



**Managing Corporate Venturing:**  
**Multilevel studies on project autonomy, integration,**  
**knowledge relatedness, and phases in the new**  
**business development process**



# **Managing Corporate Venturing: Multilevel studies on project autonomy, integration, knowledge relatedness, and phases in the new business development process**

**Het managen van corporate venturing:  
multilevel studies over projectautonomie, -integratie, gerelateerdheid van kennis, en  
fasen in het ontwikkelingsproces van nieuwe businesses**

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## Preface

Who would have thought that I would ever do PhD research? My friends, family and not in the least part I did not consider that I would become an academic. However, an academic is someone who enjoys exploring and trying to understand new phenomena, and in that sense I might have been destined to become one all my life. Becoming a “promovendus” is just another step in this journey. I am grateful to Frans and Henk for bringing out the academic in me by providing me with the opportunity to do PhD research within the department of Strategic Management and Business Environment. My move to the Queensland University of Technology gave me an excellent opportunity to reflect on the past years and made realize how much I have learned from them and how much I have grown since I started. Thanks also for supporting me to actively engage in the academic community even though the spin-off for my research was not always clear. But I am glad they also valued my personal growth. I hope I have contributed my share as an “academic entrepreneur” to improve the school. Thanks to Frans, Henk and my other colleagues at the Rotterdam School of Management for providing a thought-provoking and collegial environment. I really enjoyed working and discussing with you. A special thanks to Justin Jansen for working closely together on a couple of papers and providing me with some valuable insights in writing articles for high-quality journals. I also want to express my gratitude towards our departmental secretaries Carolien and Patricia for their endless support and availability whenever I was in need for a quick chat (which might have been a bit more often than the average colleague).

Yet, learning for the sake of learning is as means without an end. One should use this new knowledge to improve and develop the world around you. I would like to acknowledge Paul Bromberg and Han Ligteringen for providing the opportunity to do case study research at their companies, and to Koen Mioulet, Huib Rentzing and Roy Schutt for the cooperation with the Vereniging Business Development Nederland. I really enjoyed the insightful discussions of many VBDN-meetings I attended. It forced me to leave the ivory towers of academia and focused attention on the most important aspect of management research: having an impact on managers! But all these cooperations in research would not have been possible without Henk and Frans, who are always on the look-out for

new opportunities for their PhD candidates to do practically relevant research at companies.

A big thank you to my family and friends for believing in me and for showing that there are far more important things to life than research, although this might be hard to believe for some given the hours I make. Being an academic let me discover new places and meet new people, many of whom have become good friends. You all made my journey of the past couple of years as a PhD candidate a fun experience that truly enriched my life! Last but not least, my stay in Australia has shown me that the same friendship can be found at other universities too. It's an essential experience for every academic to go abroad for a while. It allowed me to explore new worlds by building upon my existing base. A lesson that is just as well applicable to companies, as you will find out after reading this dissertation. May you enjoy reading it as much as I did writing it!

Henri Burgers  
Brisbane, August 2008

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# 1 Introduction

## 1.1 Introduction

Today's managers face a competitive environment of increasing rates of globalization and technological change (D'Aveni, 1994). To cope with such dynamic environments, firms need to continuously renew themselves and generate sufficient internal variety (Burgelman, 1991; Huff, Huff, and Thomas, 1992; Volberda and Lewin, 2003). Corporate venturing is a vital tool to generate organic growth and innovation, serves as an engine for strategic renewal (Burgelman, 1983a; Guth and Ginsberg, 1990; Stopford and Baden-Fuller, 1994), and is associated with higher firm performance (Zahra, 1993; Zahra and Covin, 1995). However, corporate ventures are prone to failure; not in the least part because managers have difficulties with comprehending the challenges associated with managing corporate ventures within existing firms (Campbell et al., 2003; Chesbrough, 2000; McGrath, Keil and Tukiainen, 2006). Explorative corporate ventures should be managed, organized, rewarded, and judged differently from exploitative mainstream businesses (Birkinshaw, 1997; Block and MacMillan, 1993; Kanter, 1985). These conflicting requirements of exploitation and exploration lead to paradoxical challenges that are difficult to reconcile in a single firm, and have become one of the central questions in contemporary management literature (Gibson and Birkinshaw, 2004; Jansen, Van Den Bosch, and Volberda, 2006; O'Reilly and Tushman, 2004; Volberda, Baden-Fuller, and Van den Bosch, 2001).

To address this paradox, many scholars followed the recommendation of Poole and Van de Ven (1989) to structurally separate new business development activities from more exploitative units (Burgers et al., 2008a; Burgelman, 1984; 1985; Drucker, 1985; Fast, 1979; Hill and Rothaermel, 2003). The granted autonomy provides ventures with the freedom to experiment, innovate, and develop new capabilities, shields explorative ventures from inertial forces of mainstream businesses, and protects existing businesses from possible intruding effects of ventures (Burgelman, 1983b; 1985; Block and MacMillan, 1993; Dougherty, 1995; Hill and Rothaermel, 2003; Kanter, 2006; McGrath et al., 2006). However, a collection of separated units does not function as a system (Orton and Weick, 1990). Poole and Van de Ven (1989) pointed out that the real challenge of

spatial separation is how to link the separated units together. Separating venturing units from mainstream businesses creates, for example, problems with coordination, implementation and reintegration (Duncan, 1976; Gibson and Birkinshaw, 2004). It constrains the possibilities for sharing knowledge and resources (Katila and Ajuha, 2002; Levinthal and March, 1993; Scarbrough et al., 2004). As such, managing the part-whole relations is one of the central management tasks in order to successfully venture and innovate (Van de Ven, 1986).

## ***1.2 Research aim***

Researchers have addressed the problems associated with structural separation of venturing and mainstream units from a variety of angles (see Table 1.1). A growing body of firm level research focuses on integrating autonomous units through ambidextrous organizations (see Table 1.1). By being differentiated and integrated at the same time, individual units have the freedom to adapt to local demands, while integration assures the strategic coherence and synergistic effects between units (O'Reilly and Tushman, 2004). Although this emerging body of research has delivered substantial theorizing and qualitative evidence on how structurally separated units can be integrated on a higher level, e.g. through an integrated top management team (Gilbert, 2006; O'Reilly and Tushman, 2004; Smith and Tushman, 2005), there is still lack of cross-sectional research that simultaneously addresses multiple integration mechanisms (Collins and Smith, 2006; Westerman, McFarlan, and Iansiti, 2006).

**Table 1.1 Research challenges, findings, and gaps regarding structurally separating corporate ventures**

Challenge	Prior research	Gaps
<p><i>Firm level of analysis</i></p> <p>How to connect separated units?</p>	<ul style="list-style-type: none"> <li>• Lawrence and Lorsch (1967): high performing organizations manage integration in differentiation more effectively, e.g. through resolving potential conflicts between differentiated units.</li> <li>• Orton and Weick (1990): loosely coupling units can be compensated by enhanced leadership, focusing attention or by shared values.</li> <li>• Tushman and O'Reilly (1996): autonomous units should be integrated through a common culture and a shared vision.</li> <li>• Brown and Eisenhardt (1997): successful firms that continuously need to develop new products for dynamic environments seemed to use a combination of limited structure with extensive interaction.</li> <li>• O'Reilly and Tushman (2004): separated units should be connected through an integrated top management team.</li> <li>• Gilbert (2006): venture and mainstream businesses are able to co-exist in a structurally differentiated organization. Integration occurs at TMT level.</li> </ul>	<ul style="list-style-type: none"> <li>- Larger scale, cross-sectional research</li> <li>- Effects on corporate entrepreneurial activities such as venturing</li> <li>- Simultaneous assessment of multiple integration mechanisms</li> </ul>
<p><i>Project/ venture level of analysis</i></p> <p>What is the effect of relatedness on venture performance?</p>	<ul style="list-style-type: none"> <li>• Sorrentino and Williams (1995): relatedness between the venture and the parent firm has no effect on venture performance.</li> <li>• Dougherty (1995): relatedness with the parent firm's core competences has a positive effect on venture success, but only if firms can manage their core incompetencies.</li> <li>• Danneels and Kleinschmidt (2001): the extent to which parent firm already has the market and technological competences in place to develop the project has a positive effect on project performance.</li> <li>• Danneels (2002): each type of innovation, based on the relatedness of technological and market competences, creates unique, path-dependent challenges for an organization.</li> <li>• Schildt, Maula, and Keil (2005): technology relatedness has a positive effect on exploitative learning.</li> </ul>	<ul style="list-style-type: none"> <li>- Possible contingencies, such as project autonomy</li> </ul>
<p>To what degree should a venture be separated?</p>	<ul style="list-style-type: none"> <li>• Burgelman (1984): operational relatedness and strategic importance determine the autonomy of a venture.</li> <li>• McGrath (2001): the fit between autonomy and newness of a project has a positive effect on project performance.</li> </ul>	<ul style="list-style-type: none"> <li>- Distinguishing between types of relatedness</li> </ul>
<p>Should the degree of separation vary during the venture's life cycle?</p>	<ul style="list-style-type: none"> <li>• Pinto and Prescott (1988): the relative importance of critical project management factors changes significantly over the changes in the life cycle of the project.</li> <li>• Thornhill and Amit (2001): The autonomy of ventures and the emphasis on financial targets increases over time.</li> <li>• Westerman et al. (2006): depending on their strategic context and capabilities, firms can use a variety of modes. Modes change over time as requirements in later stages in the innovation process differ from earlier stages.</li> </ul>	<ul style="list-style-type: none"> <li>- Variations in relatedness/ exploration over time</li> </ul>



