003). The 20 cases dealt with collaborative innovation and hence involved complex transactions for which close collaboration between partners was necessary over a considerable period of time. The cases involved legally independent partners that shared costs and benefits more or less evenly. All cases entailed uncertainty and/or complexity, and specific assets, and hence risks of dependence, opportunism and ‘hold-up’.

Under strict confidentiality, we received full access to all documents of the cases – including the interfirm contracts but also project plans, annual reports of the companies involved, personal notes and letters, and half-yearly progress reports – that were available at the Ministry. Among other things, this allowed us to examine the content of the contracts with respect to the clauses that were laid down in the contract and the exact content of each clause. Also, clippings from newspapers and trade magazines concerning the collaborations were collected.

To enable comparison between the cases and to ensure the quality of the case analysis, a case protocol was written (Yin 2003), to describe the alliance’s history, development and outcome. The interviews with the consultants were transcribed into interview reports and send back for verification and agreement. Hence, all this allowed us to reconstruct the development of high-tech alliances and to check the data from the interviews with the secondary sources. We used this information to design our survey. The survey was field-tested using a sample of ten companies involved in R&D alliances. This resulted in a number of modifications to the questionnaire.

In the second stage, a research team conducted telephone interviews with 572 business managers of interfirm R&D collaboration. Prior to these interviews, all managers received an explanatory letter inviting them to participate. We briefed the team on the features of R&D, high-tech industries and interfirm relationships. The team made three attempts to identify and interview the selected respondents. The case firms were identified from a database of Dutch interfirm high-technology alliances published by the Ministry of Economics Affairs. This enabled us to identify the business managers who were responsible for interfacing with the partner firms. They were considered to be the most knowledgeable informants about the interfirm relationships. During the interview main topics such as the history and purpose of the alliance as well as contracts, investments, and industry dynamics were discussed. One of the first questions required the respondents to identify the business partner in the alliance in question. We used this information to cross-validate the information from the database.

Because high-tech alliances are typically concerned with specific projects and goals, we also asked the respondents to identify one project that was the most important to
the interfirm alliance. By focusing on interfirm collaboration within one sector (high-tech industries), we reduced the range of extraneous variations such as the level of uncertainty or competition that might influence the constructs of interest. Some open questions were added to enliven the interview and to enable the respondents to tell their own story to some extent. In total 50 main questions (often divided in several sub questions) were asked. An outcome of this was that the interviews that were designed to take half an hour would sometimes take up to one hour depending on the respondent.

We obtained 391 useable responses, giving an effective response rate of 68.5 percent. This rate is considerably higher than those observed in prior studies on interfirm relationships that usually is in the 10 to 33 percent range (Parkhe 1993; Poppo & Zenger 2002; Subramani & Venkatraman 2003). It was also satisfactory considering this studies’ requirement for direct senior management involvement and the confidentiality of some of the requested information. Although the high level of response from knowledgeable executives that were closely involved in the management of the high-tech collaboration was encouraging, it does not directly address the potential issues of consistency motives and social desirability (Podsakoff & Organ 1986). When self-reported on two or more variables are collected from the same source at one time, correlations among them may be systemically contaminated. However, for the aim of this study, reliance on key informants such as our respondents seems to be the only realistic and feasible way to obtain the required information (cf. Huber & Power 1985). We used the following actions to address possible concerns of validity in stage three of our research.

**Secondary data**
Available data can be tested for convergence by triangulation with secondary data (Keats & Hitt 1988). We compared the outcomes of the self-reported data in the questionnaire with the archival data on the 20 cooperative projects that we studied the first phase of the data-collection. The congruence of the data from the questionnaires and case studies supports the accuracy of the reported data.

**Questionnaire structure**
Via the sequence of our questions we aimed to minimize the effects of consistency artefacts. Whereas Salancik and Pfeffer (1977) suggest letting the independent variable follow, rather then precede, the independent variables, Podsakoff and Organ (1986) argue that correlations will be similar using either method. In our opinion, a life-cycle approach would best serve an accurate reflection of the interfirm collaboration.

Hence, for the purpose of this study, we structured the questions in the survey from past interactions through partner selection, contract negotiations, contract execution
and outcomes of the interfirm collaboration.

Non-response analysis.
The non-response is low (31.5 percent) especially considering that only 10.5 percent actually refused to be interviewed. 20.1 Percent could not be contacted within the 3 attempts that the interviewers used to try to get in touch with the respondent. To investigate whether the non-response incurs a bias, the non-cooperating respondents (10.5 percent) were asked for their reasons not to participate. The reasons for refusal were on the one hand a lack of time and interest, and on the other hand, irritation because they had recently cooperated in another survey. Although these reasons can hide their true motive for not participating in the survey (such as an unsuccessful cooperation), the low non-response and the reasons for not participating do not raise serious doubts on the implications of non-response.

Measures
Table 1 provides an overview of the items that we used to measure the constructs of our theoretical model.

The dependent construct is contract detail. The business relations that we analyse are characterised by high uncertainty or complexity, entail substantial alliance-specific investments, and require intensive knowledge transfer. Empirical studies suggest that for these circumstances, alliance contracts typically include clauses safeguarding (intellectual) property rights and spill-over (ownership of knowledge, products or methods, pledge of secrecy, sanctions on spill-over); clauses determining the management of complex relationships (relationship duration, project management, investments, communication); and clauses relating to future contingencies (environmental uncertainty, relationship adjustments, liability ‘in the event of’) (Klein Woolthuis et al. 2005).

In our questionnaire we specified thirteen clauses that address these issues. We verified these clauses in the exploratory case studies and the document analysis of the high-tech alliance contracts. Hence, we applied this categorisation of contractual clauses because it was tailor-made to our research context. We take the sum of the clauses included in the contract as a measure for the level of contractual detail.

We used two items to measure dedicated assets in terms of partner specific machinery and instruments. Spill-over risks are also measured by two items: one item measures these risks for the industry and one for the focal company in relation to a partner firm. We used five items to measure interorganizational trust. Our definition characterizes interorganizational trust as a multi-component construct based on three related components: forbearance from opportunism (measured by two items), care and
concern (measured by two items) and lack of monitoring (measured by one item). Two items were used to measure the size of the focal firm, i.e. the number of employees and annual turnover. The complexity and strategic importance of the project were measured by one item that directly relate to the particular construct. We used two items to measure risk avoidance by the focal firm: the inclination to use a detailed formal contract as well as to align with procedures and legal rules in an interfirm alliance.

Table 1. Constructs, items and scales

<table>
<thead>
<tr>
<th>Constructs, items and scales</th>
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</thead>
<tbody>
<tr>
<td><strong>Contract Details</strong></td>
</tr>
<tr>
<td>Please indicate whether one or more of the following arrangements are present in the contract with your partner.</td>
</tr>
<tr>
<td>1. Relationship goal and outcome</td>
</tr>
<tr>
<td>2. Relationship duration</td>
</tr>
<tr>
<td>3. Project plan of the relationship</td>
</tr>
<tr>
<td>4. Investments by all alliance parties (knowledge, material, human- and financial resources)</td>
</tr>
<tr>
<td>5. Risk allocation (internally as well as external to possible customers)</td>
</tr>
<tr>
<td>6. Project’s management: which partner has project leadership, when and how do parties inform each other, how do they communicate, and how is the project monitored</td>
</tr>
<tr>
<td>7. Pledge of secrecy: protection of know-how and sanctions in case of monopolizing knowledge and/or breach of the agreement</td>
</tr>
<tr>
<td>8. Ownership of the final product or technology</td>
</tr>
<tr>
<td>9. Ownership of the final method</td>
</tr>
<tr>
<td>10. Licence agreement concerning the exploitation of all alliance results</td>
</tr>
<tr>
<td>11. Patent rights of all alliance results</td>
</tr>
<tr>
<td>12. Relationship adjustments and/or termination arrangements under unforeseen circumstances such as disappointing market potential</td>
</tr>
<tr>
<td>13. Arrangements how parties will deal in case there are conflicting interests in the future (1 = no arrangement indicated, 13 = all arrangements indicated)</td>
</tr>
<tr>
<td><strong>Asset Specificity, alpha = 0.81</strong></td>
</tr>
<tr>
<td>1. For the project with our partner, we need custom made machinery and instruments.</td>
</tr>
<tr>
<td>2. We can also use this specific machinery for projects with other partners. (1 = strongly disagree, 5 = strongly agree)</td>
</tr>
<tr>
<td><strong>Spillover Risk, alpha = 0.97</strong></td>
</tr>
<tr>
<td>1. In our industry it is no problem if another firm observes the things we are working on.</td>
</tr>
<tr>
<td>2. Because our knowledge is difficult to protect, we are very careful in the exchange of knowledge with our partner. (1 = strongly disagree, 5 = strongly agree)</td>
</tr>
</tbody>
</table>
5.4 Empirical results

Contract characteristics

The data from our sample show that companies aim for different levels of detail in the contract. About 10 per cent of the respondents used low detailed contracts with less than five clauses included in the arrangement; another 55 per cent used moderately detailed contracts with less than 10 clauses; and 35 per cent used highly detailed contracts with 11 or more clauses included in the contract, although only 13 per cent thereof reported to have all clauses covered in the formal contract. The latter aligns with a highly detailed contract. Table 2 provides an overview of the relative importance of each contractual clause.

All contractual clauses were found in one of the contracts that we investigated. However, Table 2 shows that there is variation in the relative importance of the contractual clauses. The most important clauses concern those that address the investments of the alliance partners (present in 89.26 per cent of all contracts), the project plan (present in 86.45 per cent of all contracts), the duration (present in 85.17 per cent of all contracts) and the goal of the alliance (present in 84.91 per cent of all contracts). In less than half of all the contracts we find arrangements concerning patent rights,
risk allocation, conflict resolution and licence agreements.

Table 2. Relative importance of clauses in Dutch high-tech alliance contracts

<table>
<thead>
<tr>
<th>No. Contract Clause</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Investments</td>
<td>349</td>
<td>89.26</td>
</tr>
<tr>
<td>2 Relationship Duration</td>
<td>333</td>
<td>85.17</td>
</tr>
<tr>
<td>3 Relationship Goal and Outcome</td>
<td>332</td>
<td>84.91</td>
</tr>
<tr>
<td>4 Pledge of Secrecy</td>
<td>318</td>
<td>81.33</td>
</tr>
<tr>
<td>5 Ownership - Product/Technology</td>
<td>307</td>
<td>78.52</td>
</tr>
<tr>
<td>6 Projects Management</td>
<td>297</td>
<td>75.96</td>
</tr>
<tr>
<td>7 Ownership - Method</td>
<td>238</td>
<td>68.07</td>
</tr>
<tr>
<td>8 Risk Allocation</td>
<td>186</td>
<td>47.57</td>
</tr>
<tr>
<td>9 Conflict Resolution</td>
<td>186</td>
<td>47.57</td>
</tr>
<tr>
<td>10 Licence Agreement</td>
<td>145</td>
<td>37.08</td>
</tr>
</tbody>
</table>

Contract functions

Before we present the regression results, we first determine whether ‘contractual detail’ is a unidimensional or a multidimensional construct. For this, we performed a two-stage factor analysis for the thirteen clauses that are included in our research (Jöreskog & Sörbom 1993, 1996). Table 3 reports the results for the exploratory factor analysis and Table 4 for the confirmatory factor analysis.

The exploratory factor analysis produced three factors with eigenvalues greater than one, which together accounted for 54.6 percent of the variance in the data. The confirmatory factor analysis supports these findings: all factor loadings for a particular construct exceed the threshold value of 0.50 and are significant (with t-values > 2). Thus, our analysis provides three different factors or contract dimensions. Below, we offer an interpretation of these dimensions. The interpretation derives from carefully inspecting the content of the clauses that construct a particular dimension.

We interpret the first factor as the traditional safeguarding function of contracts for risks and spill-over. This function of the contract is mainly to limit the incentives towards and opportunities for opportunistic behaviour by one of the alliance partners. The fear of the incentives and opportunities for opportunistic behaviour leads to the design and inclusion of clauses that safeguard ownership and property rights. Hence, clauses with a high loading on this factor concern product or technology ownership, methods, licence agreements, patent rights and confidentiality. The standardized Cronbach’s alpha of this factor (0.77) is satisfactory.
We interpret the second factor as a combination of the coordination and the commitment function of a contract. This contract may be very detailed but will generally focus more on the positive (what we want to achieve and how) than on the negative (which legally enforceable measure we put in place to safeguard property or knowledge and how we take the case to court). Contractual clauses facilitating cooperation, which are interpreted as, for example, technical aids to relationship management – such as minutes from meetings, memoranda of agreements or outlines of the nature of alliances – do not necessarily increase the level of detail of a contract in terms of opportunism pre-emption. Clauses loading high on this factor concern the goal and outcome of the relationship, the project plan, and its project management. The results show that the coordination function serves to make arrangements that guide the day-to-day management of the interfirm alliance.

Additionally, the clauses that concern the investments of the alliance partners as well as the duration of the relationship also support this factor. These two terms are related to the commitment function of a contract: partners may also use the contract as a tangible expression of their trust in each other and their intention to be loyal partners with high levels of dedicated investments and long-term commitments. The contribution of each partner in terms of knowledge, financial and human resources as well as the duration of the relationship are discussed and determined.

Table 3. Contracts – exploratory factor analysis results (a)

<table>
<thead>
<tr>
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<tbody>
<tr>
<td></td>
<td></td>
<td>(Factor 1)</td>
<td>(Factor 2)</td>
<td>(Factor 3)</td>
</tr>
<tr>
<td>1</td>
<td>Relationship Goal and Outcome</td>
<td>0.110</td>
<td>0.660</td>
<td>0.220</td>
</tr>
<tr>
<td>2</td>
<td>Relationship Duration</td>
<td>0.096</td>
<td>0.668</td>
<td>0.114</td>
</tr>
<tr>
<td>3</td>
<td>Project Plan</td>
<td>0.096</td>
<td>0.710</td>
<td>-0.042</td>
</tr>
<tr>
<td>4</td>
<td>Investments</td>
<td>0.136</td>
<td>0.696</td>
<td>0.055</td>
</tr>
<tr>
<td>5</td>
<td>Risk Allocation</td>
<td>0.129</td>
<td>0.226</td>
<td>0.727</td>
</tr>
<tr>
<td>6</td>
<td>Project’s Management</td>
<td>0.112</td>
<td>0.668</td>
<td>0.158</td>
</tr>
<tr>
<td>7</td>
<td>Pledge of Secrecy</td>
<td>0.636</td>
<td>0.242</td>
<td>0.248</td>
</tr>
<tr>
<td>8</td>
<td>Ownership - Product/Technology</td>
<td>0.739</td>
<td>0.293</td>
<td>0.106</td>
</tr>
<tr>
<td>9</td>
<td>Ownership - Method</td>
<td>0.735</td>
<td>0.172</td>
<td>0.053</td>
</tr>
<tr>
<td>10</td>
<td>Licence Agreement</td>
<td>0.620</td>
<td>-0.001</td>
<td>0.244</td>
</tr>
<tr>
<td>11</td>
<td>Patent Rights</td>
<td>0.685</td>
<td>-0.002</td>
<td>0.299</td>
</tr>
<tr>
<td>12</td>
<td>Relationship Adjustments and Termination</td>
<td>0.293</td>
<td>0.111</td>
<td>0.726</td>
</tr>
<tr>
<td>13</td>
<td>Conflict Resolution</td>
<td>0.281</td>
<td>0.071</td>
<td>0.762</td>
</tr>
<tr>
<td></td>
<td>Cronbach’s Alpha</td>
<td>0.77</td>
<td>0.74</td>
<td>0.71</td>
</tr>
</tbody>
</table>

* Principal component analysis with varimax rotation and eigen values greater than one (n = 391). Factor-loadings that exceed the threshold value (factor-loadings > 0.50) are indicated in bold.
Table 4. Contracts – exploratory factor analysis results (a)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Relationship Goal and Outcome</td>
<td>0.78 (17.80)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Relationship Duration</td>
<td>0.76 (17.09)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Project Plan</td>
<td>0.79 (17.86)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Investments</td>
<td>0.83 (19.26)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Risk Allocation</td>
<td></td>
<td>0.79 (18.13)</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Project’s Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Pledge of Sacrity</td>
<td>0.92 (22.56)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Ownership - Product/Technology</td>
<td>0.92 (23.14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Ownership - Method</td>
<td>0.86 (20.39)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Licence Agreement</td>
<td>0.62 (13.29)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Patent Rights</td>
<td>0.71 (16.00)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Relationship Adjustments and Termination</td>
<td></td>
<td></td>
<td>0.82 (18.15)</td>
</tr>
<tr>
<td>13</td>
<td>Conflict Resolution</td>
<td>0.88 (19.67)</td>
<td></td>
<td>n.a.</td>
</tr>
</tbody>
</table>

Model Fit:
- Goodness of fit index (GFI) 0.98
- Adjusted goodness of fit index (AGFI) 0.91
- Normed fit index (NFI) 0.99
- Non-normed fit index (NNFI) 0.97

* The estimates derive from LISREL based on the matrix of polychoric correlation coefficients of the binary scales that measure the contract clauses (t-values in brackets, n = 391).

Apparently, coordination and commitment go hand-in-hand as our respondents do not differentiate the clauses into separate factors. For that reason we interpret this factor as the ‘coordination and commitment’ function of a contract. The standardized Cronbach’s alpha (0.74) is satisfactory. We interpret the third factor as the ‘external contingency’ function of a contract. When parties engage in a long-term and complex relationship, parties may put a detailed contract into place to have a framework for how to (re)act if unforeseeable contingencies arise. Time is a crucial aspect in this function, as over time events may transpire beyond the control of the alliance partners but for which they need to be prepared, such as radical new innovations or the hostile takeover of one of the partners. Such issues may be harmful but unlike opportunism do not have this purpose.

External contingency clauses do not take the inclination towards or possibilities for opportunism as their point of departure. In other words, managers are not actively concerned by their counterparts’ opportunistic behaviour at the moment these clauses are designed. However, they are not naive and also acknowledge that unforeseen circumstances affecting the relationship’s conditions or context may arise which could change the parties’ interests and the particularities of the relationship. Clauses
loading high on this factor concern the future risk allocation, relationship adjustment and termination arrangements, and conflict mediation. These clauses deal with issues that may arise from within or outside the relationship. The standardized Cronbach’s alpha for the items that construct this factor (0.71) is satisfactory.

To summarize, formal contracts between high-tech alliance partners may serve different functions. In our setting of Dutch innovative collaboration we show that contracts may have the function to safeguard positions and spill-over risks; to coordinate alliance activities and to show commitment; or to safeguard external contingencies.

**Antecedents of contract detail and contract functions**

Because our items have different scales, we used PRELIS to calculate the matrix of (polychoric, polyserial or Pearson) correlation coefficients and LISREL to estimate the effects of the antecedents and control variables on contract detail and the three different contract functions (Jöreskog & Sörbom 1993, 1996). The descriptive statistics are in Table 5 and the regression results in Table 6 which also provides partial evidence for the transaction cost explanation of detailed contracts.

*Table 5. Descriptive statistics and correlations (a)*

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean</th>
<th>s.d.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Dedicated Assets</td>
<td>4.70</td>
<td>3.04</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Spill-Over Risks</td>
<td>12.28</td>
<td>2.52</td>
<td>.10</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Interorganizational Trust</td>
<td>22.38</td>
<td>3.67</td>
<td>-.04</td>
<td>.02</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Size Focal Firm</td>
<td>6.71</td>
<td>2.29</td>
<td>.07</td>
<td>-.06</td>
<td>.02</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Complexity Project</td>
<td>3.51</td>
<td>2.22</td>
<td>.04</td>
<td>.01</td>
<td>-.05</td>
<td>-.03</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Strategic Importance Project</td>
<td>4.07</td>
<td>1.12</td>
<td>.65</td>
<td>.27</td>
<td>-.07</td>
<td>-.18</td>
<td>-.03</td>
<td>1.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Risk Aversion</td>
<td>6.00</td>
<td>2.48</td>
<td>.02</td>
<td>.06</td>
<td>.01</td>
<td>.03</td>
<td>-.06</td>
<td>.02</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>8. Contract Completeness</td>
<td>8.81</td>
<td>3.22</td>
<td>.01</td>
<td>-.17</td>
<td>-.04</td>
<td>.13</td>
<td>-.21</td>
<td>.09</td>
<td>.20</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Our first hypothesis predicted that contractual detail will be greater for alliances involving greater transaction-specific assets. Table 6, however, shows that dedicated assets do not determine the level of detail of an alliance contract (b = 0.01, n.s.). Hypothesis 1 therefore needs to be rejected. But we do find that spill-over risks have a positive and significant effect on contractual detail (b = 0.15, p < 0.01). The greater the risks of spill-over, the greater the number of contractual provisions built into the alliance contract. This confirms Hypothesis 2.

Our third hypothesis suggested that interorganizational trust can substitute for detailed alliance contracts. Table 6 shows that interorganizational trust does reduce the need to specify many details but the effect is not significant (b = -0.06, n.s.).
Hypothesis 3 is thus rejected. As for the control variables, our results suggest that large firms strive for more detailed contracts ($b = 0.14$, $p < 0.01$). The same applies to the complexity of the interfirm projects: the more complex the interfirm project, the more detailed the interfirm contract ($b = 0.19$, $p < 0.01$).

We cannot find significant evidence for the strategic importance of the project to the focal firm and alliance contract detail ($b = 0.06$, n.s.). However, risk aversion of the focal firm is an important antecedent because it makes the alliance contract more detailed ($b = 0.18$, $p < 0.01$). Hence, these results confirm valuable insights from transaction costs economics for the governance of high-tech alliances. More detailed contracts are needed to safeguard positions not so much due to dedicated assets but more because valuable knowledge is at stake and spill-over risks need to be reduced. The results cannot confirm that in the setting of high-tech alliances, business agreements are influenced by the social characteristics of the relationship.

We continue our analyses and determine whether our antecedents have significant relationships with the different contract functions. Three findings are worthwhile highlighting. First of all, Table 6 shows that the overall construct for alliance contracts masks the true influence of dedicated assets. Dedicated assets is an important determinant for safeguarding contracts (Model 2; $b = 0.18$, $p <0.01$). The disaggregate analysis thus suggests that firms use more safeguarding provisions in their contract as asset specificity increases.

The presence of dedicated assets has no impact on use of the contract for the coordination of the alliance activities or for the safeguarding of external contingencies. Likewise, Table 6 reports that spill-over risks increase the number of safeguarding clauses in an alliance contract (Model 2; $b = 0.16$, $p <0.01$) as well as the number of clauses that address external contingencies (Model 4; $b = 0.17$, $p <0.01$). In other words, the greater the risks of spill-over, the more the alliance partners discuss and agree upon clauses that aim to reduce these risks.

Secondly, the disaggregate analysis identifies an important and significant role for interorganizational trust. Specifically, interorganizational trust between alliance partners lead them to specify fewer provisions relating to the coordination of the alliance and showing commitment (Model 3; $b = -0.11$, $p < 0.01$). Trust has no impact on the number of safeguarding provisions that firms include in the contract. This is an interesting finding and partly confirms Williamson’s (1985) view on the limits of trust for interfirm organization. It replaces ‘weaker’ provisions but not the safeguarding clauses. Interorganizational trust helps alliance partners to e.g. improve the understanding of each others’ business cultures and habits and to improve mutual communication but, surprisingly, this does not materialize in the management of risks. In other words, interfirm governance of high-tech innovation activities may
benefit from trust but cannot do without formal agreements.

Thirdly, Table 6 shows that each group of contract clauses has unique determinants. When we group the significant antecedents we find explanations for each peculiar function of a contract. In a first situation, represented by Model 2, we find that a high-tech alliance with a large firm that executes a strategically important project – including substantial dedicated assets and spill-over risks – will discuss and subsequently include many safeguarding provisions in the formal agreement. In a second situation, represented by Model 3, we find that a high-tech alliance with a large firm that is risk-averse and that operates a complex project will review and include co-ordination and commitment provisions. At the same time, these alliances will benefit from interorganizational trust. In a third situation, represented by Model 4, we find that a high-tech alliance with a large and risk-averse firm that operates a complex and strategically important project – including spill-over risks – will have many debates on unforeseeable contingencies. They include these provisions in the contract.

5.5 Appraisal

Implications for managers

The present study has important implications for alliance managers who are, or soon will be, involved in a strategic (high-tech) alliance. First, our study informs alliance managers on the content of an interfirm contract. Business relationships in high-tech industries may offer substantial future benefits. Turnover and net profits can grow for many years in succession if companies join forces and manage to introduce new products in global consumer markets.

However, many of these high-tech alliances fail, because of, among other things, ambiguity on agreements. That is, disappointing alliance performance is often not only due to the lack of crystal clear agreements on e.g. goals, investments and communication, but also because these agreements are not specified in a formal contract. Oftentimes alliance managers are informed by their company lawyers who tend to focus on safeguarding risks and spill-over.

Our clauses provide an overview of alliance issues that go beyond that. These clauses derive from business practice. Our study confirms the relative importance of each of these in a large scale sample of 391 high tech alliances and by doing so, offers a best-practice situation. This is helpful for large companies that either have contract expertise in-house or have the financial resources to hire outside legal support. Our clauses offer an opportunity to crossvalidate the content of their (standard) contracts. For small and medium sized enterprises they offer a point of departure should they
not have contract expertise and/or a benchmark opportunity for existing contracts. Second, our study shows alliance managers that contracts are important not only when things go wrong, but also in the development and management of the relationship. Managers need to be aware of the different functions of a contract. It is not just a legal document that others can take care off. On the contrary, it is one of the most essential parts of the relationship, with different stages and, similar like trust, one that can make or break the interfirm alliance. The three functions that we identified in this study can be envisaged as a reflection of the process of negotiation and the stages of commitment that the parties go through. The concerns of safeguarding risks and spill-over may play a particularly prominent role when entering an agreement. The coordination and commitment function is not concerned with opportunism but is designed to coordinate the often complex tasks undertaken in interorganizational alliances and to show loyalty to the alliance. The final function of safeguarding external contingencies is also unconcerned with any direct fear of opportunism.

Although not implemented naively, its function is to safeguard the parties from that which might occur if the relationship or its context changes over time. Thus, in line with the findings of our study we suggest that the process of collaboration plays a central role in the design and implementation of a formal contract. It is not the mere presence or the absence of contracts, or their eventual detail that are the only issues. Instead, the focus should be on the aim and content of the contract and the atmosphere in which it is set out.

Third, we suggest that alliance managers self rather than company or outside lawyers need to design and manage the interfirm contract. Lawyers are not the most appropriate parties for alliance contracts because they have a biased focus – i.e. only safeguarding positions – and often perceive alliance contracts as one-shot documents designed at the start of the relationship (note that alliance managers need to avoid this pitfall themselves as well).

Lawyers and alliance managers can break trust by putting too much emphasis on the wrong issues at the wrong time. Alliance managers of an interfirm collaboration can make contracts subject of discussion by emphasizing that different phases of the relationship require different items to be dealt with. Thus, the meaning of a contract generally changes over time (cf. Nooteboom 2002). If we consider the development of a relationship as a process in which positive and negative behaviour can change the relationship atmosphere – as suggested in the literature by Zand (1972) and Deutsch (1973) – the writing and signing of a contract should also be envisaged as a step in this development. Contracts can, just like trust, be seen as both a cause and result of cooperation. Negotiating the contract can be seen as a process of getting to know and understand each other. Signing the contract can be seen as an act of
commitment.

Alliance managers can monitor this ongoing process of contracting by, for instance, categorizing and timely discussing particular sets of clauses so that they are addressed in the appropriate negotiating atmosphere.

**Limitations and future research**

We emphasize that improvements could and should be made in future empirical research that aims to understand the role and content of contracts behaviour in the management of (high tech) interfirm alliances. Some of the limitations of our research are generic, and have also been identified in other, related organization research. We collected cross-sectional data from business relationships in high tech alliances in the Netherlands. The data concern alliances between Dutch companies. Their contracting behaviour will thus reflect the Dutch (or broader continental European) culture in which ‘voice’ is the prevalent option for solving problems and cases are seldom taken to court (cf. Bachmann 1998). This choice limits the ability to generalize from our results. Also, we interviewed one respondent for each interfirm collaboration. Although our respondents were the best-informed parties because they were the managers of the business relationship, this means we did not explore other angles of the relationship from the perspective of the focal firm or the partner firm. A final limitation concerns the dynamic nature of contracting behaviour versus the analysis thereof using crosssectional databases.

Taking these limitations into account, we envisage the following opportunities for future research into alliance contracts. First, given the lack of empirical research on contracts, any new sample would add to our understanding of this important phenomenon. A crossvalidation of our key findings with data from Anglo-Saxon countries such as the United Kingdom or the United States would provide opportunities for analysing the effects of institutions on the role and content of formal contracts. New data from Dutch high-tech alliances would allow to test whether contract functions in the same sector and country change over time. In line with this, future research may also analyse whether and under what conditions contracts are actually used to manage interfirm alliances.

Second, we challenge the general validity of the ‘self-interest’ assumption in transaction costs and contract theory. Following Das & Teng (2001), a key premise of our research is that economic exchange also incorporates social elements that are built on personal foundations in which reciprocity and affection as well as self-interest play a role. Recent empirical studies confirm this by showing that about half of the people are completely selfish, whereas the other half exhibit egalitarian or even altruistic preferences. In other words, the assumption that actors have an intrinsic tendency
to keep promises is as true as their likelihood to behave opportunistically (Chen 2000). We plead for future research that looks at how the study of interorganizational governance (contract, control, trust) changes if these different assumptions of human behaviour are taken as point of departure.

Third, we believe that our results have implications for the ongoing trust-control discussion (Ryall & Sampson 2006). In many studies trust and formal contracts are often seen in contradiction – economists advocate the superiority of formal control mechanisms and social scientists maintain the crucial importance of trust and social capital in governing relationships. Our research methods could open a new path that allows a combination of these two perspectives.

Future research may also account for demographic characteristics such as firm tenure and age as well as contract management skills of the alliance manager or characteristics of the top management team (Finkelstein & Hambrick 1996). These may also determine the role and content of contracts in (high tech) alliances.
CHAPTER 6. APPLICATIONS OF CONTRACTS

**Summary**
In this study we investigate key contingencies that determine the active use of a formal contract after the strategic alliance has started. The antecedents for this ex post contract use address the contracting process, the need to safeguard spill-over risks and the existence of trust. The model is tested with unique and comprehensive data that were collected directly from a field study of 391 Dutch business managers. The results provide convincing evidence to support our perspective of contractual governance in durable business relationships that strive for the development of new technological knowledge.

Key words: contract use, contract design, spill-over risks, trust, contract clauses, dedicated assets, prior ties.

**6.1 Introduction**
This study investigates the governance of high-tech interfirm alliances. The governance of high-tech alliances is a challenge as it needs to balance between realizing benefits and safeguarding risks (Nooteboom et al., 2007; Tether and Tajar, 2008). Although the importance of formal contracts for strategic alliances is acknowledged (Mayer and Argyres, 2004), relatively little is known about whether and how partners actively use formal contracts once the alliance has started. We therefore pay ample attention to contingencies that determine ex post use of alliance contracts. Such an ex post analysis is important because a contract is the only tangible instrument that alliance partners have to regulate an interfirm cooperation in the absence of a formal hierarchy. There is a subtle but important distinction between the content of the contract and the use of them. Many ongoing debates in the contract literature focus on the former while largely ignoring the latter. Contract studies, for instance, are dominated by the concept of contract completeness and the relationship between that and alliance performance (Grandori and Furlotti, 2006; Okamuro, 2007). Whereas an agreement may take a variety of forms, written or verbal, implicit or explicit, a formal contract refers to such an agreement in tightly written legal forms (Macneil, 1980; Lyons and Metha, 1997). A complete formal contract is a contract that is extensive – that is, all necessary aspects of the relationship are covered – and, specific, that is, the clauses are formulated such that they are verifiable and enforceable (Chen, 2000; Deakin and Wilkinson, 1998). Empirical research on alliance contracts is scarce but the available work presents interesting findings. For example, there is mounting empirical evidence that firms often prefer to rely on ‘loose’ contracts and verbal promises in their relations with others rather than on carefully planned, detailed contracts, even in highly uncertain and volatile circumstances (Lyons and Metha, 1997).

The findings above point to an empirical anomalie. Contracting theories often have
little to say about ex post situations of alliance management. Transaction cost economics, for example, argues that particularly in conditions of asset specificity, alliance partners should safeguard to the maximum and write detailed contracts ex ante (Williamson, 1985) but it leaves ex post situations largely unaddressed. Herein lies our key contribution to the alliance literature: we investigate contingencies that determine the ex post use of a contract. It has often been suggested that alliance partners do design contracts but rarely use them because the legal enforceability of contracts may be limited due to contradictory terms in the contract and uncertainties of the legal system (Lyons, 1996), limited specificity of the contractual clauses (Chen, 2000) and the focal firm’s dependence on future exchange with the partner firm (Klein Woolthuis et al., 2005). To the best of our knowledge, however, this proposition has not been tested extensively, at least not in the setting of high-tech alliances. In this article we aim to understand whether and why contracts are actively used to manage interfirm innovation processes. The dominant theoretical perspective considers a contract as an ex ante governance mechanism. We will investigate whether contracts have an ex post function as well.

The next contribution concerns our particular explanations for variations in ex post contract use. We study the impact of three contingencies, that is, the contracting process, the need to safeguard spill-over risks, and the existence of trust. We will argue that the process of collaboration plays a central role in the active use of a formal contract. Transaction cost economics (Williamson, 1985) is certainly right that positions need to be safeguarded in strategic alliances. Hence, in line with various studies (e.g., Reuer and Ariño, 2007; Parke, 1993) we will propose that contracts are important instruments to mitigate contemporaneous and future risks (Brousseau and Glachant, 2002). But transactions are also embedded in ongoing alliance relationships. Alliance managers negotiate and agree on contract terms and the atmosphere of this ex ante negotiation process determines the ex post importance of formal contracts as well. Furthermore, we include the opportunity that trust between alliance partners develops and that this co-determines the need to use formal agreements as well. To summarize, the antecedents for ex post contractual governance in our study therefore incorporate the atmosphere of the contracting process and trust alongside the need to safeguard positions.

Our final contribution is the particular interfirm alliance that we study. Most contract literature focuses on vertical relationships such as procurement relationships where prices, quantities and qualities can be established and agreed upon (Crocker and Reynolds, 2006; Anderson and Dekker, 2005; Wuyts and Geyskens, 2005). There have been few studies of contracts in high-tech cooperative relationships, where parties have no hierarchical relationship and outcomes cannot be predetermined. Our sample is interesting as the relationships focus on the development of new knowledge.
(intangible assets); prices and budgets might be difficult to set ex ante and the verifiability of tasks and performance are likely to be low (e.g. man hours are specified but the result is still unknown). These differences in relationship characteristics and context, as compared with other contract studies, can encourage new insights into ex post studies of contracts and interfirm relationships.

The outline of this paper is as follows. In the next section, we will further explain the theoretical foundations of our study. We present three key hypotheses that explain how the ex ante contracting process, the need to safeguard positions and the existence of trust determine the ex post use of formal contracts to coordinate high-tech alliances. A discussion of the research methodology and our empirical results will follow. We conclude with an appraisal of the results and suggest avenues for future research.

6.2 Theory and hypotheses

**Contract design**

The atmosphere of the ex ante design of the formal contract is our point of departure. That is, we will argue that the design of a formal contract is the key initial condition for post-formation alliance contract use. The design of a contract is neither static nor one-dimensional. It is the interaction between parties that reveals mutual intentions and beliefs. We analyze the ex ante contracting process because the ex ante process of negotiating contracts will co-determine the firm’s vulnerability to ex post problems and hence, the necessity to use formal contractual governance. A limited number of studies indicates that the contract negotiating process influences the subsequent use of a formal contract (Gulati and Singh, 1998; Roxenhall and Ghauri, 2004). Some alliance partners will find it easy to design a contract whereas others are involved in lengthy discussions and a painfully established agreement (Ghauri and Fang, 2001). In alliances where parties trust each other, they are more likely to reach a ‘fair’ deal with a fair contract, and experience few troubles in establishing and formalising the contract. As a result, the (ex ante) costs of establishing and formalising the contract will be lower. This will foster cooperative behaviour that will lead to a constructive atmosphere with more openness and little or no destructive conflicts (Ghauri, 1983). In alliances where parties lack trust, the opposite will be the case: contracts will be interpreted merely as a safeguard against opportunism and – as the partners cannot fall back upon relational governance mechanisms such as loyalty and trust – they will have to use the contract to manage the relationship. If the parties during the negotiations thoroughly discuss each issue and all the technical details, it may hinder the development of close relations between the parties. Hence, the ex ante positive ‘shadow of the past’ of the contracting process will decrease the ex post active use of the formal agreement. So, we formulate:

Hypothesis 1: More ease with the ex ante design of the contract will result in a less
active ex post use of an alliance contract.