Venture/project level research has addressed the extent to which ventures should be separated. Studies have in particular focused on the degree to which a venture explores new knowledge versus to what extent the venture can draw on existing knowledge available in the parent firm (Chesbrough, 2000; Katila and Ahuja, 2002). However, findings have produced mixed results, questioning whether there are perhaps other factors influencing the relation. Relatedness might for instance be a multidimensional construct, consisting of a technological and market dimension (Danneels, 2002; 2007; Danneels and Kleinschmidt, 2001). There is, however, still lack of insight into how this exploration of these different types of knowledge unfolds and how affects project management. Some studies investigated therefore contingent effects of project autonomy and relatedness; that is higher relatedness requires more integration of the venture and the parent firm, while more unrelated ventures benefit more from structural separation from the parent firm (Burgelman, 1984; McGrath, 2001). Although the initial findings are convincing and make intuitive sense, there has not yet been a study that investigates this relation by distinguishing between different types of relatedness and how this affects venture performance. A third line of research on the venture level, questioned whether the level of structural separation and other managerial factors should vary over the course of the venture's life cycle (Thornhill and Amit, 2001; Pinto and Prescott, 1988; Westerman et al., 2006). A gap in this stream of research is, however, how the degree of exploration of a venture might change over time, which could also suggest that the level of structural separation might need to change over time. With this research we aim to address several of the aforementioned gaps in the research (see Table 1.1), to provide more insight in successfully managing corporate ventures. As such the aim of this research is

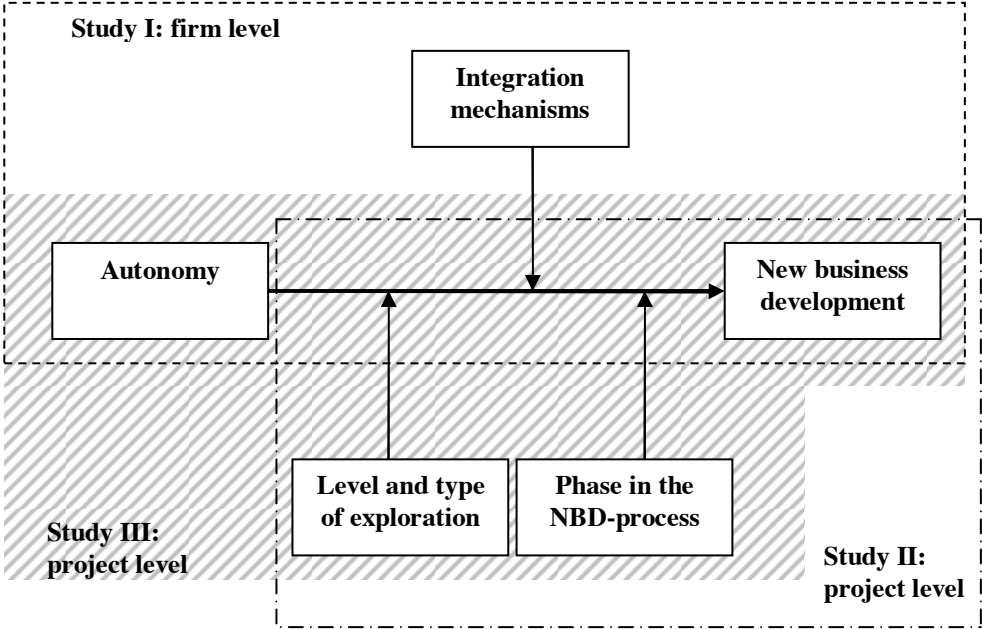
*to enhance our understanding of how organizations can successfully manage new business development efforts by linking degree of autonomy, degree of relatedness and phases of the NBD-process.*

### **1.3 A multilevel, multimethod approach**

To achieve this aim we develop a multilevel framework that investigates the relations between project autonomy, degree of exploration and phases of the NBD-process and their effects on new business development performance from several perspectives. Davidsson (2005: 60) argued that “the most fruitful way forward for

entrepreneurship research would be integrated research programs that included several types of research addressing different aspects of the same issues.” We conducted *three different studies* to investigate the relation between knowledge creation and organizational aspects within corporate ventures. Each study addresses a set of research questions that contributes to our overall research aim (see Figure 1.1). Study I investigates how autonomy and integration mechanisms jointly influence venturing activities on a firm level by means of cross-sectional survey research (indicated by the dotted line in Figure 1.1). Study II explores the differences between exploration of technological and market knowledge, how the exploration varies over the phases of the NBD-process, and what the consequences for organizing venturing activities are (indicated by the dash-dotted line in Figure 1.1). We employ a case study on several projects in a single firm. The third study builds on the second study by aiming to further investigate some of the findings of the case study on a larger, cross-sectional scale. We focus on the project level of analysis to investigate whether project performance is enhanced if project autonomy is aligned with the degree of technological and market knowledge relatedness (as indicated by the shaded area in Figure 1.1). We test our hypotheses by means of survey research.

**Figure 1.1 Research framework**



Applying such a multilevel, multimethod approach increases our understanding of a phenomenon, by being able to incorporate aspects that would have been left untouched by a study focusing on single level and applying a single method. However, pluralism for the sake of pluralism might lead to different insights without connecting the dots. It is therefore important that the studies do not only differ from each other, but also share some common characteristics to increase our understanding. As such, all the studies draw on ideas from organizational learning and knowledge sharing literatures. Also some of the studies overlap in levels of analysis (studies II and III) and method (studies I and III). The dependent variables of all three studies measure the success of the new business development efforts in a different way (see Table 1.2). The first study assesses the extent to which new businesses are introduced on the market, and the second study measures performance of individual projects on multiple dimensions such as achieving budget and quality objectives and performance in terms of profit and market share. Due to the longitudinal design of the second study we were able to assess whether the projects ultimately succeeded or failed. The core constructs

also overlap. While study II and III essentially address the same constructs, study II does so from an exploratory case study point of view to investigate how constructs such as autonomy and relatedness relate to each other, while study III attempts to generalize some of the findings through cross-sectional survey research. Autonomy is also addressed on firm level in study I in terms of how differentiated and integrated units are from another.

**Table 1.2 Overview of the three studies and how they relate**

Study	Level of analysis	Method	Dependent variable	Organizational aspects	Knowledge relatedness	Phases in the NBD-process
I	Firm	Cross-sectional survey	# of ventures introduced on the market	Structural differentiation and integration of units	Venture units versus mainstream businesses	No distinction between phases
II	Project	Longitudinal case study of 8 projects in a single firm	NBD-project success/failure	Autonomy of NBD-projects	Technological and market relatedness	Development and commercialization phase
III	Project	Cross-sectional survey	NBD-project performance (cost, quality, market)	Autonomy of NBD-projects	Technological and market relatedness	Development and commercialization phase

**1.3.1 The effects of autonomy and integration on firm level corporate venturing**

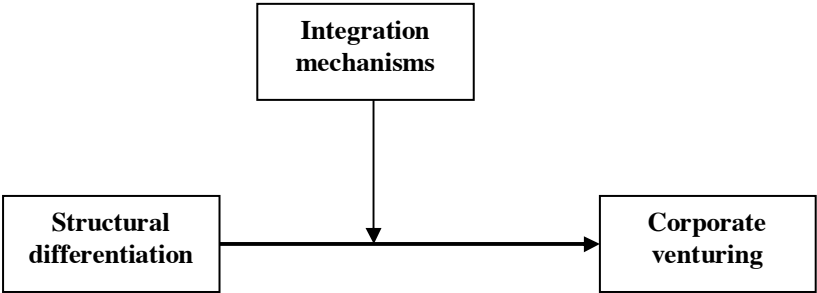
The firm level study focuses on corporate venturing and addresses how firms can simultaneously provide both autonomy and integration to enhance venturing efforts within established firms. Autonomy or *structural differentiation* is defined as “the segmentation of the organizational system into subsystems” (Lawrence and Lorsch, 1967: 3-4). Differentiated organizational structures ensure that corporate ventures receive the necessary freedom and autonomy to develop new competencies (Drucker, 1985; Hill and Rothaermel, 2003; McGrath, 2001). *Integration* refers to “the process of achieving unity of effort among various subsystems in the accomplishment of the organization’s tasks” (Lawrence and Lorsch, 1967: 4). Integrative mechanisms link the venture with the rest of the

organization, providing the venture with access to the parent's resources and skills (Chesbrough, 2000; Floyd and Wooldridge, 1999; Thornhill and Amit, 2001).

Previous research tends to view autonomy and integration in the context of venturing in terms of either-or (Heller, 1999), while configurations of differentiation and integration mechanisms could provide both local adaptability and synergy between the autonomous units (O'Reilly and Tushman, 2004). Firms could for example combine a flexible, loosely coupled structure with integrative cultural mechanisms (Volberda, 1998). Others have pointed at combining structural differentiation with a shared vision (Tushman and O'Reilly, 1996) or an integrated top management team (Gilbert, 2006; O'Reilly and Tushman, 2004; Westerman et al., 2006). Many of these ambidexterity literatures, however, focused on only one integration mechanism at the time, lacking comparison of multiple integration mechanisms. Despite the potential benefits the combinations of differentiation and integration mechanisms have for corporate ventures, there is a surprising lack of research on this topic. We address this gap in the literature by investigating the direct and interaction effects of structural differentiation and a variety of integration mechanisms on corporate venturing (see Figure 1.2).