**Safeguarding positions**

Business relationships in high-tech industries may offer substantial future benefits. Turnover and net profits can grow for many years in succession if companies join forces and manage to introduce new products in global consumer markets. Therefore, joint value creation is the raison d’être for the formation of high-tech alliances, and cooperation among partners is a prerequisite for the success. However, such relationships may involve risks and an active use of contracts can be explained by the fact that firms want to mitigate these risks. In this paper we address spill-over risks (Zeng, 2003; Nooteboom, 2004).

Knowledge is a key asset for high-tech companies for which technology development is a core activity. The purpose of a business relationship is to benefit from this firm-specific, path-dependent competencies and resources as it complements the firm’s own specialist knowledge and know-how (Nooteboom, 2002). The exchange of specialist knowledge is a prerequisite for the development of new knowledge. However, specialist knowledge is often highly confidential because it is part of the core competence of the firm and therefore offers sustainable competitive advantages. Spill-over is not the same as the loss of a resource (like the risk of dedicated assets). Under spill-over the company still owns the knowledge but it is no longer exclusive. There are direct and indirect spill-over risks (Hamel, 1991; Khanna et al., 1998). Direct spill-over risks result when the partner is, or soon will be, a competitor. In high-tech alliances this often is the case. Hagedoorn and Duysters (2002), for example, report that up to half of the alliances in the Merit-Cati database involved competitors, according to the firms in the database (cf. Hagedoorn and Hesen, 2007). Spill-over risk may also be indirect with knowledge spilling over to a competitor via a partner. Furthermore, spill-over risk is closely related to the notion of ‘free riding’ (Nooteboom, 2004). This entails that in collaboration one benefits from partners without fully contributing to collaboration. In the setting of high-tech alliances, this implies that a company gets knowledge but contributes little. Thus, we argue that in the setting of high-tech alliances contracts are actively used to manage spill-over risks associated with the knowledge exchange essential to innovation. As this specialist knowledge is often the basis of future competitive advantages, firms have a strong incentive to manage risks of spill-over, particularly when the existing or potential partner firm is or could be a competitor. This gives:

Hypothesis 2: Spill-over risks will result in a more active ex post use of an alliance contract.

**Interorganizational trust**

By bringing trust into the equation of contracting behaviour, we align our research
with the ongoing discussion concerning formal and relational governance (Knights et al., 2001; Nooteboom, 2002). Transaction cost economics denies the importance of trust as a meaningful governance mechanism (Williamson, 1993), but this is in conflict with empirical evidence showing that in interfirm alliances trust exists and has value (De Jong and Nooteboom, 2000): it facilitates joint action (Zaheer et al., 1998), reduces the need for hierarchical control (Gulati, 1995), and is a key condition for the development of new knowledge within and between organizations (Herting, 2002). In this study we focus on interorganizational trust (cf. Dyer and Chu, 2003; De Jong and Klein Woolthuis, 2008) defined as a positive perception of the partner’s behaviour, that is, the perception by the respondent of the focal firm that a partner organization will not engage in opportunistic behaviour even in the face of opportunities and incentives to do so (cf. Hosmer, 1995). We can expect this confidence or perception (trust) where the partner firm a) shows forbearance from opportunism, and b) acts with care and concern, and c) the focal firm hence shows a lack of monitoring. Zaheer et al. (1998) show that there is a strong correlation between interpersonal and interorganizational trust and that, although conceptually different, it is the latter in particular that improves interfirm performance.

Empirical studies in the alliance literature predominantly analyze the relationship between the trust and the content of a contract. This line of research shows that trust can precede as well as follow contracts (Larson, 1992; Zaheer and Venkatraman, 1995; Poppo and Zenger, 2002). Trust can result from contracts as they limit the possibilities for opportunism (Zucker, 1986). But trust can also precede contracts as trust can be instrumental to open communication and negotiations on all the issues, including the sensitive and hence difficult to negotiate ones (Fryxell et al., 2002). Hence, higher levels of trust can increase the details of a contract (the number of clauses as well as the content of each clause) by increased willingness to negotiate and commit to the partner and confirm this in the contract (much like a marriage contract), whereas lower levels of trust would likewise be related to more detailed contracts as the partners seek legal security through the contract as they lack trust in the benevolence of their partner. This could explain why the discussion on whether contracts and trust are substitutes (negative relationship) or complements (positive relationship) is still unresolved. Both trust and distrust can lead to more detailed contracts. The present paper does not deny the importance of these studies but takes another perspective. We suggest that the difference should be expected more often in the active use of the contract. In a trusting relationship parties will have alternative ordering mechanisms at hand (relational governance) to cooperatively manage the relationship and hence will refrain from actively using the contract to enforce behaviour. We therefore expect the following:

Hypothesis 3: Interorganizational trust will result in a less active ex post use of an alliance contract.
6.3 Methods

Data collection and sample

This study focuses on business relationships between two or more firms and/or research institutes that operate in high-tech industries (biotechnology, new material development, information technology, maritime technologies and environmental technology). The lifecycle of R&D in these industries is usually very short. Much of the new technological knowledge quickly becomes outdated, often even before it has been incorporated in new products and/or services. Hence, in the high-tech industries in particular, we find many collaborative efforts between firms, including rival firms. Furthermore, given environmental uncertainty, we expect contracts to operate in this context.

Our research proceeded in three stages. In the preparatory phase of the fieldwork, we conducted twenty-five semi-structured interviews with consultants of the Dutch Ministry of Economic Affairs that were involved in policy programmes to stimulate interfirm collaboration on innovation. Additionally, the consultants selected 20 cases (ten successful and ten less successful ones) that we studied in great detail to obtain in-depth knowledge of the high-tech collaboration. Case research is suitable for exploratory research where understanding is the primary objective (Yin, 2003). The 20 cases dealt with collaborative innovation and hence involved complex transactions for which close collaboration between partners was necessary over a considerable period of time. The cases involved legally independent partners that shared costs and benefits more or less evenly. All cases entailed uncertainty and/or complexity, and specific assets, and hence risks of dependence, opportunism and ‘hold-up’. Under strict confidentiality, we received full access to all documents of the cases – including the interfirm contracts but also project plans, annual reports of the companies involved, personal notes and letters, and half-yearly progress reports – that were available at the Ministry. Among other things, this allowed us to examine the content of the contracts with respect to the clauses that were laid down in the contract and the exact content of each clause. Also, clippings from newspapers and trade magazines concerning the collaborations were collected. To enable comparison between the cases and to ensure the quality of the case analysis, a case protocol was written (Yin, 2003), to describe the alliance’s history, development and outcome. The interviews with the consultants were transcribed into interview reports and send back for verification and agreement. Hence, all this allowed us to reconstruct the development of high-tech alliances and to check the data from the interviews with the secondary sources. We used this information to design our survey. The survey was field-tested using a sample of ten companies involved in R&D alliances. This resulted in a number of modifications to the questionnaire.
In the second stage, a research team conducted telephone interviews with 572 business managers of interfirm R&D collaboration. Prior to these interviews, all managers received an explanatory letter inviting them to participate. We briefed the team on the features of R&D, high-tech industries and interfirm relationships. The team made three attempts to identify and interview the selected respondents. The case firms were identified from a database of Dutch interfirm high-technology alliances published by the Ministry of Economics Affairs. This enabled us to identify the business managers who were responsible for interfacing with the partner firms. They were considered to be the most knowledgeable informants about the interfirm relationships. During the interview main topics such as the history and purpose of the alliance as well as contracts, investments, and industry dynamics were discussed. One of the first questions required the respondents to identify the business partner in the alliance in question. We used this information to cross-validate the information from the database. Because high-tech alliances are typically concerned with specific projects and goals, we also asked the respondents to identify one project that was the most important to the interfirm alliance. By focusing on interfirm collaboration within one sector (high-tech industries), we reduced the range of extraneous variations such as the level of uncertainty or competition that might influence the constructs of interest. Some open questions were added to enliven the interview and to enable the respondents to tell their own story to some extent. In total 50 main questions (often divided in several sub questions) were asked. An outcome of this was that the interviews that were designed to take half an hour would sometimes take up to one hour depending on the respondent.

We obtained 391 useable responses, giving an effective response rate of 68.5 percent. This rate is considerably higher than those observed in prior studies on interfirm relationships that usually is in the 10 to 33 percent range (Parkhe, 1993; Poppo and Zenger, 2002; Subramani and Venkatraman, 2003). It was also satisfactory considering this studies’ requirement for direct senior management involvement and the confidentiality of some of the requested information. Although the high level of response from knowledgeable executives that were closely involved in the management of the high-tech collaboration was encouraging, it does not directly address the potential issues of consistency motives and social desirability (Podsakoff and Organ, 1986). When self-reported on two or more variables are collected from the same source at one time, correlations among them may be systemically contaminated. However, for the aim of this study, reliance on key informants such as our respondents seems to be the only realistic and feasible way to obtain the required information (cf. Huber and Power, 1985). We first tested our data for common method variance with the use of Harman’s single factor test. The data reported distinct factors with eigen values greater than one. Additionally, we used the following actions to address possible concerns of validity in stage three of our research.
Secondary data
Available data can be tested for convergence by triangulation with secondary data (Keats and Hitt, 1988). We compared the outcomes of the self-reported data in the questionnaire with the archival data on the 20 cooperative projects that we studied the first phase of the data-collection. The congruence of the data from the questionnaires and case studies supports the accuracy of the reported data.

Questionnaire structure
Via the sequence of our questions we aimed to minimize the effects of consistency artefacts. Whereas Salancik and Pfeffer (1977) suggest letting the independent variable follow, rather then precede, the independent variables, Podsakoff and Organ (1986) argue that correlations will be similar using either method. In our opinion, a life-cycle approach would best serve an accurate reflection of the interfirm collaboration. Hence, for the purpose of this study, we structured the questions in the survey from past interactions through partner selection, contract negotiations, contract execution and outcomes of the interfirm collaboration.

Non-response analysis
The non-response is low (31.5 percent) especially considering that only 10.5 percent actually refused to be interviewed. 20.1 Percent could not be contacted within the 3 attempts that the interviewers used to try to get in touch with the respondent. To investigate whether the non-response incurs a bias, the non-cooperating respondents (10.5 percent) were asked for their reasons not to participate. The reasons for refusal were on the one hand a lack of time and interest, and on the other hand, irritation because they had recently cooperated in another survey. Although these reasons can hide their true motive for not participating in the survey (such as an unsuccessful cooperation), the low non-response and the reasons for not participating do not raise serious doubts on the implications of non-response.

Constructs and measures
Table 1 provides an overview of the items that we used to measure the constructs of our theoretical model.

The dependent variable “contract use” was measured by one item that directly relates to this construct. We also used a single-item measure for our variable concerning “contract design” that also directly relates to this construct. “Spill-over risks” are

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2 Depending on the nature of the construct that is measured and the potential ambiguity from the perspective of the respondents, single-item measures may or may not be appropriate. Wanous and Hudy (2001) offer three conditions suggesting the use of such items; namely, when the construct of interest is a) unidimensional rather than multidimensional, b) clear to the respondents, and c) sufficiently narrow. The constructs measured in this study meet these criteria.
measured by two items: one item measures these risks for the industry and one for the focal company in relation to a partner firm. We used five items to measure “interorganizational trust”. Our definition characterizes interorganizational trust as a multi-component construct based on three related components: forbearance from opportunism (measured by two items), care and concern (measured by two items) and lack of monitoring (measured by one item). We used three items to measure the existence and nature of prior ties between the alliance partners. Apart from a neutral statement, this includes two items that capture the possible affective nature of the past relationship.

Table 1. Constructs, items and scales

<table>
<thead>
<tr>
<th>Constructs, items and scales</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Contract Use</strong></td>
<td>n.a.</td>
</tr>
<tr>
<td>1. The contract is, after it has been drawn up, actively used to manage the relationship with [name partner]. (1 = strongly disagree, 5 = strongly agree)</td>
<td></td>
</tr>
<tr>
<td><strong>Contract Design</strong></td>
<td>n.a.</td>
</tr>
<tr>
<td>1. It was easy to design the contract with [name partner].</td>
<td></td>
</tr>
<tr>
<td><strong>Contract Details</strong></td>
<td>n.a.</td>
</tr>
<tr>
<td>Please indicate whether one or more of the following arrangements are present in the contract with your partner.</td>
<td></td>
</tr>
<tr>
<td>1. Relationship goal and outcome</td>
<td></td>
</tr>
<tr>
<td>2. Relationship duration</td>
<td></td>
</tr>
<tr>
<td>3. Project plan of the relationship</td>
<td></td>
</tr>
<tr>
<td>4. Investments by all alliance parties (knowledge, material, human- and financial resources)</td>
<td></td>
</tr>
<tr>
<td>5. Risk allocation (internally as well as external to possible customers)</td>
<td></td>
</tr>
<tr>
<td>6. Project’s management: which partner has project leadership, when and how do parties inform each other, how do they communicate, and how is the project monitored</td>
<td></td>
</tr>
<tr>
<td>7. Pledge of secrecy: protection of know-how and sanctions in case of monopolizing knowledge and / or breach of the agreement</td>
<td></td>
</tr>
<tr>
<td>8. Ownership of the final product or technology</td>
<td></td>
</tr>
<tr>
<td>9. Ownership of the final method</td>
<td></td>
</tr>
<tr>
<td>10. Licence agreement concerning the exploitation of all alliance results</td>
<td></td>
</tr>
<tr>
<td>11. Patent rights of all alliance results</td>
<td></td>
</tr>
<tr>
<td>12. Relationship adjustments and/or termination arrangements under unforeseen circumstances such as disappointing market potential</td>
<td></td>
</tr>
<tr>
<td>13. Arrangements how parties will deal in case there are conflicting interests in the future (1 = no arrangement indicated, 13 = all arrangements indicated)</td>
<td></td>
</tr>
</tbody>
</table>

**Dedicated Assets, alpha = 0.81**

1. For the project with our partner, we need custom made machinery and instruments. 0.92
2. We can also use this specific machinery for projects with other partners. 0.92
(1 = strongly disagree, 5 = strongly agree)

**Spillover Risks, alpha = 0.97**

1. In our industry it is no problem if another firm observes the things we are working on. 0.82
2. Because our knowledge is difficult to protect, we are very careful in the exchange of knowledge with our partner. 0.82
(1 = strongly disagree, 5 = strongly agree)
Table 1. continued

Control Variables
We included seven control variables that are recognized as having an influence on the active use of alliance contracts (see Table 1). First, we include “focal firm size” as a variable to control for extraneous factors such as bargaining power and resource base (Reuer and Ariño, 2007). These factors may influence the governance because large firms have more legal resources, experience and staff, and may be more successful in directly extracting hostages than smaller firms. Therefore, they will be less dependent on bilateral governance mechanisms such as contracts to protect their confidential, proprietary knowledge and their business interests. Two items were used to measure the size of the focal firm, i.e. the number of employees and annual turnover. Second, we include “risk avoidance” as a control variable because the willingness to take risks
differs among firms and is reflected by the use of formal contracts (Nooiteboom, 2002). Firms that are high in uncertainty avoidance need predictability and uniformity; they have a strong preference for codification and the establishment of and the inclination to actively use formal rules (Steensma et al., 2006). We used two items to measure risk avoidance: the inclination to use a detailed formal contract as well as to align with procedures and legal rules in an interfirm alliance. Third, we include the relative importance of an alliance contract over relational governance. By definition, alliance partners might disregard the value of a contract. Our data concerns high-tech alliances between Dutch companies. The trusting and contracting behaviour will thus reflect the Dutch (or broader continental European) culture in which ‘voice’ is the prevalent option for solving problems (Bachmann, 1998). We measure “relative importance of the contract” by one item that directly relates to this construct. Fourth, we also assess the “strategic importance of the alliance partner” (Reuer et al., 2006). More specifically, we include the value that the focal firm places on the knowledge that the partner firm has to offer. Companies will be more inclined to actively use the contract for alliances that involve valuable partners because they are more exposed to the hazards of the interfirm alliance. We measure “strategic importance of the partner” by one item that directly relates to this construct. Fifth, we include the level of dedicated assets. In circumstances with dedicated assets, firms become more dependent and thus more vulnerable to opportunistic behaviour and parties may therefore sooner resort to active use of contracts. We used two items to measure “dedicated assets” in terms of partner specific machinery and instruments. Sixth, we control for the existence of “prior ties” between alliance partners. A shared past may reduce the inclination to actively use a contract because prior ties may lead to the development of routines and habituation, independent of trust (Zollo et al., 2002). The final control variable is “contract details”. It is possible that the ex post use of the contract is determined by the ex ante level of detail. The business relations that we analyse are characterised by high uncertainty or complexity, entail substantial alliance-specific investments, and require intensive knowledge transfer. Empirical studies suggest that for these circumstances, alliance contracts typically include clauses safeguarding (intellectual) property rights, determining the management of complex relationships, and clauses relating to future contingencies (Lui and Ngo, 2004, Klein Woolthuis et al., 2005). In our questionnaire we specified thirteen of these clauses. We applied this categorisation of contractual clauses because it was tailor-made to our research context. We take the sum of the clauses included in the contract as a measure for the level of contractual detail.

Factor analysis and ordered probit analysis
We performed a two-stage factor analysis for the multi-dimensional constructs (Jöreskog and Sörbom, 1993; 1996). All items for a specific construct meet the regular requirements. The constructs displayed statistically significant item loadings
(t-values > 2) that exceeded the threshold value for CFA (factor-loadings > 0.50). The composite reliability for each construct is above the critical value of 0.60 (Bagozzi and Yi, 1988) – except for ‘risk avoidance’ that reports a Cronbach alpha of 0.59. However, given the satisfactory EFA and CFA results we maintain this construct in our analysis. The Likert-scale questionnaire item that was the source of the dependent variable allowed us to distinguish among ordered outcomes. The ordered logit regression model, derived from the binomial logit model, is appropriate for such dependent variables (McCulagh, 1980; Peterson and Harrell, 1990). We standardized the explanatory variables before entering them into the regression model. The general specification of the ordered logit regression model is:

\[ \Pr(\text{outcome}_j = i) = \Pr(k_{i-1} < B_1X_1j + B_2X_2j + ... + B_kX_kj + u_j \leq = k_i) \]  

(1)

where \( u_j \) is assumed to be logistically distributed. The coefficients \( B_k \) are estimated, along with the threshold values \( k_i \), where \( i \) is the number of possible outcomes. In our research context, the interpretation of the results relates to the likelihood of contract use. A positive and significant coefficient, for instance, indicates that the variable is positively correlated with a greater likelihood that a formal contract will be actively used to manage the interfirm alliance.

### 6.4 Empirical results

The means, standard deviations and correlations among composite indicators are shown in Table 2. The findings for the relationships between the antecedents and the use of a formal contract are reported in Table 3.

<table>
<thead>
<tr>
<th>Construct</th>
<th>Mean</th>
<th>s.d.</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Contract use</td>
<td>2.21</td>
<td>1.63</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Contract design</td>
<td>4.21</td>
<td>1.24</td>
<td>-.21**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Contract details</td>
<td>8.81</td>
<td>3.22</td>
<td>.27**</td>
<td>-.15**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Dedicated assets</td>
<td>4.70</td>
<td>3.64</td>
<td>.07**</td>
<td>-.03</td>
<td>-.03</td>
<td>-.00</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Spillover risks</td>
<td>12.28</td>
<td>2.52</td>
<td>.13**</td>
<td>.06</td>
<td>.16**</td>
<td>.05**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Interorganizational trust</td>
<td>22.38</td>
<td>3.67</td>
<td>-.25**</td>
<td>.28**</td>
<td>-.05</td>
<td>-.03</td>
<td>.01</td>
<td>.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Prior ties</td>
<td>11.17</td>
<td>3.98</td>
<td>-.13**</td>
<td>.12**</td>
<td>-.05</td>
<td>-.00</td>
<td>-.05</td>
<td>-.05</td>
<td>.13**</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Size focal firm</td>
<td>6.71</td>
<td>2.29</td>
<td>.01**</td>
<td>.07</td>
<td>.13**</td>
<td>.06**</td>
<td>-.11**</td>
<td>.02</td>
<td>.03</td>
<td>.03</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Risk avoidance</td>
<td>6.09</td>
<td>2.48</td>
<td>.16**</td>
<td>.00</td>
<td>.21**</td>
<td>.02</td>
<td>.07</td>
<td>-.01</td>
<td>-.06</td>
<td>.03</td>
<td>.03</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>10. Strategic importance</td>
<td>3.80</td>
<td>1.39</td>
<td>.12**</td>
<td>.00</td>
<td>.08</td>
<td>.01</td>
<td>.06</td>
<td>.14**</td>
<td>.02</td>
<td>.09**</td>
<td>-.07</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>11. Relative importance</td>
<td>4.15</td>
<td>1.20</td>
<td>-.17**</td>
<td>.18**</td>
<td>-.07</td>
<td>.04</td>
<td>.00</td>
<td>.20**</td>
<td>.14**</td>
<td>.05</td>
<td>-.10**</td>
<td>.04</td>
<td>1.00</td>
</tr>
</tbody>
</table>

\*n = 391, \*p < .05, **p < .01
Table 3. Antecedents of ex post contract use in high-tech alliances (A)

<table>
<thead>
<tr>
<th>Main Effects</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contracting Process</td>
<td>-0.35 ***</td>
<td>-0.37 ***</td>
<td>-0.27 **</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.10)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td></td>
</tr>
<tr>
<td>Spill-Over Risks</td>
<td>0.19 *</td>
<td>0.21 *</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.12)</td>
<td>(0.12)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interorganizational Trust</td>
<td>-0.44 ***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control Variables</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contract Details</td>
<td>0.57 ***</td>
<td>0.52 ***</td>
<td>0.49 ***</td>
<td>0.52 ***</td>
</tr>
<tr>
<td></td>
<td>(0.13)</td>
<td>(0.13)</td>
<td>(0.13)</td>
<td>(0.14)</td>
</tr>
<tr>
<td>Dedicated Assets</td>
<td>0.22 **</td>
<td>0.21 **</td>
<td>0.20 *</td>
<td>0.19 *</td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
</tr>
<tr>
<td>Prior Ties</td>
<td>-0.16</td>
<td>-0.13</td>
<td>-0.13</td>
<td>-0.09</td>
</tr>
<tr>
<td></td>
<td>(0.10)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
</tr>
<tr>
<td>Size Focal Firm</td>
<td>-0.09</td>
<td>-0.11</td>
<td>-0.08</td>
<td>-0.06</td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
</tr>
<tr>
<td>Risk Avoidance</td>
<td>0.27 **</td>
<td>0.31 ***</td>
<td>0.30 ***</td>
<td>0.30 ***</td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
</tr>
<tr>
<td>Relative Importance Contract</td>
<td>-0.34 ***</td>
<td>-0.27 ***</td>
<td>-0.28 ***</td>
<td>-0.22 **</td>
</tr>
<tr>
<td></td>
<td>(0.10)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
</tr>
<tr>
<td>Strategic Importance Partner</td>
<td>0.21 *</td>
<td>0.23 **</td>
<td>0.23 **</td>
<td>0.28 **</td>
</tr>
<tr>
<td></td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
<td>(0.11)</td>
</tr>
<tr>
<td>Model Fit</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-2(log-likelihood)</td>
<td>891.43</td>
<td>828.94</td>
<td>826.36</td>
<td>810.13</td>
</tr>
<tr>
<td>Chi-Square</td>
<td>54.29 ***</td>
<td>65.26 ***</td>
<td>67.85 ***</td>
<td>84.08 ***</td>
</tr>
<tr>
<td>Cox Snell pseudo-R2</td>
<td>0.14</td>
<td>0.16</td>
<td>0.17</td>
<td>0.20</td>
</tr>
<tr>
<td>Nagelkerke pseudo-R2</td>
<td>0.15</td>
<td>0.18</td>
<td>0.18</td>
<td>0.22</td>
</tr>
</tbody>
</table>

*a n = 391. Standard errors appear in parantheses. * p < .10, ** p < .05, *** p < .01

Table 3 presents the results of the hierarchical ordered logistic regression analysis. We estimated four models. In addition to the control variables (Model 1), we subsequently added contracting design (Model 2), safeguarding spillover risks (Model 3) and interorganizational trust (Model 4) to the first model in order to assess the unique contribution of each in predicting contract use. The hierarchical ordered logistic regressions reveal that all antecedents have an independent effect on the active use of alliance contracts when introduced in steps as groups. The addition of the various
antecedents leads to a significant improvement of the model fit (changes in Chi-square are 10.97, 2.59 and 16.23 with p < 0.01 for Models 2, 3 and 4, respectively). In what follows, we discuss our findings with respect to the results for the final Model 4.

Our empirical results provide convincing evidence for the impact of ex ante contract design on ex post contract use. The parameter estimate for contract design is positive and significant. Hypothesis 1 is thus confirmed (p < 0.01). We also find significant support for the safeguarding perspective. Table 3 shows that spill-over risks induce an ex post active use of contracts as we expected (p < 0.10). Nonetheless, not all knowledge shares the same amount of spill-over risk and this may explain the somewhat modest support (Nooteboom, 2004). The tacitness of knowledge, for example, may decrease these risks. The greater the tacitness of knowledge, the greater the causal ambiguity and hence, the less likely it is that outside firms will understand the ‘production process’ of that knowledge. It also depends on the absorptive capacity of the recipient firm whether or not it can imitate it to their advantage. In exploration much knowledge is new and tacit and hence difficult to absorb. Taken together, this may explain the modest significant support. Our empirical results provide strong support for the substituting effect of interorganizational trust and the active use of contracts. This confirms Hypothesis 3 (p < 0.01) and indicates that in the setting of high-tech alliances business agreements are influenced by the social characteristics of the relationship. It supports the prevailing idea in the sociological literature on interfirm alliances that trust can substitute for contracts and become a superior governance mechanism due to the positive side effects such as constructively solving conflicts and loyalty (Shapiro, 1987).

As for the control variables, our results suggest that many of them have a significant impact on contract use in line with our expectations. In particular, the level of contract detail (p < .01), dedicated assets (p < .10), risk avoidance (p < .01), and the strategic importance of the partner (p < .05) will increase the likelihood of ex post contract use. The relative importance of the contract versus relational governance decreases the likelihood of ex post contract use (p < .01) and confirms that this variable offers a benchmark for formal governance per se. Table 3 shows that a shared past between the alliance partners decreases the likelihood of contract use as expected but the effect is non-significant. Apparently, the effects of a shared past do not directly materialize in the active use of a contract. Prior ties may serve to develop trust and therefore only indirectly lead to a reduced need for formal governance. The results also indicate that larger firms are less likely to actively use a contract to manage an alliance albeit that this effect is non-significant. In summary, we found support for our main effects, while controlling for a substantial firm- and relational characteristics. By doing so, we
eliminated potentially spurious relationships as well as alternative explanations for ex post contract use.

6.5 Summary and conclusions
In this paper, we present a first attempt to explain whether and how alliance partners actively use a formal contract to manage a high-tech alliance. In so doing, we shifted the attention from the ex ante content to the ex post use of a formal contract. We believe the latter is interesting in its own right: a firm’s governance decision need not be a once-and-for-all proposition that take place at the alliance design phase. The antecedents for the ex ante content of alliance contracts are increasingly identified in the governance literature (Furlotti, 2007; De Jong and Klein Woolthuis, 2009). The determinants for the ex post use of a contract remain relatively unknown. The point of departure in this paper is that the underlying causal structure for the content and the use of a formal agreement is different. Both sets need to be disentangled in order to fully understand the role of a contract in high-tech alliances. Hence, our paper aims to combine initial alliance conditions with post-formation alliance dynamics in order to understand how innovation processes between independent companies are managed. Explaining the active use of a contract is critical in a global knowledge economy where high-tech alliances remain crucially important in order to survive and obtain sustained competitive advantages. However, many of these high-tech alliances fail, because of, among other things, ambiguity on agreements. The dominant perspective considers contracts to be a necessary but rather inefficient instrument to manage interfirm agreements. As Lyons (1996: 31) states, ‘The written word has apparent objectivity, and would be the prime source of evidence in the event of litigation. However, numerous contracts are written ... but ... might never be invoked even in the event of a dispute.’ It has been suggested that an active use of the contract (e.g. by monitoring activities, threat or litigation) may evoke conflict, opportunism and defensive behaviour (Goshal and Moran, 1996). Even mentioning the word ‘contract’ would have reputation effects and harm the relationship. Our study intends to show alliance managers that contracts are important governance instruments not only when things go wrong, but also in the development and management of the relationship. The active use of a contract after the start of an alliance not only entails constraining of behaviour but als the enabling and guiding of interfirm cooperation.

Traditionally, contract studies have considered a contract as a static, legal document and have therefore paid little or no attention to the active role contracts may play in interorganizational alliances (David and Han, 2004). Transaction cost theory has contributed greatly to the study of interorganizational exchange because it specifies in detail the nature and extent of risk in transactions and provides indications that allow the construction of schemes for ‘governing’ transactions in such a way that
risks are reduced. According to this perspective, contracts, particularly very detailed contracts, are important instruments to mitigate contemporaneous and future risks. Nevertheless, there are empirical contradictions and theoretical limitations to transaction cost economics (Nooteboom, 2004). Not all firms write detailed contracts when they are involved in bilateral exchange. Empirical evidence shows that firms often design limited formal agreements, even in highly uncertain and volatile circumstances, notwithstanding the other studies that confirm the role of contracts in line with the predictions of transaction cost economics.

The behavioural assumption of opportunism is one of the theoretical limitations in transaction cost economics that may explain the empirical anomalies. That is, we suggest that fear of opportunistic behaviour by a potential or actual partner and a willingness to trust and reciprocate may both be considered by those designing and implementing contracts to manage interfirm alliances. The assumption that actors have an intrinsic tendency to keep promises is as true as their likelihood to behave opportunistically (Chen, 2000; De Jong and Klein Woolthuis, 2008). Thus we recommend a more detailed and finely nuanced analysis of formal contracts in studies of high-tech alliances (see Das and Teng, 2001). We therefore proposed a model that provides a stepping stone for investigating in detail core determinants of ex post contract use. We draw attention to, first, the design of the contract. The process of contract negotiation cannot be ignored if one wants to understand the use of a formal contract. Second, we draw attention to the safeguarding of spill-over risks. High-tech alliances may bring substantial benefits to the participating parties but may likewise seriously hamper the economic performance of the organization if positions are misused. Finally, we draw attention to relational governance because alliance partners may have developed (interorganizational) trust.

In the analysis of the ex post use of contracts, this article presents unique data. Empirical research on alliance contracts is sparse because they are often subject to confidentiality and therefore rarely published. Our study is based on primary data collection from business managers directly responsible for the interfirm relationship and the design of the interfirm contract. The sample included small, medium and large companies. The data enabled us to develop good insight into both factual information and subjective interpretations of the alliance contract. By doing so, our empirical work complements other contract studies, where data derive from, e.g. very large, and hence unique, multinationals (Ryall and Sampson, 2009; Robinson and Stuart, 2007), from panel data (Crocker and Reynolds, 2006), game theoretical experiments (Bernheim and Whinston, 1998) or case studies (Klein Woolthuis et al., 2005; Roxenhall and Ghauri, 2004).
Overall, we believe that our approach to the study of contract use is promising. This is supported by the significant empirical findings of our work. We contribute to the understanding whether and how alliance managers actively use a contract to manage interfirm innovation activities. Contracts that are easy to design and interorganizational trust foster a cooperative atmosphere and reduce a need for ex post contractual governance. With interorganizational trust we take into account that personal relationships may end whereas the interfirm alliance continues. This particularly applies to high tech industries, at least in the Netherlands, where the average turnover of managers and specialized personnel is much higher than in other sectors of the economy. As a result, many different persons are involved in high-tech innovation between organizations over the years. For that reason, the interfirm context becomes important and the partner organization the object of reference. Spill-over risks induce alliance managers to more actively use the contract after the start of the alliance in order to safeguard their positions. Hence, in line with the key findings of our study we suggest that the process of collaboration plays a central role in the active use of a formal contract. It is not the mere presence or the absence of contracts, or their eventual level of detail that are the only issues. Instead, the focus should be on the active use of the contract, the embeddedness in trustful relationships and the atmosphere in which it is designed.

Of course given the novel focus on contract use our study cannot be but a first step. In future research we intend to develop the theoretical framework and empirical work. For example, we interviewed one respondent for each interfirm collaboration. Although our respondents were the best-informed parties because they were the managers of the business relationship, it would also be interesting to explore other angles of the alliance from the perspective of the focal firm or the partner firm. In relation to this, our study focused on high-tech alliances in the Netherlands. In due time, samples from other nations such as the United States or Japan as well as other industries would allow a cross-validation of the results presented in this paper and provide the opportunity for analyzing the effects of institutions on the creation and functioning of formal contracts. These new sample may also include different measures for e.g. the content of the contract clauses. Our study does not account for demographic characteristics such as firm tenure and age of the alliance manager or characteristics of the top management team (Finkelstein and Hambrick, 1996). These may also determine the active use of formal contracts to manage an interfirm alliance. A final limitation concerns the dynamic nature of interfirm alliances versus the analysis thereof using cross-sectional databases. Our work is grounded in detailed case-studies that we used to reconstruct the contracting process and to design the survey research. Nonetheless, our cross-sectional sample may or may not provide a substantial picture of a substantive process. A dynamic approach towards the use of
contracts is interesting by itself. Given the robust empirical results, our model offers an important point of departure for this.
CHAPTER 7. FUNCTIONS OF CONTRACTS

Summary
Recent research on alliance governance has emphasized that contracts can have both a control and coordination function. In this paper, we test the impact of these different contract functions on alliance performance. Conducting structural equation analyses on a sample of 270 Dutch technology alliances, we disentangle the relationship between different contract functions, partner cooperation and alliance success. Our data show that different contract roles have a different impact on partner cooperation within the alliance. In addition, we find strong indications that the presence/absence of prior trustful collaboration and the number of alliance partners moderate the relationship between contract functions and partner cooperation. Finally, our data provide evidence that contract functions indirectly influence alliance success via partner cooperation.

Keywords: contracts, contract functions, trust, high-tech alliances.

7.1 Introduction
Alliances have become an increasingly popular strategy for organizations to complement and supplement their internal activities (Doz & Hamel, 1998; Kale & Singh, 2009; Hagedoorn, 2002). Although popular, their failure rates are high (Bleeke & Ernst, 1991), instigating numerous scholars to study the governance of alliances (Faems, Janssens, Madhok & Van Looy, 2008). In this research stream, contracts or ‘agreements in writing between two or more parties, which are perceived as legally binding (Lyons & Mehta, 1997: 241)’ have been identified as an important mechanism to effectively govern alliances.

Whereas alliance contract research has traditionally focused on the complexity of the contract (i.e. the amount of clauses in the contract), some scholars (e.g. Faems et al., 2008, Hagedoorn & Hesen, 2007; Mayer & Teece, 2008; Klein Woolthuis, Hillebrand & Nootboom, 2005) have recently started to also consider the content of the contract. In this way, these scholars managed to identify that contracts can both (i) allow for formal control of the partner’s behavior; and (ii) facilitate coordinated action. However, research on the impact of such different contract roles on the performance of the alliance has remained absent (de Jong & Klein Woolthuis, 2008).

In this paper, we therefore explore the impact of different contract functions on alliance performance. In order to do so, we rely on a sample of 270 Dutch technology alliances. Conducting structural equation analyses, we explore the relationships between contract functions, partner cooperation and alliance success. Our data provide strong indications that different contract functions can significantly influence partner cooperation during the alliance. For instance, we find that the more important the contractual control function, the lower the partner cooperation within the alliance.
In addition, we find that the presence/absence of trustful prior collaboration and the number of alliance partners moderate the relationship between contract roles and partner cooperation. In particular, we find that the negative impact of the contractual control function on partner cooperation disappears when partners share a history of trustful collaboration. In addition, we observe that, in the setting of dyadic alliance, the contractual coordination function has a significant negative impact on partner cooperation. Finally, our data provide consistent evidence that contract roles indirectly influence alliance success via partner cooperation.

The reminder of this paper is structured in four sections. First, we position our study in the existing alliance governance literature. Subsequently, we discuss the methodology that we applied to examine the impact of contract functions on alliance performance. Next, we present the main findings of our study. Finally, we discuss the main theoretical and managerial implication of our findings, discuss the main limitations of this study and identify several avenues for future research.

7.2 Theoretical background and hypotheses

Contractual alliance governance: complexity versus content of the contract

Whereas alliance governance research has long been dominated by a concern for the choice between equity or non-equity structures, scholars have also started focusing on the role of specific structural and relational governance mechanisms (Arino & Reuer, 2005). In this literature stream, contracts have been recognized as an important structural governance mechanism. Alliance contract studies (e.g. Anderson & Dekker, 2005; Luo, 2002; Parkhe, 1993; Poppo & Zenger, 2002; Reuer, Arino & Wellevigt, 2006; Ryall & Sampson, 2006) have mainly focused on the complexity of the contract or the amount of clauses that are present in the contract. In particular these studies examined 1) the impact of several transactional and relational conditions on the amount of clauses that are present in the contract; 2) the impact of contract complexity on alliance performance, and 3) the relationship between contract complexity and trust or ‘a psychological state comprising the intention to accept vulnerability based on positive expectations of the intentions or behavior of another’ (Rousseau, Sitkin, Burt & Camerer, 1998: 395)...

Several scholars (e.g. Faems et al., 2008, Hagedoorn & Hesen, 2007; Mayer & Teece, 2008; Klein Woolthuis, Hillebrand & Nooteboom, 2005) have therefore started...
exploring not only the complexity of the contract, but also the actual content of the clauses that are defined in alliance contract. Based on this content-based assessment, these scholars came to the conclusion that contracts might play different roles in the governance of alliances. Mellewigt, Madhok and Weibel (2008) identify two different contract roles. First, in line with insights from transaction cost theory (e.g. Williamson, 1985), they emphasize that alliance contracts might have a control role, reducing the risk that one of the partners will abuse the alliance for opportunist reasons. Second, in line with organizational theory (e.g. Galbraith, 1977; Thompson, 1967), they stress that the contract might also contain clauses that facilitate coordinated action between the partners. Other scholars have come to similar conclusions. Klein Woolthuis et al. (2005) argue that contracts might have a safeguarding or coordination function in alliances. Examining the 88 strategic alliances, Reuer and Arino (2007) empirically demonstrate that contractual clauses in alliance contracts can have both enforcement and coordination functions.

**Impact of contract roles on alliance performance: A conceptual framework**

Whereas scholars have provided valuable insights into the different functions that contracts may have in governing alliances, they remain silent on how these contract roles influence alliance performance. Below, we develop a conceptual framework in which we (i) link the different contract functions to partner cooperation and alliance success and (ii) hypothesize on the potential moderating effects of history of trustful collaboration and number of alliance partners (see Figure 1).

**Impact of contractual control function on partner cooperation.**

One key difference between single-firm strategies and interfirm alliances is the uncertainty attending the cooperation among partners. When independent firms collaborate together, there is the risk of the partner not cooperating in good faith in addition to the usual risk of unsatisfactory business performance (Das & Teng, 2001: 253). Applying a transaction cost framework, scholars have referred to this kind of behavioral uncertainty in terms of opportunistic behavior or ‘seeking self interest with guile’ (Williamson, 1985). Opportunistic behavior in alliances is exemplified by ‘cheating, shirking, distorting information, misleading partners, providing substandard products/services, and appropriating partners’ critical resources’ (Das & Teng, 1998: 492).

In line with transaction cost theory, numerous alliance governance scholars have argued that alliance partners can negotiate safeguarding clauses, inflicting penalties for the omission of cooperative behaviors or commission of violative behaviors.

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3 Klein Woolthuis et al. (2005) identify a third contract role. They stress that contracts may also serve as a tangible expression of partners’ trust in each other and their intention to be loyal partners. In other words, the contract might also function as a signal of commitment.
(Parkhe, 1993). As a result, the cost of self-interest activities subsequently increases, curbing partners’ willingness to act opportunistically (Dyer & Singh, 1998). In other words, safeguarding clauses allow for formal control or the utilization of formal rules, procedures, and policies to monitor and punish undesirable behavior and/or outcomes (Anderson & Dekker, 2005; Das & Teng, 2001), reducing the likelihood of opportunistic behavior. First indications are also present that, when the contract has a strong control function, knowledge transfer between the partners will be more open and transparent. Examining three R&D alliances, Faems, Janssens & Van Looy (2007), for instance, observed that, in cases where explicit contractual clauses were present that controlled the exchange of knowledge, partners were much more willing to disclose sensitive knowledge to the other partner.

In sum, we expect that, the more alliance partners rely on contracts as a mechanism to control for opportunistic behavior, the lower the probability that opportunistic behavior will occur and the higher the willingness to transfer knowledge between the partners. We therefore formulate the following hypothesis:

*Hypothesis 1: The more important the control function of alliance contracts, the higher the partner cooperation within the alliance.*
Several scholars have argued that the relevance of the contractual control function might be dependent on alliance partners’ history of prior collaboration. When partners share a history of successful prior collaboration, they are likely to have build up ‘resilient trust’ or a psychological state between collaborating partners, characterized by shared norms, values and beliefs that emphasize faith in the moral integrity or goodwill of others (Ring, 1997). Looking from a social exchange perspective (e.g. Blau, 1964), several scholars (e.g. Inkpen & Currall, 2004; Das & Teng, 1998, 2001; Dyer & Singh, 1998; Jones and George, 1998; Ring & Van de Ven, 1994) argued that the presence of resilient trust influences how partners work together in alliances. First, under conditions of resilient trust, ‘shared valued underlying trust provide individuals with the assurance that knowledge and information will be used for the greater good and that one need not exercise power to protect one’s own interests’ (Jones & George, 1998: 542). In other words, when resilient trust is present, the perception of opportunistic hazards is likely to be reduced. In the alliance literature, these dynamics have been referred to in terms of ‘social control’ (Inkpen & Currall, 2004; Das & Teng, 2001). Opposite to formal control, emphasizing rules, procedures and policies, social control tries to minimize divergence of preferences among participants by relying on the development of shared values, beliefs, and goals among members (Eisenhardt, 1985; Ouchi, 1979). In such circumstances, partners’ incentives to behave opportunistically are reduced (Das & Teng, 2001; Dyer & Singh, 1998).

In sum, in case of prior trustful collaboration, alliance partners do not need formal control because they can rely on social control to mitigate opportunistic behavior and stimulate open knowledge exchange. We therefore expect that the contractual control function is especially relevant for stimulating partner cooperation in settings where a history of trustful prior collaboration is absent: 

**Hypothesis 2: The positive impact of the contractual control function on partner cooperation is stronger when alliance partners do not share a history of trustful collaboration.**

In the alliance literature, a distinction is made between dyadic alliances, in which only two organizations collaborate, and multilateral alliances, in which the collaboration involves more than two partners. Moreover, some scholars (e.g. Garcia-Canal et al., 2003; Gong, Shenkar, Lou & Nyaw, 2007) provide first indications that the impact of the contractual control function on the quality of interaction might differ in dyadic and multilateral alliances. Both Garcia-Canal et al. and Gong et al. (2007) provide empirical evidence that, in multilateral alliances, contract complexity has a significant positive impact on alliance performance, whereas such a relationship is not present in the setting of dyadic alliances. To explain these findings, these scholars argue that, the more partners are present in an alliance, the more difficult it becomes to monitor the actions of all different parties and to align the partners’ goals. In such a setting,
partners’ incentives to engage in opportunistic behavior are likely to increase (Das & Teng, 2002), which increases the relevance of using the contract as a formal control mechanism. We therefore hypothesize:

**Hypothesis 3:** The positive impact of the contractual control function on partner cooperation is stronger in multilateral alliances.

**Impact of contractual coordination function on partner cooperation**

Whereas transaction scholars focus on the behavioral uncertainty of alliances, other scholars, applying insights from organization theory (e.g. Lawrence & Lorsch, 1967; Thompson, 1967), emphasize the difficulty of achieving coordinated action in alliances. Two main reasons have been mentioned to explain the difficulties of coordination in alliance. First, alliances cannot make an appeal to all hierarchical structures and systems that are available within organizations to achieve coordinated action (Gulati & Singh, 1998). Second, differences in national context as well as differences in corporate cultures further complicate the coordination between collaborating partners (Parkhe, 1991).

At the same time, the alliance contract has been identified as a viable mechanism to improve coordination. In particular, through extensively defining performance control systems, action planning systems, and standard operating procedures in the formal contract, the division of labor and the interactions between partners become more predictable and joint decisions can be made more by rules than by exception (Klein Woolthuis et al., 2005; Mellewigt et al., 2008; Reuer & Arino, 2007). In other words, a contract allows for standardized coordination (Mintzberg, 1979), facilitating cooperation between the involved partners:

**Hypothesis 4:** The more important the coordination function of alliance contracts, the higher the partner cooperation within the alliance.

Based on a longitudinal study of contracting in the personal computer industry, Mayer and Argyres (2004: 394) concluded that contracts may also function as ‘repositories for knowledge about how to govern collaborations.’ In particular, they argue that when collaborative partners share a history of previous collaboration, they are likely to adjust the content of the contract based on their mutual learning experiences in their previous collaborative transactions. In addition, Faems et al. (2008) empirically illustrate that this contract learning effect is particularly important for coordination clauses in the contract. Based on these observations, we expect that, when partners share a history of trustful collaboration, they will be able to define in the contract more fine-grained coordination clauses, which will reinforce the positive impact of contractual coordination function on partner cooperation:

**Hypothesis 5:** The positive impact of the contractual coordination function on partner cooperation is stronger when alliance partners share a history of trustful collaboration.
Focusing on the distinction between dyadic and multilateral alliances, several scholars (Das & Teng, 2002; Garcia-Canal et al., 2003; Gong et al., 2007) argue that multilateral alliances do not only imply a higher risk of opportunistic behavior, but also entail a higher risk of problematic coordination. After all, the more alliance partners, the more likely substantial differences will be present in terms of organizational culture, structure and strategic vision, which complicate achieving coordinated action. At the same time, it is argued that, in dyadic alliances, partners do not need standardized coordination, but can rather rely on coordination by mutual adjustment (Mintzberg, 1977). In sum, the relevance of the contractual coordination function seems to be higher in multilateral alliances compared to dyadic alliances. We therefore hypothesize: **Hypothesis 6: The positive impact of the contractual coordination function on partner cooperation is stronger in multilateral alliances.**

**Impact of partner cooperation on alliance success**

According to existing alliance research (e.g. Dyer & Singh, 1998; Madhok & Tallman, 1998; Zajac & Olsen, 1993), the extent of partner cooperation has a strong impact on alliance success or the degree to which partners manage to realize or even exceed the initial expectations. In particular, it is argued that the more cooperative behaviors (e.g. open exchange of knowledge between partners, joint sensemaking, joint problem solving) are present and the more non-cooperative behaviors (e.g. shirking, stealing knowledge, hiding information) are absent, the higher the ability of partners to come to synergistic value creation within the alliance. We therefore expect that: **Hypothesis 7: Higher partner cooperation increases alliance success.**

### 7.2 Methodology

**Research design and sample**

To test our hypotheses, we use a sample of Dutch firms that participated in technology alliances. The sample was constructed with the help of Senter Novem, an agency of the Dutch ministry of Economic affairs. The main goal of Senter Novem is to support the development and innovation activities of Dutch firms on both domestic and international markets. Among other things, Senter Novem manages a funding scheme (i.e. WBSO) that allows firms, knowledge institutes, and individuals to receive tax compensation for technological innovation projects. The research sample for this studies consists of firms that (i) made use of this particular funding scheme for technological innovation project, (ii) indicated that they formally collaborated with other partners for this particular innovation project, and (iii) indicated that this particular innovation project was recently finished or was in the final stage of being finished. The initial sample consisted of 648 firms that had filed for tax compensation for a particular technological innovation project in 1999. 391 organizations eventually responded to the survey. Because of missing values on the variables that we
constructed, the size of our sample was further restricted. In total, the sample of this study consists of 270 collaborative innovation projects. Table 1 gives some additional information about the survey response rate.

Table 1. Overview Sampling Procedure

<table>
<thead>
<tr>
<th>Initial Sample</th>
<th>648 firms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to come in contact with project leader</td>
<td>24 firms</td>
</tr>
<tr>
<td>Double address in database</td>
<td>18 firms</td>
</tr>
<tr>
<td>Project leader has quit the company</td>
<td>6 firms</td>
</tr>
<tr>
<td>Not a cooperative project</td>
<td>28 firms</td>
</tr>
<tr>
<td><strong>Total base for response</strong></td>
<td>572 firms</td>
</tr>
<tr>
<td>Unable to locate project leader during data collection phase</td>
<td>115 firms</td>
</tr>
<tr>
<td>Respondent only wants to answer in written form</td>
<td>6 firms</td>
</tr>
<tr>
<td>Respondent does not want to cooperate for various reasons</td>
<td>60 firms</td>
</tr>
<tr>
<td><strong>Total response rate</strong></td>
<td>391 firms (68.5%)</td>
</tr>
<tr>
<td>Missing values on constructs</td>
<td>121 firms</td>
</tr>
<tr>
<td><strong>Final sample</strong></td>
<td>270 firms</td>
</tr>
</tbody>
</table>

An external research organization was made responsible for the data collection phase. This research organization made use of telephone surveys to collect the needed information. The responding firms were active in the areas of: biotechnology, new materials, information technology, maritime technologies, chemicals, and environmental technologies.
7.3 Measures

**Contract roles**

Whereas previous alliance contract research has focused on measuring the complexity of the contract through counting the number of contractual clauses or evaluating the presence/absence of a set of predefined contractual clauses, we wanted to measure to which extent respondents used the contract as a control and/or coordination mechanism. In order to do so, we asked respondents to indicate on a five point Likert scale (i.e. 1 = strongly disagree; 5 = strongly agree) (i) whether the contract functioned as a guarantee against opportunistic behavior of the other partner(s), and (ii) whether the contract functioned as a plan of action in order to streamline the collaboration. The scores on these items were used to measure the importance of the contractual control function and the contractual coordination function.

**Partner cooperation.** In line with Luo (2002) and Gong et al. (2007), we measured partner cooperation through evaluating the absence or presence of specific cooperative situations. In particular, we asked respondents to rate on a 5 point Likert scale (1 = strongly disagree, 5 = strongly agree) the degree to which three cooperative situations and two non-cooperative situations characterized the relationship among partners (see Table 2). Subsequently, we conducted an explorative factor analysis, indicating that all items loaded on one single factor (see Table 2). In line with our expectations, the cooperative situations loaded positively on this factor, whereas the non-cooperative situations loaded negatively on this factor. Next, we relied on the standardized factor score for each case to construct the variable ‘partner cooperation.’

**Alliance success**

Alliance scholars (e.g. Geringer & Hebert, 1991; Arino, 2003) have provided evidence that subjective measures of alliance success highly correlate with objective measures of success. Following previous alliance research (e.g. Geringer & Hebert, 1991; Gong et al., 2007) we adopt a multidimensional approach to measure alliance success. We asked respondents to rate on a 5 point Likert scale (1 = totally disagree, 5 = totally agree) the following three aspects: (i) the project has become a technological success; (ii) the project has lead to lower development costs than if we would have done the project alone or if we would have done the project with another partner; (iii) the result of the collaboration has exceeded my expectations. Subsequently, we conducted an explorative factor analysis, indicating that all items loaded on one single factor (see Table 3). Next, we relied on the standardized factor score for each case to construct the variable ‘alliance success.’
Table 2. Exploratory Factor Analysis on Partner Cooperation

<table>
<thead>
<tr>
<th>Statement</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>We and our partner always talked openly and informally about our ideas, feelings, and wishes</td>
<td>0.522</td>
</tr>
<tr>
<td>We and our partner always gave each other all information that is relevant for the project</td>
<td>0.874</td>
</tr>
<tr>
<td>We and our partner could openly criticize each other when this contributes to the execution of the project</td>
<td>0.601</td>
</tr>
<tr>
<td>Our partner tried to get more advantages from the project than could be justified based on her efforts</td>
<td>-0.684</td>
</tr>
<tr>
<td>Our partner kept important information hidden for us</td>
<td>-0.788</td>
</tr>
</tbody>
</table>

Table 3. Exploratory Factor Analysis on Alliance Success

<table>
<thead>
<tr>
<th>Statement</th>
<th>Factor loadings</th>
</tr>
</thead>
<tbody>
<tr>
<td>the project has become a technological success</td>
<td>0.715</td>
</tr>
<tr>
<td>the project has lead to lower development costs than if we would have done the project alone or if we would have done the project with another partner</td>
<td>0.640</td>
</tr>
<tr>
<td>the result of the collaboration has exceeded my expectations</td>
<td>0.748</td>
</tr>
</tbody>
</table>
History of trustful collaboration

Previous alliance research (e.g. Garcia-Canal et al., 2003; Gulati, 1995; Mellewigt et al., 2008) has relied on the presence of prior collaboration as an indicator of resilient trust. However, these studies ignore that prior collaboration might have been unsuccessful, which might even trigger negative trust dynamics (Faems et al., 2008). In this study, we therefore rely on a more fine-grained measure of prior collaboration. In particular, we asked respondents whether a friendly connection already existed before the project. Based on this question, we constructed a dummy variable, representing the absence (value = 0) or presence (value = 1) of ‘prior trustful collaboration.’ In our sample 176 (65.2%) of the observed alliances had a history of trustful collaboration.

Number of alliance partners

In the survey, respondents had to indicate the amount of partners that were involved in the alliance. Based on this information, we constructed a dummy variable ‘number of alliance partners’, representing the difference between dyadic alliances (value = 0) and multilateral alliances (value = 1). In our sample 96 (35.6%) alliances were of a dyadic nature whereas 174 (64.4%) were of a multilateral nature.

Contract complexity

Although we focus in this study on the different functions of the contract, we also wanted to control for contract complexity. In line with previous alliance contract research (e.g. Parkhe, 1993; Poppo & Zenger, 2002; Reuer & Arino, 2007), we therefore provided respondents with a list of 13 specific contractual clauses and asked them to indicate whether or these contractual clauses were present in the contract. Based on this information, we constructed the variable contract complexity, representing the sum of these 13 items.

Alliance objectives

Firms can rely on collaboration with external partners for both explorative and exploitative innovation projects (Faems et al., 2005; Lavie & Rosenkopf, 2006; Rothaermel & Deeds, 2004). Explorative innovation projects refer to projects in which the focus is on fundamental research in order to generate new technological capabilities. Exploitative innovation projects are defined as projects in which the focus is on applied research in order to leverage existing technological capabilities. In the alliance literature (e.g. Bijlsma-Frankema & Costa, 2003; Koza & Lewin, 1998; Faems et al., 2006) first indications have been provided that explorative and exploitative collaborations are characterized by different interaction patterns and have different success rates. We therefore wanted to control for the objective of the collaboration in our analyses. In the survey, we asked respondents to indicate whether the collaborative innovation project was (i) very fundamental; (ii) rather fundamental; (iii) in the middle between fundamental and applied research; (iv) rather applied;
(v) very applied. Based on this information, we constructed the variable ‘Exploitative orientation.’

7.3 Results

Descriptive statistics and analyses

Table 4 gives an overview of the most important descriptive statistics. This table shows the presence of a significant positive correlation between the contractual control function and the contractual coordination function. This indicates that alliance partners can simultaneously apply the contract as a mechanism to safeguard against opportunistic behavior and, at the same time, rely on it as a tool to facilitate coordinated action.

Table 4. Descriptive statistics and correlations

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S</th>
<th>Partner cooperation</th>
<th>Alliance success</th>
<th>Contractual coordination function</th>
<th>Contractual control function</th>
<th>Exploitation orientation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partner cooperation</td>
<td>0.00</td>
<td>1.00</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alliance success</td>
<td>0.00</td>
<td>1.00</td>
<td>0.217***</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractual coordination function</td>
<td>3.34</td>
<td>1.66</td>
<td>-0.027</td>
<td>0.033</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contractual control function</td>
<td>2.03</td>
<td>1.46</td>
<td>-0.150*</td>
<td>-0.077</td>
<td>0.145*</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Exploitation orientation</td>
<td>3.56</td>
<td>1.23</td>
<td>-0.057</td>
<td>0.075</td>
<td>-0.022</td>
<td>-0.118</td>
<td>1</td>
</tr>
<tr>
<td>Contract complexity</td>
<td>9.17</td>
<td>2.81</td>
<td>-0.034</td>
<td>0.065</td>
<td>0.048</td>
<td>0.213**</td>
<td>-0.290</td>
</tr>
</tbody>
</table>

To test the hypotheses, we used structural equation modeling (SEM) with manifest variables. Compared to ordinary linear regression models, this technique has two advantages (Sels et al., 2006). First, the method enables to define and test hypothesized relationships between variables. The output indicates whether the model is supported by the data as a whole and gives a significance test for the various
individual relationships. Second, a variable in a SEM model can either be dependent or independent. This allows testing the indirect influence, if any, of certain variables. We relied on the Calis procedure in the SAS software package to conduct our SEM analyses. First, we analyzed the relationship between contract functions, partner cooperation and alliance success on the full sample. In this model, we did not take into account the potential moderating impact of history of trustful collaboration and number of alliance partners. Instead, we integrated these latter variables as control variables in addition to contract complexity and exploitative orientation. Subsequently, we did split the full sample based on the variable ‘history of trustful collaboration’ in order to test the moderating impact of it. After splitting the sample we ran one SEM analysis for the cases that lacked a history of trustful collaboration and one analysis for the cases that were characterized by the presence of prior trustful collaboration. A similar procedure was conducted to test the moderating impact of the number of alliance partners. In all models, we programmed the existence of a significant correlation between the contractual control function and the contractual coordination function. The goodness-of-fit overview (see Table 5) indicates that the different analyzed models were adequately supported by the data.

<table>
<thead>
<tr>
<th>Model 1: Full sample (n = 270)</th>
<th>Model 2: No history of trustful collaboration (n = 94)</th>
<th>Model 3: History of trustful collaboration (n = 186)</th>
<th>Model 4: Dyadic alliances (n = 96)</th>
<th>Model 5: Multilateral alliances (n = 184)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bentler’s Comparative Fit index</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Bentler and Bonett’s Non-normed index</td>
<td>1.26</td>
<td>1.00</td>
<td>0.99</td>
<td>1.09</td>
</tr>
<tr>
<td>Bentler and Bonett’s Normed Fit index</td>
<td>0.99</td>
<td>0.98</td>
<td>0.97</td>
<td>0.98</td>
</tr>
<tr>
<td>Chi-Square test (p-value)</td>
<td>0.68</td>
<td>0.37</td>
<td>0.36</td>
<td>0.48</td>
</tr>
</tbody>
</table>

Below we interpret and explain the effects. First, we look at the effect of the contractual control function on partner cooperation. Second, we assess the impact of the contractual coordination function on partner cooperation. Third, we evaluate the indirect effect of these contract functions on alliance success via partner cooperation. Fourth, we discuss the impact of our control variables. For the different models, the standardized path coefficients are listed in Table 6, Table 7, Table 8, Table 9, and Table 10. The results are also represented in Figure 2 and Figure 3. The control variables have been omitted in this graphical representations in order not to overload the figures.
Table 6. Standardized path coefficients Model 1: Full sample

(†p<0.10; *p < 0.05; **p<0.01; ***p<0.001)

<table>
<thead>
<tr>
<th>Path from / to</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Contractual control function</td>
<td>-0.14*</td>
<td></td>
</tr>
<tr>
<td>(2) Contractual coordination function</td>
<td>-0.01</td>
<td></td>
</tr>
<tr>
<td>(3) Partner cooperation</td>
<td></td>
<td>0.22***</td>
</tr>
<tr>
<td>(4) Alliance success</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) Exploitation orientation</td>
<td>-0.08</td>
<td>0.10</td>
</tr>
<tr>
<td>(7) Contract complexity</td>
<td>-0.03</td>
<td>0.10</td>
</tr>
<tr>
<td>(8) History of trustful collaboration</td>
<td>0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>(9) Multilateral collaboration</td>
<td>0.04</td>
<td>0.14*</td>
</tr>
</tbody>
</table>
Table 7. Standardized path coefficients Model 2: No history of trustful collaboration (*p<0.10; *p < 0.05; **p<0.01; ***p<0.001)

<table>
<thead>
<tr>
<th>Path from / to</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Contractual control function</td>
<td>-0.20**</td>
<td></td>
</tr>
<tr>
<td>(2) Contractual coordination function</td>
<td>-0.01</td>
<td></td>
</tr>
<tr>
<td>(3) Partner cooperation</td>
<td></td>
<td>0.20**</td>
</tr>
<tr>
<td>(4) Alliance success</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(6) Exploitation orientation</td>
<td>-0.11</td>
<td>0.01</td>
</tr>
<tr>
<td>(7) Contract complexity</td>
<td>-0.16*</td>
<td>0.07</td>
</tr>
<tr>
<td>(8) History of trustful collaboration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9) Multilateral collaboration</td>
<td>-0.02</td>
<td>0.22**</td>
</tr>
</tbody>
</table>
### Table 8. Standardized path coefficients Model 3: History of trustful

<table>
<thead>
<tr>
<th>Path from / to</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Contractual control function</td>
<td>-0.09</td>
<td></td>
</tr>
<tr>
<td>(2) Contractual coordination function</td>
<td>-0.03</td>
<td></td>
</tr>
<tr>
<td>(3) Partner cooperation</td>
<td></td>
<td>0.23***</td>
</tr>
<tr>
<td>(4) Alliance success</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Control variables**

<table>
<thead>
<tr>
<th>Path from / to</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(6) Exploitation orientation</td>
<td>-0.05</td>
<td>0.16**</td>
</tr>
<tr>
<td>(7) Contract complexity</td>
<td>0.07</td>
<td>0.10</td>
</tr>
<tr>
<td>(8) History of trustful collaboration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9) Multilateral collaboration</td>
<td>0.08</td>
<td>0.10</td>
</tr>
</tbody>
</table>

### Table 9. Standardized path coefficients Model 4: Dyadic alliances

<table>
<thead>
<tr>
<th>Path from / to</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Contractual control function</td>
<td>-0.11</td>
<td></td>
</tr>
<tr>
<td>(2) Contractual coordination function</td>
<td>-0.19**</td>
<td></td>
</tr>
<tr>
<td>(3) Partner cooperation</td>
<td></td>
<td>0.26***</td>
</tr>
<tr>
<td>(4) Alliance success</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Control variables**

<table>
<thead>
<tr>
<th>Path from / to</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(6) Exploitation orientation</td>
<td>-0.03</td>
<td>0.21**</td>
</tr>
<tr>
<td>(7) Contract complexity</td>
<td>0.04</td>
<td>0.06</td>
</tr>
<tr>
<td>(8) History of trustful collaboration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(9) Multilateral collaboration</td>
<td>0.00</td>
<td>0.08</td>
</tr>
</tbody>
</table>
Table 10. Standardized path coefficients Model 5: Multilateral alliances

<table>
<thead>
<tr>
<th>Path from / to</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Contractual control function</td>
<td>-0.17*</td>
<td></td>
</tr>
<tr>
<td>(2) Contractual coordination function</td>
<td>0.09</td>
<td></td>
</tr>
<tr>
<td>(3) Partner cooperation</td>
<td></td>
<td>0.20**</td>
</tr>
<tr>
<td>(4) Alliance success</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Control variables

| (6) Exploitation orientation      | -0.10  | 0.03   |
| (7) Contract complexity           | -0.04  | 0.11   |
| (8) History of trustful collaboration | 0.09   | -0.02  |
| (9) Multilateral collaboration    |        |        |

Figure 2. Result for Full sample (†p<0.10; *p < 0.05; **p<0.01; ***p<0.001)
In our first hypothesis, we expected a positive impact of the importance of the control function of the contract on partner cooperation. Our findings in model 1 (see Table 6 and Figure 2), however, suggest the existence of a significant negative effect of the contractual control function on partner cooperation. This means that, the more the contract was used as a mechanisms to control the behavior of the partners, the less (more) likely (non)-cooperative behaviors were to emerge within the alliance.

In hypothesis 2, we also expected a moderation effect of the presence of prior trustful collaboration. Model 2 and Model 3 (see Table 7, Table 8 and Figure 3) provide strong indications that prior trustful collaboration indeed moderates the relationship between the contractual control function and partner cooperation. In particular, we observe that the significant negative impact of the contractual control function on partner cooperation disappears when a history of prior collaboration is present.
Finally, we also find that the number of alliance partners has a moderating impact on the relationship between contractual control function and partner cooperation. However, whereas we expected in hypothesis 3 that the contractual control function has a more positive impact on partner cooperation in the setting of a multilateral alliance, Model 5 (see Table 10 and Figure 3) points to a significant negative impact of the contractual control function on partner cooperation in this particular setting. At the same time, Model 4 (see Table 9 and Figure 3) indicates that the contractual control function has no impact on partner cooperation in dyadic alliances.

**Impact of contractual coordination function on partner cooperation**
In contrast to our hypothesis 4, we do not find a significant impact of the contractual coordination function on partner cooperation for the full sample (see Table 6 and Figure 2). In addition, we do not find that the relationship between the contractual coordination function and partner cooperation is moderated by the presence or absence of prior trustful collaboration (see Table 7, Table 8 and Figure 3). At the same time, we find strong indications that the number of alliance partners moderates the relationship between contractual coordination function and partner cooperation (see Table 9, Table 10 and Figure 3). Whereas Model 5 indicates that the contractual coordination function has no significant impact on partner cooperation in multilateral alliances, Model 4 points to a significant negative impact of the contractual coordination function on partner cooperation in dyadic alliances.

**Impact of partner cooperation on alliance success**
In line with hypothesis 7, we find in all different models a significant positive impact of partner cooperation on alliance success. This significant effect also implies the existence of some indirect effects between the contractual control/coordination function and alliance success in different models. An overview of these indirect effects can be found in Table 11. This overview of the indirect effects shows that the actual impact of the contractual control/coordination functions on alliance success is close to zero or negative.

**Impact of control variables**
In the different models, we controlled for contract complexity, exploitation orientation, presence of prior trustful collaboration and number of alliance partners. For the full sample, we observe that multilateral alliance have a significant higher alliance success rate than dyadic alliances (see Table 6). If we only consider the alliances in which a history of trustful collaboration is lacking, this positive effect of multilateral alliances on alliance success becomes even more pronounced (see Table 7). At the same time, we do not find a significant effect of the number of alliance partners on alliance success for alliance that are characterized by a history of trustful collaboration (see Table 8).
In the full sample, we do not find an effect of exploitation orientation on alliance success (see Table 6). However, we also observe that exploitation orientation has a positive impact on alliances success for 1) alliances that are characterized by a history of trustful collaboration (see Table 8) and 2) dyadic alliances (Table 9). In other words, we find that the impact of the exploitation orientation on alliance success depends on the presence/absence of prior trustful collaboration and the number of alliance partners.

Previous studies (e.g. Luo, 2002; Poppo & Zenger, 2002) have examined the impact of contract complexity on alliance success. However, our study indicates that, when we also consider the actual functions of the contract, the explanatory value of contract complexity becomes rather low. We only find a significant negative effect of contract complexity of partner cooperation for alliances in which partners lack a history of trustful collaboration. In the other models, no significant impact of contract complexity on partner cooperation or alliance success was observed.

Table 11. Indirect of contractual functions on alliance success

<table>
<thead>
<tr>
<th></th>
<th>Model 1: Full sample (n = 270)</th>
<th>Model 2: No history of trustful collaboration (n = 94)</th>
<th>Model 3: History of trustful collaboration (n = 186)</th>
<th>Model 4: Dyadic alliances (n = 96)</th>
<th>Model 5: Multilateral alliances (n = 184)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractual control function</td>
<td>-0.03</td>
<td>-0.04</td>
<td>-0.02</td>
<td>-0.03</td>
<td>-0.03</td>
</tr>
<tr>
<td>Contractual coordination function</td>
<td>0.00</td>
<td>0.00</td>
<td>-0.01</td>
<td>-0.05</td>
<td>0.02</td>
</tr>
</tbody>
</table>

7.4 Discussion and conclusion

In this section, we first discuss our main findings. Subsequently, we present their main managerial implications. Finally, we point to the main limitations of this study and suggest interesting avenues for future research.

Contractual control function and partner cooperation

Previous research has provided evidence that, in settings were the risk of opportunistic behavior is high (e.g. high asset specificity, high uncertainty), alliance partners are likely to negotiate more complex contracts (Parkhe, 1993) and are likely to pay more attention to control clauses in such contracts (Reuer & Arino, 2007). Based on these findings and in line with transaction cost theory, these scholars pointed to contracts
as an important control mechanism in alliance settings.

In this study, we actually tested the impact of this contractual control function on partner cooperation. In contrast to our expectations, we found that the more important the contractual control function, the less (more) likely (non)-cooperative behaviors are to emerge in alliances. This unexpected result can be explained in different ways. A first explanation might be that when partners pay a lot of attention to negotiating control clauses, they actually signal to each other that they expect the manifestation of opportunistic or non-cooperative behavior. Subsequently, it might be that partners will act in line with these initial expectations, engaging in opportunistic actions. In other words, negotiation of control clauses might function as a self-fulfilling prophecy were the announcement of the risk of opportunistic behavior will indeed become true. A second potential explanation is that, when partners emphasize the control function of the contract, they actually create a foundation of distrust. In such a setting, it might be that alliance partners are more likely to link the emergence setbacks during the alliance to the endogenous behavior of the other partner (i.e. opportunistic action) instead of attributing such negative events to exogenous conditions. Our observation that the negative impact of the contractual control function on alliance contracts disappears when partners share a history of prior trustful collaboration seems to support this latter reasoning.

**Contractual coordination function and partner cooperation**

Adopting insights from organization theory, several scholars (e.g. Mellewigt et al., 2008; Reuer & Arino, 2007) have stressed that contracts can not only used as a formal control mechanisms, but can also be used as a mechanism to facilitate coordinated action. Our analyses, however, suggest that the actual impact of the contractual coordination function on partner cooperation is quite limited. This result might suggest that contractual coordination clauses mainly have an informational purpose (i.e. they inform partners about how they will perform the tasks), but do not really have a facilitating impact (i.e. they do not really stimulate more cooperative behavior).

In addition, we observe a significant negative effect of the contractual coordination function on partner cooperation in the particular setting of dyadic alliances. This latter finding might be explained by the fact that the standardized coordination, which is imposed on the alliance via contractual coordination clauses, might actually obstruct the emergence of coordination by mutual adjustment that is easily established in dyadic alliances.

**Managerial implications**

In the alliance governance literature, numerous scholars have argued that, when managers are able to adjust the complexity of the contract to the transactional and
relational conditions in which the alliance is embedded, the contract can have a positive impact on the success of the alliance. Based on our findings, we rather caution managers for the potential negative impact of contracts on the success of alliances. In particular, we emphasize that negotiating a strong contractual control function is likely to have a negative impact on alliance performance especially when no history of trustful collaboration is present. In addition, we warn for the use of contracts as mechanisms for achieving standardized coordination in the setting of dyadic alliances.

**Limitations and future research**

Although the goodness-of-fit of the tested models turns out to be very satisfactory, there is a lot of potential to improve the explanatory power of the models. For instance, we only could find significant effects of the contractual functions on partner cooperation, whereas all the control variables did not have a significant impact on this variable. These results suggest that there are other transactional and/or relational characteristics that determine the level of (non)-cooperative behaviors during the alliance. A more fine-grained assessment of the determinants of partner cooperation in alliances therefore seems to be necessary.

Our research was situated in a very particular setting. More specifically, we focused on subsidized technological innovation projects in which different firms were involved. This particular setting might limit the generalizability of our findings. Additional survey research on the impact of contractual functions on performance in other interfirm settings therefore seems to be necessary.

A final limitation of our study was that we could only survey one partner of the alliance. However, it might be that different partners have different opinions about the function of the contract, the nature of partner cooperation and the success of the alliance. We therefore encourage future research on alliance governance that incorporates the opinions of all involved partners.