1. *How can autonomy be defined and measured on a firm level?*
2. *How does structural differentiation influence corporate venturing on a firm level?*
3. *How do integrative mechanisms moderate the relationship between structural differentiation and corporate venturing on a firm level?*

**Figure 1.2 Research framework for study I**



We empirically investigate these questions through a cross-sectional survey of 240 companies in the Netherlands. To increase the validity and reliability of our research findings, we used multiple informants per company and measured the independent and the dependent variables at different points in time. This study advances our insights into the field of venturing in several important ways. First, the study provides new insight into how managers can use configurations of structural differentiation and integrative mechanisms to facilitate corporate venturing. By doing so, we extend previous conceptual studies that hinted at the benefits of configurations of differentiation and integration mechanisms (Heller, 1999; Orton and Weick, 1990). Second, we simultaneously assess multiple integration mechanisms. Previous research has been fragmented by focusing on one integration mechanism at the time. We addressed the call for studies encompassing multiple integration mechanisms (Collins and Smith, 2006; Westerman et al., 2006). Drawing on ambidexterity and organizational learning literatures, we distinguish four types of integration mechanisms along two dimensions: formal versus informal integration mechanisms, and b) organizational versus top management team integration mechanisms. Third, we argue that some of these integration mechanisms will have negative effects in a venturing context, while these mechanisms are generally perceived to have positive outcomes among units. We argue that too much integration may lead to complex and rigid mechanisms that are detrimental to corporate venturing.

### **1.3.2 The exploration of technological and market knowledge across phases of the new business development process**

This second study delves into the degree of relatedness between the venture and the parent firm. We show that taking into account the different types of relatedness (technology versus market) and the phases in the business development process, significantly enriches our understanding of the pivotal role of relatedness in business development. Prior studies that attempted to capture the relatedness of the venture relative to the parent firm's knowledge and resource base viewed it as a single dimension (cf. He and Wong, 2004; Jansen et al., 2006; March, 1991; McGrath, 2001; Sorrentino and Williams, 1995). An increasing number of authors argue to distinguish between product/ technology exploration and market exploration when investigating projects (Danneels, 2002; Danneels and Kleinschmidt, 2001; Tanriverdi and Venkatraman, 2005). *Exploration of technological knowledge* refers to the degree of departure from the existing technological knowledge bases and how this results in new products, making use of new technologies and/ or new processes. *Exploration of market knowledge* refers to targeting new customer sets, entering emerging markets and developing new channels of distribution, often with new marketing approaches and new business models (Abernathy and Clark, 1985; Benner and Tushman, 2003; Danneels, 2002). By classifying projects on both dimensions as either new-to-the-firm or existing-to-the-firm, we distinguish between four types of projects (see Figure 1.3). There is, however, still lack of insight in how the exploration of technological and market knowledge unfolds in NBD-projects and what effects it has on managing and organizing such projects. Previous research has shown that projects evolve through several phases, which each phase having its distinct managerial challenges (Kazanjian, 1988; Kazanjian and Drazin, 1990; Pinto and Prescott, 1988; Thornhill and Amit, 2001). An under-researched issue is how these two types of exploration differ across phases in the NBD-process. Whereas previous studies focused on the development phase, we argue that exploration of market knowledge continues during the commercialization phase. If exploration of technological and market knowledge take place in different phases of the NBD-process, this might have consequences for project completion criteria. As such, we investigate how the requirements for project autonomy and project completion criteria differ for each of the four types of projects (see Figure 1.3). We will address the following research questions:

1. How can exploration of technological and market knowledge be defined and measured on a project level?
2. What phases can we distinguish in the new business development process?
3. How does the level and type of exploration differ between these phases and what are the implications for project management characteristics?

**Figure 1.3 Conceptual framework for study II**

		<b>Market knowledge</b>	
		<i>New-to-the-firm</i>	<i>Existing-in-the-firm</i>
<b>Technological knowledge</b>	<i>New-to-the-firm</i>	Exploration of both technological and market knowledge <b>1</b>	Exploration of technological knowledge <b>2</b>
	<i>Existing-in-the-firm</i>	Exploration of market knowledge <b>3</b>	No exploration of knowledge <b>4</b>

Addressing these questions calls for a dynamic view of the management of NBD-projects, which can be captured through longitudinal research. We employ a longitudinal case study of eight new business development projects in a division of a major European consumer appliances firm to investigate these questions. These projects were executed in the period 1993-2005. The length of the observation period allowed us to not only track the development phase of a project, but also the subsequent commercialization leading ultimately to success or failure. This provides richer insights into the projects.

This study offers several *contributions*. First, we empirically investigate the differences between exploration of technological and market knowledge, showing that the managerial implications for NBD-projects differ for both types of exploration. By doing so, we build upon previous research that has hinted at the distinction, but did not explicitly address it (Abernathy and Clark, 1985; De Brentani, 2001; Jansen et al., 2006; Benner and Tushman, 2003).



Second, we investigate how exploration of technological and market knowledge takes place in different phases of the NBD-process. This provides a dynamic view of the exploration process, thereby creating new insights into how NBD-projects evolve over time. Most studies investigating relatedness and exploration have treated the project as static over time. Managerially, this provides new insights into when to end a project.

Third, we address how the relationship between the project and its organizational context evolves over time. Engwall (2003) criticized prior studies on projects for treating projects as being detached from its organizational context. In this research we address for example how relationships with top management, sales organizations, and alliance partners influence the exploration of technological and market knowledge and project performance.

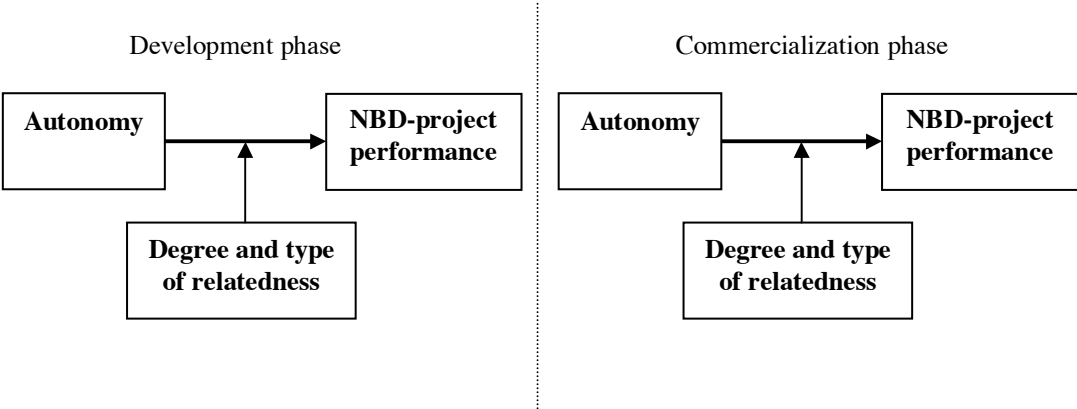
### **1.3.3 Enhancing NBD-project performance: the dynamic interplay of relatedness and autonomy across phases of the NBD-process**

The second study argued that the degree of technological and market relatedness have different implications for projects, partly because they affect different phases of the NBD-process. This third study aims to further explore these topics by dealing with the issue of managing and organizing NBD-projects over time. Burgelman (1984) argued for example that the autonomy of a NBD-project should fit with the relatedness of the project to the parent firm. This was confirmed by a study from McGrath (2001). She argued that the higher a project's newness, the greater the degree of autonomy should be for such projects. This enhances learning effectiveness within the project and ultimately project performance. However, previous studies do not take into account the phases of the NBD-process through which a project evolves nor how the degree of technological and market knowledge relatedness have different impacts on this relation between project autonomy and project performance (see Table 1.1). Our second study showed that the latter might be essential aspects in explaining success and failure of NBD-projects. Moreover, studies have also shown that in later phases of the NBD-process, the emphasis tends to shift to more financial performance criteria (Hart et al., 2003; Thornhill and Amit, 2001), suggesting that studies should take a variety of performance measures into account when researching antecedents of project performance for the stages of a project's life cycle. As such, we compare the

relations between project autonomy, technological and market relatedness and different types of project performance between the development and commercialization phase of NBD-projects (see Figure 1.4). We investigate the following questions:

1. *How can autonomy be defined and measured on a project level?*
2. *How does exploration of technological and market knowledge interact with project autonomy and NBD-project performance?*
3. *How does the interaction between exploration of technological and market knowledge and project autonomy differ between the phases of the NBD-process and what are the consequences for NBD-project performance?*

**Figure 1.4 Research framework for study III**



We research these questions through the use of a survey among members of the Dutch Association of Business Development (VBDN). We assess the projects organizational and managerial characteristics and project performance at two points in time: during the development phase before market introduction and during the commercialization phase after market introduction. Such a design allows us to investigate whether changing the project’s autonomy over these phases affects project performance.