Despite these limitations, this study has triggered first insights in how different contractual functions influence alliance performance. We hope that our findings might help alliance managers in optimizing their contractual governance strategies. In addition, we hope that our insights might motivate other scholars to further examine the governance of interfirm relationship in a wide variety of organizational settings.
CHAPTER 8. CULTURE, CONTRACTS AND TRUST

Summary
Prior work has established the importance of trust and contracts for understanding the performance of strategic alliances. Despite all these efforts, however, the need for formal and informal governance mechanisms is still the subject of ongoing debate due to inconclusive findings. We suggest that the alliance literature has largely overlooked organizational cultural differences and interdependence as important determinants of trust and contracts. We will argue that the impact of cultural differences and interdependence is different for trust and contracts. This difference may help to explain some of the inconclusive findings in the alliance literature and may also help to assess the trade-off between trust and contracts in strategic alliances. Our study is among the first to examine the role of cultural differences and interdependence in high-tech alliance management, using a unique dataset from 391 Dutch alliances. The results provide convincing support for our approach to the study of high-tech alliance management.

Keywords: trust, contracts, interdependence, cultural difference, high-tech alliances

8.1 Introduction
Strategic alliances offer companies opportunities to survive competition in ever-increasingly globalizing markets (Das & Kumar, 2011a; Das & Teng, 2001). Previous research has established that alliance management contributes to the success of interfirm collaboration (Ariño & Reuer, 2004; Lowensberg, 2010). Alliance management is not a product that can be bought on the market, which implies that collaborating firms need to design and implement governance mechanisms themselves (Artz & Brush, 2000; de Jong & Klein Woolthuis, 2009). According to the alliance literature, there are two main governance mechanisms that firms can develop and use, each corresponding to considerable areas of research (Das & Kumar, 2007). One line of research indicates a need for formal governance (i.e., contracts) for the management of interfirm collaboration (de Jong & Klein Woolthuis, 2010). Another line of research highlights the importance of relational governance (i.e., trust) for successful alliances (Brockner, Siegel, Daly, Tyler, & Martin, 1997; Chen, 2000). Despite all these efforts, however, the management of strategic alliances is still subject to ongoing debate as a result of mixed empirical findings, among other reasons, (Contractor, 2005; Das & Kumar, 2011b; Das & Teng, 1998), which thus calls for more studies that investigate antecedents of and relationships between formal and informal governance mechanisms.

To some extent, differences in concepts, measurements, methods, and samples can explain the inconclusive empirical findings (de Jong & Nooteboom, 2000). These explanations notwithstanding, we suggest that alliance governance research suffers
from a missing variable bias. In other words, existing research models lack variables to comprehend how alliance partners apply formal and informal mechanisms for the governance of the interfirm collaboration. Our first contribution to the literature is to propose organizational cultural differences and interdependence as being the key missing variables in alliance governance research. More especially, we argue that cultural differences and interdependence are inherent in any alliance but particularly in high-tech collaboration, which is the focus of this research. We argue that cultural differences and interdependence have a different impact on trust and contracts: this may serve as an explanation for some of the mixed empirical findings. Although cultural differences and interdependence have been acknowledged as important factors in international business (e.g., Beugelsdijk, Koen, & Noorderhaven, 2009) and in strategic collaboration (e.g., Das & Kumar, 2007), whether and how they determine formal and informal governance mechanisms is not, at least not explicitly, addressed in the alliance literature. We aim to fill this research gap.

Our second contribution concerns the empirical study. Notable exceptions notwithstanding, large-scale empirical studies of trust and contracts, in general, and in combination with interdependence and cultural differences, in particular, are few and far between. Among other reasons, this is due to the confidentiality involved in business contracts, which hampers data collection. Our empirical study focuses on business relationships between firms that operate in high-tech industries (biotechnology, new material development, information technology, maritime technologies, and environmental technology). In these industries, strategic alliances are almost a pre-requisite for innovation and successful firm performance. The life cycle of R&D in these industries is usually short. Much of the new technological knowledge quickly becomes outdated, often even before it has been incorporated into new products and/or services. Hence, in high-tech industries in particular, we find many collaborative efforts between firms, including rival firms. Our research setting is also relevant because high-tech alliances are almost inherently characterized by interdependence and organizational cultural differences.

The outline of this chapter is as follows. In the next section, we will explain the theoretical foundations of our study. A discussion of the research methodology and our empirical results will then follow. We will conclude with an appraisal of the results and suggest avenues for future research.

**8.2 Theoretical background**

Alliance governance research has offered valuable insights concerning the role of contracts and trust in strategic alliances (Lyons & Mehta, 1997; Mayer, Davis, & Schoorman, 1995; Nooteboom, 2004). In what follows, we will first review the
definitions of and main findings for contracts and trust, as well as the relationships between these two governance mechanisms. Subsequently, we will discuss insights related to the main characteristics of high-tech alliances, that is, cultural differences and interdependence.

**Contracts and Trust**

Strategic alliances “[…] include voluntarily collaborating firms who engage in exchange, sharing, or co-development, and include contributions by partners of capital, technology, or firm-specific assets” (Gulati & Singh, 1998). In principle, all strategic alliances can be thought of as co-alignments between two or more firms (Lei, Sloum, & Pitts, 1997); the interests are aligned to achieve a common goal. This is not without risks; firms are especially subject to the risk of opportunism. Opportunism refers to incomplete or distorted disclosure of information, and especially to calculated efforts to mislead the partner (Williamson, 1985; Hill, 1990). Transaction cost economics states that the threat of opportunism may be curbed in social exchanges by designing a detailed formal contract between the parties (Gulati, 1995; Poppo & Zenger, 2002). This legal document provides a framework, within which cooperation between partners proceeds by specifying the mutual rights and obligations of the partners, as well as a specification of their input and expected output, the processes involved in their exchange, and dispute-resolution mechanisms (Reuer & Ariño, 2007).

Hence, the design of a contract is important in order to mitigate ex ante and ex post transaction costs (de Jong & Klein Woolthuis, 2008a). Contract research indicates a need to develop an appropriate measurement for the content and the role of contracts in strategic alliances. Alliance research has shown that the level of detail in alliance contracts varies greatly and that contracts may have different roles or functions. Transaction cost economics argues that the level of contractual detail depends on the extent to which the alliance partners face opportunism; more contractual safeguards are needed when the risks of opportunistic behavior are great. Research has shown that contracts are indeed used to safeguard positions, as suggested by transaction cost economics, but also to coordinate activities or to mitigate external contingencies (de Jong & Klein Woolthuis, 2009; Mellewigt, Madhok, & Weibel, 2007).

Economic theory argues that the risk of opportunism stems from the inherent untrustworthiness of exchange partners. That is, the concept of “trust” among alliance partners is in fact a manifestation of their pure self-interest to behave in a trustworthy manner, since the alliance contract serves as an incentive for them to behave in this way (Barney & Hansen, 1994). Alliance research has shown that this perspective in terms of trust is too narrow. According to a more behavioral perspective, transactions are embedded in social relationships (Baker, Gibbons, & Murphy, 2002). Trust represents one partner’s expectation that the other will not exploit their vulnerabilities, even
when presented with the opportunity to do so (Krishnan & Noorderhaven, 2006).

Several scholars have argued that trust is a multidimensional construct with multiple antecedents (Aulakh, Kotabe, & Sahay, 1996; de Jong & Klein Woolthuis, 2008b; Mayer et al., 1995; Nooteboom, 2002). These studies highlight, for example, the importance of open information sharing and flexibility. Because trust develops in the course of the process of collaboration, it is likely to be different at the various stages of interfirm collaboration (Ariño, De la Torre, & Singh, 2001). Nooteboom (1996), for instance, refers to trust in people or organizations as behavioral trust, and differentiates among trust in competences (competence trust), trust in intentions, and honesty or truthfulness. Trust may have different antecedents such as continuity expectations, flexibility, information exchange, and control mechanisms. Although trust primarily exists between individuals, alliance governance research has shown that it can be applied to organizations as well (Aulakh et al., 1996).

It is acknowledged that trust and contracts coexist and interact with each other in the context of strategic alliances (Baker et al., 2002; Contractor, 2005; Lyons & Mehta, 1997), albeit the relationship between the constructs is subject to debate. One line of research suggests that contracts and trust are substitutes for each other in alliance governance (Dyer & Chu, 2003; Gulati, 1995; Gulati & Singh, 1998; Reuer & Ariño, 2007). When trust acts as a means of curbing transaction costs, it reduces the need to write a detailed contract, since a large proportion of future contingencies can be resolved on the basis of trust. In such cases, trust substitutes for detailed contracts. The arguments for complementarity in terms of trust and contracts stem from the key characteristic of contracts, that is, that contracts are inherently incomplete. As it is impossible to foresee all future contingencies and incorporate them into the contract, alliance partners have to rely on trust. Hence, trust becomes important where contracts no longer suffice (Nooteboom, 2004).

The aforementioned studies differ in the sign of the relationship between trust and contracts that is hypothesized. This derives from contradictory assumptions about the causality of the governance mechanisms. It is a question of whether trust determines contracts, or conversely, whether the characteristics of the contract are what shape trust. Klein Woolthuis, Hillebrand, and Nooteboom (2005) show that, although theoretical papers assume that the legal framework predicts the level of trust, empirical findings generally report the opposite. Based on in-depth case studies, Klein Woolthuis et al. (2005) argue that in case trust and contracts are complementary governance tools, the contract is the basis for trust to develop. In a similar vein, Nooteboom (2002) also argues that contracts are one of the sources of reliability in exchanges, with reliability referring to trustworthiness in the broadest sense.
That said, large-scale empirical studies of trust and contracts are few and far between, leaving the question about the relationship between trust and contracts largely unresolved. Our study will serve to complement prior alliance governance research as follows. We aim to reveal how trust and contracts are affected by interdependence and cultural differences. To do this, we designed two models (that is, one for each of the two governance forms), and studied whether or not the relationship between the key characteristics of high-tech alliances and each of the governance forms is different. Although interdependence and cultural differences are identified as important features of international business in general (Beugelsdijk, Koen, & Noorderhaven, 2009; Denison & Mishra, 2005) and have been used to explain alliance performance differentials (Guidice & Cullen, 2007; Sambasivan, Loke, Mohamed, & Leong, 2011), they have not been related to alliance governance in terms of trust or contracts, which is the key focus of research in this study.

**Organizational Culture and Interdependence**

Beugelsdijk et al. (2009) define organizational culture as “the shared values and beliefs that help individuals understand organizational functioning […] and help managers direct the course of the organization more effectively” (2009:313). For two reasons, this definition is helpful for our research. First, since organizational culture is based on a sentiment similar to trust, it is likely to influence the behavior and beliefs of individuals. Second, although it is a sentiment, it can be applied as a managerial tool to develop the organization; in other words, it can be applied as a coordination device, such as the alliance contract. From this perspective, the organizational culture of a focal company is likely to determine the governance mechanisms of the alliance, in which they participate.

Various scholars have argued that organizational culture may determine alliance performance directly (Beugelsdijk et al., 2009; Pothukuchi, Damanpoor, Choi, Chen, & Park, 2002). Yang and Lin (2005), for example, find that the higher the degree of strategic and technical distances between firms, the higher the probability that firms will choose an alliance instead of a merger. In other words, organizational culture is potentially important, because the management styles of the partnering companies are reflected in the management of the alliance. If, for example, cultural distance creates ambiguous expectations about the behavior of the partner firm, trust might be difficult to develop or to maintain. Furthermore, a lack of similarity in the organizational cultures of the partnering firms may induce collaborating firms to request more guarantees to be specified in a contract.

According to the resource-based view, interorganizational relationships enable firms to attain a mutually beneficial outcome that they could not have reached on their own (Lowensberg, 2010; Mellewigt et al., 2007). If organizations depend on the resources
of their exchange partners in achieving their goals, then such strategic alliances entail
dependence on the part of the collaborating firms. Hence, dependence refers to a
firm’s need to maintain an exchange relationship with other firms in order to achieve
its desired goals (Razzaque & Boon, 2008). Interdependence refers to the belief
that the outcome of a relationship depends on the separate as well as joint actions
of the members of the cooperative project. Like trust, interdependence is a multi-
dimensional construct. Sambasivan et al. (2011), for example, differentiate between
the extent to which firms have to rely on their partners to complete their tasks (task
interdependence) or to reach their goals (goal interdependence) in the alliance, and
how their individual success influences the performance of the collaboration (reward
interdependence). One important aspect of mutual dependence is that it entails a
firm’s exposure to changes in its partner’s behavior and actions. Since this exposure
may lead to perceived vulnerability in a cooperative relationship, the level of trust or
contractual detail is likely to be affected by the level of interdependence among the
partner firms.

8.3 Hypotheses
Economic models of transactions stem from the generic idea that organizations
emerge to curb transaction costs (Gulati, 1995). Firms will formally organize their
transactions with other companies in order to monitor the hazards associated with
exchange, such as opportunism. Williamson (1985) focuses on the institutional
arrangements of interfirm exchange or, more specifically, formal contracts. Whereas
Williamson denies the importance of trust in business relationships, other scholars
have argued and shown that trust does have value and that it is useful in strategic
alliances (Nooteboom, 2002). It goes without saying that alliances have risks that
need to be mitigated, for which contracts are applied. At the same time, collaborative
relationships are typically associated with trust between alliance partners. We will
therefore use both perspectives for the development of our hypotheses. Figure 1.1
presents our research model which consists of two parts: one for interorganizational
trust and one for contractual complexity.
Model I. Interorganizational Trust

Model I is concerned with interorganizational trust, defined as the expectation that a partner will not engage in opportunistic behavior, even in the face of opportunities and incentives for opportunism, irrespective of the ability to monitor or control that party (Krishnan & Noorderhaven, 2006). The model examines how cultural differences and interdependence affect interorganizational trust.

Organizational culture has been defined as the norms and beliefs that bind organizations together. These values help managers to communicate goals and strategy throughout the organization (Marcoulides & Heck, 1993). It is argued that when companies engage in collaboration, the outcome of their cooperative project and the satisfaction associated with their partnership depend on the similarities in their organizational culture (Beugelsdijk et al., 2009; Pothukuchi et al., 2002). When alliance partners encounter organizational cultural differences, this may lead to misunderstandings and interaction problems. Gulati and Sytch (2008), for example, argue that organizational similarity makes partners more attractive in the partner selection process. Similarities in organizational practices foster knowledge-driven trust stemming from repeated interaction. Partners with dissimilar organizational cultures need time to develop common managerial practices and may therefore experience lower trust than culturally similar partners (Potchuchi et al., 2002). Organizational differences in culture may...
also be associated with lower commitment (Veiga, Lubatkin, Calori, & Very, 2000). Building trust might be more difficult when organizational cultures are highly dissimilar, since homogenous expectations and shared assumptions about the alliance may not readily exist (Parkhe 1998a, 1998b). These arguments lead to:

Hypothesis 1a: Organizational cultural differences have a negative effect on interorganizational trust.

Alliance research has shown that in the presence of trust, parties can cooperate with each other more fluently, as trust lowers the transaction costs inherent in exchanges (Aulakh et al., 1996; Krishnan & Noorderhaven, 2006). Trust can be understood as the willingness to rely on the behavior of others and the willingness of a party to be vulnerable to the actions of another party, based on the assumption that the other party will perform a particular action important to the trustor (Mayer et al., 1995). This definition of trust implies that a trusting relationship is associated with the acceptance of the vulnerability that stems from the dependence on the partner. In a similar vein, Razzaque and Boon (2008) argue that a trusting relationship makes the dependence inherent in the alliance more acceptable to partners, since they then feel assured that the desired outcome of the partnership will be achieved. Moreover, a symmetric high-dependence relationship engenders valuable resources as well as cooperation between partners. Razzaque and Boon (2008) therefore conclude that when mutual dependence in the partnership is high, satisfaction with the alliance is more likely to be achieved in the presence of trust. Smith and Barkley (1999) argue that greater interdependence between partners leads to greater mutual trust in their working relationship. As partners to an alliance depend highly on their partners to achieve their goals, they experience high exit barriers, which is a strong motivation for them to build a strong relationship. Trust and commitment emerge when the interdependence structure between the partners leads to a convergence of the interests of the participants (Kumar, Scheer, & Steenkamp, 1995). Ariño et al. (2001) also define interdependence as a key element of interorganizational trust and suggest that trust develops in the presence of the vulnerability resulting from the dependence inherent in cooperation. The arguments above indicate that trust emerges as a result of the interdependence inherent in the relationship, because partners have valuable resources to lose should they behave opportunistically; therefore, interdependence fosters trust between the partner firms. These arguments lead to:

Hypothesis 1b: Interdependence has a positive effect on interorganizational trust.

Model II. Contractual Complexity

In Model II, the central point of the analysis is how organizational cultural differences and interdependence influence the extent of contractual complexity in strategic alliances. Contractual complexity, as it has been pointed out, is a function of the increasing risk of opportunistic behavior (Reuer & Ariño, 2007). Relational risk in
alliances can be mitigated by adapting a formal contract in alliances (Mellewigt et al., 2007). Relational risk relates to whether or not cooperation between alliance partners is effective (Das & Teng, 1996).

We argue that organizational cultural differences may lead to conflicts that may create obstacles and a greater need to mitigate risks by means of a detailed contract. Organizational cultural differences might also translate into different assessments of control styles (Pothukuchi et al., 2002). If companies have a different understanding about management monitoring and control, a specific and detailed contract that specifies alliance responsibilities and roles counterbalances inconsistencies in management styles. Marcoulides and Heck (1993), for example, identify organizational culture as a set of sociocultural systems that define an organization. One of these systems refers to the formal organizational structure of a company, which can also be understood as managerial practices including those associated with contracting. Hence, organizational cultural differences will lead to conflicts and a need to bridge different management styles, which are reflected in a more detailed contract in order to mitigate risks, define roles and responsibilities, and reduce contingencies. These arguments lead to:

Hypothesis 2a: Organizational cultural differences have a positive effect on contractual complexity.

Interdependence is inherent in strategic alliances as firms need to rely on their partners to achieve their goals. The extent to which a firm is dependent on its partner and the alliance project may differ. We hypothesize that variations in dependence explain variations in contract complexity. Guidice and Cullen (2007) examine the relationship between interdependence, control, and alliance performance. They find that the use of formal contracts will reduce performance in alliances characterized by high interdependence, whereas the use of informal controls will improve performance. Guidice and Cullen argue that if mutual dependence in a strategic alliance is high, the partners in the cooperative project have much to lose from opportunistic behavior, since they rely heavily on their partner and the alliance projects to achieve their firm-specific and collaborative goals. Hence, mutual dependence acts as a control mechanism against opportunism, since the possibility of losing a valuable and resourceful partnership acts as a self-enforcing sanction (Reuer & Ariño, 2007). In the presence of interdependence, complex contracts also become less attractive, because a detailed contract entails high ex post transaction costs due to high monitoring and/or contract renegotiation costs. High interdependence makes it extremely dangerous for the partners to behave opportunistically (Kumar et al., 1995); it therefore minimizes the risk of a firm’s acting in its self-interest, since any move which adversely affects a partner would adversely affect the alliance as a whole (Sambasivan et al., 2011). These arguments show that interdependence may act as a means to limit
opportunistic behavior and therefore reduce the need to specify complex contracts. These arguments lead to:
Hypothesis 2b: Interdependence has a negative effect on contractual complexity.

Trust and Contracts as Substituting Governance Mechanisms
The alliance literature offers different perspectives on the relationship between trust and contracts, accompanied by mixed empirical findings. The nature of the trust-contract relationship is subject to an ongoing debate with conflicting views about whether there is a substitution or complementary relationship between the two governance forms. We will contribute to this debate as follows. We argue that organizational cultural differences will lead to conflicts that can be solved by developing a complex contract (Hypothesis 2a), but at the same time we also hypothesize that this will decrease interorganizational trust (Hypothesis 1a). Hence, given that organizational cultural differences will decrease interorganizational trust, a detailed formal contract can substitute for trust as a governance mechanism in the case of major cultural differences. A similar line of reasoning applies to the hypotheses concerning interdependence. We hypothesize that interdependence will foster trust (Hypothesis 1b), but at the same time it will also decrease the need to specify a detailed contract (Hypothesis 2b). Thus, given that interdependence reduces the need for a detailed contract, trust can substitute for contracts in the case of high interdependence. Our final hypothesis is based on the assumption that the hypotheses of Models I and II are accepted, leading to:
Hypothesis 3: Contracts and trust act as substitute governance mechanisms.

8.4 Methods
Data Collection and Sample
Our data collection proceeded in two phases (see also de Jong & Klein Woolthuis 2008a, 2008b). In the preparatory phase of the fieldwork, we conducted twenty-five semi-structured interviews with consultants of the Dutch Ministry of Economic Affairs, who were involved in policy programs to stimulate interfirm collaboration in terms of innovation. Additionally, the consultants selected 20 cases (ten successful and ten less successful ones) that we studied in great detail to obtain in-depth knowledge of the high-tech collaboration. Case research is suitable for exploratory research where understanding is the primary objective. The 20 cases dealt with collaborative innovation and hence involved complex transactions, for which close collaboration between partners was necessary over a considerable period of time. The cases involved legally independent partners who shared costs and benefits more or less evenly. All cases entailed uncertainty and/or complexity, and specific assets, and hence risks of dependence, opportunism, and “hold-up.” Under strict confidentiality, we received full access to all documents in the cases – including not only the interfirm contracts
but also project plans, annual reports of the companies involved, personal notes and letters, and half-yearly progress reports – that were available at the Ministry. Among other things, this allowed us to examine the contracts with respect to the exact content of each clause laid down in them. In addition, clippings from newspapers and trade magazines concerning the collaborations were collected. To enable comparison between the cases and to ensure the quality of the case analysis, a case protocol was written in order to describe the alliance’s history, development, and outcome. The interviews with the consultants were transcribed into interview reports and sent back for verification and agreement. Hence, all this allowed us to reconstruct the development of high-tech alliances and to check the data from the interviews with the secondary sources. We used this information to design our survey. The survey was field-tested using a sample of ten companies involved in R&D alliances. This resulted in a number of modifications to the questionnaire.

In the second stage, a research team conducted telephone interviews with 572 business managers of interfirm R&D collaboration. Prior to these interviews, all managers received an explanatory letter inviting them to participate. We briefed the team on the features of R&D, high-tech industries, and interfirm relationships. The team made three attempts to identify and interview the selected respondents. The case firms were identified from a database of Dutch interfirm high-technology alliances published by the Ministry of Economics Affairs. This enabled us to identify the business managers who were responsible for interfacing with the partner firms. They were considered to be the informants most knowledgeable about the interfirm relationships. During the interview, main topics such as the history and purpose of the alliance as well as contracts, investments, and industry dynamics were discussed. One of the first questions required the respondents to identify the business partner in the alliance in question. We used this information to cross-validate the information from the database. Because high-tech alliances are typically concerned with specific projects and goals, we also asked the respondents to identify the one project that was the most important to the interfirm alliance. By focusing on interfirm collaboration within one sector (high-tech industries), we reduced the range of extraneous variations such as the level of uncertainty or competition that might influence the constructs of interest. Some open questions were added to enable the respondents to tell their own story to some extent. In total, 50 main questions (often divided into several sub-questions) were asked. One outcome of this was that the interviews that were designed to take half an hour would sometimes take up to an entire hour, depending on the respondent.

We obtained 391 useable responses, giving an effective response rate of 68.5 percent. This rate is considerably higher than those observed in prior studies on interfirm relationships, which were usually in the 10 to 33 percent range (Dyer & Chu, 2003;
Gulati & Sytch, 2008; Poppo & Zenger, 2007). It was also satisfactory considering that this study required direct senior management involvement and the confidentiality of some of the information requested.

The non-response is low (31.5 percent) especially considering that only 10.5 percent actually refused to be interviewed. Out of the respondents, 20.1 percent could not be contacted within the 3 attempts that the interviewers made to try to get in touch with them. To investigate whether the non-response incurs a bias, the non-cooperating respondents (10.5 percent) were asked for their reasons for not participating. The reasons for refusal were, on the one hand, a lack of time and interest, and, on the other hand, irritation because they had recently taken part in another survey. Although these reasons can hide their true motive for not participating in the survey (such as an unsuccessful cooperative project), the low non-response and the reasons for not participating do not raise serious doubts as to the implications of the non-response. Studies of this type, where one asks the same respondent about both dependent and explanatory variables, are in principle vulnerable to common method bias, in particular common source bias (Podsakoff & Organ, 1986). In terms of the aim of this study, reliance on key informants such as our respondents seems to be the only realistic and feasible way to obtain the required information (Huber & Power, 1985). We implemented the following steps to address possible validity concerns. First, we used a complex model specification with two separate models (estimated with different techniques), one that is recognized as among the most important solutions to prevent common source bias. Second, available data were able to be tested for convergence by triangulation using secondary data. We compared the outcomes of the self-reported data in the questionnaire with the archival data on the 20 cooperative projects that we studied in the first phase of the data collection. The congruence of the data from the questionnaires and case studies supported the accuracy of the reported data. Third, we asked questions concerning objective events rather than subjective expectations or opinions. Fourth, via the sequence of our questions we aimed to minimize the effects of consistency artifacts. Some suggest letting the independent variable follow, rather than precede, the independent variables. Podsakoff and Organ (1986), however, argue that correlations will be similar using either method. In our opinion, a life-cycle approach would best serve an accurate reflection of the interfirm collaboration. Hence, for the purpose of this study, we structured the questions in the survey from past interactions through partner selection, contract negotiations, contract execution, and outcomes of the interfirm collaboration. Fifth, we conducted Harman’s single factor test and this gave no indication of common method bias. Exploratory factor analysis yielded 12 factors with eigenvalues greater than 1. The principal component factor resulted in 16 factors passing the Kaiser criterion of eigenvalues greater than 1. In sum, it is unlikely in our case that the findings can be attributed to common source bias.
**Measurements**
Table 1.1 provides an overview of the items that we used to measure the constructs of our theoretical model.

### Table 1. Concepts and Measurements

<table>
<thead>
<tr>
<th>Constructs, items, and scales</th>
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<tr>
<td><strong>Interorganizational trust</strong> (alpha = 0.73)</td>
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<tr>
<td>1. During the project, our partners treated our problems constructively and with care.</td>
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<tr>
<td>2. I never had the feeling of being misled.</td>
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<tr>
<td>3. We talked openly and informally with our partner about our ideas, feelings, and interest.</td>
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<tr>
<td>4. We provided each other with all the information that was relevant to the project.</td>
</tr>
<tr>
<td>5. Criticism could be openly aired if this contributed to the completion of the project.</td>
</tr>
<tr>
<td>(1 = strongly disagree, 5 = strongly agree)</td>
</tr>
</tbody>
</table>

**Contractual complexity** (alpha = 0.83)
Please indicate whether one or more of the following agreements are present in the contract with you partner:
| 1. Relationship goal and outcome |
| 2. Relationship duration |
| 3. Project plan of the relationship |
| 4. Investments by all alliance parties (human, material, and financial resources, and knowledge) |
| 5. Risk allocation (internally as well as externally in terms of possible customers) |
| 6. Project management: Which partner has project leadership, when and how do parties inform each other, how do they communicate, and how is the project monitored |
| 7. Pledge of secrecy: protection of know-how and sanctions in case of monopolizing knowledge and/or breech of agreement |
| 8. Ownership of the final product or technology |
| 9. Ownership of the final method |
| 10. License agreement concerning the exploitation of all alliance results |
| 11. Patent rights of all alliance results |
| 12. Relationship adjustments and/or termination arrangements under unforeseen circumstances such as disappointing market potential |
| 13. Arrangement as to how parties will deal with any future conflicting interests |

**Interdependence** (r = 0.26, p < .05)
1. We gave our partner access to new customers and markets, which was very
important to us.
2. Our partner gave us access to new customers and markets, which was very important to them.
(1 = strongly disagree, 5 = strongly agree)

Organizational cultural differences (r = 0.57, p < .01)
1. Cultural differences between us and our partner have resulted in problems.
2. Due to inefficient ways of communicating, problems often occurred with our partner.
(1 = strongly disagree, 5 = strongly agree)

Firm size (r = 0.76, p < .01)
1. What is the number of employees in your firm? (1=0-10; 3=100-250; 5=>1000)
2. What was your turnover in 1997? (1:<500.000; 3 = 1-10M; 5:>50M)

Reputation (r = 0.37, p < .05)
1. Our partner had a very good name and reputation in our industry.
2. The reputation of our partner played an important role in our choice of partner.
(1 = strongly disagree, 5 = strongly agree)

Previous relationship history (r = 0.57, p < .01)
1. Our current relationship is a continuation of a previous, long-term relationship.
2. Before this project, a friendly relationship with the partner was established.
(1 = strongly disagree, 5 = strongly agree)

Transaction specific investments (r = 0.67, p < .01)
1. Our company had machinery and tools custom-made for working with our partner.
2. Our company can also use these machines for projects with other partners.
(1 = strongly disagree, 5 = strongly agree)

Note: The original questions are presented in the table. Prior to the empirical analysis, the scales for particular items were reversed to maintain construct consistency.

The research model includes two dependent variables: interorganizational trust and contract complexity. We used five items to measure interorganizational trust. Our definition characterizes interorganizational trust as a multi-component construct based on three related components: forbearance from opportunism (measured by two items), care and concern (measured by two items), and lack of monitoring (measured by one item). The choice and specification of these items was based on earlier studies (de Jong & Klein Woolthuis 2008a, 2008b). Following Reuer and Ariño (2007), we measured contractual complexity by 13 contract clauses that indicated the level of detail in the legal framework of the alliance. The complexity of the contract was indicated by the number of clauses in the contract. The research model included two main variables:
organizational cultural differences and interdependence. The former was measured by two items that assessed whether the respondent experienced any conflict resulting from potential differences in the organizational culture of the partnering companies. The latter was also measured by two items: one item assessed the dependence of the respondent firm and the second item the dependence of the partner. We included four control variables in our models. First, we include focal firm size as a variable to control for extraneous factors such as bargaining power and resource base (Yiang, Gao, & Li, 2008). Firm size was measured by two items: the number of employees and the turnover of the focal firm. Second, we included previous alliance history. This may influence the alliance governance, since past relationships can serve as basis for mutual understanding and, for instance, trust. Third, we included transaction-specific investments, because non-recoverable investments increase relational risk and therefore the need to specify detailed contracts. Fourth, we included the reputation of the partner firm in our research model as reputation may substitute for governance mechanisms that act to verify the intentions and monitor the actions of business partners (Arend, 2009). Partner reputation was measured by two items. All of our multi-item constructs met the regular criteria for construct validity in terms of factor loadings (factor loadings large than .60), Cronbach’s alpha (larger than 0.60 for three or more item constructs), or inter-item correlation coefficients (positive and significant for two-item constructs).

**Estimation Methods**

Our research model consists of two models. In Model I we regress interorganizational trust on the main effects and the control variables. In Model II we do the same for contract complexity. We expected to find opposite effects for the main effects on interorganizational trust and contract complexity in Models I and II that, taken together, would offer evidence for the substituting effects of trust and contracts. We used an ordinary least square regression to estimate Model I. The measure for contract complexity ranges from 0 to 13, and therefore we used ordered logistic regression to estimate Model II (Reuer & Ariño, 2007). We estimated Models I and II separately, leaving refinements in estimation techniques, model specifications, and alternative measurements for robustness analyses. Occasionally, the data included missing values that were deleted prior to entering the variables into the regression.

**8.5 Empirical results**

The means, standard deviations, and correlations among composite indicators are shown in Table 1.2. The hierarchical OLS and ordered logistic regression results are provided in Table 1.3. The baseline specifications (Models 1a and 1b) present the control variables. Models 2a and 2b report the effects of the main variables on interorganizational trust and contract complexity, respectively. In preparation for the
regression analysis, we performed the regular tests to obtain reliable estimates. The latter tests gave satisfactory results: neither heteroscedasticity nor non-normality was an issue. We tested for possible bias caused by collinearity among variables by calculating the variance inflation factor (VIF) for each of the regression coefficients. The VIF values were well below the cut-off value of 10 recommended by Neter, Wasserman, and Kutner (1985).

Table 2. Correlations, Means, and Standard Deviations (n = 391)

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<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>1</th>
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<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
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<tbody>
<tr>
<td>1. Interorganizational trust</td>
<td>22.366</td>
<td>3.673</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Contract complexity</td>
<td>8.808</td>
<td>3.224</td>
<td>-0.001</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Interdependence</td>
<td>7.594</td>
<td>2.019</td>
<td>0.099</td>
<td>0.256</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Cultural differences</td>
<td>3.092</td>
<td>1.989</td>
<td>-0.521</td>
<td>0.039</td>
<td>0.037</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Firm size</td>
<td>6.711</td>
<td>2.293</td>
<td>0.051</td>
<td>0.050</td>
<td>-0.119</td>
<td>0.042</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Alliance history</td>
<td>7.194</td>
<td>3.230</td>
<td>0.161</td>
<td>-0.103</td>
<td>0.032</td>
<td>-0.113</td>
<td>-0.026</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Partner reputation</td>
<td>7.092</td>
<td>3.893</td>
<td>0.120</td>
<td>0.120</td>
<td>0.088</td>
<td>-0.165</td>
<td>0.005</td>
<td>0.178</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>8. Transaction-specific investments</td>
<td>4.703</td>
<td>3.044</td>
<td>-0.037</td>
<td>-0.010</td>
<td>0.171</td>
<td>0.042</td>
<td>0.030</td>
<td>0.023</td>
<td>0.038</td>
<td>1.000</td>
</tr>
</tbody>
</table>

* Correlations larger than .10 are significant at 5%, and larger than .15 significant at 1%

The various fit parameters show that our models increasingly fitted the data better. We restricted the discussion of the findings to the model that included main effects and control variables. Model 1b shows that organizational cultural differences indeed reduced trust as hypothesized ($\beta = -0.453; p < 0.01$). Hypothesis 1a was accepted. Model 1b also showed that interdependence increased trust but the parameter estimate was not significant ($\beta = 0.072; \text{n.s.}$). Hypothesis 1b was therefore rejected. Model 2b reports that organizational cultural differences lead to a more detailed contract. This confirmed our expectations but the estimate was not significant ($\beta = 0.036, \text{n.s.}$). Hypothesis 2a was therefore rejected. Model 2b shows that interdependence has a positive and significant effect on contract complexity ($\beta = 0.483; p < 0.01$). This is the opposite of what we hypothesized and to some extent aligns with Gulati and Singh (1998), who conclude that greater interdependence between alliance partners will induce collaborating firms to adapt to more hierarchical governance structures.
result, however, might also be related to the measurement of contractual complexity. We therefore performed an additional analysis.

Table 3. The Roles of Trust and Contracts in High-Tech Alliances

<table>
<thead>
<tr>
<th></th>
<th>Trust (Model 1a)</th>
<th>Contracts (Model 2a)</th>
<th>Trust (Model 1b)</th>
<th>Contracts (Model 2b)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Main effects</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural differences</td>
<td>-0.453***</td>
<td>0.036</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.078)</td>
<td>(0.126)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interdependence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>0.072</td>
<td>0.483***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.049)</td>
<td>(0.142)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Control variables:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td>0.067</td>
<td>0.157</td>
<td>0.036</td>
<td>0.157</td>
</tr>
<tr>
<td></td>
<td>(0.062)</td>
<td>(0.134)</td>
<td>(0.060)</td>
<td>(0.140)</td>
</tr>
<tr>
<td>Previous history</td>
<td>0.102</td>
<td>-0.268*</td>
<td>0.054</td>
<td>-0.289*</td>
</tr>
<tr>
<td></td>
<td>(0.064)</td>
<td>(0.144)</td>
<td>(0.058)</td>
<td>(0.149)</td>
</tr>
<tr>
<td>Reputation</td>
<td>0.152***</td>
<td>0.320**</td>
<td>0.088*</td>
<td>0.321**</td>
</tr>
<tr>
<td></td>
<td>(0.057)</td>
<td>(0.129)</td>
<td>(0.049)</td>
<td>(0.135)</td>
</tr>
<tr>
<td>Transaction-specific investments</td>
<td>-0.008</td>
<td>-0.023</td>
<td>0.009</td>
<td>-0.129</td>
</tr>
<tr>
<td></td>
<td>(0.053)</td>
<td>(0.132)</td>
<td>(0.050)</td>
<td>(0.139)</td>
</tr>
<tr>
<td><strong>Constant</strong></td>
<td>0.013</td>
<td>0.029</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.057)</td>
<td>(0.052)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Model fit</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.046</td>
<td>0.012</td>
<td>0.250</td>
<td>0.028</td>
</tr>
</tbody>
</table>

*** p < 0.01, ** p < 0.05 and * p < 0.10

A principal component factor analysis of the 13 contract clauses resulted in three different factors that are associated with three different contract functions. The first factor is interpreted as the traditional safeguarding function of a contract. Clauses loading high on this factor aim at safeguarding ownership and property rights, and limit the incentives towards opportunistic behavior by implementing clauses of technology ownership, methods, license agreements, patent rights, and confidentiality. The second factor corresponds to the coordination and commitment function of contracts, relating to clauses that concern relationship management – the
goal and outcome of the relationship – and hence reflecting a contract which focuses on the process of cooperation in the alliance. The third factor reflects a framework for unforeseen contingencies in the collaborative process. Contracts drawing primarily on these clauses function as safeguards against external contingencies by focusing on relationship adjustment, termination, and risk allocation. The results of the regression analysis for each of the three contract functions are presented in Table 1.4.

Table 4. Contract Functions, Interdependence, and Cultural Differences in High-Tech Alliances

<table>
<thead>
<tr>
<th></th>
<th>Function 1 Safeguarding risks and spillover contract</th>
<th>Function 2 Coordination and commitment contract</th>
<th>Function 3 Safeguarding external contingencies contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main effects</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cultural differences</td>
<td>-0.024</td>
<td>-0.024</td>
<td>-0.014</td>
</tr>
<tr>
<td></td>
<td>(0.057)</td>
<td>(0.062)</td>
<td>(0.0660)</td>
</tr>
<tr>
<td>Interdependence</td>
<td>-0.170**</td>
<td>-0.072</td>
<td>-0.290***</td>
</tr>
<tr>
<td></td>
<td>(0.071)</td>
<td>(0.060)</td>
<td>(0.062)</td>
</tr>
<tr>
<td>Control variables:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm size</td>
<td>-0.066</td>
<td>-0.132**</td>
<td>-0.057</td>
</tr>
<tr>
<td></td>
<td>(0.068)</td>
<td>(0.057)</td>
<td>(0.062)</td>
</tr>
<tr>
<td>Previous history</td>
<td>0.080</td>
<td>0.074</td>
<td>0.104</td>
</tr>
<tr>
<td></td>
<td>(0.077)</td>
<td>(0.056)</td>
<td>(0.066)</td>
</tr>
<tr>
<td>Reputation</td>
<td>-0.068</td>
<td>-0.148**</td>
<td>-0.163**</td>
</tr>
<tr>
<td></td>
<td>(0.074)</td>
<td>(0.069)</td>
<td>(0.063)</td>
</tr>
<tr>
<td>Transaction-specific investments</td>
<td>0.008</td>
<td>0.103</td>
<td>-0.002</td>
</tr>
<tr>
<td></td>
<td>(0.074)</td>
<td>(0.064)</td>
<td>(0.062)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.022</td>
<td>-0.008</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>(0.071)</td>
<td>(0.062)</td>
<td>(0.063)</td>
</tr>
<tr>
<td>Model fit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.042</td>
<td>0.051</td>
<td>0.129</td>
</tr>
</tbody>
</table>

*** p < 0.01, ** p < 0.05 and * p < 0.10

Table 1.4 largely confirms our Hypothesis 2b. Partners who are interdependent do not use a contract to safeguard risk. The effect of interdependence on this contract function is negative and significant ($\beta = -0.170$, $p < 0.05$). Interdependent partners also have less inclination to use contracts to safeguard from external contingencies.
Here also the effect of interdependence on this contract function is negative and significant ($\beta = -0.299$, $p < 0.01$). Table 1.4 also reports a negative relationship between interdependence and the coordination and commitment function of a contract, albeit this effect is not significant ($\beta = -0.072$, n.s.). Taking all results of Table 1.4 into account, we find convincing evidence that interdependence reduces a need to write complex contracts, provided that particular contract functions are accounted for. Table 1.4 confirms the non-significant relationship between organizational cultural differences and each of the contract functions reported for contractual complexity in Table 1.3. We therefore conclude that organizational cultural differences are not related to formal contracting mechanisms in Dutch high-tech alliances.

An interpretation of the results in Tables 1.3 and 1.4 offers support for our third hypothesis. We find that organizational cultural differences have opposite effects on the two governance mechanisms. Hence, the conclusion is that organizational cultural differences do have a different impact on trust and contracts as hypothesized – and, in so doing, support a substituting perspective. A similar conclusion holds for interdependence. Here we also find mutually excluding effects: Interdependence decreases the need for particular contract functions dedicated to safeguarding and it has a positive albeit not significant relationship with interorganizational trust. Finally, it is worthwhile to mention that our results hold while controlling for a large number of alternative determinants of trust or contract complexity in high-tech collaboration.

Robustness Analysis
We conducted further analyses to assess the robustness of our results. First, we substituted for missing values by using the mean value of a particular variable. This did not affect the results. Second, we used an alternative measurement for interdependence, measuring the distance between focal and partner dependence, which in our case had values of between -4 and +4. The value of 0 indicates that there is no difference between the alliance partners. This did not affect the results. Third, we included interaction terms between our main and dependent variables in order to more directly test the relationship between trust and contracts. For this, we extended the trust model by using contract complexity, as well as the interaction effects between contract complexity and cultural differences, and those between contract complexity and interdependence. In a similar vein, we extended the contract model using trust and the interaction effects between trust and the main effects variables. The results for these extended models show that none of the interaction terms were significant, thus adding to the confidence in our initial model specifications. Fourth, we used alternative estimation techniques that allowed us to estimate the trust and the contract models simultaneously. Seemingly unrelated regressions estimate equations simultaneously and account for correlation in the error terms of both model specifications. Structural equation modeling also estimates both models simultaneously. The results for the
main effects are the same as reported in Table 1.3, by and large. Hence, in these supplementary analyses, the results were largely consistent with the initial results, adding to confidence in our findings vis-à-vis the role of contracts and trust in high-tech alliances.

8.6 Conclusions
The purpose of this chapter has been two-fold. The first aim was to verify the importance of interdependence and organizational cultural differences in explaining the governance of strategic alliances. A review of the alliance literature suggests that the role of the alliance characteristics in the management of interfirm collaboration has received relatively little attention. They are acknowledged in alliance performance studies but seem to be largely ignored as explanatory variables for formal and informal mechanisms. Our theoretical considerations offer a first step in the explanation of whether and, if so, how interdependence and interorganizational cultural differences matter for the use of trust and contracts in high-tech alliances. We used our survey-based dataset of Dutch high-tech alliances to test our proposition. The empirical results offered convincing support for the hypothesized relationships. Among other things, we show that organizational cultural differences are detrimental for trust and hence hamper interfirm collaboration, given that trust generally is perceived to be beneficial for overall alliance performance.

The empirical findings also offer ample opportunities for the second aim of our research, that is, to offer an alternative perspective concerning the potential trade-off between formal and informal governance mechanisms. Prior alliance management studies report inconclusive findings with respect to the substitution of trust and contracts. We find mutually exclusive relationships with cultural differences as reducing trust (while not significantly impacting on contract complexity) and, simultaneously, interdependence as reducing the need for particular contract functions (while not significantly impacting on trust). It is worthwhile mentioning that these key findings hold for various tests of robustness. In our research setting we find evidence for the substitution between formal and informal governance forms.

Our research is not without limitations, which thus offers opportunities for future research. A first limitation concerns the static nature of our model. Some of the concepts used in the causal specifications are dynamic. In particular, the levels of trust and interdependence may change over time (whereas other elements such as organizational cultural differences and contract complexity are likely more stable alliance phenomena). This dynamic is not explicitly accounted for in our models. Future research may develop more dynamic perspectives on these alliance characteristics (by also accounting for the stage in the overall alliance lifecycle) and may determine how
this can alter alliance governance mechanisms over time. Other research methods such as simulation techniques may offer complementary dynamic perspectives to the more static analyses presented here. A second limitation concerns the use of cross-sectional single-country data. It goes without saying that comprehensive datasets incorporating many different alliance characteristics are rare, the more so when alliance contract information is included. Companies are oftentimes reluctant to share detailed information on partner agreements. We show that such information can be collected in large-scale settings, thus enabling the analysis of simultaneous formal and informal governance mechanisms. That said, new information from other industries and other countries would make it possible to test the general validity of our cross-sectional and Dutch-based high-tech results. New data collection might well be especially directed towards Asian countries such as China, for which strategic alliances such as joint ventures are often a pre-requisite in order to successfully enter the Chinese market. It may also include documentation from companies that ally with firms in transition economies or those Central and Eastern European states where international collaboration is a result of government policies directed towards an increase in foreign direct investment and privatization in general.
CHAPTER 9. ADDED VALUE OF THIRD PARTIES

Summary
The role of third parties in effective alliance management, especially with regards to innovation, has been identified recently but is still underexplored in the alliance literature. Whereas existing alliance governance literature mainly focuses on the role of third parties in stimulating trust building, this chapter develops a comprehensive framework, illuminating how third parties can influence the initiation and application of structural and relational governance mechanisms. In so doing, it provides a basis for further research on the role of third parties roles in alliance governance and the effects thereof on relationship quality and outcome.

Key words: third party roles, strategic alliances, structural governance, relational governance

9.1 Introduction
Strategic alliances are increasingly common (Becerra, Lunnan, & Huemer, 2008) and considered essential for innovation and business success (de Man & Duysters, 2005), but they do have high failure rates (Bleeke & Ernst, 1991; Das & Teng, 2001). Although alliance management has been studied extensively (Nooteboom, 1999c, 2002), studies on the role of third parties in governing alliances are virtually non-existent. Although several studies point to the importance of third-party interventions for trust repair (Mesquita, 2007; Tomlinson & Mayer, 2009), innovation (Obstfeld, 2005) and enforcing cooperative behavior (Charness, Cobo-Reyes, & Jimenez, 2008; Fehr & Fischbacher, 2004; Stephens, Fulk, & Monge, 2009) in alliances, third party perspectives are still an under-theorized and poorly-understood phenomenon.

In this chapter we therefore develop a comprehensive framework of third party roles in strategic alliance management. In particular, we present a comprehensive framework illuminating how third-party interventions might influence both the initiation and application of structural and relational governance mechanisms. The framework is built upon recent studies that have shed first light on certain aspects of third parties, but have not yet provided an integrated overview of all potential roles of third parties in relationship governance. The reminder of this chapter is structured as follows. First, we define the concept of third parties. Subsequently, we discuss our framework on the role of third parties in alliance governance. In the concluding section of this chapter, we discuss the implications of our framework for future alliance governance research.

9.2 Third parties and alliance governance
Alliances are governed by a particular combination of structural and relational governance mechanisms. Structural governance involves the use of contracts,
monitoring and contract enforcement to control and coordinate the relationship. Relational governance consists of using trust, norms of fair dealing (social obligation), values and loyalty to govern the relationship. Below, we discuss the role of third parties regarding these different governance mechanisms. In particular, we show how third-party interventions might influence both the initiation and application of structural and relational governance mechanisms (see Table 1 below for an overview).

Before doing so, it is worthwhile to make four comments about the peculiarities of third parties. First, we focus on the role of third parties that do not belong to the organizations of the collaborating actors and that do not have a relationship with these actors in the sense of a friendship or other connection that could corrupt their impartiality. These third parties can be specialist consultants, lawyers, researchers, etc. Second, the third party should not have a permanent relationship with the other actors, for example, as an employee of the same organization or a family member. Third, the third party should not be servicing the interests of one actor more than those of the other: he or she should be chosen and paid by all the parties involved and not benefit from the gains of one of the parties. The latter two conditions warrant the independence of the third party and distinguish the role of the third party from other roles such as a team leader. Finally, a third party should be trusted in his or her competences and intentions, and that he or she should be known to be impartial and incorruptible to be suitable as an effective third. He or she should have an interest in acting scrupulously, with a view to his or her reputation as a third party. Note also that a third party does not have to play all roles, quite to the contrary. There is a range of actors who can play these roles, and the desired intervention should be leading in the choice for a certain third. For legal issues, lawyers are for instance logical candidates, whereas consultants or project managers will more likely solve organizational issues. The roles of third parties in alliance governance
Table 1. The roles of third parties in alliance governance

<table>
<thead>
<tr>
<th>Initiating governance mechanisms</th>
<th>Structural governance</th>
<th>Relational governance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Provide coordination (Obstfeld, 2005)</td>
<td>Facilitate and speed up the implementation of an appropriate legal form/contracts</td>
<td>Help with establishing shared social norm (Möllering, 2001, 2006; Fehr &amp; Fischbacher, 2004)</td>
</tr>
<tr>
<td>2. Provide impartial, objective information for effective monitoring and control</td>
<td>Provide trilateral governance if transaction is not worth drawing an extensive contract for (Williamson, 1985)</td>
<td>2. Trust transfer to parties that lack history of prior relationship (Ferrin, Dirks, &amp; Shah, 2006, )</td>
</tr>
<tr>
<td>4. Informal arbitration: judging contract deviation and punish the abuse of power (Fehr &amp; Fischbacher, 2004), thereby reducing behavior that deviates from the social norm/contract (Charness, Cobo-Reyes, &amp; Jimenez, 2008) and preventing the case going to court</td>
<td>Bridge cultural distance (Nooteboom 1999a,b; Bijlsera-Frankema, Sitkin, &amp; Weibel, 2008)</td>
<td></td>
</tr>
<tr>
<td>Applying governance mechanisms</td>
<td>5. Prevent reputation damage by solving problems according to the 'spirit of the contract' or industry norms (Klein-Woolthuis, Hillebrand, &amp; Nooteboom, 2005)</td>
<td>2. Solve the idea problem (myopia and group-think) (Li, 1997; Obstfeld, 2005) by means of a gatekeeper (Katz &amp; Tushman, 1981)</td>
</tr>
<tr>
<td>6. Help the parties to 'get through' the legal system in situation where a dispute is taken to court</td>
<td>4. Trust repair (Tomlinson &amp; Mayer 2009): obtain objective and accurate information, thereby judging and ascribing the causes of deviance (attribution)</td>
<td></td>
</tr>
</tbody>
</table>
9.3 The impact of third parties on structural governance

Structural governance entails the governance of relationships through the use of contracts, formal control and monitoring mechanisms (Poppo & Zenger, 2002; Reuer, Arino, & Mellewigt, 2006). In a context of innovation, legal ordering can be expected to be problematic (Williamson, 1975, 1985). Contracts will be hard to specify ex ante because of uncertain development trajectories, and this may lead to undesirable rigidity in project execution (Noo teboom, 1999b). There is also a more technical obstacle to the full enforcement of contracts (Rosenkopf & Tushman, 1994; Rowley, Behrens, & Krackhardt, 2000). The agreements that characterize ‘relational contracting’ will often include elements that are not legally enforceable. These might be agreements in the form of poorly specified intentions and/or promises. Deakin and Wilkinson (2000: 150) note that ‘such arrangements may easily be misinterpreted by the courts, which do not have access to the specialized knowledge or assumptions shared by the parties’. Such an incomplete contract goes beyond what is verifiable, for example with agreements on a quality level that cannot be verified (Chen, 2000). Moreover, monitoring can be difficult if contracts are incomplete, when monitoring requires specialist knowledge in the partner’s technological field or when it requires close interaction.

Too much attention to legal structural governance might have a negative effect on trust, can be time-consuming and can distract from value creation (Klein-Woolthuis, Hillebrand, & Nooteboom, 2005). For this reason trust is often considered a substitute for contracts as trust reduces the need for formal control (Gulati, 1995; Zaheer, McEvily, & Perrone, 1998). Fehr and Fischbacher (2004:185) furthermore emphasize that legal enforcement mechanisms cannot function without a broad consensus about the normative legitimacy of the rules, that is, the social norms.

Phase 1: Initiating structural governance mechanisms

1. Help with establishing the appropriate legal form/contracts

The third party might help partners to construct the right legal governance, that is, helping parties to find the appropriate form of cooperation and draw up a sufficiently but not overly detailed contract to govern and safeguard the relationship successfully. Especially in the case of smaller firms, companies will often not have the staff and experience to design a suitable contract (Noo teboom, 2004). Specialist consultants or public agents, for example, can play an important role by guiding contract negotiations as an impartial, independent chair and by providing the specialist knowledge on how the contract should be designed. Such a guiding role of an independent third party can not only increase the quality of the contractual design but might also reduce the time needed for drawing up the contract.
2. **Provide trilateral governance**
A third party can provide trilateral governance (Williamson, 1985) when transactions are small or infrequent and it is not worth the cost and effort of setting up an extensive scheme for governance. In this case, it is more efficient to engage a third party to serve as an arbitrator or mediator to complement a simple, limited contract (Noooteboom, 2004).

**Phase 2: Applying structural governance mechanisms**
1. **Provide co-ordination**
Simmel (1950) already wrote that the tertius could have two roles: mediating between parties with conflicting interests, and becoming involved in a relationship where parties share the same goals. It is in this latter case that third parties merely serve the function of aiding coordination (Obstfeld, 2005), for instance, by helping previously unacquainted parties to get to know each other. Third parties suitable for such roles are likely to be project managers or consultants. Parties in the collaboration could decide to resort to this function rather than drawing up an extensive contract. A precondition for such a choice, however, is that interests are well aligned and there is a basis for trust.

2. **Provide impartial, objective information for effective monitoring and control**
As discussed previously, it may be hard to draw up or enforce contracts. Third parties may play a role in informally monitoring and enforcing agreements. This might circumvent the ultimate appeal to court that might permanently harm the relationship and endanger the firm’s reputation and future potential relations (Noooteboom, 1999a, 1999b). Burt (1992) already underlines the role of the tertius in complementing a contract and argues ‘that control is uncertain, that no one can act as if they have absolute authority [...] There is no long-term contract that keeps a relationship strong, no legal binding that can secure the trust necessary to a productive relationship’ (1992: 78). Therefore, a third party may help monitor the execution of the contract and monitor spillover risks. If parties perform these roles themselves, this may lead to defensive behavior or a breakdown of trust, and it may eventually put both the project and relationship at risk. A third party may fulfill the monitoring role as an independent mediator without causing the negative effects described. Moreover, since the third party has no direct commercial interest in the information, he or she may find it easier to gain access to companies and information, rendering monitoring more possible (Noooteboom, 1999a, 1999b).

3. **Bridge cognitive distance**
Whereas complementary knowledge and know-how are often the key rationales for engaging in inter-firm relationships, they also entail cognitive distance (Noooteboom, 2000). The gap that exists between companies with regard to their cognitive frameworks
and specialist knowledge might form an important obstacle to mutual understanding, learning, innovation and effective monitoring (Nootboom, Van Haverbeke, Duysters, Gilsing, & van den Oord, 2007) and thus an important obstacle for establishing trust, reaching an agreement and drawing up and monitoring a contract. The third party can help to bridge the gap between cognitive frameworks, that is, help to cross ‘cognitive distance’. Third parties can ‘translate’ behavior to optimize ‘absorptive capacity’ (Cohen & Levinthal, 1990). This has been defined as the role of knowledge broker (Hargadon, 1998; Wolpert, 2002). Translation activities might be necessary if highly specialized researchers have trouble understanding each other’s work and thus appreciating each other’s competences and expertise. Third party intervention might also be valuable to bridge the cultural gap between technology-oriented people and market-oriented people, who often experience great difficulty understanding each other’s language, competences and even attitudes, which provides a fertile ground for misunderstanding and distrust. To be able to fulfill this role, the third party must be an expert or specialist in his or her field and be recognized as such by the collaborating parties. Potential third parties for this role are thus (top) researchers or other specialists who have a reputation in their field, but who, at the same time, are able to oversee, and connect to, other fields.

4. Informal arbitration and preventing a case going to court
Recent insights from game theory find that conditional cooperation is the norm for human cooperation, that is, actors cooperate if the other group members also cooperate, whereas the defection of others is a legitimate excuse for individual defection (Fehr & Fischbacher, 2004). They see the third party as a type of arbitrator that can punish and reward, thereby maintaining the social norm. Experiments in this field show how third-party intervention can prevent opportunistic behavior in investment games. For instance, Charness, Cobo-Reyes, & Jimenez (2008) explore the effect of third-party punishment and reward in the ‘Berg et al. investment game’ in which a first mover can pass all of his or her endowment to a responder, who receives three times the amount sent by the first mover. The responder then selects an amount to pass back to the first mover. The behavior shown by the players is seen as a proxy for trusting and trustworthy behavior. Charness et al. (2008) introduce the role of a third party to this game. They find that the presence of a person who can observe and punish the violation of the distribution norm, which is the social norm on how gains should be distributed (Fehr & Fischbacher, 2004), significantly and substantially increases the amount of money sent by the first mover. In addition, the responder’s return is significantly higher. A third party can thus have an important role in deterring opportunism or arbitrating uncooperative behavior. This does not just aid the relationship by ‘enforcing’ trustworthy behavior, it can also prevent the cost, effort and damage of taking a case to court. Important preconditions for this are that both parties accept third-party interference and potential punishment, and trust the
fairness of the third party’s judgment.

5. **Prevent reputation damage**
Coercive contract enforcement might be detrimental to the efficiency and effectiveness of the relationship because it can yield unwanted side effects, such as break down of trust, evoking conflict (Gaski, 1986; Gaski & Nevin, 1985; Ghoshal & Moran, 1996; Hunt & Nevin, 1974), opportunism and defensive behavior (Hirschman, 1970; Zand, 1972). A well-known saying in business is that things are definitely wrong if the contract is pulled out of the drawer, that is, contracts are primarily intended to indicate how the project and relationship should proceed and they are considered a source of non-resolvable conflict if they are actually called upon. In other words, if a third party can prevent the parties from quarrelling about the exact execution of the contract (the letter of the contract), this will not just potentially prevent trust to break down, but also the parties’ reputations in terms of how they view each other and how external parties view them. This can be attempted by solving problems according to the ‘spirit of the contract’ or industry norm (Klein-Woolthuis et al., 2005), and falling back upon social ordering mechanisms as trust, loyalty and social obligation.

6. **Help parties ‘get through’ the legal system**
If neither the parties in the collaboration nor the third party can solve the conflict that has arisen in a relationship nor the case goes to court, third parties can play a role in helping the parties get through the process as best as possible. Contract enforcement through the courts is very expensive in terms of money, time and delay. This is especially the case for small firms that lack a legal department (Nooteboom, 1993). A third party, most likely in the form of a legal advisor or experienced manager who has gone through the process before, can guide parties through the process without too much cost and delay.

In sum, a third party can not only improve the quality and effectiveness of structural governance mechanisms in place to govern the relationship, he or she may also prevent conflicts to arise and trust to break down as a result of misunderstandings, haggling or, for example, threats to take a case to court. As such, a third party can play an important role in preventing the negative effects of formal aspects of the relationship on trust development and maintenance.

**9.4 The impact of third parties on relational governance**
Relational governance consists of using trust, norms of fair dealing (social obligation), values and loyalty to control and coordinate the relationship. Although relational governance appears at first to be a very personal matter in which third parties have no role to play, a closer examination of the downside of trust gives considerable hints
as to how the third party could play a role here. This explains the recent attention to the role of third parties intervention in trust building and trust repair (Mesquita, 2007; Tomlinson & Mayer, 2009). Potential actors that can transfer and mediate trust are representatives of industry associations, development agencies or technology transfer offices. These are parties that are independent and have a good knowledge of companies in a field or area, and are thus able to bring actors together.

**Phase 1: Initiating relational governance mechanisms**

1. **Help with establishing social ordering and speeding up the trust-building process**

   The importance of relational governance, especially in the form of trust, has been acknowledged many times (Bachmann, 1998; Gambetta, 1988; Möllering, 2006; Nooteboom, 2002). Fehr and Fischbacher (2004) refer to this phenomenon as the shared social norm (see also Fehr & Gachter, 2002 or Gintis, Bowles, Boyd, & Fehr, 2003). They see it as the shared belief in how individual group members ought to behave in a given situation. Trustworthiness consequently refers to the adherence to these norms. In bilateral relationship development, there is a risk that many of these norms will be implicit: the actors assume that people will have similar ideas over what is fair and what is the appropriate behavior in certain circumstances. These ideas may vary greatly, however, from person to person and also within firms or industries. A third party can help to clarify ideas and make the social norm explicit. Furthermore, the third party can help in the process of developing a shared language and understanding, and can help to establish shared visions and goals regarding the collaborative venture (Larson, 1992; Ring & Van de Ven, 1994). The third party can thus help to build up trust and speed up the process by providing guidance and advice.

2. **Trust transfer to parties that lack history of prior relationship**

   As trust is important and takes time to develop, the existence of prior ties has been stressed as important to relationship success (Blumberg, 2001). As we have already argued, it is often hard to establish trust between unfamiliar parties. However, new developments and the prevention of myopia and lock-in require the parties to collaborate with new, unknown partners as well. Furthermore, innovation often requires highly specialized but different skills and knowledge, contributing to the cognitive gap between the parties involved. In these circumstances, third parties can provide at least a partial solution to this problem. They can refer parties to each other and help in the first stages of relationship development. The trust that parties have in the actor who refers them to each other will mean that they are more likely and ready to trust each other (Baker, 2000; Ferrin, Dirks, & Shah, 2006). This is because they trust the third party to recommend only a partner that is both competent and benevolent (Nooteboom, 2004).
3. **Prevent emergence of distrust during negotiations**

Alliance negotiation can be a very sensitive process in which different functions (i.e., layers, operational managers, top managers) have to communicate with each other. As such negotiations might easily trigger feelings of misunderstanding and even distrust. The intervention of the third party can reduce the likelihood of such negative relational dynamics by providing a more impartial perspective on the demands and wishes of both parties. Moreover, experienced third party mediators can frame and translate the concerns of both partners in such a way that misunderstanding is less likely to occur. This can prevent a negative spiral of distrust and haggling, which might take a long time to resolve before an agreement can be reached.

**Phase 2: Application of relational governance mechanisms**

1. **Bridge cultural distance**

As trust is a social phenomenon, it is the product of communication and understanding. Misunderstandings, as well as differences in perception make the trust-building process more difficult. Cultural distance can therefore be an important hindrance to trust development (Bijlsma-Frankema, Sitkin, & Weibel, 2008; Nooteboom, 1999c). Cultures may differ between companies (more entrepreneurial versus large bureaucratic firms, for instance) or between professions, knowledge fields, regions or countries. Actors with different dominant logics have difficulty understanding each other and as a result knowledge transfer and learning will be hampered (P. J. Lane & Lubatkin, 1998). Third parties can, as in the case of bridging cognitive distance, fulfill the role of a translator in aiding this process. The third party can explain behavior and translate the underlying logic and intentions to the partner that is not (yet) capable of understanding this.

2. **Solving the idea problem (myopia and group-think)**

Whereas trust is mostly associated with positive aspects, the ‘danger’ of a very strong trust basis is an ‘unhealthy’ closeness between partners that might lead to myopia, inertia and hence lack of openness to new opportunities (Li, 1997, 1998). This will be detrimental for innovation because there will be a redundancy of information between parties (they tend to know and think the same) (Granovetter, 1973; Obstfeld, 2005) and a lack of variation in knowledge and perspectives (Nooteboom, 2004). In such situations, a third party can be important for ensuring there is sufficient new input from outside the relatively closed collaboration. A third party might help to establish a cooperative structure that does not entail ‘barriers to entry’ for potential new entrants, he or she might regularly introduce new potential parties, keep track of new developments and opportunities and/or make the parties aware of the negative aspects too close relationships might have. Another function is that of the gatekeeper who keeps track of relevant developments, potential partners and new opportunities (Tushman & Katz, 1980).
3. **Preventing blind trust**

A closed attitude as described with reference to the idea problem may not only refer to the object of collaboration (knowledge exchange, innovation) but also to the relationship itself. Tomlinson and Mayer (2009) refer to the latter situation as a stable attribution. They argue that partners may have such strong beliefs about each other and the other’s behavior that a trustor can be blind to evidence that the partner is, in fact, behaving opportunistically (Tomlinson & Mayer, 2009). In this respect, Lewicki and Bunker mention the role of the objective third party as he or she who can observe and signal such behavior, without being swayed by stable or blind beliefs (Lewicki & Bunker, 1996). As such, a third party can mirror the parties’ behavior and beliefs, and bring certain aspects to the discussion.

4. **Trust repair**

Trust and the possibility of trust repair has only recently received more specific attention (Bijlsma-Frankema et al., 2008; Lewicki & Bunker, 1996). Tomlinson and Mayer (2009) examine the possibilities of trust repair using the causal attribution dimensions of Weiner (1986) arguing that actors that believe in the goodwill of others can interpret behavior positively when factually it is not (which is attribution). In other words, the authors argue that trust can be repaired if the breaking of trust (e.g. not performing according to agreement) can be ascribed to 1) external factors beyond the control of the partner 2) a lack of ability, benevolence or integrity beyond the partner’s control 3) a lack of stability in the perception of the given trait (e.g. partners in long-established relationships will interpret individual actions in the light of previous cooperation and hence have more stable perceptions of the other’s trustworthiness in the various aspects) (Tomlinson & Mayer, 2009). Alongside the reference to ability, benevolence and integrity in trust repair, they also mention the role of denial and excuse in repairing trust. In this case, taking responsibility for what went wrong, issuing apologies or justifications that reduce the perceived negativity and/or promises that things will not happen again are ways of repairing trust. A number of studies have shown this to be effective (Kim, Ferrin, Cooper, & Dirks, 2004; Tomlinson, Dineen, & Lewicki, 2004). Note that both, Tomlinson and Mayer (2009) and Nooteboom (2004) stress the importance of obtaining objective and accurate information in this process of finding the true cause of norm deviance. A correct judgment can be made of the causes of deviance based on objective information. A third party can be very valuable in this process, not only because he or she will be impartial but also because his or her external role is likely to give him or her better access to information on all sides, which will help him or her reach a correct judgment.

5. **Reputation management and blocking exit for deviant actors.**

Apart from trust, reputation has been considered as an important relational governance
mechanism in alliances. A third party can play a crucial role with regard to the reputation mechanism. Nooteboom describes how a third party can ‘spread the news’ through his or her network: he or she can transmit a party’s reputation without giving in to gossip and slander. His or her independent judgment of the parties’ benevolence or opportunism will have more credibility than the word of parties that have a direct interest, which may be seen as malicious, strategic gossip. The third party can thus aid the reputation mechanism in several ways. First, as already discussed, the third party will have easier access to information, thereby enabling the third party to have more accurate and objective information that can signal deviance from the agreement and judge the grounds for such deviance (lack of loyalty, lack of competence). Second, the third party can use his or her network of weak ties to ‘spread the word’ more easily and credibly to potential future partners. Because the third party cannot afford to be part of a ‘gossip-campaign’, he or she can be trusted to function as a sieve and amplifier by checking accusations of opportunistic or incompetent behavior and transmitting them only if correct. Third, although the third party is perhaps not able to prevent an opportunistic or incompetent party exiting by taking on another identity or ‘escaping’ to new markets, the third party will certainly have more means to broadcast defection than the parties to the agreement (Nooteboom, 1999a, 1999b). When third parties are part of, e.g. development agencies, innovation centers, research communities or other government & semi-government organizations in particular, the parties often have ample contacts and opportunities to transmit a reputation.

6. **Timely and minimally destructive relationship termination.**
Nooteboom (2004) describes how third parties can also play a role in terminating a relationship. If relationships end in a fight, the damage will often prevent parties from engaging in future collaboration (despite the fact that there may be a business rational for doing so). In addition, future relationships with other parties may be at stake as a result of reputation damage. A third party can play an important role in reducing the negative effects of conflict and relationship breakdown. It is important here that the relationship is terminated before it turns sour and damage is irreparable. Mediators will be suitable third parties who can mediate in this process.

9.5 **Conclusions**
A growing body of literature points to the added value third parties can have in relationship management (Nooteboom, 2004), inter-firm co-ordination (Obstfeld, 2005), and the management of network ties (Burt, 2000). Yet, no structural connection has been made to the mix of legal, private and social ordering mechanisms of relationship governance, or to the role of third parties along the stages of relationship development. This chapter contributes to the alliance literature by providing a comprehensive framework on third party roles, integrating existing third party
perspectives with alliance management insights from the organization, network, innovation and trust literature (Howells, 2006). Third parties have an important role to play in relationship governance as their independence and impartiality makes them more suitable than the parties involved to, for instance, mediate and arbitrate. As a result of their ‘outside’ position, they can contribute to establishing and maintaining strategic alliances, as they can provide help to make an assessment of risks, provide advice on suitable governance structures, and provide help when problems occur. In other words, by aiding the governance of a strategic alliance, they support the establishment and maintenance of high inter-firm performance.

Existing studies of third party intervention generally focus on one particular element out of the mix of governance mechanisms. Transaction cost economics, for instance, describes how third parties can complement legal governance or incomplete contracts (Williamson, 1985). In a same realm, attention has been given to how third parties can help in private ordering – e.g., by aligning interests and providing coordination (Obstfeld, 2005; Simmel, 1950) – and in third party mediation and arbitration in social ordering, for instance in trust building and repair (Möllering, 2006; Tomlinson & Mayer, 2009). This study contributes to this literature by presenting a coherent framework in which third party roles are structured along the various governance mechanisms and the stages of relationship development. In this way, first of all, the various third party roles are explicitly coupled to the specific governance forms, providing insight into how roles differ per ordering mechanism, and hence which type of third party may be needed to assist. For instance, the type of intervention for supporting the drawing of a contract is very different from the process of transferring trust. Yet, these processes are highly interdependent.

The underlying logic of the framework is that it is not the facts such as asymmetric dependence or absence of prior trust that determine the quality of the relationship, but the ways that parties deal with their differences and governance problems. Third parties can fulfill many different roles in aiding this process. The framework elaborates on how third parties cannot only help to set up an appropriate governance structure, but also how they can help to prevent the negative consequences of misuse or misinterpretation of governance mechanisms. In this way, governance mechanisms can be used in a constructive way, without provoking negative side effects. Hence, in our framework we theorize how third parties can prevent such negative consequences to occur, and how governance structures can be established that are supportive for the alliance.

We find that third party roles vary widely according to the stage of relationships development and the governance mechanism used. In the build-up and management stage of a relationship’s development, third parties’ help will mainly focus on
establishing an appropriate governance structure. For example, the third party helps to balance the interests in the relationship and complements an incomplete contract with trilateral governance in such a way that the level of trust, flexibility and openness essential for innovation can be maintained. When problems and conflicts occur in a relationship’s development, different roles of third parties come to light. More attention will have to be focused on solving problems, realigning interests, adjusting the mix of governance, repairing trust, or simply limiting the damage of conflict and relationship termination. In this phase, governance is less concerned with creating value, and more with limiting damage.

In a similar fashion, roles vary according to the governance mechanism in which third parties provide aid or guidance. In structural governance, roles such specialist legal advice on contractual forms, and formal and informal arbitration may play an important role. Also, mediation may be more important to align or re-align interest between parties. Industry or technology specialists will be actors that have sufficient knowledge to value inputs and can hence provide help in balancing interests. In relational governance, again other capabilities will be needed and hence other actors may become important. Trust, impartiality and independence are crucial aspects to transfer, mediate and potentially repair trust, and hence trusted mediators or consultants may provide valuable in this process. This in itself is a challenge for alliance governance, as several actors may be needed for the various aspects of relationship governance in the different phases of relationship development.

**Future research**

Our framework provides a basis for further research and theory building on the important and delicate role that third parties fulfill in relationship governance, taking into account the many aspects and subtleties of these interventions. Limited attention had been paid to the interrelatedness between the various ordering mechanisms and to the question how third parties can help to establish an appropriate governance structure. This chapter can form a basis for future research as it makes the various potential roles of third parties explicit and explores the interrelatedness between the governance mechanisms. Although attention has been paid to, for example, the relationship between trust and contracts (C. Lane, 2000), and to how trust, contracts and dependence interrelate (Klein-Woolthuis, 1999), no empirical or theoretical studies have structurally examined the roles of third parties in helping to establish an appropriate governance mix by, e.g., substituting or complementing these governance mechanisms. Such insights are essential as the use and potential misuse of certain governance mechanisms are important ingredients for successful high-tech alliances. An important next step is the empirical testing of the different roles that we hypothesize third parties to have. Questions arise such as: can third parties counterbalance asymmetric dependence in alliances by providing independent project management
or installing administrative procedures that counteract potential opportunism by a more powerful party? And if this is possible, can trust exist despite the relationship’s unbalance? Another important question would be whether third parties could complement incomplete contracts. Trust is often considered a complement or even substitute contracts, but is also fragile in its use. Could third party intervention provide a reliable alternative? Empirical studies into these questions, as well as the question on who these third parties are, and how they fulfill their role, are all topics that call for additional theoretical and empirical studies on the role of third parties in relationship governance and trust.
CHAPTER 10. THIRD PARTIES AND TRUST REPAIR

Summary
The relationship between organizations and their stakeholders has become increasingly problematic due to breaches of trust. This trust problem is at the heart of the recent financial crisis in which individuals and whole societies were shown to be highly dependent on large corporations. For example, banks have control over savings, mortgages, and pensions, while – individually and often even collectively – affected stakeholders have no means of control over these parties. The key questions are: what is the role of third parties in trust repair? Given power imbalances, can trust be repaired, and if so, how?