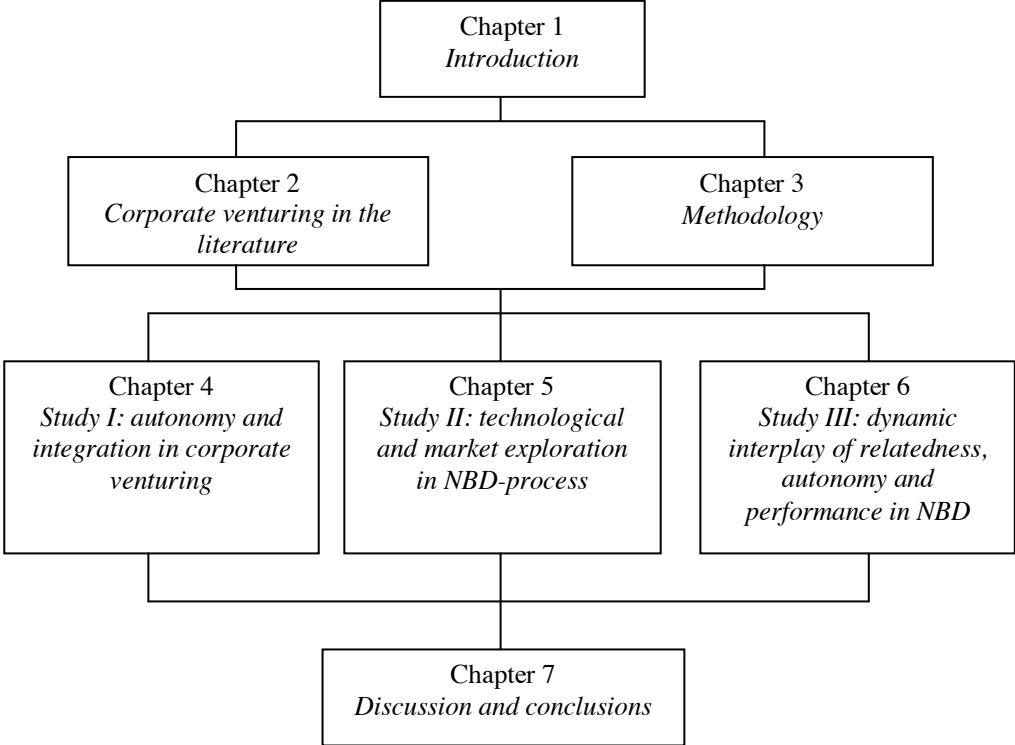
By doing so, we deliver the following *contributions*. First, we extend McGrath’s (2001) research by showing how the various dimensions of project relatedness (technology versus market) differentially interact with project

autonomy and influence project performance. Second, we extend the static nature of prior project research by investigating the dynamic interplay between project autonomy and relatedness and their effects of project performance. This should enrich our understanding of how projects evolve and how they should be managed during each phase to maximize project performance. We thereby integrate literature on project evolution (e.g. Thornhill and Amit, 2001), the dimensions of project relatedness (e.g. Danneels and Kleinschmidt, 2001) and studies linking project relatedness to project autonomy (e.g. McGrath, 2001). Third, we used multiple measures of performance and show how these are affected by the interaction between technology and market relatedness with project autonomy over the different phases of the NBD-process.

#### ***1.4 Outline of the dissertation***

The next chapter starts with a theoretical overview of new business development, its antecedents, and its embeddedness in the management literature. Chapter three describes the different methodologies used in this research, and chapters four to six each focus on one of the parts mentioned above. Chapter seven highlights the main conclusions of this research and provide a reflection on the findings and approaches taken.

**Figure 1.5** Dissertation outline





## 2 Corporate venturing in the literature

In this chapter we first define corporate venturing and subsequently discuss its theoretical origins. The third paragraph discusses the differences between the two main levels of analysis in venturing literature: firm and project. Fourth, we will provide an overview of the major findings of prior literature on each of the three major aspects of corporate venturing we identified in the previous chapter: autonomy, relatedness, and phases in the new business development process.

### 2.1 *Corporate venturing defined*

Corporate venturing is the development of new businesses within existing organizations (Guth and Ginsberg, 1990; Sharma and Chrisman, 1999). Another defining aspect of corporate venturing is that it at least has some degree of autonomy from mainstream businesses during (part of) their life cycle (Block and MacMillan, 1993). A venture usually starts as a small project team and could grow into an independent business unit or division (Burgelman, 1984). In this dissertation we will refer to this as either corporate ventures or new business development projects.

In more recent studies, corporate venturing is viewed as part of the field of corporate entrepreneurship (Ling et al., 2008; Simsek, Veiga, and Lubatkin, 2007; Zahra, 1996). In their seminal article, Guth and Ginsberg (1990: 5) stated that “corporate entrepreneurship encompasses two types of phenomena and the processes surrounding them: (1) the birth of new businesses within existing organizations, i.e. internal innovation or venturing, and (2) the transformation of organizations through renewal of the key ideas on which they are built, i.e. strategic renewal.”

Corporate entrepreneurship on its turn is part of the domain of entrepreneurship. Stevenson and Jarillo (1990: 23) defined entrepreneurship as “a process by which individuals –either on their own or inside organizations- pursue opportunities without regard to the resources they currently control.” Researchers realized that many of the traits associated with entrepreneurship are also positive for established firms (Stevenson and Jarillo, 1990). As such, early studies viewed corporate entrepreneurship as new business creation within firms (i.e. corporate

venturing), analog to individual entrepreneurship (cf. Vesper, 1985). Yet, later authors suggested new business creation within established firms is markedly different from start-up entrepreneurship, as NBD within a corporate setting has to deal with an existing resource base and management systems (Block and MacMillan, 1993; Burgelman, 1985). To fully appreciate this distinction, we will first discuss the roots of the entrepreneurship field, to finally arrive at a discussion of previous research on corporate venturing.

## ***2.2 The origins of corporate venturing research***

The origins of entrepreneurship as a field of research have often been attributed to the works of Knight, Kirzner, and Schumpeter (Casson, 1982; Shane and Venkatraman, 2000). In Knight's (1921) view, entrepreneurs receive pure profit as a reward for bearing the costs of decision-making under uncertainty. Although reducing uncertainty could be achieved by diversifying one's business, Knight argued it is primarily achieved through selecting people with foresight (Casson, 1982). These characteristics of bearing costs for decision-making under uncertainty, reaping the potential rewards, and having some kind of foresight, have been linked to entrepreneurs, but could equally well apply to directors of established firms who are also shareholders of their firm (Casson, 1982). Knight's theory might provide an explanation why firms want to engage in corporate entrepreneurial activities, as it might be a way to reduce uncertainty without risking the whole firm. An example of such behavior would be Intel's ecosystem approach, which includes investing in a variety of ventures to stay at the forefront of technology and waiting until uncertainty is reduced before fully committing to an opportunity (Campbell et al., 2003). Brown and Eisenhardt (1997: 3) suggested that firms should "explore the future by experimenting with a wide variety of low-cost probes."

Austrian economists such as Kirzner (1973; 1997) and Hayek (1948) view entrepreneurial discovery "as gradually pushing back the boundaries of sheer ignorance" (Kirzner, 1997: 62). They argue there is a lot of knowledge out there that is simply un-thought off before, and is waiting to be discovered. Through acquiring more and more knowledge about the processes of supply and demand, they argue entrepreneurial discovery is gradually leading the market towards equilibrium (Kirzner, 1997). The Austrian school has brought attention to the role of knowledge in the entrepreneurial process, and their notions of entrepreneurial discovery might also be applicable to established firms. Discovery of new

knowledge is not just a skill solely attributable to start-up entrepreneurs, it could also happen in established firms by corporate entrepreneurs (Burgers et al., 2008b; Guth and Ginsberg, 1990).

Schumpeter (1934) viewed entrepreneurship as the development of new combinations of resources. These innovations could range from new products, processes and markets to the creation of a new type of organization. By carrying out new combinations of resources, entrepreneurship changes the price of resources, resulting in market disequilibrium (Shane and Venkatraman, 2000). By acting before others, entrepreneurs can earn profit by obtaining these resources for the “old” price, recombining them and selling them for a new, higher price (Schumpeter, 1934). Although Schumpeter linked this process primarily to entrepreneurs creating new companies, corporate entrepreneurs could just as well create new combinations of resources that radically alter the market (Hill and Rothaermel, 2003).

In summary, it is the initiative of actors to develop something new that seems a common ground in entrepreneurship (Davidsson, 2005). However, not everything that is new necessarily qualifies as entrepreneurship. Davidsson (2005) therefore proposes to follow Kirzner (1973:19-20) to view entrepreneurship as “the competitive behaviors that drive the market process.” Yet, even this definition does not preclude corporate entrepreneurs, as corporate entrepreneurs have also been shown to create discontinuous innovations that change the rules of the industry (Anderson and Tushman, 1990; Stopford and Baden-Fuller, 1994). Based on the above discussion we can conclude that entrepreneurship inside and outside a company are similar phenomena. Yet, as a research domain start-up entrepreneurship and corporate entrepreneurship are markedly different (Davidsson, 2005). Important differentiating features are that corporate entrepreneurs face an existing organizational resource base and operate within the organizational context of a parent organization.

A prime difference between corporate entrepreneurship and start-up entrepreneurship is that the former has to cope with the legacy of an existing resource base, which may constrain the possibilities to freely carry out new resource combinations (Burgelman, 2002; Dougherty, 1995, Leonard-Barton, 1992). Next to an existing resource base, firms also consist of administrative structures which are often at conflict with requirements for corporate entrepreneurship (Birkinshaw, 1997; Vesper, 1985). Christensen (1997), for example, showed that most disruptive innovations in the hard disk drive industry



were created within established firms, yet commercialized by start-ups. Due to inertial pressures and a dominant logic aiming at mainstream businesses, established firms are likely to fail to capitalize on these innovations (Tripsas and Gavetti, 2000).

That points to the importance of studying corporate venturing in relation to the organizational context in terms of a firm's knowledge base (cf. Burgelman, 1984; Floyd and Lane, 2000; Katila and Ajuha, 2002; Schildt et al., 2005; Sorrentino and Williams, 1995) and organizational structure and systems (cf. Block and Ornati, 1987; Burgelman, 1983a; Hill and Birkinshaw, 2007; Kanter, 1985). In the following paragraphs we summarize research relating corporate venturing to organizational knowledge bases, structures, and discuss the evolution of ventures during their life cycle. First, however, we will turn to an important distinction in level of analysis. While for start-up entrepreneurship the organization is confined to the new venture, in corporate entrepreneurship organizational aspects can refer to corporate ventures as well as parent organizations.

### ***2.3 Firm level versus project level research on corporate venturing***

Birkinshaw (1997: 208) argued that “corporate venturing works on the premise that entrepreneurship and management are fundamentally different processes that require different modes of organization to occur effectively.” This paradox has been tackled by previous studies focusing at the firm level of analysis and by focusing more directly at the venture (Birkinshaw, 1997). Firm level research sees the venture as part of the parent firm by investigating appropriate organizational contexts that allow both mainstream and venturing units to co-exist (cf. Burgelman, 1985; Gilbert, 2006; Jansen et al., 2006; Kanter, 1985; O'Reilly and Tushman, 2004). Researchers have among others focused on rewarding employees and creating an entrepreneurial climate (Block and Ornati, 1987; Kuratko, Montagno, and Hornsby, 1990), on middle and top management roles (Burgelman, 1983b; Day, 1994; Greene, Brush, and Hart, 1999; Srivastava and Lee, 2005), and on the organizational structure to enhance their venturing efforts (Fast, 1979; Burgelman, 1983a; 1984; 1985). Because organizational structures and systems need consistency and stability, organizational designs tend to optimize the structural context for a firm's portfolio of ventures rather than the needs of an individual venture.

However, previous research also argued that ventures differ widely. Ventures can for example develop new products or new technologies (Block and MacMillan, 1993), can be explorative or exploitative in nature (Hill and Birkinshaw, 2007), or can differ in type of market they target (Birkinshaw, 1997). Different types of ventures may therefore require different approaches. Focusing on firm level structural contexts' may therefore constrain certain types of ventures and led researchers to focus also on the venture or project level. Such studies focus on the development, management and organization of the individual venture in which the organizational context, much like the environmental context, is an externality with which a venture has to cope (Birkinshaw, 1997). Project management studies have been criticized for their neglect of studying NBD-projects in relation to their organizational context (Engwall, 2003; Scarbrough et al., 2004).

Concluding, prior research points to the relevance of studying corporate venturing from both the firm and the project level of analysis. As such, we conduct studies that investigate ventures both from the firm and the project level, in order to provide a richer understanding of the concepts. We look at firm level organizational mechanisms that may affect the whole portfolio of firms' venturing activities and we investigate specific mechanisms that can be adjusted to the needs of individual ventures at the venture level of analysis.

#### ***2.4 The role of relatedness and knowledge creation in managing corporate ventures***

Entrepreneurship is about the discovery of new knowledge (Kirzner, 1997). Yet, the presence of an existing knowledge base and managerial and organizational factors in parent organizations influence the acquisition of new knowledge (Cohen and Levinthal, 1990; Van De Vrande, Vanhaverbeke, and Duysters, 2008; Van Den Bosch, Volberda, and De Boer, 1999; Zahra and George, 2002). Researchers have investigated corporate venturing from knowledge, resource-based, and learning perspectives (Burgelman, 1988; Floyd and Wooldridge, 1999; McGrath, 2001; Schildt et al., 2005; Zahra, Nielsen, and Bogner, 1999). The potential to benefit from a parent firm's resources and knowledge has been deemed the one advantage that corporate ventures have over independent start-ups (Chesbrough, 2000). Managers rate the fit with parent firms'

activities as the number one reason to select ventures (DeSarbo, MacMillan, and Day, 1987).

**Table 2.1 Examples of previous studies on relatedness and knowledge creation in venturing research**

<b>Authors</b>	<b>Level of analysis</b>	<b>Main findings</b>
Miller and Camp (1985)	Venture	Sharing customers, plants and equipment has a negative relation with a venture's return-on-investment.
DeSarbo et al. (1987)	Firm	Fit with the parent firm was the most important reason for managers to select corporate ventures.
Jolly and Kayama (1990)	Firm	Firms with ventures that build upon the company's core technology tended to integrate their ventures more than others.
Miller et al. (1991)	Venture	The interaction between resource sharing and venture reporting level had a positive effect on controlling costs, yet a negative effect on the venture's product quality.
Sorrentino and Williams (1995)	Venture	The relatedness of the venture with the firm has no effect on venture performance in terms of market share.
Danneels and Kleinschmidt (2001)	Venture	Marketing and technological fit have a positive effect on product performance in terms of sales and profits
Birkinshaw, Nobel, and Ridderstrale (2002)	Firm	The more system embedded the knowledge is within R&D, the greater the autonomy of the R&D unit and the lesser the interunit integration
Katila and Ajuha (2002)	Firm	Both reusing existing knowledge and exploring new knowledge were positively related to the number of new products a firm introduces.
Sapienza, Parhankangas, and Autio (2004)	Venture	Product and technological relatedness of the venture and the parent firm had an inverted U-shape relation with post-spin-off growth.
Schildt et al. (2005)	Venture	Technology relatedness has a negative effect on explorative learning.
Calantone et al. (2006)	Firm	Synergies with existing technologies and distribution channels had a positive effect on product profitability, which was mediated by product advantage and customer familiarity respectively.
Hill and Birkinshaw (2007)	Venture unit	Exploitation-oriented venture units were associated with increased venture unit survival

Related diversification in general has a positive effect on performance (Ansoff, 1965; Bettis, 1981; Rumelt, 1974). The more related the new activity with the firm's existing activities, the more possibilities to share resources, distribution channels, etcetera (Markides and Williamson, 1994). The resource-based theory of the firm added to this perspective the possibility to share idiosyncratic, inimitable resources such as core competences to achieve sustainable competitive advantage (Barney, 1991; Dierickx and Cool, 1989; Prahalad and Hamel; 1990; Wernerfelt, 1984). Related markets and technologies have also been argued to benefit the venture (Pinchot, 1985; Sykes, 1986), because of leveraging knowledge and increased support due to top management understanding (Fast, 1979; Mosey and Wright, 2007; Sykes, 1986).

Findings are, however, inconclusive about the effect of relatedness on corporate venturing (see Table 2.1). Sorrentino and Williams (1995) found no effect of relatedness on market share, while Hill and Birkinshaw (2007) showed that exploitation-oriented venture units had a higher chance of survival than exploration-oriented venture units. Sharing resources has a negative effect on a venture's ROI (Miller and Camp, 1985). To shed more light on the relation between relatedness and project performance, an increasing number of authors made a distinction between technological and market relatedness. Calantone, Chan, and Cui (2006) showed that synergies with the technologies and distribution channels of the parent firm had a positive effect on new product profitability. Findings of Danneels and Kleinschmidt (2001) indicated that technological and marketing relatedness had a positive effect on product performance. Schildt et al. (2005) showed that technological relatedness had a negative effect on explorative learning of ventures, while Sapienza et al., (2004) found an inverted U-shape relation with post spin-off growth. McGrath (2001) linked relatedness to venture autonomy and showed that the fit between the two had a positive effect on project performance.

These findings show that relatedness is an important aspect when investigating performance of individual ventures, but there is still little understanding of what the effect of in particular market relatedness is. As such, we conduct an exploratory case study to investigate how the exploration of technological and market knowledge unfolds. We follow this up with a cross-sectional study that assesses the effects of relatedness on NBD-project performance and how it interacts with the organizational context.

## ***2.5 Organizing for corporate ventures: autonomy and integration***

Entrepreneurship is creating new things in order to generate value. Schumpeter referred to this as creative destruction. In order to create value for something new, the old ways of doing need to be destroyed. Studies have shown that new standards can overthrow old standards in the harddisk drive industry (Christensen, 1997), typesetter industry (Tripsas, 1997) and the glass and minicomputer industries (Anderson and Tushman, 1990; Tushman and Anderson, 1986). In order to develop such radical innovations, corporate venturing researchers have argued to place ventures in autonomous units, far away from mainstream businesses (Burgelman, 1985; Fast, 1979; Hill and Rothaermel, 2003). This reduces the influence of top management and mainstream businesses, which often have vested interests in maintaining the status quo (Tripsas and Gavetti, 2000). It also decreases the possibility for intrusion in ongoing operations (Block and MacMillan, 1993). It allows top management to differentiate control and reward systems for ventures and ongoing businesses, as corporate entrepreneurship involves risk-taking, innovation, and opportunity maximization instead of the risk-avoidant, efficiency-driven, short-term profit maximization behavior required in the typical bureaucratic organization. Providing autonomy enhances creativity (Amabile et al., 1996) by delivering freedom to develop radically new technologies and products, and explore new ways of working. Bonner, Ruekert, and Walker (2002) showed that top management influence and control had negative effects on new business development (NBD-) projects. Burgelman (1984) argued there are different ways of achieving autonomy through the organizational hierarchy, from a micro new ventures department to an individual business unit. Wheelwright and Clark (1992) suggested autonomy can also be determined by the extent to which project members are allowed to work on a project. McGrath (2001) linked the different degrees of autonomy to the degree of newness of NBD-projects by showing that newer projects need more autonomy than related projects. Table 2.2 provides an illustrative overview of studies addressing the role of autonomy in new business creation in established organizations.