This chapter presents one of the first empirical tests of the role of third parties in trust repair. Third parties are tasked with repairing damage to trust that results from three disruptive events among partner organization: legal haggling, misuse of power, and cultural distance. With regard to legal haggling, the process of drawing up a contract and its actual use tend to evoke distrust unless a third party steers it clear from suspicion. Third parties can help eliminate misunderstandings, clarify causes of disappointed expectations, and help negotiate altered conditions. Under guidance of a third party, legal haggling need not harm trust.

Likewise, power plays may not be viewed as threatening if third parties can help to clarify intentions or help negotiate conditions. Specific demands may be prejudged as a power play until an objective outsider can show that they are reasonable or necessary. The third party can also prevent demands that are indeed unreasonable. We expect that this occurs especially in innovation. There, the third parties may be needed to clarify why something seemingly irregular does make sense. Cultural distance could not be mitigated by the use of a third party. Seemingly, cultural mind frames can be persistent, and the gaps between them difficult to bridge for a third party. A possible explanation for this is that legal and power struggles relate to the business side, rather than the personal side of the relationship and hence have no direct relation with the cultural and internalized values, beliefs, and understandings of the parties involved.

This chapter offers various key lessons. The need for flexibility and a continuous rebalancing of interests will form a potential source for conflict and breakdown of trust. It is here, in particular, that third parties can be value. Third parties should be impartial and independent as trust suffers from causal ambiguity. Third-party roles facilitating the relationship between business and society do exist, but generally fail to meet the requirement of impartiality and independence. This raises the question as to which third parties are actually actively playing a role in supporting public rust, and which additional functions are needed to restore the current trust crisis. Cultural
distance – especially on the level of fundamental differences in norms, values, and beliefs – might hamper public trust. The negative effect of cultural distance among partner firms could not be eliminated by third-party involvement and the same may hold true for public trust.

Key words: trust repair, third parties, public trust, governance, high tech alliances

10.1 Introduction

Trust is of pivotal importance to the functioning of our modern networked economies, which has become clear in recent crises and a growing literature on legitimacy of organizations (Lamin & Zaheer, 2012; Pfarrer, Smith, Bartol, Khanin, & Zhang, 2008; Sullivan, Haunschild, & Page, 2007) and public trust (Moriarty, 2009). The relationship between organizations and their stakeholders has become increasingly problematic due to a breach of trust. Trust is defined as the expectation that a partner will not engage in opportunistic behaviour, even in the face of opportunities and incentives for opportunism, irrespective of the ability to monitor or control that party (Klein Woolthuis, Hillebrand, & Nooteboom, 2005; McAllister 1995; Bradach and Eccles 1989; Nooteboom 1996). Key to this definition is trustor’s vulnerability and inability to control the other that he/she has entrusted something to (trustee). This trust problem is at the heart of the current crises in which individuals and whole societies are highly dependent on large corporations and banks for example for their savings, mortgages and pensions, while – individually and often even collectively - having no means of control over these parties. Yet, a breach of trust is disadvantageous for both sides as distrust breaks down relationships and paralyzes consumption, investment and economic growth. This coins the important question: can trust be repaired, and if so, how? For instance, can pension funds restore public trust in their institution after losing the money that people had entrusted them? Can companies repair trust after scandals of administrative fraud, excessive bonuses, and malignant products? Can the trustee regain trustor’s trust? Trust repair will have to involve some form of independent judgement to enable a reinterpretation of events, and to take away the suspicion of opportunism by the trustee, for instance by attributing the breach of trust to other factors than self-interest seeking with guile. This is where third parties come in.

In this study we built upon knowledge from an inter-organizational context to shed light on the role of third parties in trust repair. We investigate how third parties can help partners to rebuild and repair interorganizational trust in high tech alliances. Highly effective collaborative relationships are typically associated with high trust between alliance partners (Bachmann, 1998; Becerra, Lunnan, & Huemer, 2008;
High-tech alliances are crucially important for innovation, and thereby for the competitiveness of firms (Klein Woolthuis, Hillebrand, & Nooteboom, 2005; De Man & Duysters, 2005), as well as regions and nation states (Edquist, 2005). As these relationships are complex, characterized by uncertainty, and risks of spillover and opportunism, their governance has attracted much attention (Nooteboom, 1999). Although aspects of trust such as uncertainty, (relational) risks, and control are addressed in most studies, thereby implicitly emphasising the vulnerability of trust in alliances, research on how to repair trust or how to deal with distrust, has only recently emerged (Dirks, Lewicki, & Zaheer, 2009; Tomlinson & Mayer, 2009).

The role of third parties is another area that has received relatively little attention in the alliance literature. For instance, a review of more than 150 papers on alliances and alliance governance (Ireland, Hitt, & Vaidyanath, 2002) does not mention the role of third parties in supporting such relationships, and only recently has the role of third parties in mediating and arbitrating in interfirm relationships received more attention (Howells, 2006; Mesquita, 2007). We consider the question of what to do once trust is under pressure a highly relevant one, as in business relationships trust will always be vulnerable to trust-reducing forces such as competition for knowledge, resources and market position (Mesquita, 2007). The contribution of this chapter is to address the role of third parties in trust repair.

The importance of third parties or intermediaries has been noted (Fukuyama, 1995; Shapiro, 1987; Williamson, 1985; Zucker, 1986) and some proposals for specific roles of third parties have been made (Gould & Fernandez, 1989; Nooteboom, 1999). However, the literature is still eclectic, as most studies see the role of the intermediary as tangential to their main field of enquiry (Howells, 2006). The literature is still in the phase of theory building (Bijlsma-Frankema, Sitkin, & Weibel, 2008; Mesquita, 2007) or provides at best case study results or secondary data (Bidault & Fischer, 1994; Bryant & Reenstra-Bryant, 1998; Morgan & Crawford, 1996). Empirical tests of the roles of third parties are few and far between, and also the attention to the function of third parties is limited. Whereas many studies acknowledge the role of third parties in gathering, translating, and encoding information, there are only few studies that relate third parties to alliance governance. An important strand in the alliance literature (in particular Burt, 1992) emphasizes how third parties can obtain advantage by playing off two parties against each other, according to the principle of the ‘laughing third’ (tertius gaudens). This principle is found in the earlier work of Simmel (1950), who did, however, also recognize the positive roles third parties can play to help two parties to collaborate. This role was later elaborated on by Obstveld in his description of the tertius iungens, the helping third (Obstveld, 2005).

The contribution of this chapter is as follows. It considers the possible roles of third
parties that are recognized in the literature, elaborates and operationalizes some of their effects on trust repair. In particular, we look at potential trust destroying effects of power play, legal haggling and cultural misunderstandings. While this does not cover all possible roles that third parties can play, it does address some of the key roles as identified in the recent literature. We test our hypotheses in a sample of 391 high-tech alliances, thereby presenting one of the first empirical tests of the role of third parties in trust repair.

The outline of this chapter is as follows. In the next section, we explain the theoretical foundations of our study. A discussion of the research methodology and our empirical results follows. We conclude with an appraisal of the results, derive lessons for public trust and suggest avenues for future research.

10.2 Theory and hypotheses
The role of trust in high-tech alliances

Firms in an alliance can use different mechanisms to manage the relationship, such as control by contracts or hierarchy. In recent years, alliance research identified trust as a key governance mechanism for alliance success (Das & Teng, 2001; Fryxell, Dooley, & Vryza, 2002; Poppo & Zenger, 2002). Trust has value because, for example, it reduces the need for hierarchical control and improves openness and problem solving (Gulati, 1995; Zaheer, McEvily, & Perrone, 1998; Zand, 1972). However, it has disadvantages as well: it takes a long time to develop, is vulnerable to pressures of survival, can easily be broken down and then is difficult to restore (Nooteboom, 2002). In all stages of an interfirm alliance – from initiating contacts to developing collaboration, contract negotiations, monitoring behaviour and renegotiations – critical events may occur that can break down trust. For instance, the active use of power by a stronger partner may induce feelings of anger and revenge and therefore dismantle trust. Even without the stronger partner using its power, perceived vulnerability or lacking self-confidence may generate enough suspicion to dismantle trust (Klein Woolthuis et al., 2005). Trust can also deteriorate as a result of a lack of communication or misunderstandings, differences in perception or as a result of cultural distance (Bijlsma-Frankema et al., 2008; Nooteboom, 1999). This may all result in a premature ending of the relationship whereas innovation requires durable relationships between interdependent actors that can work through changing circumstances and adjust expectations. Along the way, parties will have to rethink their projects, and renegotiate their relationship. The need for flexibility and a continuous rebalancing of interests will form a potential source for conflict and break down of trust. It is here, in particular, that third parties can be of value.
Roles of third parties

The analysis of the role of third parties goes back a long way, but has surprisingly not led to a rich and coherent body of literature (Howells, 2006). A classic source of the ‘tertius’ is Simmel (Simmel, 1950). Some of his work was picked up and diffused by (Burt, 1992) in his seminal work on third parties as boundary spanners of structural holes, but this was more focussed on how to profit as a third party (‘tertius gaudens’) than on solving problems of collaboration. More recently, studies have reported on an increasing trend in relying on external support if a firm lacks sufficient internal competencies (Chiesa, Manzini, & Pizzurno, 2004; Grant & Baden-Fuller, 2004; Hislop, 2002; Morgan & Crawford, 1996). The third party has acquired many labels, depending on the aim of the research, which usually focuses on one function of a third party under particular circumstances, that is, labels such as intermediaries in innovation (Stankiewicz, 1995), gatekeepers in technological knowledge transfer (Friedman & Silberman, 2003; Siegel, Waldman, & Link, 2003), boundary spanners in networks (Burt, 1992), or ‘impannatore’ (specialist co-ordinators) and ‘superstructure organisations’ in clusters (Lynn, Reddy, & Aram, 1996) are used.

Recently, several studies have attempted to structure the different roles of third parties. Howells (2006), for example, looked at the role of intermediaries in innovation. Mesquita (2007) theorized on the role of third parties as trust facilitators for clustered firms. However, it is especially in situations where trust is under pressure, that the role of third parties becomes important, as trustor and trustees are themselves too much ‘part of the problem’ to be able to for instance arbitrate, mediate, and interpret. Hence, it makes sense to involve independent and knowledgeable third parties to fulfil such functions. This role of third parties to prevent break down of trust, or turn a situation around once conflicts or distrust has arisen, has recently been acknowledged in literature on trust building and trust repair (Bijlsma-Frankema et al., 2008; Mesquita, 2007).

For this chapter we build upon the categorization of Nooteboom (2004) who specifically addresses the role of go-betweens in innovation alliances and distinguishes eight roles. The first role, presented also in transaction cost economics (Williamson, 1985), is ‘trilateral governance’. When transactions are small or infrequent, it is not worth the cost and effort to set up an extensive governance structure. In this case it is more efficient to set up an incomplete contract and involve a third party to serve as an arbitrator or mediator to solve problems of legal haggling in setting up the contract and settling disputes. A second role is in the value assessment of information or knowledge before it is divulged or sold. Knowledge specialists that can assess and transfer the knowledge necessary for the innovation process should fulfil this role. This role has often been described as intermediary (see, e.g., Callon, 1994). A
third role lies in helping to bridge cultural distance. In collaboration processes third parties can ‘translate’ behaviour. Such translations can also be necessary between technology fields, for example, to optimize ‘absorptive capacity’ (Cohen & Levinthal, 1990). This role has also been named knowledge or technology brokers (Hargadon, 1998; Wolpert, 2002) and comes close to the role of the ‘tertius iungens’ defined as a person who brings parties together and aims to improve collaboration (Simmel, 1950).

Fourth, third parties can reduce the negative effects of power play, by preventing it or eliminating suspicion and mistaken interpretations of actions. A fifth role is to guard spill-over through the monitoring of information flows, which role is also referred to as that of the gatekeeper (Cohen & Levinthal, 1990). A sixth role is that as a keeper of hostages to secure conformity to agreements (Williamson, 1985). The seventh role that Nooteboom (2004) distinguishes is in assisting a timely and minimally destructive ending of relationships, so that a future potential remains for parties to collaborate. A final role refers to the support of reputation mechanisms by intentional ‘gossip’ as a means to deter opportunistic behaviour.

Because our study focuses on the role of the third parties in high-tech alliances in which uncertainty and risk, and hence trust plays a crucial role, we choose to focus on those roles that directly relate to rebuilding trust or preventing its breakdown once it is under pressure, that is, (a) the role of a mediator in legal disputes in the absence of hierarchical control or complete contracts; (b) the role of moderating power-play whereby the disruptive nature of such events can be lessened and trust maintained; for instance by making use of reputation mechanisms, and (c) the role of bridging cultural distance to enhance understanding and hence facilitate the process of trust where this is problematic.

Interorganizational trust
Before we continue, we need to find a working definition of interorganizational trust. A key challenge is the applicability of the concept of ‘trust’ to different contexts and levels of analysis, which easily creates confusion (Inkpen & Currall, 2003). Hence, the first issue is the level of analysis, given that the referent of trust may vary (Dirks & Ferrin, 2002). For this paper, the distinction between interpersonal and interorganizational trust is relevant (De Jong & Klein Woolthuis, 2008; Zaheer et al., 1998). In the first approach trust is a micro-level phenomenon and has its basis in individuals. A distinction has been made between trusting behaviour and trust as a psychological disposition. Since there is no psychology on the organizational level, the common wisdom is to say that organizations as such cannot trust. However, if we see disposition in a more general sense, we can very well see an organizational disposition to trust, on the basis of its culture, style of governance (more legal or more informal), risk acceptance, which are embodied and maintained in personnel selection, training,
decision structures and procedures, reporting procedures, etc. Organizations can also be the object of trust (trustee), on the basis of their reputation, experience, structure and process. Clearly, to have trust in an organization one must also trust the individuals that enact the policies of the organization, which again depends, in part, on organizational culture, structure and processes. Conversely, it is not enough to trust the employees of the organization one is dealing with, their commitments should be supported by their role and position within their organization. In other words, personal and organizational trust should be in line (Nooteboom, 2002).

In the present study we focus on trust in the organization of a partner (trustee), as judged by respondents that can reliably express the experience of the focal firm (trustor). In small firms the owner-manager is the most reliable source. Hence we derive at our working definition of interorganizational trust as a positive perception of the partner’s behaviour, that is, the perception by the respondent of the focal firm that a partner organization will not engage in opportunistic behaviour, even in the face of opportunities and incentives to do so (Hosmer, 1995). We can expect trust to be present in situations where (1) the trustee in the business relationship shows forbearance from opportunism and (2) is known to behave carefully and with concern (integrity, goodwill, and benevolence), and where (3) the trustor shows limited control behaviour. Hence, our definition characterizes interorganizational trust as a multi-component construct based on three related components: forbearance from opportunism, care and concern, and limited control. This conceptualization operationalizes interorganizational trust as a relational rather than a dispositional feature as it can be more reliably observed than underlying dispositions. This is important in this study to reduce single-source bias that occurs in surveys in which one asks the same respondent about both antecedents and outcomes. In what follows, we consider three disruptive events for interorganizational trust that we hypothesize can be tempered by third parties, namely legal haggling in the absence of formal hierarchy, active misuse of power, and cultural distance.

Legal haggling
The relation between trust and contracts is somewhat ambivalent. On the one hand, having been able to reach an agreement, and writing this down in a formal written contract, forms a ‘safe haven’ to fall back upon in case of trouble and can hence make it easier for trust to develop. On the other hand, it has been argued that parties that trust each other more have less incentives to write contracts as they rely on their mutual willingness to solve problems as they arise. This is interesting because it is exactly their trusting relationship that would make it easier to arrive at detailed written agreements as there will be less hesitance to accept (inter)dependence and commit to an agreement in writing (Klein Woolthuis et al., 2005). Cynically one could
conclude that contracts are easiest to draw up when they are not needed, that is, when parties (still) trust each other and have good working relationships, and most needed in situations where they are difficult to draw up, that is, in situations where parties are haggling over the agreement or its execution. Legal haggling relates to all disputes that may arise in the design, execution, use and renegotiation of the contract between alliance partners. Such disputes may include squabbles of interpretation, demands for compliance, threats and execution of sanctions or litigation and requests for adjustments (Williamson, 1985). This is likely to affect trust in several ways and a third party can help to moderate its negative effects.

First of all third parties can play an important role by guiding contract negotiations as an impartial, independent ‘moderator’. This can reduce distrust arising from the emphasis placed on contracts that may be interpreted as a sign of distrust. Furthermore, a third party can help in the design and monitoring of the contract, in resolving misunderstandings, re-interpretation of events, pointing out risks of escalating conflicts, and helping to re-negotiate the contract. This is all part of ‘trilateral governance’ as identified in transaction cost theory. Nooteboom (2002) adds to this that the third parties may play a role in determining whether deviance from the contract rests on a misunderstanding, lack of competence or bad intentions, that is, not only the actions counts, but also the intentions behind actions as they yield the most resilience in trust development. The impossibility of obtaining this information from an objective source may lead parties to unfoundedly distrust each other, start shirking or retaliating. Trust suffers from ‘causal ambiguity’: When something goes wrong, there is the dilemma of interpretation since the cause of the trouble may not be opportunism but an accident or lack of competence. However, it is precisely the opportunist who will claim that an error occurred (Nooteboom, 2002). In this way accidents can escalate to mutual distrust. The third party can fulfil an objective mediating role and thereby take away doubts, reduce the risk of false accusations and help to maintain or restore an atmosphere in which disputes can be constructively resolved. This may prevent parties from calling upon means of ultimate appeal or ‘revenge’, and thus the third party can reduce the detrimental effects of contract enforcement. This is the first role of the third parties in restoring trust. We therefore hypothesize:

Hypothesis H1a. Legal haggling will dismantle interorganizational trust.
Hypothesis H1b. Third parties can help to solve legal haggling and thus restore interorganizational trust.

Power play
In an interfirm alliance, parties can resort to social (e.g., trust), legal (e.g., contract) or private ordering mechanism to ‘encourage’ desired behaviour of their counterpart.
Private ordering includes the deliberate use of one’s relative position of power, that is, by imposing one’s will, demands, views, approaches and actions. A strong power position by one of the alliance partners may already have an unintended negative effect because it may create a fear of power abuse or opportunistic behaviour (Hart & Saunders, 1997). Power play, however, relates to the active and intentional use of power to enforce for instance the (beneficial) terms of an agreement, (unfair) execution of, or (disproportional) gains from an agreement. Of course, such power play will have strong effects on the relationship. It may provoke defensive behaviour, breakdown of trust and thus carries the risk of harming the alliance (Bachmann, 2001). It may also lock the relationship into a straightjacket that leaves little room for learning and innovation. However, use of power or having clear power dependence between partners does not always have to be bad. Having ‘one captain on the ship’ can make it possible to push a project forwards and achieve results within planned time frames and budgetary constraints (Klein Woolthuis 1999). It is when power play crosses the borders of perceived fairness that it will have a particularly detrimental effect on the level of trust between parties and hence on the quality of the relationship. It is especially in a situation of power play that a third party has a role to play.

In the event of actual use of power, a third party can assist the abused party to address and discuss this behaviour with the alliance partner. He or she may show the adverse effects of power play on motivation and trust, and on reducing both the space and the motivation for the abused party to take initiative and contribute to the best of his/her ability. The third party may also show the negative impact of the misuse of power on the reputation of the company. ‘Spreading the news’ on benevolent or opportunistic parties will have more credibility when done by the third parties than by parties holding a direct interest, whose words may be seen as malicious, strategic gossip. Because the third parties cannot afford to take part in a gossip campaign, (s)he can be trusted to function as a sieve and amplifier by checking accusations of opportunistic or incompetent behaviour and transmitting them only if correct (Nooteboom, 2002). Hence, third parties can moderate power play directly, or indirectly by supporting the reputation mechanism. This brings us to the following hypotheses:

Hypothesis H2a. Power play will dismantle interorganizational trust.
Hypothesis H2b. Third parties can help to restrict the misuse of power and thus restore interorganizational trust.

Cultural distance
In interfirm relationships dissimilarities between parties can create problems of understanding and judging the other’s competences and intentions (Nieto & Santamaria, 2007). In highly dynamic technological fields, this process may take too long for timely reactions to new developments. Third parties can help to bridge the
gap between mental frameworks and guide the processes that are needed to increase mutual understanding of capabilities and mind frames, thereby inducing trust into the relationship. It is especially when doubts emerge during the alliance or disputes that occur due to a lack of understanding of the other that the third parties can play a crucial role. He or she may offer second opinions on the progress of the project, verify information, form an objective judgement on the success of the partnership and ‘translate’ knowledge, information and judgements. This is the ‘bridging’ role of third parties as identified earlier. We therefore hypothesize that:

Hypothesis H3a. Cultural distance will dismantle interorganizational trust.

Hypothesis H3b. Third parties can help to bridge distance and thus restore interorganizational trust.

10.3 Methods

Data collection, sample and measures

This study focuses on business relationships between two or more firms and/or research institutes that operate in high-tech industries (biotechnology, new material development, information technology, maritime technologies and environmental technology). The lifecycle of R&D in these industries is usually short. Much of the new technological knowledge quickly becomes outdated, often even before it has been incorporated in new products and/or services. Hence, in the high-tech industries in particular, we find many collaborative efforts between firms, including rival firms. Furthermore, environmental uncertainty and project complexity make partnerships in high-tech innovation a challenge as flexibility, learning and adaptability are core qualities a relationship in this context should have. Because of all these relationship characteristics, we expect trust to play a vital role in these relationships.

Our data collection proceeded in two phases. In the preparatory phase of the fieldwork, we conducted twenty-five semi-structured interviews with consultants of the Dutch Ministry of Economic Affairs who were involved in policy programmes to stimulate interfirm collaboration on innovation. Additionally, the consultants selected 20 cases (ten successful and ten less successful ones) that we studied in great detail to obtain in-depth knowledge of the high-tech collaboration. Case research is suitable for exploratory research where understanding is the primary objective (Yin, 2003). The 20 cases dealt with collaborative innovation and hence involved complex transactions for which close collaboration between partners was necessary over a considerable period of time. The cases involved legally independent partners that shared costs and benefits more or less evenly. All cases entailed uncertainty and/or complexity, and specific assets, and hence risks of dependence, opportunism and ‘hold-up’. Under strict confidentiality, we received full access to all documents of the cases – including the interfirm contracts but also project plans, annual reports of the
companies involved, personal notes and letters, and half-yearly progress reports – that were available at the Ministry. Among other things, this allowed us to examine the content of the contracts with respect to the clauses that were laid down in the contract and the exact content of each clause. Also, clippings from newspapers and trade magazines concerning the collaborations were collected. To enable comparison between the cases and to ensure the quality of the case analysis, a case protocol was written (Yin, 2003), to describe the alliance’s history, development and outcome. The interviews with the consultants were transcribed into interview reports and send back for verification and agreement. Hence, all this allowed us to reconstruct the development of high-tech alliances and to check the data from the interviews with the secondary sources. We used this information to design our survey. The survey was field-tested using a sample of ten companies involved in R&D alliances. This resulted in a number of modifications to the questionnaire.

In the second stage, a research team conducted telephone interviews with 572 business managers of interfirm R&D collaboration. Prior to these interviews, all managers received an explanatory letter inviting them to participate. We briefed the team on the features of R&D, high-tech industries and interfirm relationships. The team made three attempts to identify and interview the selected respondents. The case firms were identified from a database of Dutch interfirm high-technology alliances published by the Ministry of Economics Affairs. This enabled us to identify the business managers who were responsible for interfacing with the partner firms. They were considered to be the most knowledgeable informants about the interfirm relationships. During the interview main topics such as the history and purpose of the alliance as well as contracts, investments, and industry dynamics were discussed. One of the first questions required the respondents to identify the business partner in the alliance in question. We used this information to cross-validate the information from the database. Because high-tech alliances are typically concerned with specific projects and goals, we also asked the respondents to identify one project that was the most important to the interfirm alliance. By focusing on interfirm collaboration within one sector (high-tech industries), we reduced the range of extraneous variations such as the level of uncertainty or competition that might influence the constructs of interest. Some open questions were added to enable the respondents to tell their own story to some extent. In total 50 main questions (often divided in several sub questions) were asked. An outcome of this was that the interviews that were designed to take half an hour would sometimes take up to one hour depending on the respondent.

We obtained 391 useable responses, giving an effective response rate of 68.5 percent. This rate is considerably higher than those observed in prior studies on interfirm relationships that usually is in the 10 to 33 percent range (Parkhe, 1993;
Poppo & Zenger, 2002; Subramani & Venkatraman, 2003). It was also satisfactory considering this studies’ requirement for direct senior management involvement and the confidentiality of some of the requested information.

The non-response is low (31.5 percent) especially considering that only 10.5 percent actually refused to be interviewed. 20.1 Percent could not be contacted within the 3 attempts that the interviewers used to try to get in touch with the respondent. To investigate whether the non-response incurs a bias, the non-cooperating respondents (10.5 percent) were asked for their reasons not to participate. The reasons for refusal were on the one hand a lack of time and interest, and on the other hand, irritation because they had recently cooperated in another survey. Although these reasons can hide their true motive for not participating in the survey (such as an unsuccessful cooperation), the low non-response and the reasons for not participating do not raise serious doubts on the implications of non-response.

Studies of this type, where one asks the same respondent about both dependent and explanatory variables, are in principle vulnerable to common method bias, in particular common source bias (Podsakoff & Organ, 1986). For the aim of this study, reliance on key informants such as our respondents seems to be the only realistic and feasible way to obtain the required information (Huber & Power, 1985). We used the following actions to address possible concerns of validity. First and foremost, we use a complex model specification with interaction terms that is recognized as one of the most important solutions to prevent common source bias (Aiken & West, 1991; Brockner, Siegel, Daly, Tyler, & Martin, 1997). Second, available data can be tested for convergence by triangulation with secondary data (Keats & Hitt, 1988). We compared the outcomes of the self-reported data in the questionnaire with the archival data on the 20 cooperative projects that we studied the first phase of the data-collection. The congruence of the data from the questionnaires and case studies supports the accuracy of the reported data. Third, we asked questions concerning objective events rather than subjective expectations or opinions. Fourth, via the sequence of our questions we aimed to minimize the effects of consistency artefacts. Whereas Salancik and Pfeffer suggest letting the independent variable follow, rather than precede, the independent variables, Podsakoff and Organ argue that correlations will be similar using either method (Podsakoff & Organ, 1986; Salancik & Pfeffer, 1977). In our opinion, a life-cycle approach would best serve an accurate reflection of the interfirm collaboration. Hence, for the purpose of this study, we structured the questions in the survey from past interactions through partner selection, contract negotiations, contract execution and outcomes of the interfirm collaboration. Fifth, we conducted Harman’s single factor test and this gave no indication of common method bias. In sum, in our case it is unlikely that the findings can be attributed to
common source bias.

Control variables
We included three control variables in our model. First, we include focal firm size as a variable to control for extraneous factors such as bargaining power and resource base (Ariño & Reuer, 2004). These factors may influence the governance because large firms have more legal resources, experience and staff as a result of which they are likely to be less dependent on governance mechanisms such as interorganizational trust to protect their business interests. Second, we include the perceived importance of institutions in the form of the role of norms and values over formal alliance management. Those also may affect trust, particularly in the Dutch (or broader continental European) culture in which ‘voice’ is the prevalent option for solving problems (Bachmann, 1998). Third, we include the strategic importance of the alliance partner (Reuer, Arino, & Mellewigt, 2006). More specifically, we include the value that the focal firm places on the knowledge that the partner firm has to offer. In high-tech alliances, knowledge is important and alliance partners that have relevant knowledge will be able to obtain a strategically better position. An alliance with a strategically important partner will receive more attention that will foster interorganizational trust. Also, professionals exchanging technical information may have more affinity and initial respect for each other that may serve as a basis for trust.¹

¹ The question arises whether alliances with and those without the use of third parties differ not only in the effects of the explanatory variables on trust but also, perhaps, in other respects that might affect the results of the explanatory variables. For example, do they differ also in the effects of the control variables on trust? We tested for this by also appending the condition of using an intermediary or not to the control variables, and we found no significant difference.
**Measures**
Table 1 provides an overview of the items that we used to measure the constructs of our theoretical model.

*Table 1. Concepts and measures*

<table>
<thead>
<tr>
<th>Constructs, items and scales</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interorganizational Trust, alpha = 0.78</td>
<td></td>
</tr>
<tr>
<td>1. We did not feel that we constantly had to keep an eye on [name partner].</td>
<td>0.76</td>
</tr>
<tr>
<td>2. During the relationship, [name partner] treated our problems constructively and with care.</td>
<td>0.76</td>
</tr>
<tr>
<td>3. I never had the feeling of being misled by [name partner].</td>
<td>0.77</td>
</tr>
<tr>
<td>4. [Name partner] tried to reap disproportional gains from the cooperation relative to its input</td>
<td>0.71</td>
</tr>
<tr>
<td>5. [Name partner] withheld important information from us. (1 = strongly disagree, 5 = strongly agree)</td>
<td>0.74</td>
</tr>
<tr>
<td>Go-between</td>
<td></td>
</tr>
<tr>
<td>1. Did you during the start of the relationship with [name partner] and the execution of the project ever ask the help of a third party (with a third party we mean a non-contract party)? (1 = yes, 0 = no)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Contracting Process</td>
<td></td>
</tr>
<tr>
<td>1. It was easy to design the contract with [name partner] (1 = strongly disagree, 5 = strongly agree)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Active Contract Use</td>
<td></td>
</tr>
<tr>
<td>1. The contract is, also after it has been drawn up, actively used to manage the relationship with [name partner]. (1 = strongly disagree, 5 = strongly agree)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Use of Power</td>
<td></td>
</tr>
<tr>
<td>1. The partner forced us to do the things they wanted them to be. (1 = strongly disagree, 5 = strongly agree)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Cultural Distance, alpha = 0.72</td>
<td></td>
</tr>
<tr>
<td>1. Cultural differences between us and [name partner] have resulted in problems</td>
<td>0.89</td>
</tr>
<tr>
<td>2. Due to different ways of communicating, problems in discussions and meetings with [name partner] often occurred. (1 = strongly disagree, 5 = strongly agree)</td>
<td>0.89</td>
</tr>
<tr>
<td>Strategic Importance of the Alliance Partner</td>
<td></td>
</tr>
<tr>
<td>1. [Name partner] supplied us with important information on new technologies. (1 = strongly disagree, 5 = strongly agree)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Relative Importance of Institutions</td>
<td></td>
</tr>
<tr>
<td>1. Informal norms and values were in our relationship with [name partner] more important than the formal contract. (1 = strongly disagree, 5 = strongly agree)</td>
<td>n.a.</td>
</tr>
<tr>
<td>Size Focal Firm, alpha = 0.82</td>
<td></td>
</tr>
<tr>
<td>1. What is the number of employees in your firm? (1 = 0 - 10; 3 = 100 - 250; 5 &gt; 1000)</td>
<td>0.92</td>
</tr>
<tr>
<td>2. What is the annual sales revenue of your firm? (1 &lt; 500.000; 3 = 1 - 10M; 5 &gt; 50M)</td>
<td>0.92</td>
</tr>
</tbody>
</table>

* The original questions are presented in the table. Prior to the empirical analysis, the scales for items 4 and 5 for interorganizational trust and for contracting process have been reversed to maintain construct consistency.
10.4 Empirical results
With our model we seek to explain how inter-organizational trust breaks down as a result of legal haggling, power-play and cultural distance, and how third parties can mitigate these detrimental effects. We split up the effects on trust in two classes: for collaboration without an intermediary (66% of the cases) and for collaboration in which an intermediary was used (34%). This is specified in the form of interaction variables for the presence or absence of third parties and each of the three trust-breaking conditions. Here we expect a negative effect for cases without intermediary, and a significantly lesser or zero negative effect for cases with an intermediary. The means, standard deviations and correlations among composite indicators are shown in Table 2. The hierarchical OLS regression results are provided in Table 3. We standardized the explanatory variables before entering them into the regression model. The baseline specification (Model 1) presents the control variables. Model 2 reports the interactions of the disruptive events without and with the use of a third party. In preparation for the regression analysis, we performed the regular tests to obtain reliable estimates. The latter tests gave satisfactory results: neither heteroscedasticity nor nonnormality is an issue. We tested for possible biases caused by collinearity among variables by calculating the variance inflation factor (VIF) for each of the regression coefficients. The VIF values were well below the cut-off value of 10 recommended by Neter, Wasserman & Kutner (1985).

Table 2. Correlations, Means and Standard Deviations

<table>
<thead>
<tr>
<th></th>
<th>Mean S.D. (1)</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Interorganizational trust</td>
<td>22.366 3.673</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Go-between</td>
<td>0.512 0.501</td>
<td>0.023</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Contracting process</td>
<td>4.199 1.241</td>
<td>0.263</td>
<td>0.008</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Active contract use</td>
<td>2.209 1.583</td>
<td>-0.192</td>
<td>-0.031</td>
<td>-0.223</td>
<td>1.000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Use of power</td>
<td>1.315 0.856</td>
<td>-0.320</td>
<td>-0.049</td>
<td>-0.217</td>
<td>0.039</td>
<td>1.000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Cultural distance</td>
<td>3.118 1.909</td>
<td>-0.426</td>
<td>-0.029</td>
<td>-0.199</td>
<td>0.217</td>
<td>0.385</td>
<td>1.000</td>
<td></td>
</tr>
<tr>
<td>7. Importance partner</td>
<td>3.798 1.389</td>
<td>0.120</td>
<td>-0.001</td>
<td>0.023</td>
<td>0.059</td>
<td>-0.015</td>
<td>-0.034</td>
<td>1.000</td>
</tr>
<tr>
<td>8. Importance institutions</td>
<td>4.151 1.201</td>
<td>0.129</td>
<td>-0.082</td>
<td>-0.205</td>
<td>-0.130</td>
<td>-0.100</td>
<td>-0.260</td>
<td>0.072</td>
</tr>
<tr>
<td>9. Size &amp; self firm</td>
<td>6.711 2.295</td>
<td>-0.001</td>
<td>-0.080</td>
<td>-0.015</td>
<td>-0.025</td>
<td>-0.015</td>
<td>-0.020</td>
<td>0.073</td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01
Table 3. Third parties and Interorganizational Trust in High-Tech Alliances

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>22.38 ***</td>
<td>22.38 ***</td>
</tr>
<tr>
<td>(0.98)</td>
<td>(0.98)</td>
<td></td>
</tr>
<tr>
<td>Control variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm size focal</td>
<td>–0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>organization</td>
<td>(0.08)</td>
<td>(0.06)</td>
</tr>
<tr>
<td>Value of the alliance</td>
<td>0.13 **</td>
<td>0.14 ***</td>
</tr>
<tr>
<td>partner</td>
<td>(0.13)</td>
<td>(0.10)</td>
</tr>
<tr>
<td>Relative importance of</td>
<td>0.20 ***</td>
<td>0.12 ***</td>
</tr>
<tr>
<td>institutions</td>
<td>(0.15)</td>
<td>(0.12)</td>
</tr>
<tr>
<td>Independent variables</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Contracting process ×</td>
<td>–2.6 ***</td>
<td>–2.6 ***</td>
</tr>
<tr>
<td>(1 – go-between)</td>
<td>(0.13)</td>
<td>(0.13)</td>
</tr>
<tr>
<td>Active contract use ×</td>
<td>–1.4 **</td>
<td>–1.4 **</td>
</tr>
<tr>
<td>(1 – go-between)</td>
<td>(0.13)</td>
<td>(0.13)</td>
</tr>
<tr>
<td>Use of power × (1</td>
<td>–2.2 ***</td>
<td>–2.2 ***</td>
</tr>
<tr>
<td>– go-between)</td>
<td>(0.25)</td>
<td>(0.25)</td>
</tr>
<tr>
<td>Cultural distance × (1</td>
<td>–5.4 ***</td>
<td>–5.4 ***</td>
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<tr>
<td>– go-between)</td>
<td>(0.12)</td>
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<tr>
<td>Contracting process ×</td>
<td>–0.7</td>
<td>–0.7</td>
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<tr>
<td>go-between</td>
<td>(0.14)</td>
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<tr>
<td>Active contract use ×</td>
<td>–0.1</td>
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<tr>
<td>go-between</td>
<td>(0.13)</td>
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<tr>
<td>Use of power × go-between</td>
<td>–0.5</td>
<td>–0.5</td>
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<td>(0.27)</td>
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<td>Cultural distance × go-between</td>
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<td>Model fit indices</td>
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<tr>
<td>$R^2$</td>
<td>0.06</td>
<td>0.46</td>
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<tr>
<td>Adj. $R^2$</td>
<td>0.05</td>
<td>0.44</td>
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<tr>
<td>$F$</td>
<td>7.74 ***</td>
<td>28.81 ***</td>
</tr>
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* *p < 0.10; **p < 0.05; ***p < 0.01

The entries in the table are standardized coefficients (βs). The numbers in brackets are standard errors.