**Table 2.2 Overview of main findings on organizational and managerial antecedents in venturing research**

<b>Authors</b>	<b>Level of analysis</b>	<b>Main findings</b>
Burgelman (1985)	Firm	Firms should provide autonomy and apply a separate set of control and reward mechanisms to corporate ventures. Middle level mgt. should seek links between the firm's capabilities and skills and the venture.
Siegel, Siegel, and MacMillan (1988)	Firm	Firms should establish corporate ventures in independent units, and use different compensation than for mainstream businesses.
Zahra (1991)	Firm	Communication is positively associated with corporate entrepreneurship, formal control negatively. Differentiation was negatively related to internal and positively related to external corporate entrepreneurship. For integration the relationship is reversed.
Wheelwright and Clark (1992)	Project/ firm	Projects can have various degrees of autonomy, depending on the power of the project manager relative to functional managers.
McGrath (2001)	Venture	The interaction between project autonomy and exploration had a significantly positive effect on project performance.
Bonner et al. (2002)	Project	Top management influence and control over the venture has a negative effect on project performance
Thieme, Song, and Shin (2003)	Project	Cross-functional integration had a positive effect on new product survival in Korean firms, but not in Japanese firms.
O'Reilly and Tushman (2004)	Firm	Organizations need to structurally separate venturing from mainstream units, and integrate them through the senior team.
Scarbrough et al. (2004)	Project/ firm	Project autonomy led to the establishment of learning boundaries, which determined whether the learning was within project or between project-firm.
Gilbert (2006)	Firm/ venture	Organizations need to structurally separate venturing from mainstream units, and integrate them through the senior team.
Jansen et al. (2006)	Firm	Centralization has a negative effect on exploratory innovations, while connectedness has a positive effect on exploratory innovations.

Others have pointed to the relevance of integration mechanisms in developing new businesses, although these findings are not as conclusive as regarding autonomy (see Table 2.2). Zahra (1991) showed that integration had a negative effect on externally oriented corporate entrepreneurship activities, while it had a

positive effect on internally oriented corporate entrepreneurship activities. Jansen et al. (2006) showed that formal centralization had a negative effect on exploratory innovations, while informal connectedness had a positive influence on exploratory innovation. Findings from Thieme et al. (2003) indicated that cross-functional integration was positive for new product survival in Korean firms but had no effect in Japanese firms. Dougherty (1992) argued that cross-functional interfaces on itself might not be enough, what is really needed to stimulate venture development is collective action. Burgelman (1983b) argued that a level distinction should be made. His process model of venturing shows that on lower levels autonomy should be favored, while middle management should strive for integration of the venture and the parent firm. Such arguments start to go beyond seeing autonomy and integration as a trade-off, but instead envision them as mechanisms that can coexist in a single firm (Heller, 1999). Several recent studies on the ambidextrous organization just started exploring the possibility of providing autonomy to distinct units and integrating them through the senior team (Gilbert, 2006; O'Reilly and Tushman, 2004; Tushman and O'Reilly, 1996; Westerman et al., 2006).

In brief, these previous studies pointed to the pivotal role of autonomy in the process of new business development. In our three studies autonomy will also play a central role when we investigate several less-explored contingencies. In our first study we link autonomy to a variety of firm level integration mechanisms and investigate the effects on corporate venturing. In the second and the third study we explore the relations of autonomy with the degree of technological and market relatedness and how this affects NBD-project performance in several phases of the new business development process.

## ***2.6 The process of corporate venturing: phases in the business development process***

The prior studies we discussed in the preceding paragraphs used primarily a static perspective when investigating the relations between ventures and organizational knowledge bases and structures. Another set of venture and product development literatures recognizes that the parent-venture relationship is dynamic in nature (see Table 2.3). NBD-Projects evolve through certain stages (Cooper, 1986; Hart et al., 2003; Kazanjian, 1988; Olson et al., 2001; Thornhill and Amit, 2001). Song, Thieme, and Xie (1998: 296) stated that their “results show that the

pattern of effective integration varies throughout the NPD process, and each stage has a unique productive and counterproductive integration structure.” Each phase has its dominant problems (Kazanjian, 1988) and requires certain organizational and managerial contingencies to solve (Kazanjian and Drazin, 1990; Olson et al., 2001). Burgelman (1983b) showed for example that ventures should be autonomous in earlier stages and at lower levels of the organization, while in later stages middle and top management should set the appropriate strategic context and integrate the venture in the structural context of the organization.

**Table 2.3 Examples of previous studies on phases in the new business development process**

Authors	Level of analysis	Main findings
Burgelman (1983b)	Venture	The ICV process starts with definition of the project by project managers, and moves slowly upwards in the hierarchy to top management rationalization. At each step the venture becomes more integrated in the structural and strategic context of the firm.
Pinto and Prescott (1988)	Venture	Success factors differ over the project’s life cycle.
Kazanjian (1988)	Venture	Phases in the development process each have their own dominant problems. Building organizational systems and external relations became significantly more important in later phases.
Kazanjian and Drazin (1990)	Venture	The fit between decision-making centralization and functional specialization with the phase in the development process had a significant positive effect on rate of growth in that stage.
Song et al. (1998)	Firm	Matching the joint involvement of R&D, manufacturing, and marketing to the demands of each phase in the NBD-process has a positive effect on NBD-project success.
Olson et al. (2001)	Venture	The importance of cooperation between functional departments for NBD-project performance varies by phases in the development process, by type of dyadic cooperation and by level of innovativeness in the project.
Thornhill and Amit (2001)	Venture	Venture-parent firm relation is dynamic in nature, as relational bonds stay intact over the life time of the venture, while economic ties seem to diminish. CEO involvement also seemed to decrease while an increasing emphasis was placed on financial targets.
Hart et al. (2003)	Firm	Companies use different evaluation criteria for each phase of the development process.



Other studies showed that the level of cooperation and involvement of various functional departments in the NBD-process changed during an NBD-process (Olson et al., 2001; Song et al., 1998). When new business development processes progress, the criteria for judging ventures should be adjusted accordingly (Hart et al., 2003). Their findings suggested that in earlier stages the performance of a venture should be judged more in terms of venture potential and quality and in later stages the emphasis shifts towards more financial performance measures. This is in line with findings from Pinto and Prescott (1988), which showed that success factors differ for phases in the business development process.

Concluding, these studies show the relevance of taking a dynamic perspective on NBD-projects by taking into account different phases of the NBD-process. In particular, these studies pointed to the use of different performance criteria and different structural arrangements. In our case study, we will investigate how exploration of technological and market knowledge evolves over phases in the NBD-process and how this influences the criteria on which management should judge ventures. In the third study, we are investigating how autonomy evolves over the NBD-process and how this influences NBD-project performance.

## **2.7 Conclusion**

In this chapter we discussed how corporate venturing is based in the entrepreneurship literature and how corporate venturing as a phenomenon of new business creation shares many similarities with start-up entrepreneurship. We also argued that corporate venturing is markedly different from entrepreneurship, because it has to deal with a firm's existing knowledge base and organizational structures. As such, our three studies put the relation with the parent firm's structure and knowledge base central in our effort to increase our understanding of corporate venturing. Prior studies pointed at the relevance of studying corporate venturing at the firm and project level of analysis. These studies deliver different insights, as firm level research shows how a firm's structure influences a firm's whole portfolio of venturing activities, while project level research explores how project management and organizational aspects can be adjusted to match the needs of an individual venture. We therefore address corporate venturing from both the firm (study I) and the project (studies II and III) levels of analysis to gain insights from multiple perspectives.

We also discussed how prior research has placed emphasis on three important aspects of corporate venturing, namely relatedness of ventures with the parent firm, the level of autonomy/ integration a venture receives, and how a venture evolves over certain phases in the business development process. Relatedness determines to what extent a venture should explore new knowledge or can benefit from existing knowledge. Autonomy might provide a venture freedom to develop new businesses, while integration might facilitate the use of existing knowledge. NBD-projects have also been shown to have different project management requirements for each of the phases of the business development process (Song et al., 1998; Westerman et al., 2006). Yet, research has been inconclusive on the effects of these aspects on NBD-project performance. We argued that an important reason is that previous studies have limitedly addressed contingencies between autonomy, relatedness and the phases in the NBD-process and how these aspects jointly affect NBD-project performance. For example, McGrath (2001) discussed how the fit between relatedness and project autonomy might have a positive effect on NBD-project performance. In our three main studies we explore these contingencies between these three aspects in the context of new business development in more detail. Study I investigates how firms can provide both autonomy and integration to corporate ventures. Study II delves into relatedness by investigating the differences between exploration of technological and market knowledge over the phases of the NBD-process. Study III follows up on the second study by exploring how the relation autonomy and technological and market relatedness might be dynamic in nature by having different effects on NBD-project performance for the development versus commercialization phase of the NBD-process. Together, these three studies provide a richer understanding of managing corporate ventures by addressing some of the missing links in previous research on new business creation.



## **3 Methodology**

### ***3.1 Introduction to a multilevel, multimethod approach***

In chapter one we referred to Davidsson's statement that "the most fruitful way forward for entrepreneurship research would be integrated research programs that included several types of research addressing different aspects of the same issues" (2005: 60). We argued that investigating our phenomenon of interest from different levels of analysis and through different methodologies increases our understanding of successfully managing new business development activities in established firms. A multimethod approach points attention to factors that would have fallen beyond the boundaries of applying a single methodology. It also increases our meta-understanding of the phenomena we study, as it allows for cross-fertilization by linking findings from different levels of analysis together (Davidsson, 2005). An often used allegory to point out the drawback of a single lens is the tale of six blind men and the elephant that are all very able to understand part of the elephant, but fail to grasp the big picture (see Mintzberg et al., 2000). Yet, methodologies should first and foremost follow from the research questions one asks (Davidsson, 2005; Yin, 2003). In the following paragraph we discuss how our methodologies fit with our research questions and the general state of the field concerning our investigated phenomena by using the frameworks of Edmondson and McManus (2007) and Greene, Caracelli, and Graham (1989). This will be followed by a discussion of multilevel theory. The final three sections will introduce the case study and survey methods used in our three studies and provide a reflection on the chosen methodology. A more detailed discussion on the methods and the study variables is provided in chapters 4-6, that each discusses one of our studies.

### ***3.2 Methodological fit***

One of the ground rules for any good research project is that the chosen methodology matches the research questions one seeks to address. There is also implicit understanding amongst researchers that the methodologies and research questions relate to the theoretical contributions an article can make (Edmondson

and McManus, 2007). A recent article by Edmondson and McManus (2007) argued that such a view is too narrow and that a good research project not only shows consistency between research questions, research design and theoretical contributions, but also with the state of the literature on the phenomena. They argue that the state of the field can roughly be divided in three categories: nascent, intermediate and mature theories (see Table 3.1). Nascent theories are new fields of research characterized by explorative case studies, whereas mature theories are established research fields, with a strong emphasis on addressing relationships between constructs in quantitative ways. Intermediate theories fall in-between nascent and mature fields of research, where there is some notion of the relations between constructs, but the theory needs to be refined and improved by bringing in additional theories and constructs. In intermediate fields the body of knowledge benefits most from multimethod approaches combining qualitative and quantitative methods.

In this typology, the field of corporate venturing can be defined as an intermediate field. There has been substantial case research in earlier years, most notably by Burgelman (1983b; 1985), but there have also been attempts at approaching the phenomenon more quantitatively (cf. Hill and Birkinshaw, 2007; Sorrentino and Williams, 1995; Thornhill and Amit, 2001; Zahra, 1996). Yet, results have been preliminary and ambiguous with little attempt at replicating earlier findings to strengthen the theoretical body of knowledge. Sorrentino and Williams' (1995) study for example mentioned a range of studies that provided arguments for or against a positive effect of venture relatedness and performance. Their study's findings were insignificant, further suggesting that there may be contingencies influencing the relationship that have not been addressed. McGrath (2001) showed that autonomy is one of those variables moderating the relationship between relatedness and venture performance. Another indication that the field still has not reached a mature stage is the attempts of scholars to define the field (cf. Dess et al., 2003; Guth and Ginsberg, 1990; Miles and Covin, 2002; Sharma and Chrisman, 1999). Our study fits in this typology. We bring in theories on ambidextrous organizations to observe venturing in organizations (see chapter 4), and connect theories on new business development processes with theories on technology and market relatedness (see chapter 5). The purpose of bringing in these theories is to build a more elaborate theory that can better explain the success of corporate venturing.

**Table 3.1 Methodological fit in nascent, intermediate and mature fields of research**

	Nascent	Intermediate	Mature
<b>State of the field</b>	Little or no prior theory exists.	Some theory exists. Often brings in new constructs or connects previously disconnected literatures.	A well-developed body of research exists, with validated constructs and models.
<b>Type of research question</b>	Open-ended inquiry.	Proposed relationships between new and established constructs.	Focused questions relating existing constructs. Exploring the boundaries of the theories in new settings.
<b>Data collection</b>	Qualitative, process type research.	Hybrid. Qualitative to further explore the phenomena and validate constructs. Quantitative to provide first statistical evidence.	Quantitative research to test relations among existing constructs.
<b>Data collection fallacies</b>	Using quantitative data may result in fishing expeditions or may limit the exploration process to one or two variables.	Overly focus on quantitative data lacks validity and reliability for new constructs. Focus on qualitative data results in missed opportunities to support the theory.	Relying on qualitative data may result in reinventing the wheel, while adding qualitative data to the quantitative data usually adds nothing more then lengthening the paper.
<b>Contribution</b>	A suggestive theory inviting further work.	A provisional theory that often brings together previously separate theories.	Supporting or rejecting a theory. Often exploring its applicability in new contexts.

Source: based on Edmondson and McManus (2007)

Studies in an intermediate field typically should have both qualitative and quantitative aspects (Edmondson and McManus, 2007). However, effective papers tend to emphasize one over the other (Mohr, 1982), as it can be notoriously difficult to incorporate two different methodologies in a single paper. Qualitative data may for example be used to strengthen the validity of a new construct in a more quantitative study, whereas quantitative data may be used for a first assessment of propositions developed in more qualitative oriented studies (Edmondson and McManus, 2007). Greene et al. (1989) argued that mixed-method studies can also be carried out in different studies, depending on the objective a researcher is after when implementing a mixed-method design. Yet, this is a grey area, as researchers may often try to achieve multiple objectives with a mixed-method study (Greene et al., 1989). For instance, Greene et al. (1989) showed that studies often mention triangulation as an objective, but studies rarely achieve triangulation, as it requires studying the same phenomena at the same time through different methodologies that are independently executed. They argued that most of these studies were in fact of a complementary type, in which the second study is used to clarify the results of the first study. In such cases one would typically follow a quantitative study with a more qualitative study to better understand the results.

In the light of their proposed typology, the primary purpose of our study is can be characterized as the expansion type with part development in it as well. The purpose of an expansion type study is “to extend the scope, breadth, and range of inquiry by using different methods for different inquiry components” (Greene et al., 1989: 269). The distinguishing feature of an expansion type study is that it looks at partially overlapping and partially different phenomena and matches the method to the object of study. The methods don’t necessarily have to be dependent on each other, as findings of the different studies are often not integrated (Greene et al., 1989). This applies also to our three studies (see Table 3.2). The first study assesses corporate venturing at firm level to assess the role of organizational and managerial mechanisms in corporate venturing. The second study addresses the new business development process in an established firm and focuses on how the exploration of technological and market knowledge unfolds over time and what the effects are on project management characteristics. The third study builds on some of the findings in the second study by addressing the relations between project autonomy and technological and market relatedness over time. In this sense, the presented research is partly developmental, as the third study builds on

some of the findings of the second study. In the third study we build on the notion that the exploration of technological and market knowledge and the level of autonomy may vary over time, because we argue that the fit between relatedness and autonomy positively affects NBD-performance.

**Table 3.2 Overview of the methods applied in the three studies**

Study	Topic	Dependent variable	Method	Level of analysis	Sample	Timeframe	Data source
I	Effect of organizational aspects on venturing	Corporate venturing	Survey	Firm	Cross-sectional	Measurement on two points in time. Independents in 2005, dependent in 2006.	Senior team members
II	Knowledge exploration process in NBD-projects	NBD-project success/failure	Case study	Project	Multiple projects within single firm	Retrospective longitudinal study of development of NBD-projects (up to 10 years).	Project, marketing, R&D, and senior managers. Variety of documents
III	Knowledge relatedness, organizational aspects and NBD-project performance	NBD-project performance	Survey	Project	Cross-sectional	Retrospective comparison of two phases in the NBD-process.	Project managers

By writing three different papers on the three different studies, our mixed-method design deviates somewhat from the recommendations made by Greene et al. (1989), as their study was aimed at writing articles and not so much books or dissertations. We believe that their findings can be extended to books and dissertations, which provide more room for executing multiple studies. Greene et al. (1989) opt for mixed-methods in a single study, yet their sample is biased as they focused on single articles, meaning that their study did not include multiple articles with each a different method from the same researcher. Although the synergies might be reduced when writing multiple articles, a dissertation or a book is the place where different studies in different chapters can be brought together, as we attempt to do in this present thesis. Second, their recommendations are



aimed at writers of articles. Publishing mixed-method studies is already difficult due to the length and complexity of such studies, bringing together different studies in one paper makes matters even worse (Edmondson and McManus, 2007). Again, a book or a dissertation provides the space and the leeway to bring together these studies and explore them more in-depth to do full justice to each of these studies. In particular the development or expansion type study we conduct can benefit from bringing together multiple studies with different methods.

### ***3.3 Homogeneity and heterogeneity issues in multilevel studies***

Besides the applied method the level at which one performs the analysis is of critical importance. The level of analysis determines the applicability of the theory. Without clearly identifying the level of analysis results become meaningless. As discussed in paragraph 2.3 studies on corporate venturing have, among others made distinctions between the venture (Biggadike, 1979; Sykes, 1986) and the firm level of analysis (Covin and Miles, 2007). Regardless of the level of analysis, however, every study should address their assumptions on homogeneity, independence and heterogeneity (Klein, Dansereau, and Hall, 1994). Assuming *homogeneity* implies that the unit can be depicted as a whole. This might be more obvious if one looks at global properties of a venture or a firm, such as the revenue of last year or the size of the firm in terms of number of employees. One would expect just one value for each of these measures (Klein and Kozlowski, 2000). However, it gets a bit trickier when investigating shared properties such as a shared vision or the degree of social integration. It can be assumed that shared vision is a venture level construct and every member of the venture would share the vision to more or less the same degree. It could also be argued this differs widely for each member of a firm. Besides having different theoretical viewpoints on homogeneity, there are, however, statistical techniques for testing the validity of homogeneity assumptions (Klein et al., 1994; Klein and Kozlowski, 2000).

*Independence* assumes that members of a group are not influenced by that group. Such theories might argue that the performance of a corporate venture is independent of the parent firm. For example, a venture developing a new internet browser would achieve the same performance if it were part of Microsoft than if it were part of Monsanto. In such cases a study could focus solely on attributes of the venture and any part of the firm can be ignored in the analysis. This

assumption is a bit unrealistic regarding corporate venturing, as several studies have argued that ventures are not independent of their organizational context, which might have strong effects on ventures (cf. Bonner et al., 2002; Miller and Camp, 1985; Sorrentino and Williams, 1995). This suggests heterogeneity might be a more appropriate assumption.