The various fit parameters show that our models increasingly fit the data better. Conclusions from the empirical results are twofold. First, as expected, the disruptive events of legal haggling, power play, and cultural distance do have a detrimental effect on interorganisational trust, if no use is made of an intermediary. The effects in Model 2 report a negative and strongly significant effect of legal haggling within the contracting process ($\beta = -0.26$, $p < .01$) and by the active use of contracts to i.e. enforce behaviour ($\beta = -0.14$, $p < .05$), power play by the alliance partner ($\beta = -0.22$, $p < .01$), and cultural distance between the alliance partners ($\beta = -0.54$, $p < .01$).
p < .01). Second, the empirical results confirm three of the four mitigating roles of third parties. That is, Model 2 shows that in those cases where a third party is involved, the two dimensions of legal haggling have a negative but non-significant effect on interorganizational trust (β = –0.07, n.s.; and β = –0.01, n.s.). A similar conclusion can be obtained for the impact of power play: with a third party involved, the significant effect is transformed into a non-significant relationship (β = –0.05, n.s.). For cultural distance, however, we cannot find a difference in the effects without and with the use of third parties. This may indicate that third parties did not manage to solve such problems. However, there is another possibility. The question concerning cultural distance was whether differences in culture affect trust. Perhaps third parties manage to reduce cultural difference and what we see here is the effect of any remaining difference that they did not manage to eliminate. Then using a third party should have a negative effect on cultural distance. We tested for this, again using the control variables, and indeed a negative effect on cultural distance of using a third party was found but it was not statistically significant. These third parties did not seem to be able to either reduce cultural distance or mitigate its negative effect on trust.

10.5 Conclusions
In this chapter we examined the role that third parties can play in repairing trust in high tech alliances. Collaboration is rife with triggers of suspicion under causal ambiguity and misunderstanding that a third parties may help to unravel, with expertise and a sobering attitude, taking the emotions and the sting out of mishaps that inevitably occur. Our contribution is to provide an empirical test of some of the potential roles of third parties, and drawing lessons from this for public trust.

The literature so far has categorized third parties’ roles (Howells, 2006), and has theorized their trust-mitigating role between collaborating firms (Nooteboom, 2002; Mesquita, 2007). Other literature has implicitly addressed the role of third parties by focusing on trust-restoring processes, while implicitly acknowledging the role of third parties in this process by taking this role upon themselves as independent researchers (Bijlsma-Frankema et al., 2008). Our empirical test forms a step towards substantiating the proposed roles of third parties identified in these earlier studies.

On the basis of our empirical study we conclude the following. First, as expected, legal haggling, power play and cultural distance have a negative effect on trust between alliance partners. Second, with the involvement of third parties, these negative effects can in two out of three cases be eliminated. With regard to legal haggling, we conclude that both the process of drawing up a contract and its actual use tend to evoke distrust, unless a third party steers it clear from suspicion, presumably by
eliminating misunderstandings, clarifying causes of disappointed expectations, and for instance helping to negotiate altered conditions. This, we believe, is an important result. It is partly in line with earlier views of contract use as an action of last resort, but corrects it with the finding that under the guidance of a third parties it need not harm trust.

We find a similar result for power play. Apparently, pressure by one party, seeking to impose its views on the other, may not be seen as threatening if third parties can help to clarify intentions or help negotiate conditions. Demands may be prejudged as power play until an objective outsider can show that they are reasonable or necessary, or will be compensated. The third party can also prevent demands that are indeed unreasonable. We can imagine that this occurs especially in innovation. There, the third parties may be needed to clarify why something seemingly irregular does make sense, or why one should work towards deadlines and budgets where there might still be so much to explore.

Last, we found that cultural distance also yields a problem. This, however, could not be mitigated by the use of a third party. Seemingly, cultural mind frames can be persistent, and the gaps between them difficult to bridge for a third party. A possible explanation for this is that legal and power struggles relate to the business side, rather than the personal side of the relationship and hence have no direct relation with the cultural and internalized values, beliefs, and understandings of the parties involved. Legal and power issues can be discussed and (re)negotiated, whereas cultural differences lie closer to the heart and rest on personal and stable beliefs and interpretations. Even with the help of third parties, it will be difficult to re-interpret situations which conflict with parties’ beliefs and values.

10.6 Lessons for public trust - avenues for further research
Whereas a study of trust in high tech alliances cannot be linearly extrapolated into the domain of public trust, it can inspire some basic conditions and principles of roles that third parties may have in supporting or restoring public trust. The lessons from the interfirm context as such help to formulate a research agenda for public trust.

As argued in this chapter, it is especially in situations where trust is under pressure that the role of third parties becomes important, as parties themselves are too much ‘part of the problem’ to be able to for instance arbitrate, mediate, and interpret; hence such functions are better fulfilled by independent and knowledgeable third parties (Mesquita, 2007). The role of independent third parties does not only exist in the interfirm context, it also exists in the public domain to ensure trust in our institutions: rating agencies, watch dogs, financial auditors, certification offices, commissions, and
courts are some of the many organizations that fulfil the role of ‘independent third’ that can help to make, break or repair trust. An important difference between the interfirm context and the public trust domain is that, whereas the interfirm context is generally characterized by personal relationships between managers with decision power and a considerable level of mutual dependence as the rationale for collaboration, public trust is characterized by impersonal relationships and large power asymmetry. Public trust is therefore a more abstract phenomenon as it cannot relate to real trust as defined by Nooteboom (2002). Real or thick trust relates to trust that is personal and specific to the exchange relationship (Deutsch 1973; Shapiro 1987). This coins the complex question how public trust can be supported or repaired, and how third parties can assist in this process.

In a similar vein, third parties in interfirm relationships are often trusted persons or experts, whereas in public trust the third party appears more like a function: general ratings and comparisons for customer products, certifications and audits for business performance, and for instance watchdogs and financial authorities for market and price fixing. In the terms of Nooteboom (2002), public trust therefore has its base in macro sources of trust which are general and impersonal, and not specific to an exchange relation (Williams 1998; Bachmann 1998). Macro sources arise from the institutional environment of laws, norms, values, standards, and agencies for their enforcement. This yields ‘institution-based’ or ‘thin’ trust. Thin trust is ‘borrowed’ from the trust we have in those institutions that verify, support or enforce the trustworthiness of people and organizations. This coins the question on how the function of an independent and impartial third party can prosper in absence of personal relationships. Can the role of third parties to build, maintain or repair trust be fulfilled by impersonal institutions?

Whereas any extrapolation from interfirm to public trust should bear in mind the above questions, we do believe that there are lessons that can be learned from the interfirm context. First, and most important, are the conditions for a third party to be effective in building, maintaining or restoring trust. Third parties should be impartial and independent as trust suffers from causal ambiguity (Nooteboom 2002). Third party roles facilitating the relationship between business and society do exist, but generally fail to meet the requirement of impartiality and independence. Consumer organisations defend the interests of customers, rating agencies are paid by the companies they rate, and brokers and advisors of for example pensions and financial products are incentivized by sales commissions on the most profitable products. This raises the question as to which third parties are actually actively playing a role in supporting public trust, and which additional functions are needed to restore the current trust crisis.

Our empirical research into trust break-down in high tech alliances as a result of legal
haggling, power play and cultural quarrels, leads to more specific suggestions and considerations for the study of public trust. Whereas the lessons above mainly related to the conditions that a third party should adhere to (independent and personal), the lessons from the specific relational problems (power play, legal haggling and cultural struggles) relate more to some basic principles that play a role in trust-break down and repair, such as power asymmetry and fairness. We draw on these lessons to formulate further research questions on how these principles pan out in the public trust domain.

First, legal haggling in an interfirm context supposes that contracts can be (re)negotiated with an eye on mutual interests and fairness. In public trust, the (re)negotiation of agreements will be hard if not impossible as the relationship is highly asymmetrical: a single consumer or citizen cannot renegotiate conditions with its large counterpart, nor defend their own interests. This is why institutions and safeguards have been put in place, such as compensation schemes for failing banks and antitrust regulations to prevent price fixing. However, individuals generally do not have a real ‘voice’ nor personal contacts with people in large organizations that are able to weigh individual interests and take decisions accordingly with mutual consent. This makes the public-business relationship a unilateral contract in which the trustor is a ‘contract-taker’, and whereby the imbalance inherent to the relationship will make it difficult to build or repair trust. This makes the individual vulnerable, and trust very fragile. One way to deal with this vulnerability is to try and establish beforehand the trustworthiness of the trustee. The fast rise of providers of independent and impartial information on e.g. the internet (rating and review websites) can be seen as an illustration of this quest for information. An interesting avenue for further research is to see which parties fulfil the role of the independent third in the public domain. How? And with what effect? Further questions relate to the nature of the relationship between business and society: How can trust function when unilateral contracts and impersonal contacts characterize the relationship? And what is the role of ‘thin’ trust and institutions in this context?

Second, power play was found detrimental to the relationships, but the negative effects could be eliminated by the involvement of a third party. In the interfirm context, issues arising from power play could be steered clear from conflict by moderating dependence, for instance through the reputation mechanism. The business- society relationship is characterized by a large power distance, whereby asymmetry is the logical consequence of modern business. Asymmetry, however, is known to greatly hinder trust build-up and lead to defensive behaviour, lack of openness and destructive conflict (Klein Woolthuis et al., 2005). Like in the interfirm domain, power symmetry also appears a problem in the business- society interface. There is a growing trend of large citizen- and consumer movements conquering the hegemony of large business
by for instance organizing customer boycotts and cyber attacks. However, like with legal haggling, a ‘real’ third party function, that should focus on moderating power distance through alignment of interests, is lacking. Instead, the mediating ‘third’ is often organized according to an ‘us’ versus ‘them’ logic, whereas the real challenge lies in the creation of value for all stakeholders involved. Promising in this respect are the new business models evolving around the concept of shared value (Porter & Kramer, 2011) in which the creation of value for all is the central aim. This aligns interests and supports (public) trust as direct relationships are restored between business and its stakeholders (Senge, Kruschwitz, Smith, Laur, & Schley, 2010). Whereas front runner organizations are quick to adapt these new business models, the question remains how the general break-down of public trust can be countered, and what the role of third parties could be in aligning interests to facilitate this process. Like in the interfirm context, reputation mechanisms can be used to affect the legitimacy of organizations, and this function has spontaneously evolved into for instance online forums where experiences are shared and reputations can be made or broken. Are such functions sufficiently effective to moderate the power asymmetry between business and society? Which other mechanisms exist to mediate power asymmetry? Which role could third parties play in this process and how could they weigh and align interests? And, how can institutions, but also sanctions and safeguards, be employed to prevent power play?

Lastly, cultural distance might hamper public trust. This is a deeper problem than a superficial alignment of consumer products to local preferences or speaking the other’s language. It refers to fundamental differences in norms, values and beliefs that can lead to a break-down of trust. In our study we found that the negative effect of cultural distance could not be eliminated by third party involvement. We believe that the same will hold true for public trust. A breach of trust resulting from issues such as excessive executive bonuses whilst ‘normal people’ are losing their pensions cannot be repaired by outsiders. These situations conflict with common norms and values and are hence perceived as morally wrong. No logical, nor any independent explanation can counter such deeply anchored emotional judgement. It is hence up to businesses to realign their business models to the prevailing norms and values in society at large to repair public trust. This chapter contributes to this aim by identifying some of the key problems in the trust relationship between business and society, giving leads to redesign the business – society relationship, and defining roles and conditions for third party involvement in public trust.
CHAPTER 11. DYNAMICS OF STRATEGIC ALLIANCES

Summary
This chapter challenges the received view that long-term supply relationships are a typically Japanese feature, embedded and developed in a typically Japanese society characterized by high levels of trust and cooperation, and for that reason cannot be established in the typically a-cooperative, competitive and low trust Western world of the United States and Europe. Our results from the automobile industry show that (i) suppliers in all three continents are involved in durable relationships, and (ii) that the governance of these business relationships is by and large the same. The few differences that remain are interesting. In our interpretation they suggest that perhaps in the US a ‘third way’ of relationship management has been found. This ‘third way’ combines the advantages of sufficiently durable relations with the advantages of an open system with a variety of relations that benefits innovation. If our interpretation is correct the historical situation may have reversed: for the governance of durable relationships Japanese firms may now learn from U.S. firms.

Keywords: long-term supply relationships, Japan, USA, Europe, automobile industries

11.1 Introduction
The received view on durable supply relationships is that they are a specifically Japanese feature, embedded and developed in a typically Japanese society characterized by high levels of trust, cooperation and interdependence (Dore, 1983; Hofstede, 1980; Smitka, 1991; Cusumano, 1985; Nishiguchi, 1994; Fruin, 1994; Dyer, 1997). Moreover, this form of industrial organization supposedly does work in Japan but not elsewhere in the world. Attempts by Western companies to imitate or copy Japanese business norms are costly and difficult because the way in which supply relationships developed in Japan is path-dependent i.e. they are enabled by the Japanese specific cultural features, politics, regulation, networks and corporate ethics. Smitka (1991), for example, argues that ‘governance by trust’ is more prevalent in the Japanese than in the U.S. automobile industry due to the existence of suppliers’ associations in Japan and their absence in the U.S.

Despite the arguments above there is increasing evidence that Western firms successfully develop sustainable coalitions. In particular in the automobile industry producers have changed their short-term orientation with their suppliers towards more commitment, in more durable relationships (Clark, 1989; Sako, 1992; Helper, 1994). The present study seeks to understand and assess these developments in a new way, compared to earlier work on the same subject (Heide & John, 1990; Cusumano & Takeishi, 1991; Deyer & Ouchi, 1993; Sako and Helper, 1998; Kamath & Liker, 1994). The novelty of our contribution is twofold.
First, we take into account a variety of interlocking, and partly circular, causal relations between composite constructs of relationships. For example, one of the hypotheses, derived from transaction cost economics (TCE), is that dedicated investments increase dependence, and hence risk of hold-up. However, they can also increase one’s unique value for the partner, thus increasing his dependence, which increases his commitment, which reduces hold-up risk. Further examples will emerge from our empirical analysis. To test our model we employ LISREL, which is an appropriate tool to analyze complex and sometimes circular patterns of causation.

Second, we include issues of ‘competence’ (learning and innovation) next to issues of ‘governance’. Williamson (1999) pleaded for the building of bridges between the competence and governance perspectives and we aim to contribute to that. More in particular, our analysis of long-term supply relationships is conducted on an interdisciplinary basis combining perspectives of governance with learning and innovation, and social exchange (trust and commitment) into a coherent model. The model incorporates a set of economic and non-economic motives that drive durable supply relationships.

We test our model with detailed information on 553, 450 and 226 supply relationships in the U.S., Japanese and European automobile industry. When comparing the results for the three regions we find differences that seem small, relative to the received views on systemic differences between ‘Japanese’ and ‘Western’ contracting. Our results indicate that in each of the three regions a common, underlying causal structure of durable relationships exists. Hence, suppliers in all three regions are involved in durables coalitions and the governance of these business relationships is by and large the same. This finding challenges the ‘embeddedness’ perspective according to which durable relationships are an exclusively Japanese phenomenon. However, from the empirical evidence we identify a few remaining differences between Japan and the West that may be important. Our interpretation is that they suggest that in the U.S. perhaps a ‘third way’ has been found (cf. Nooteboom, 1998). This ‘third way’ of relationship management combines the advantages of sufficiently durable relations with the advantages of an open system with a variety of relations that benefits innovation. If our interpretation is correct the historical situation may have reversed: for the governance of durable relationships Japanese firms may now learn from U.S. firms.

The structure of the chapter is as follows. In section 2, we discuss the theoretical foundations for this study. Section 3 specifies the focal constructs and hypotheses. In section 4, we describe our research methodology, while we present our results in section 5. We end with a discussion, limitations and further research issues in section 6.
11.2 Theory

*Transaction cost economics*

Based on Williamson (1985) we employ some of the insights of transaction cost economics (TCE). More in particular we incorporate the notions of dedicated investments and the hold-up problem.

The transaction is the basic unit of analysis in TCE and each transaction shares costs. Furthermore, human nature ‘as we know it’ is characterized by opportunism (i.e. self-interest seeking with guile) and bounded rationality. TCE suggests that there are rational economic (i.e. efficiency) reasons for organizing some transactions this way and other transactions another. The different forms of governance are due to the different combinations of three principal dimensions for describing transactions: frequency of exchange, the level of specialized assets, and uncertainty. Asset specificity is the most important but it only takes on importance in conjunction with opportunism and bounded rationality, which follows from uncertainty. Specialized assets are the result of dedicated investments that are specifically undertaken in support of a particular transaction.

The market is the main governance structure for non-specific transactions of both occasional and recurrent transactions. However, the incentives for trading will weaken as transactions become increasingly more specific. Rational firms will not make dedicated investments unless the resulting transaction-specific assets can be safeguarded against the hazards of opportunism. Hence, the core insight from TCE is that dedicated investments create dependence, resulting in a risk of hold-up. Given the hazards of opportunism, this risk must be governed for which different mechanisms such as contracts and integration can be applied. To the extent that there is uncertainty concerning motives and conditions of collaboration, it is difficult to control risk by closed contingent contracts. High uncertainty will require other forms of bilateral governance such as hostages or vertical integration to control it. Vertical integration is the most powerful mechanism because it gives the customer the best control and ability to monitor the supplier’s behavior.¹ Later we will propose that also from the perspective of learning and innovation, the relevance of specific assets remains. In fact, we will argue that new categories of specific investments emerge.

Various scholars have argued that TCE is incomplete concerning innovation and learning and the role of non-economic, relational factors such as commitment and trust (Bradach & Eccles, 1989; Powel, 1990; Nooteboom, 2002). We consider trust and commitment to be important, because supposedly these features play a great role in Japanese contracting and we do not want to exclude them at forehand from

¹ In this chapter we neither study contracts (see the arguments in a later section) nor vertical integration. We analyze durable relationships between two interdependent but autonomous entities (cf. Fruin, 1992).
the analysis. Hence, contrary to TCE (Williamson, 1993) we hypothesize that in the governance of long-term supply relationships trust and loyalty matters.

In our analysis of durable relations in the automobile industry innovation is important. Since the beginning of the 1980s, the automobile industry has gone through a period of rapid technological, commercial and organizational change. TCE, however, has little to say about the development of novel competencies. As Williamson (1985, p. 143) himself concluded: “...the study of economic organization in a regime of rapid innovation poses much more difficult issues than those addressed here”. Later Williamson (1999, p. 1103) again argued that TCE “...makes only limited contact with the subject of learning”, and proposed that bridges should be built between the competence and governance perspectives. The next section addresses this issue.

**Competence theory**

While TCE focuses on static efficiency –efficiency is maximized by trading off production costs, transaction costs and costs of organization, given a certain state of knowledge, technology and preference– we employ a perspective of dynamic efficiency or innovation, incorporating shifts of knowledge, technology and preferences.

In many industries the current shift from ‘making’ to ‘buying’ is best explained on the basis of dynamic efficiency. In order to be at the forefront of development –and to maintain flexibility of configurations of competencies, for the sake of innovation– a producer should concentrate on the activities at which he is best and outsource the other activities as much as strategically possible. Furthermore, in order to reduce development times of new products and to reduce risks of maladjustment to customer needs, the supplier should be brought in as a partner in developing and launching a new product. Ongoing interaction between a customer and a supplier is a necessary condition in order to share and develop competencies.

By securing interfirm collaboration the resources of a firm can be refined and refocused. This will enhance knowledge-building and organizational competencies. In other words, durable relations are a basis for extending inter- and intrafirm capabilities because internal resources are increasingly connected with those of another enterprise.

The importance of complementary competencies is underpinned by a theory of knowledge. This theory suggests that people’s perceptions and interpretations are dependent on mental frameworks that in turn depend on idiosyncratic experience (Nooteboom, 2000). Those frameworks constitute absorptive capacity (Cohen & Levinthal, 1990). The need to create a common focus, in order to achieve common goals, is more fundamental for organizations than the need to reduce transaction costs. This is the idea of an organization as a ‘sense making system’ (Weick, 1995),
a ‘focusing device’ (Nooeeboom, 1992, 1999), or an ‘interpretation system’ (Choo, 1998). However, such organizational focus creates a risk of myopia, which needs to be repaired by employing complementary cognition from appropriate partners. Such complementary cognition must be at a ‘cognitive distance’ that is sufficiently large to yield novel insight and sufficiently small to ensure that it is still comprehensible. Competencies are not off-the-shelf products but are embedded in the heads and hands of people, in teams, organizational structure and procedures, and in organizational culture. They often have a strong tacit dimension. Their development is path-dependent in the sense that they are contingent upon preceding firm-specific assets and organizational learning (cf. Lippman & Rumelt, 1982). In the case of tacit knowledge, ongoing interaction is needed to enable the transfer of knowledge. The linkage between firms with different complementary perspectives and competencies requires appropriate absorptive capacity and a shared language for communication. This takes time to develop, on the basis of interaction, and represents a dedicated investment. For that reason business relations have to last a sufficiently long time to make the investment worthwhile.

In sum, from the competence view we take the idea that nowadays (i.e. under a regime of rapid innovations) inter-firm relations exist primarily for learning and for competence development. These arise by interaction, in the use of cognitive variety, which requires (dedicated) investments in mutual understanding.

Social exchange theory
In line with other scholars that study interfirm relationships we argue that we need to consider not incidental and unrelated transactions as in transaction cost economics, but transactions in the setting of an exchange relationship that develops in time (Granovetter, 1985; Helper, 1987; Ring & Van de Ven, 1992; Sako, 1992; Gulati, 1995). Not the transaction –as in Williamson’s theory– but the relationship needs to be the unit of analysis. One reason for this was argued in the previous section: the need to develop and recoup dedicated investments in the building, exchange, absorption and utilization of complementary competences.

In addition to that, an important cause as well as a consequence of repeated interaction among firms is the emergence of commitment, as a basis for trust. Commitment is an important safeguard for relational continuity. A committed partner does not immediately exit from the relationship in case of (unforeseen) problems, but engages in ‘voice’ (Hirschman, 1979; Helper, 1987). Trust is a complex concept and because of space limitations it cannot be fully discussed here (for detailed discussions, see Gambetta, 1988; Kramer et al., 1996; Nooteboom, 2002).

Trust and commitment can have both a calculative and an affective basis. Commitment
may result from habitualization (Gulati, 1995; Geyskens et al., 1996). Also, as a relationship develops, partners begin to know each other better, in the development of empathy, and can better assess the extent and limits of trustworthiness (‘knowledge based trust’). Convergence of cognitive frameworks may arise, and this can lead to mutual identification (‘identification based trust’, cf. Lewicki & Bunker, 1996). Mutual identification means that partners can identify and understand each other’s goals, weaknesses, and mistakes. They are able to engage in the give and take of voice. This not necessarily means that they always agree. There may be sharp disagreements, but those are combined with a willingness to express them and to discuss them more or less openly, while extending mutual benefit of the doubt. As a result, conflicts may deepen the relationship rather than breaking it.

Mutual openness is essential to the building of trust (Zand, 1972). An extensive communication system is necessary to facilitate the rich flow of information needed for the ‘let’s work things out’ approach of the voice strategy. This information flow both requires and engenders a high degree of commitment to the relationship. The development of relation-specific trust also entails a specific investment. Having gone through it, one will face switching costs in going to another partner and having to go through it again. In contrast, an exit-based strategy requires low commitment, so as to maintain the credibility of the threat to leave.

This does not entail that relations should last endlessly. Indeed, relations can become too durable, with too much mutual identification and trust, yielding rigidities and lack of the variety that is needed for learning. In our view, relationships should last sufficiently long to recoup the investments necessary for high added value and learning by interaction, but not longer than that.

To summarize, from social exchange theory we incorporate the idea that trust is necessary and feasible, and that it can develop in mutual dependence, in growing mutual commitment.

**Synthesis**

An essential difference between TCE on the one hand and both the competence perspective and social exchange theory on the other hand is that the former only studies outcomes, which are supposedly efficient, while the latter look at processes, which may or may not lead to efficient outcomes. We take the competence perspective as our basic framework, supported by the constructivist theory of knowledge that we summarized. Thereby we put value of partners to each other, and perspectives for competence development, center stage. To this we add the insights of social exchange.
The competency perspective and social exchange theory are consistent in their process approach. In social exchange theory the development of trust fits well with the perspective of learning by interaction that we adopt as a basis for the competence approach. In the development of relations it is in our view crucial that partners invest in each other to utilize opportunities from complementary competencies, in joint competence development. This yields mutual dependence, which in turn creates commitment. These specific investments take on new forms. From the competence perspective they include investments in mutual understanding. From the social exchange perspective they include investments in the building of loyalty and trust. In line with TCE, we grant that there may be a relational risk of hold-up in such dedicated investments and this risk must be safeguarded.

According to TCE a contract is an important safeguarding mechanism and needs to be in place whenever dedicated investments are involved. Contracts reduce opportunities for opportunism. Therefore, TCE suggests studying the role of contracts in situation like ours that involve dedicated investments. In our view, however, contracts as safeguards have only limited viability. This derives from Macauley (1963) who already indicated the limited significance of contracts.

Firms involved in durable relations often use contracts. There will seldom be no contract at all. However, contracts may have several parts and may serve a variety of purposes. One purpose is technical i.e. to serve as a mere record to support memory, like the minutes of a meeting. In that case the content of a contract can be quite extensive in particular if the interface between business partners is technically complex. Another purpose of a contract may be symbolic i.e. as the seal of a psychological rather than a legal contract, or as a ritual of agreement. This type of contract tends to be very limited in content. Finally, a contract may indeed have the purpose intended by transaction cost economics i.e. to safeguard against possible opportunism.

To find out what the role of a contract is, one cannot simply record whether a contract is in place. Nor is it sufficient to measure the size of the contract, since extensive contracts may have the purpose not of safeguarding against opportunism but as a record for technical coordination. In fact, contracts often lack the detailed contractual safeguards that transaction cost economics suggest. Such safeguards are inevitably incomplete, the more so to the extent that there is uncertainty and when innovation is the purpose of the relationship. It can be very costly to monitor contracts and to re-specify the content when circumstances change. Finally, contracts can be a source for mutual distrust when applied strictly to an agreement.

Hence, because of a lack of a relevant measure of contracts we do not include a hypothesis stating that dedicated investments lead to contracts for safeguarding. Nevertheless, the principle of safeguarding remains important but we will show that
it can be achieved by other means than contracts.

Our main hypotheses are as follows:

(1) From TCE: a positive effect of dedicated investments on relational risk, and a negative effect of relational risk on dedicated investments.

(2) From the competence perspective: a positive effect of (potential) value of the partner, including future perspectives (for competence development), on dedicated investments, a positive effect of dedicated investments on value to the partner, and a positive effect of his commitment on his value.

(3) From the social exchange perspective: a positive effect of one’s value to a partner on his dependence, and of his dependence on his commitment (loyalty), and a negative effect of his commitment on relational risk.

The hypotheses are illustrated in figure 1, which is discussed in more detail in the next section.

*Figure 1. The Structural Model of Long-Term Supply Relationships*
11.3 The structural model
This section embeds our key constructs and hypotheses in the empirical literature on interorganizational relationships.

Constructs
Dedicated investments, as a core concept of transaction cost economics, has been extensively employed in empirical research on transaction-cost explanations of vertical integration (e.g. Monteverde & Teece, 1982; Levy, 1984; Anderson, 1985; John & Weitz, 1988; Anderson & Weitz, 1989) and relational governance (e.g. Dwyer et al., 1987; Zaheer & Venkatraman, 1995; Berger, Noorderhaven, & Nooteboom, 1995). With few exceptions, strong support is found for the expected effect of dedicated investments. They increase (perceived) relational risk of dependence (hold-up), and this tends to stimulate organizational integration, which confirms the TCE part of our hypotheses. Heide & John (1990) found that dedicated investments also increase the extent of joint action. Further, they find that the supplier’s investments in dedicated assets increase the expectations of relationship continuity. This is consistent with both the competence theory and TCE. According to TCE specific investments yield a need for a relationship to last sufficiently long to recoup the dedicated investments. According to the competence perspective, dedicated investments are used to create durable relations for the development of competencies.

Following TCE, one effect of specific investments is switching costs, which yields dependence. Heide (1994) uses the replaceability of the firm’s existing partner as a measure of the firm’s dependence and shows that unilateral dependence undermines opportunities of flexibility. However, he also finds that symmetric and high dependence promotes opportunities of flexibility. In a similar vein, Buchanan (1992) finds that high mutual dependence enhances performance. Some studies on interorganizational exchange also incorporate the concepts of ‘total interdependence’ and ‘interdependence asymmetry’. The former is the sum of both firm’s dependence, and the latter is the difference in dependence on the two sides of a dyad. Kumar et al. (1995) show that total interdependence in a channel relationship has a positive effect on commitment. Further, they find that greater interdependence asymmetry increases conflict and decreases commitment. Geyskens et al. (1996) show that greater total interdependence increases both ‘affective’ and ‘calculative’ commitment. Berger et al. (1995) found similar effects on supplier’s perceived dependence and supplier’s net dependence (excess of own dependence over buyer’s dependence). Thus the evidence suggests that while specific assets yield switching costs – which yields dependence, which increases relational risk – dependence may also yield commitment, which reduces relational risk. Therefore, we will test whether specific investments have a dual effect: a positive effect on relational risk, and an indirect negative effect, through
a positive effect on commitment.

Value, including perspectives for future development, is key in the competence perspective. It is also another source of dependence. To the extent that a partner yields more unique value, in competencies that are difficult to imitate, one becomes more dependent. In fact, the previous indirect negative effect of specific investments on relational risk is likely to operate through value: specific investments increase the unique value to the partner, who thereby becomes more committed, which reduces relational risk. Value is defined as the competencies partners offer each other. Besides productive efficiency, value includes many more dimensions such as developmental capacity, value as a source of learning (innovative capabilities), international presence, and continuity.

The negative effect of dependence on relational risk is supposed to operate through commitment. Customer’s commitment is defined as the customer’s efforts to maintain and continue the relationship (cf. Helper, 1987). This brings it close to loyalty, and hence to trust, interpreted as perceived loyalty. Most empirical studies find strong support for the expected positive effect of trust on ‘continuance’ commitment (e.g. Anderson & Weitz, 1989; Morgan & Hunt, 1994). Geyskens et al. (1996) find that commitment is greater when total interdependence is higher and that when asymmetry increases, commitment decreases for the less dependent party and increases for the more dependent party. Nooteboom et al. (1997) find confirmation of the expectation that trust has a negative effect on the perceived probability of relational loss.

Expectations of the future, or the ‘shadow of the future’, has an important impact (Macneil, 1974; Heide & Miner, 1992). The supplier’s future perspectives is defined as the supplier’s expected continuation of the relationship with the dedicated customer of the focal dyad at a given point in time (cf. Parkhe, 1993). Heide & Miner (1992) find support for the hypothesis that anticipated open-ended future interaction, which they define as ‘extendedness’, increases the chance of a pattern of cooperative behavior. Parkhe (1993) also showed that cooperative performance is promoted the longer the ‘shadow of the future’. Anderson & Weitz (1989) found that expectations of open-ended interaction between buyers and suppliers have a positive influence on the supplier’s investments in dedicated assets. This is consistent with the theory and experiments on repeated games, which show that greater expectations of relational continuity increase collaboration (Axelrod, 1984; Heide & John, 1990). Hence, future perspectives are expected to have two effects. First, from a competence perspective, they make the partner more attractive, so that it becomes more worthwhile to engage in specific investments. Second, the ‘shadow of the future’ reduces the risk associated with dedicated investments.
The Structural Model

In our model we explicitly relate economic with non-economic, relational factors. Most of the causal relationships between our constructs have been well documented in the literature. Therefore, we will only briefly discuss our hypotheses with regard to these associations (see Figure 1).

Concerning the determinants and consequences of dedicated investments we hypothesize:-

H1A Supplier’s dedicated investments will have a positive effect on supplier’s dependence.
H1B Supplier’s future perspectives will have a positive effect on supplier’s dedicated investments.
H1C Customer’s value to the supplier will have a positive effect on supplier’s dedicated investments.

We propose several determinants of dedicated investments. Firstly, there must be future perspectives, i.e. the perspective of future exchange is needed for the development of competencies to ensure that dedicated assets will be recouped (Hypothesis 1B). A second determinant comes from the competence perspective, where value of the partner is the core concept. The customer’s value to the supplier can be defined as all skills, competencies, and capabilities the customer can offer the supplier. The more important the customer is to the supplier, the more incentives the supplier will have to invest in the relationship to make sure that the relationship continues and it maintains access to the customer’s resources. This yields Hypothesis 1C.

The hypotheses concerning supplier’s value to the customer are as follows:-

H2A Supplier’s dedicated investments will have a positive effect on supplier’s value to the customer.
H2B Supplier’s value to the customer will have a positive effect on customer’s dependence.

TCE is certainly correct to argue that dedicated investments create risks of dependence. However, dedicated investments also create value and this may create countervailing dependence. When the supplier makes dedicated investments, he will be better able to perform tasks that are geared to the specific needs of the buyer, and therefore the supplier’s value to the customer will increase (Hypothesis 2A). An example of the two-sided effect of dedicated investments, i.e. on supplier dependence and on its value to the customer, is Toyota’s customer-supplier just-in-time (JIT) system (Dyer & Ouchi, 1993). For JIT to be in place, customized investments are necessary to be able to realize organizational input (division of labor, cycle times, and staff
training), information systems, plants and other flexible manufacturing systems. These investments are often not readily applicable to other partners. The customized investments, however, also create value because they reduce complexity and costs by eliminating inventories and work in progress. This ensures that there are no unnecessary buffer stocks, distribution facilities or quality inspections. Thus we hypothesize that value created by the supplier for the customer increases the latter’s dependence (Hypothesis 2B).

The antecedent and two consequences of customer’s commitment are as follows:-
H3A Customer’s dependence will have a positive effect on customer’s commitment.
H3B Customer’s commitment will have a positive effect on customer’s value to the supplier.
H3C Customer’s commitment will have a positive effect on supplier’s future perspectives.

Thus far we have considered risks, safeguards, and the development of competencies. Next, we turn to customer’s commitment, i.e. the customer’s motivation to continue the relationship with a supplier. Calculative commitment refers to the customer’s need to maintain the relationship given the anticipated switching costs associated with leaving (cf. Geyskens et al., 1996). It is the result of the calculation of costs and benefits, including an assessment of the investments made in the relationship and the ability to replace or make up for the foregone investments should the relationship be terminated. Hence, the greater the customer’s dependence, the greater the customer’s commitment (Hypothesis 3A). As explained by Helper (1987) in her exit-voice approach, customer’s commitment refers to all the customer’s efforts to work out problems with the supplier rather than ending the relationship. For example, a new supplier may present itself, offering a similar product of equal quality but at a lower price than the customer’s current supplier. As a response, a committed customer will offer his current supplier assistance –for example, via specialized technical support teams– to help the current supplier to lower his price and to match his competitor’s production performance. Therefore, customer’s commitment will contribute to the customer’s value to the supplier (Hypothesis 3B). Finally, we expect the customer’s commitment to be related to the supplier’s future expectations of the relationship. Customer’s commitment is an indicator for the supplier that the customer will not end the relationship in the short run. Therefore, customer’s commitment will increase the supplier’s future perspectives. This yields Hypothesis 3C.

The hypotheses concerning relational risk are as follows:-
H4A Customer’s commitment will have a negative effect on supplier’s uncertainty avoidance.
H4B Supplier’s uncertainty avoidance will have a negative effect on supplier’s
dedicated investments.
H4C  Supplier’s dependence has a positive effect on supplier’s uncertainty avoidance.

Customer’s commitment indicates that the customer will not engage in opportunistic behavior as soon as the opportunity and an incentive for it arises. In other words, he will engage more in voice than in exit. This increases the willingness of the supplier to accept dependence (Hypothesis 4A). Supplier’s uncertainty avoidance refers to the supplier’s inclination or desire to avoid risks, in particular hold-up risk. This risk is determined by the degree to which one is dependent, as a result of dedicated investments. Hence, one way of reducing the risk of hold-up is to reduce dedicated investments and thus reduce dependence. This yields Hypothesis 4B. Suppliers dependence increases his perceived relational risk, and hence uncertainty avoidance. This is Hypothesis 4C.

The eleven hypotheses are summarized in Table 1 and together they yield our structural model of long-term supply relationships (see also Figure 1).

11.4 Research methodology
This section continues with a discussion of our research methodology, including a review of the data, the measures and the statistical methods.

Data collection
The data used to test our structural model of long-term supply relationships are derived from responses from first-tier component suppliers in the automotive industries of the U.S., Japan and Europe. For details on the sampling framework and response rates, see Appendix A.

The samples are mixed in terms of the suppliers that are involved in relationships with different lengths of duration. The focus of this chapter is to explain the nature of durable relationships in an international perspective. The mixed population may bias the results (cf. Dwyer et al., 1987; Moorman et al., 1992; Das & Teng, 2002). Therefore, we included responses from suppliers that have a relationship older than three years. It provided us with detailed information on 553, 450 and 226 long-term supply relationships in the U.S., Japan and Europe respectively.

The data employed in this study have several main advantages. First, they provide very detailed information about the relationship between a supplier and a customer, which enables us to design the constructs we are interested in. Second, many items required the respondent to score on a Likert or a semantic differential type of scale; i.e. many items refer to the perceptions of respondents. Measuring perceptions
is increasingly acknowledged as being important because it are often perceptions rather than objective criteria that drive a firm’s strategic decision-making process (Noorderhaven, 1995). Third, the data allowed us to compare long-term supply relationships in the U.S., Japan and Europe and by doing so to establish whether the received view on systemic differences between Japanese and Western subcontracting still exist. Fourth, the data concerned the automobile industry, which in all three regions is one of the main industries in terms of its contribution to gross domestic product and employment. Also, the automobile is a complex product to which supply

<table>
<thead>
<tr>
<th>No.</th>
<th>From Construct</th>
<th>Sign</th>
<th>To Construct</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Dedicated Investments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1A</td>
<td>Supplier’s dedicated investments</td>
<td>+</td>
<td>Supplier’s dependence</td>
</tr>
<tr>
<td>H1B</td>
<td>Supplier’s future perspectives</td>
<td>+</td>
<td>Supplier’s dedicated investments</td>
</tr>
<tr>
<td>H1C</td>
<td>Customer’s value to supplier</td>
<td>+</td>
<td>Supplier’s dedicated investments</td>
</tr>
<tr>
<td>II</td>
<td>Value of the Partner</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H2A</td>
<td>Supplier’s dedicated investments</td>
<td>+</td>
<td>Supplier’s value to the customer</td>
</tr>
<tr>
<td>H2B</td>
<td>Supplier’s value to the customer</td>
<td>+</td>
<td>Customer’s dependence</td>
</tr>
<tr>
<td>III</td>
<td>Commitment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3A</td>
<td>Customer’s dependence</td>
<td>+</td>
<td>Customer’s commitment</td>
</tr>
<tr>
<td>H3B</td>
<td>Customer’s commitment</td>
<td>+</td>
<td>Customer’s value to the supplier</td>
</tr>
<tr>
<td>H3C</td>
<td>Customer’s commitment</td>
<td>+</td>
<td>Supplier’s future perspectives</td>
</tr>
<tr>
<td>IV</td>
<td>Relational Risk</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H4A</td>
<td>Customer’s commitment</td>
<td>–</td>
<td>Supplier’s uncertainty avoidance</td>
</tr>
<tr>
<td>H4B</td>
<td>Supplier’s uncertainty avoidance</td>
<td>–</td>
<td>Supplier’s dedicated investments</td>
</tr>
<tr>
<td>H4C</td>
<td>Supplier’s dependence</td>
<td>+</td>
<td>Supplier’s uncertainty avoidance</td>
</tr>
</tbody>
</table>
relationships are tremendously important. An average car consists of about 15,000 components, all of which have to be produced, delivered and assembled in order to produce a well-functioning vehicle. As a result, supply does not concern mere commodities. Collaboration on the basis of dedicated investments and congruent competencies is highly relevant.

**Estimation Techniques**

This study follows the two-step approach of LISREL, separating estimates for the measurement models from the structural model (Jöreskog & Sörbom, 1993a, 1993b). Based on the definitions of the constructs we developed multi-item measures for six latent constructs i.e. for supplier’s dependence, customer’s dependence, supplier’s value, customer’s value, customer’s commitment, and supplier’s uncertainty avoidance. As usual, observed indicators that constitute the items of the survey measure these latent constructs. The other two constructs, supplier’s dedicated investments and supplier’s future perspectives, are measured by one item. Appendix B provides an overview of our constructs and the corresponding items of the survey.

For the factor-analytic measurement of the latent constructs we used LISREL’s maximum likelihood (ML) estimation procedure, based on a correlation matrix of items per construct. The acceptance levels were .30 for the factor-loadings and 2.0 for the estimated t-values. For the structural model we also used LISREL’s ML estimation procedure –based on the correlation matrix of the constructs– to obtain the standardized estimates of the parameter coefficients and the estimated t-values. This information is used to test our hypotheses. A hypothesis is confirmed if the estimated path-coefficient is significant and has the hypothesized sign. A t-value larger than 1.28 corresponds to p<.10 (weakly significant); a t-value larger than 1.65 corresponds to p<.05 (moderately significant) and a t-value larger than 2.33 to p<.01 (strongly significant). Furthermore, we used LISREL to calculate three of the most common indicators for the evaluation of the model-fit to the sample data (Boomsma, 1996; Browne & Cudeck, 1992). These model-fit indicators are the goodness-of-fit (GFI) index, the adjusted goodness-of-fit (AGFI) index, and the root mean square error of approximation (RMSEA). For the GFI and AGFI, a value greater than .90 is considered an indication of good fit. For the RMSEA, a value smaller than .08 is considered an indication of good fit.

**11.5 Results**

**Validation of the Measures**

In all three regions the items for a specific latent construct pass the various criteria i.e. the factor-loadings exceed .30 and the estimates are significant (with t-values >2.0). Table 2 gives the end results for the validation of the constructs.
A special case is the latent construct ‘supplier’s value’. Eight items were selected which were expected to measure this construct. The analysis resulted in three factors which have a clear interpretation: the supplier’s value in terms of his skills (factor 1), innovative capabilities (factor 2), and technical competencies (factor 3). It is striking that this outcome applies to all three regions. This empirically confirms the importance of different dimensions of value in terms of competencies.

Following the satisfactory results for the validation of our variables we added the scale items to obtain composite measures for the six latent constructs. The other two constructs are measured by a single item, i.e. ‘supplier’s dedicated investments’ by the amount of dedicated investments made by the supplier (logarithm scale), and ‘supplier’s future perspectives’ by the number of years the supplier expects the relationship with the customer to continue. Table 3 presents the averages for the eight constructs in the three regions (see Appendix C for the summary statistics and the correlation matrices).

**Comparing the Constructs**

In the introductionary section of this chapter we argued that much of the literature on interorganizational exchange suggests that systemic differences between the three regions exist. Supposedly, this is due to different approaches of supplier relationships, based on deep cultural and institutional differences. From that perspective, it is striking that in Table 3 most averages of the constructs for the three regions are quite close, and the differences that do arise run counter to the expectations. For example, both supplier’s and customer’s dependence, as well as customer’s commitment have similar values in the three regions. This belies the idea that in contrast with Japan, Western companies avoid dependence and commitment in supposedly ad hoc, arms-length transactions. Hence, the data show that in all three regions suppliers are involved in durable relations.
Table 2. Factor-Loadings for the Constructs (t-values within parentheses)

<table>
<thead>
<tr>
<th>No.</th>
<th>Construct</th>
<th>Item</th>
<th>USA</th>
<th>Japan</th>
<th>Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Supplier’s Dependence</td>
<td>SD1</td>
<td>.36 (4.25)</td>
<td>.32 (2.74)</td>
<td>.31 (2.36)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD2</td>
<td>.41 (6.12)</td>
<td>.34 (2.91)</td>
<td>.57 (5.24)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD3</td>
<td>.65 (7.48)</td>
<td>.59 (3.86)</td>
<td>.67 (3.56)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SD4</td>
<td>.38 (5.83)</td>
<td>.39 (3.24)</td>
<td>.34 (3.84)</td>
</tr>
<tr>
<td>02</td>
<td>Customer’s Dependence</td>
<td>CD1</td>
<td>.56 (10.18)</td>
<td>.43 (5.50)</td>
<td>.42 (3.72)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CD2</td>
<td>.56 (10.18)</td>
<td>.43 (5.50)</td>
<td>.42 (3.72)</td>
</tr>
<tr>
<td>03</td>
<td>Supplier’s Value Relative Skills</td>
<td>SV1</td>
<td>.49 (2.52)</td>
<td>.73 (3.46)</td>
<td>.32 (2.03)</td>
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<tr>
<td></td>
<td></td>
<td>SV2</td>
<td>.63 (8.71)</td>
<td>.70 (6.23)</td>
<td>.70 (6.23)</td>
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<tr>
<td></td>
<td></td>
<td>SV3</td>
<td>.78 (9.40)</td>
<td>.95 (6.49)</td>
<td>.95 (6.49)</td>
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<td></td>
<td></td>
<td>SV4</td>
<td>.91 (9.67)</td>
<td>.91 (6.49)</td>
<td>.91 (6.49)</td>
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<tr>
<td></td>
<td>Technical Competencies</td>
<td>SV5</td>
<td>.91 (9.67)</td>
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<td>.91 (6.49)</td>
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<tr>
<td></td>
<td></td>
<td>SV4</td>
<td>.43 (4.96)</td>
<td>.35 (3.92)</td>
<td>.35 (3.92)</td>
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<tr>
<td></td>
<td></td>
<td>SV5</td>
<td>.42 (4.94)</td>
<td>.98 (3.12)</td>
<td>.98 (3.12)</td>
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<tr>
<td>05</td>
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<tr>
<td></td>
<td></td>
<td>CV4</td>
<td>.58 (10.64)</td>
<td>.44 (5.33)</td>
<td>.50 (4.74)</td>
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<tr>
<td>06</td>
<td>Customer’s Commitment</td>
<td>CC1</td>
<td>.83 (14.69)</td>
<td>.47 (6.67)</td>
<td>.47 (3.89)</td>
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<td></td>
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<td>.49 (6.87)</td>
<td>.32 (2.94)</td>
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<tr>
<td></td>
<td></td>
<td>CC3</td>
<td>.46 (8.69)</td>
<td>.30 (4.56)</td>
<td>.35 (3.19)</td>
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<tr>
<td></td>
<td></td>
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<td>.50 (6.96)</td>
<td>.55 (4.21)</td>
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<td></td>
<td>Supplier’s Uncertainty Avoidance</td>
<td>SUA1</td>
<td>.67 (14.60)</td>
<td>.84 (20.64)</td>
<td>.73 (11.04)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SUA2</td>
<td>.67 (14.60)</td>
<td>.84 (20.64)</td>
<td>.73 (11.04)</td>
</tr>
</tbody>
</table>

Comparing the Constructs
In the introductory section of this chapter we argued that much of the literature on interorganizational exchange suggests that systemic differences between the three regions exist. Supposedly, this is due to different approaches of supplier relationships, based on deep cultural and institutional differences. From that perspective, it is striking that in Table 3 most averages of the constructs for the three regions are quite close, and the differences that do arise run counter to the expectations. For example, both supplier’s and customer’s dependence, as well as customer’s commitment have similar values in the three regions. This belies the idea that in contrast with Japan, Western companies avoid dependence and commitment in supposedly ad hoc, arms-
length transactions. Hence, the data show that in all three regions suppliers are involved in durable relations.

Table 3. Mean Values for the Constructs

<table>
<thead>
<tr>
<th>No</th>
<th>Construct</th>
<th>U.S.</th>
<th>Japan</th>
<th>Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Supplier’s dedicated investments</td>
<td>14.10</td>
<td>5.92</td>
<td>16.48</td>
</tr>
<tr>
<td>02</td>
<td>Supplier’s dependence</td>
<td>10.49</td>
<td>11.34</td>
<td>10.57</td>
</tr>
<tr>
<td>03</td>
<td>Customer’s dependence</td>
<td>8.09</td>
<td>8.21</td>
<td>8.28</td>
</tr>
<tr>
<td>04</td>
<td>Supplier’s value to customer</td>
<td>25.02</td>
<td>23.41</td>
<td>25.66</td>
</tr>
<tr>
<td>05</td>
<td>Customer’s value to the supplier</td>
<td>11.22</td>
<td>12.80</td>
<td>11.13</td>
</tr>
<tr>
<td>06</td>
<td>Supplier’s commitment</td>
<td>10.89</td>
<td>11.49</td>
<td>13.77</td>
</tr>
<tr>
<td>07</td>
<td>Supplier’s future perspectives</td>
<td>7.93</td>
<td>25.37</td>
<td>17.69</td>
</tr>
<tr>
<td>08</td>
<td>Supplier’s uncertainty avoidance</td>
<td>0.44</td>
<td>1.08</td>
<td>0.38</td>
</tr>
</tbody>
</table>

Concerning the observed differences, it is firstly striking that in Japan the average level of dedicated investments is much lower than of the level in the U.S. and Europe (less than a third). From the perspective of durable ‘Japanese’ buyer-supplier relations in vertically connected ‘keiretsu’ one would have expected the opposite. The difference is somewhat misleading because Japanese investments are measured in Yen (5.92, logarithm), U.S. investments in dollars (14.10, logarithm) and European investments in a collection of currencies (16.48, logarithm). However, even when we convert these figures into a common currency the same result appears: on average Japanese dedicated investments are much lower than in the U.S. and in Europe.

Secondly, Table 3 shows that customer’s commitment in Japan is hardly higher than in the U.S., and lower than in the Europe. This raises questions concerning the supposedly more ‘loyal’ relations in Japan. Thirdly, again in contrast with the received view, supplier’s uncertainty avoidance in the supposedly more ‘loyal’ Japan is not lower than in the U.S. and Europe, but twice as high. Fourthly, U.S. supplier’s value is the highest of the three regions. Finally, the fact that in Japan supplier’s future perspectives is clearly highest, followed by Europe, conforms better with the received view. On average, the Japanese suppliers in our sample expect the relationship to continue for about 25 years, the U.S. suppliers 8 years, and the European suppliers little over 17 years.

Based on these preliminary results we conclude that while perhaps in the past there might have been great differences in Japanese and Western styles of buyer-supplier relationships, there has been a certain amount of convergence towards a generic model of governance. Hence, not only in Japan but also in the West, buyer-supplier relationships are now characterized –at least in the auto industry– by significant levels
of dedicated investments, mutual dependence, and commitment from the automobile producer. Apparently, the West has learned from Japan concerning the benefits of certain durability and mutual dependence in relationships. Having said that, we do see some differences, and to investigate them further we proceed to the analysis of the causal relations between the constructs.

**Testing the Structural Model**
The estimates for our structural model are reported in Figures 2 (U.S.), 3 (Japan) and 4 (Europe). They are also brought together in Table 4. In all three regions, the values of GFI and AGFI exceed the minimum level of .90 and the values of RMSEA are less than the maximum level .08. We therefore conclude that the model fits each of the three samples well.

*Figure 2. LISREL Parameter Estimates for the U.S.*

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*a † p < .01; ** p < .05; and * p < .10*
In all regions there is strong support for the hypothesis that uncertainty avoidance has a negative effect on dedicated investments (Hypothesis 4B). One way of reducing the risk of hold-up is to reduce dedicated investments and thus reduce dependence. This, of course, is not a new insight. It confirms part of transaction cost theory thinking.

A newer result is that in all three regions supplier’s dedicated investments indeed have the double effect of increasing supplier’s dependence (Hypothesis 1A) but also supplier’s value to the customer (Hypothesis 2A). In all three regions these effects are strongly significant. This confirms our ideas about the double function of dedicated investments, i.e. they create risks because they increase the supplier’s switching costs, but they also create value, which creates mutual dependence, which mitigates risks.
There is strong support in all three regions for the hypothesis that the value of the supplier increases the dependence of the buyer (Hypothesis 2B). In all three regions there is also strong support for two of the hypotheses concerning the role of commitment: customer’s dependence increases commitment (Hypothesis 3A), and this contributes to customer’s value (Hypothesis 3B) and supplier’s future perspectives (Hypothesis 3C). However, concerning the hypothesized negative effect of customer commitment on uncertainty avoidance the evidence is mixed (Hypothesis 4A). It is weakly confirmed in the U.S., strongly confirmed in Europe, and not confirmed in Japan. Apparently, the logic of using dedicated investments to make the customer dependent and thereby to reduce relational risk does not operate in Japan.
Differences between the regions arise in the determinants of dedicated investments. As noted before, in all three regions there is strong support for the negative effect of uncertainty avoidance on dedicated investments (Hypothesis 4B). However, the regions deviate concerning the hypothesized positive effects on dedicated investments of customer value (Hypothesis 1C) and future perspectives (Hypothesis 1B). These

Table 4. Summary of the Empirical Results (t-values within parentheses)a

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a † p < .01; ** p < .05; * p < .10
are both confirmed only in the U.S., the first strongly (Hypothesis 1C: p<.01), and the second weakly (Hypothesis 1B: p<.10). In Japan the influence of future perspectives is strongly confirmed, but there is no significant effect of customer’s value. This indicates that in the U.S. dedicated investments are strongly oriented towards valuable partners, while in Japan they are more oriented towards a continuation of the relation. In Europe, neither customer value nor future perspectives seem to be an argument for suppliers to make dedicated investments. We checked whether this lack of effect might be explained by lack of variation of the two variables. We found that the coefficient of variation of customer’s value was low in Japan (0.18) relative to the U.S. (0.29) and Europe (0.25). This may explain the lack of effect in Japan but not the lack of effect in the Europe. The coefficient of variation for future perspectives was not less in the Europe (1.69), but, on the contrary, higher than in the US (0.73) and Japan (1.15).

11.6 Discussion
In the remainder, we first discuss our key contributions and the implications of our findings. Than we review our research limitations and provide suggestions for further research.

Key Contributions and Implications
This study offers four key contributions. First, our analysis of long-term supply relationships is conducted on the basis of an interdisciplinary approach. We show that perspectives concerning governance (transaction cost economics), competencies (learning and innovation), and social exchange theory can be integrated into a coherent model. By doing so, we accepted the challenge brought forward by Williamson (1999) who proposed that in a regime of rapid innovation –which particularly applies to the automobile industry– studies of organization must include governance as well as competence perspectives. From the competence view we incorporate the idea that nowadays inter-firm relations exist primarily for learning and for the development of competencies. Learning and competence development arise by interaction, in the use of cognitive variety, which requires dedicated investments in mutual understanding. From TCE we use the notions of dedicated investments and the hold-up problem. From social exchange theory we apply the insight that trust is necessary and feasible, and that it can develop in mutual dependence, in growing mutual commitment. Apart from theoretical arguments that we present, our interdisciplinary approach is also supported by the empirical results of this study. That is, most of the hypothesized causalities between the constructs are significantly confirmed in the U.S., Japan and Europe and the model fits the three different datasets well.

Second, in our structural model we take into account a variety of interlocking, and
partly circular, causal relations between different constructs that composite long-term supply relationship. We have intended to unravel and structure the web of economic and relational constructs that in interaction build long-term relationships. Many empirical studies on interorganizational exchange apply regression techniques with one dependent and two or more explanatory variables. These studies tend to ignore interaction effects between constructs. In our opinion, this type of ‘unilateral’ organization research has matured: this research offers explanations for specific features of interfirm relationships although some overall generalizations can be established (cf. Geyskens, Steenkamp & Kumar, 1998, 1999; Swan, Bowers & Richardson, 1998). To the best of our knowledge, the present chapter is one of the first that explicitly addresses interaction effects for the study of long-term supply relationships.

Third, the empirical results challenge the received view that long-term supply relationships are a typically Japanese feature, embedded and developed in a typically Japanese society and for that reason cannot be established in the competitive, low-trust Western worlds of the United States and Europe. The first indication derives from the comparison of the mean values for the constructs (see Table 3). Most of the mean values in the three regions are quite close, and the differences that do arise run counter to the expectations. Based on these results we concluded that while perhaps in the past there might have been great differences in Japanese and Western style of subcontracting relationships, there has been a certain amount of convergence towards a generic model of governance. The second indication for this conclusion derives from the results for empirical tests of the structural model. Many of our hypotheses are significantly confirmed in the U.S., Japan and Europe and the model fits the three datasets well. Hence, we find that the causal structure of long-term supply relationships is more or less the same in the Triad regions. Apparently, in the West, the car industry has learned from Japan concerning the benefits of a collaborative relationships (provided that in the past systemic differences between the Triad regions existed, that the ‘Japanese’ model was considered to be superior, and for that reason has been successfully copied by Western firms).

Fourth, we do find some differences, and those may be significant. They can be summed up as follows:-
1. In Japan, the level of dedicated investments is lower than in the West (see Table 3), and they are more based on the expected continuity of the relation, than on the value of the customer.
2. In Japan, customer’s commitment –as a result of dependence that results from dedicated investments– is not perceived to reduce relational risk.
3. In the U.S., dedicated investments are more oriented towards valuable partners.
4. In the U.S., future perspectives are the smallest among the three regions, but
it does have a weakly significant effect on dedicated investments.
5. In Europe, future perspectives takes an intermediate value and neither customer value nor future perspectives have a significant effect on dedicated investments.

The U.S. case conforms most to the expectations, confirming all hypotheses. The evidence indicates that U.S. suppliers involve in cooperative relations, focused on joint production of added value on the basis of utilizing complementary competencies. However, there still appears to be a difference in the duration of such cooperative relations, and in the scope for suppliers to choose from a variety of potential customers. In our view, this offers advantages. Relations need to be long enough to recoup dedicated investments and to build up cooperation; to achieve mutual understanding, trust and joint development. But relations may also be too long, causing undue rigidity and lack of the variety of relations that is needed for innovation (cf. Nooteboom, 1998). If it were true that in Japan suppliers are more locked into parallel, competing vertical industrial structures (keiretsu), with limited choice across the boundaries of a keiretsu, then the following would follow.

The expected effect of customer value on dedicated investments follows from the opportunity for the best suppliers to choose the most attractive customers—and to engage in more dedicated investments for them—leaving the less attractive customers to the less attractive suppliers. Those firms have less incentive to tie themselves down with dedicated investments, and they prefer to maintain an opportunity to switch to a more attractive customer later. In the Japanese system, with a narrower scope of choice limited by the boundaries of keiretsu, we would expect the effect of customer value to be less. Due to the lock-in effect of keiretsu there is less incentive for suppliers to compete for the most attractive customers by engaging in more dedicated investments. As a result, the average level of dedicated investments is lower. With a limited choice of customers, suppliers can only be enticed to engage more in dedicated investments by offering better conditions in terms of a durable relation, guaranteed by high commitment. This explanation is confirmed by the fact that in Japan the coefficient of variation of customer value (0.18) is less than in the U.S. (0.29). Thus dedicated investments depend only on the expected duration of the relation, i.e. future perspectives, fed by customer commitment. In Japan, dedicated investments are not used to reduce relational risk but rather to confirm long-term commitments inside keiretsu.

Of course what we offer here is only a hypothesis, inferred from the outcomes of this study. It needs independent testing to further validate our interpretation. This is of some importance. If the benefits of durable relations can be obtained without making the relations longer and more rigid than necessary, and maintaining more variety of relations, this may be better from the perspective of innovation. In other words: in
the US perhaps a ‘third way’ of relationship management may have been found (cf. Nooteboom, 1998). This ‘third way’ combines the advantages of sufficiently durable relations with the advantages of a more open system with greater variety of relations. It incorporates advantages of higher quality with higher dynamic, innovative efficiency. This is reflected in both the lower U.S. levels of expected duration of relations and the weaker effect of that expectation on the level of dedicated investments. If our interpretation is correct it may well be that the historical situation has reversed: for the governance of durable relationships Japanese firms may now learn from the Americans. This would entail that Japanese firms need to break down their keiretsu system to allow for more variety and lesser durability of vertical relations.

The results for Europe are less univocally to interpret but nonetheless they offer valuable information. As in the U.S., customer commitment –created by supplier value as a result of dedicated investments– is seen to reduce relational risk. They can neutralize the fact that dedicated investments also increase dependence. However, in contrast with the U.S., customer value does not have an effect on dedicated investments. In contrast with Japan, future perspectives does not have an effect either. In other words, in Europe the management of durable relations takes an intermediate position between the U.S. and Japan. This generally conforms the expectations.

Limitations and Further Research

A first limitation of our study is the use of cross-sectional data. It would be an advantage to test the causal effects in a longitudinal study in which both the sequencing as well as the timing of effects is studied explicitly. This is interesting because it would allow seeing whether levels of constructs change over time and how this effects the causal structure of a relationship. Trust, for example, is expected to grow gradually, can easily breakdown, but can also be restored again. Commitment grows very fast when a relationship is initiated, and once it is established it is very difficult to breakdown: even when relationships are ended strong feelings of loyalty may continue to exist. In an ideal research setting the perceptions of the same respondents over time would serve as key input. This really would facilitate the analysis of durable relationships in space and time. Such longitudinal studies may apply LISREL (provided that sufficient cases are collected) or other methods e.g. case studies or computer simulation. In either case, the results from the present study may serve as point of departure.

A second limitation is that the data were gathered from only one side of the inter-firm dyad. This precluded any analysis of possible differences in perceptions between suppliers and their customers about their long-term relationship. Again LISREL can be applied but also a limited number of case studies could be helpful to explore whether differences in perceptions about the relationship exist and how such possible differences should be incorporated in the model.
A third and final limitation is that the results of this study only apply to the automobile industry. Without further testing they cannot be generalized to other industries and/or entire economies. In particular, when we conclude that the U.S. may have learned from the Japanese way of relationship management, and may subsequently have improved on them, the question remains whether that is also the case in other industries. New data collection could benefit from the design and validation of the questionnaires that are used in this study.

**APPENDIX A. IMVP Automotive Questionnaires**

*A.1 Data Collection*

The 1993-1994 automotive surveys were part of and financed by the International Motor Vehicle Program (IMVP) of the Massachusetts Institute of Technology (MIT, Cambridge, U.S.). The surveys were mailed to the first-tier suppliers of automobile producers. As many companies supply their customers with several different types of products, and their relationships with their customer differ by product, respondents were asked to answer the survey questions for their most important customer regarding one product which was typical of their company’s output and with which they were familiar.

*A.2 Sampling Framework*

The U.S. survey was mailed to every automotive supplier and automaker division mentioned in the Elm guide to Automotive Sourcing. This guide lists the major first-tier suppliers—both domestic and foreign owned—to manufacturers of cars and light trucks in the United States and Canada. The target respondents were the divisional directors of marketing at independent firms and the divisional business managers or directors of strategic planning at car manufacturer components divisions. Since they commonly take a lead in interfacing with customers, they were deemed the most knowledgeable informants about customers’ procurement practices. The U.S. respondents had a wealth of experience, and were thus the single individuals able to answer all of the questions for the customer/product pair they chose. U.S. respondents averaged more than 18 years in the automobile industry and more than 11 years in their companies.

In Japan the survey (in Japanese) was sent out to all members of the Japan Auto Parts Industries Association (JAPIA), to all automotive suppliers named in Nihon no Jidosha Buhin Kogyo 1992/1993 (Japanese Automotive Parts Industry, published by Auto Trade Journal Co. Inc. and JAPIA, Tokyo, 1992), and to the component divisions of vehicle manufacturers. The latter publication lists all first-tier suppliers (both domestic and foreign-owned) to the eleven manufacturers of cars and trucks in Japan. In order to maintain consistency with the US sample, the respondents were
asked not to respond with respect to heavy trucks and buses. The target respondent in Japan was the director of sales and marketing at independent firms. For member companies of JAPIA, the survey was sent to the main contacts named by JAPIA, many of whom were either chief executives or marketing directors. JAMA (the Japan Auto Manufacturers Association) took responsibility to identify the respondents for the vehicle manufacturer components divisions. The Japanese respondents were generally well experienced: they had worked for 22 years on average at their company.

The European survey was sent out to about 1,600 major automotive suppliers in Western Europe. This sample was compiled from several sources, including trade associations and the major vehicle manufacturers in Europe. The target respondent was the director of sales and marketing at each firm. Here also, respondents were asked not to respond with respect to heavy trucks and buses. The respondents had a wealth of experience: European respondents averaged 16 years in the automobile industry and 8 years with their companies.

**A.3 Response Rates**

The U.S. and Japanese responses were far above the norm for business surveys. It was 55 percent in North America, 30 percent in Japan (45 percent among JAPIA members). The response rate for Europe was 16 percent: 25 percent among suppliers from the United Kingdom, 24 percent from Germany, 9 percent from France, and 10 percent from Italy. These response rates are after taking into account those firms, which were unreachable (mail sent to them was returned undelivered), and those, which were not eligible to participate in the survey (they were not first-tier suppliers, or they specialized in supplying for heavy trucks and buses).

The European response rate may seem somewhat low. A low response rate is particularly worrisome when one intends to analyze levels of variables. The main aim of this study, however, is to identify causal relationships between variables, and to study this with LISREL. The issue than is more indirect i.e. sufficient cases is needed to obtain robust LISREL estimates. As a rule of thumb, 20 observations for each (latent) variable included in the (structural) model are needed. Hence, for our structural model with eight variables the European sample is sufficiently large because the number of cases exceeds the minimum number of 160 observations.

With respect to the U.S. and Japan, non-response bias is assessed in several ways. First, the characteristics of those who returned the survey were compared to those of the entire population. On the characteristics of size and location no significant differences are found. Second, the survey respondents were divided into two groups based on response data. The hypothesis is that those who responded only after the second follow-up mailing might have more in common with those who did not respond.
at all than those who responded early. This test shows no significant differences for early and late respondents on any of the measures reported in Appendix B. The statistical significance in both cases is judged using a one per cent cut-off point. With respect to Europe, a non-response analysis is not available and hence, a non-response bias may exist.

**APPENDIX B Explanation of the constructs, items and scales**

1. **Supplier’s dedicated investments SUPINV**
   Please estimate the total amount of your business unit’s investment in equipment to make this product for this customer over the last four years. (Scale: the logarithm of the amount of investments).

2. **Supplier’s dependence SUPDEP**
   SD1 If you were to stop getting these orders from this customer, approximately how much of your investment for this product in plant, equipment, and training would you be unlikely to find alternative uses for and have to write off? (A 1-5 scale with 1 = 10% or less; 5 = 90-100%).
   SD2 Please estimate the technical complexity involved in manufacturing the product in 1992. (A 1-5 scale with 1 = fairly simple; 5 = highly complex).
   SD3 Please check the appropriate range for the average piece price of the product in 1992. (A 1-5 scale with 1 = <$1; 5 = > $100).
   SD4 Does your business unit have any of the following? (A 1-5 scale with one point for each of the checked opportunities). A marketing office near your customer; a design office near your customer; a facility near your customer to consolidate shipments of your parts for ‘Just-in-Time’ (JIT) delivery; an engineers resident at your customer’s facility.

3. **Customer’s Dependence CUSDEP**
   CD1 Please estimate the number of months it would take your customer to replace your business unit with another supplier. Consider the time required to locate, qualify, train, make investments, test, and develop a working relationship with another firm. Please exclude legal considerations such as the existence of long-term contracts. (A 1-6 scale with 1 = 0; 6 = > 48).
   CD2 What percent of your business unit’s sales ends up as original equipment for cars or light trucks? (A 1-6 scale with 1 = 0-10; 6 = 81-100).

4. **Supplier’s value to the customer SUPVAL**
   SV1 For design engineering. Currently, how would you rate your business unit’s skills at making modifications to products or processes? Please compare yourself to other firms in your industry throughout the world. (A 1-5 Likert scale with 1 =
significantly below average; 5 = significantly above average).

SV2 For making incremental process improvements. Currently, how would you rate your business unit's skills at making modifications to products or processes? Please compare yourself to other firms in your industry throughout the world. (A 1-5 Likert scale with 1 = significantly below average; 5 = significantly above average).

SV3 For implementing entirely new processes. Currently, how would you rate your business unit’s skills at making modifications to products or processes? Please compare yourself to other firms in your industry throughout the world. (A 1-5 Likert scale with 1 = significantly below average; 5 = significantly above average).

SV4 Of the metal cutting machines currently in use at the plant that makes this product, about what percent are CNC? (A 1-5 scale with 1 = 0%; 5 = 76-100%).

SV5 About how many robots (programmable machines with at least three axes of movement) are in use at the plant? (A 1-5 scale with 1 = 0; 5 = >10).

SV6 Approximately what percent of the contacts with your customer regarding this product were for 'your business unit providing technical assistance to customer'? (A 1-5 scale with 1 = 0-19; 5 = 80-100).

SV7 Which range best describes your business unit’s R&D as a percent of sales? (A 1-5 scale with 1 = 0%; 5 = >4%).

SV8 Please check the descriptions which apply to the product development process for your company’s product. (A 1-5 scale with 1 = customer took entire responsibility; 5 = your business unit took entire responsibility).

5 Customer’s value to the supplier CUSVAL

CV1 Over the last four years, what sorts of technical assistance have you received from your customer? (A 1-5 scale with one point for each checked opportunity). Provided personnel who visited your site to aid in implementing improved procedures (for zero or a nominal charge; or for a fee). Arranged for training of your personnel at their site (for zero or a nominal charge; or for a fee). Provided personnel who worked two weeks or more on your shop floor to improve your processes (for zero or a nominal charge; or for a fee).

CV2 Approximately what percent of the contacts with your customer regarding this product were for 'customer providing technical assistance to your business unit'? (A 1-5 scale with 1 = 0; 5 = 31-100).

CV3 The advice our customer gives us is not always helpful. (A 1-5 Likert scale with 1 = strongly agree; 5 = strongly disagree).

CV4 In dealing with this customer, we have learned much that will help us with other customers. (A 1-5 Likert scale with 1 = strongly disagree; 5 = strongly agree).

6 Customer’s commitment CUSCOM

CC1 How would your customer react if one of your competitors offered a lower price for a product of equal quality? (A 1-5 scale with 1 = switch to competitor as soon as
technical feasible; 5 = help you match your competitors’ efforts).

CC2 How would your customer react if your material suppliers raised their prices? (A 1-5 scale with 1 = reduce your business unit’s market share or switch to another supplier at end of contract; 5 = provide significant help for your business unit to reduce costs).

CC3 Suppose your business unit had an idea that would allow you to reduce your costs, but would require your customer to make a slight modification in its procedures. How would your customer react? (A 1-5 scale with 1 = customer does not welcome suggestions that would require modifications in its procedures; 5 = customer would eagerly solicit such suggestions).

CC4 We can rely on our customer to help us in ways not required by our agreement with them. (A 1-5 Likert scale with 1 = strongly disagree; 5 = strongly agree).

7 Supplier’s future perspectives SUPFUT
For how long do you think there is a high probability that your business unit will be supplying this or a similar item to your customer (in years)? (Scale: the number of years).

8 Supplier’s uncertainty avoidance SUPUNC
SUA1 If our customer had given us less assurance of continued business for this product, we would definitely have invested less in plant, equipment, and training which could be used to serve only this customer. (A 1-5 Likert scale with 1 = strongly disagree; 5 = strongly agree).

SUA2 If our customer had given us less assurance of continued business for this product, we would definitely have invested less in plant, equipment, and training which could be used to serve either this customer or other customers. (A 1-5 Likert scale with 1 = strongly disagree; 5 = strongly agree).
# APPENDIX C Summary Statistics and Correlation Matrices

## TABLE C.1. Summary Statistics (standard deviations within parentheses)

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## TABLE C.2. Correlation Matrix U.S. (below diagonal) and Japan (above diagonal)

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</table>

## TABLE C.3. Correlation Matrix Europe
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H


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K


M


Science.


S


T


V


W


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Centre for Sustainable Entrepreneurship, Monograph Series.

- No 2. de Jong, Gjalt (2016). Successful strategy and organization.
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Gjalt de Jong