*Heterogeneity* assumes that group members are different but that it depends on the group they are in. Klein et al. (1994) described this as the frog pond effect. The same frog may be large in a small pond, but small in a very large pond. For example, a venture with a budget of 25 million Euros would be a negligible expense for a company such as Royal Dutch Shell with operating profits in excess of 25 billion Euros. But the same venture would consume all of Royal Haskoning's operating profits for 2007. In cases of heterogeneity it is thus vital to take the larger group into account. This also points to multilevel issues with theory, as it refers to within and between unit analysis. For example, one may assume that a venture is a homogenous unit, but at the same time expect ventures to differ from each other within a firm or industry.

Our assumptions regarding homogeneity and heterogeneity are expressed in Table 3.3. First, we expect a venture or project to be relatively homogenous regarding our study variables. Our object of interest regarding ventures are relatively objective variables such as venture performance, how new it is for the organization what the venture is developing, and decision-making autonomy. A key informant such as the project manager should be able to provide these values. Although in principle such responses can be biased, through providing anonymity and making sure that respondents are not affected by the answers, more unbiased responses are generated. Providing respondents with an optional management report means that answering in a biased way reduces the value for respondents (Li, Bingham, and Umphress, 2007). Second, we do expect heterogeneity between projects. One of our key variables, relatedness, is expected to be an important cause of heterogeneity in NBD-project performance and is therefore explicitly taken into account in our studies on projects. Studies have shown that there are major differences between projects/ ventures (cf. McGrath, 2001; Schildt et al., 2005). The relatedness and autonomy constructs explicitly assume that there is a relation between the venture and the parent firm that may be of influence. These results suggest that heterogeneity fits better with the reality of ventures than assuming independence when investigating differences between ventures. Third, we assume that organizational mechanisms are relatively homogenous within

firms. For example, we expect a firm to have a certain structure or reward systems and not multiple mechanisms that differ in the eyes of the beholder. This assumption has a strong foothold in management literature often targeting the senior executive of the firm as the most knowledgeable (cf. Michel and Hambrick, 1992). Fourth, we expect again heterogeneity between firms as firms will make different choices as how to compete and organize themselves. Even though there might be more similarities between firms in certain industries, just the mere difference in size and performance could have an impact on a firm’s venturing efforts (cf. Zahra and Hayton, 2008).

**Table 3.3 Assumptions regarding homogeneity and heterogeneity**

Level of analysis	Assumption regarding study variables	Data source
Within venture	Homogenous	We focus on more “objective” aspects of the venture such as venture performance and relatedness of the venture
Between ventures	Heterogeneous	Ventures differ widely in their activities, yet are not independent of their parent firm, because of resource sharing for example.
Within firm	Homogenous	Organizational mechanisms such as structure, integration are expected to be similar within a firm.
Between firms	Heterogeneous	Firms differ from each other, in particular since aspects such as age, size and performance have been argued to influence venturing activities.

There are various strategies for dealing with heterogeneity. If the researcher is after the cause of heterogeneity, one could model it as a moderator or perform subsample analysis (Davidsson, 2008). For example, if findings on the relation between project autonomy and project performance are ambiguous, and a researcher expects this might be caused by heterogeneity due to differences in the relatedness of projects, one could include relatedness as a moderator in the analysis. In a similar vein, if one expects the venturing process to be completely

different in the construction versus electronics industry, a study could investigate a sample of ventures in the construction industry and one in the electronics industry and deliver important new insights by comparing the results for both groups. Another way of dealing with heterogeneity is to focus on a more homogenous group, e.g. firms in one industry. Although this reduces the effect of heterogeneity, it also reduces the possibilities for generalization (Davidsson, 2008). More common approaches of dealing with heterogeneity are to include control variables and to develop more generic measures (Davidsson, 2008). The latter approach usually results in an underestimation of the true effect (Davidsson, 2008). Controlling for heterogeneity works best when it is expected that there is not too much disturbing influence of heterogeneity. In an extreme case where the relation between two variables would be strongly negative for men and somewhat positive for women, controlling for gender would produce the meaningless result of a slightly negative main effect and a positive effect for the female control variable (Davidsson, 2008). In the following three paragraphs we will explain how we dealt with heterogeneity issues in each of our three studies in more detail.

### **3.4 Study I: firm level survey**

Our first study investigates what the consequences of structural differentiation and integration mechanisms are for the firm's portfolio of ventures. Most organizational mechanisms might be too rigid to be adjusted to the individual needs of a project, which warrants looking at the effects of integration mechanisms on the portfolio of new business development initiatives in a firm. To reduce the risk of highly context-specific findings when focusing on a limited set of companies, we needed a large sample. We chose to conduct a survey, because the variables we intended to investigate such as the degree of top management team social integration or a shared vision can typically not be found in secondary data. We administered a survey that measures managerial and organizational factors and corporate venturing on a firm level to the executive directors of a sample of 4000 firms derived from the most comprehensive database on companies in the Netherlands, Reach. Such a large cross-sectional sample increases our external validity and produces generalizable results. The generalizability is further increased by the wide variety of industries we targeted. Responding firms were present in among others manufacturing, construction, trade, transportation,

financial and professional services. We expect that the theorized relations between our study constructs will generally hold in different types of firms across a variety of industries. Nevertheless, there might always be some heterogeneity that can be controlled for. Typical controls in corporate entrepreneurship studies are industry, dynamism, and firm size and age (cf. Zahra and Hayton, 2008). We include these controls in our analyses too.

We expect homogeneity within firms regarding the organizational mechanisms we investigated such as shared vision (see Table 3.3). As such, we can select a single key informant for each firm (Klein and Kozlowski, 2000). We selected executive directors as our key respondents, as they have the best oversight over firm level mechanisms and outcomes (O'Reilly and Tushman, 2004). To assess the validity of the responses of a single senior executive, we surveyed one additional top management team member in each responding company (Venkatraman and Grant, 1986). By calculating the agreement between these two respondents through procedures outlined by James, Demaree and Wolf (1984) and Kozlowski and Hults (1987), we can statistically assess whether there is homogeneity within the firm regarding our constructs.

We received surveys from 452 firms. A year later we send those firms a follow-up survey to measure corporate venturing, our dependent variable. We separated the measures of our independent and dependent variables to reduce the likelihood of common method bias, which is in particular prone to occur in firm-level survey constructs (Podsakoff et al., 2003). The questionnaires measured our study variables through multi-item constructs. Multi-item measures are preferred over single-item measures, as it allows for making more fine-grained distinctions, and reliability tends to increase while measurement error decreases when adding additional items (Churchill, 1979). Moreover, our measures were based on scales previously validated in literature, further increasing the validity of our survey instrument. The items for all our constructs can be found in Appendix A. A more elaborate discussion of our methodology and validity tests for study I can be found in chapter 4.

### **3.5 Study II: case study**

Notwithstanding the benefits of a firm level approach, there might be factors that differ between projects, suggesting a need for project level research. One such factor is the relatedness between the project and the parent firm in terms of new

knowledge that the project needs to develop. Yet, little is known about knowledge relatedness and the effects it may have on project management. Investigating knowledge relatedness points to the importance of studying the project in relation to its organizational context. Engwall (2003) argued that addressing the organizational context is one of the most neglected aspects in research on projects. This suggests a multilevel design, as firm level factors may influence projects. When there is a need for exploration and explanation of the phenomenon, and there is considerable ambiguity regarding the organizational context, a case study design is the preferred solution (Yin, 2003). While surveys require parsimony with relatively few organizational variables that can be taken into account, a case study can address many contextual variables from a variety of perspectives (Yin, 2003). As we wanted to investigate how exploration of technological and market knowledge unfolds over time, we employed a longitudinal case study design.

As argued in paragraph 3.4, we expect heterogeneity between firms. To reduce this heterogeneity, we selected a single firm to conduct our case study. Through investigating all cases in a single firm, we were able to keep other firm or industry factors constant, while allowing for variation in technological and market knowledge relatedness. Also we assumed that certain organizational mechanisms are relatively homogenous within a firm (see study I). Technically speaking this means that there is no variation in firm level variables hence it can never explain any variation in projects (Davidsson, 2008). However, we do expect differences between projects and expect projects to react differently to aspects of the organization such as control systems and top management pressure. This means that factors of the NBD-project are expected to interact with organizational variables. Although we cannot test the strength of the effect and establish its causality in a statistical sense, we can use sound theoretical reasoning and an in-depth inquiry by means of a case study to understand the effects of the organizational context on NBD-projects. The next study will test some of these relations through a cross-sectional survey design.

As such we conducted an in-depth, longitudinal case study of eight new business development projects at the *DOMUS division* of ELECTRA, a major manufacturer of consumer electronics. The cases were selected based on a theoretical sampling logic, meaning they differed regarding our primary object of interest, i.e. technological versus market exploration in the setting of NBD-projects. Using multiple cases allowed us to replicate our findings and strengthened the validity of our research (Eisenhardt, 1989; Yin, 2003). In the

logic of Figure 1.3, we selected cases in all quadrants (1-3) that had some degree of exploration to classify them as NBD-projects. In each quadrant we wanted cases that maximally differed from each other in terms of success and failure (Pettigrew, 1990). This allows for more meaningful theoretical comparisons as we can compare within and across quadrants. To uncover how developments in these projects over time led to success or failure, we took a 10-year time span (1993-2003) to investigate these projects.

Given the long time span, it was not possible to observe these projects real-time. Instead we drew on retrospective accounts. Retrospective longitudinal designs, however, have been criticized for incorporating potential hindsight biases in the findings (Golden, 1992; 1997). Informants might not recall the exact order of events and selectively remember certain events, while forgetting others that might have been of importance (Leonard-Barton, 1990). To counter this potential problem, we took several steps to create a more compelling case study. We used multiple informants (Phan and Hill, 1995), triangulated interview data with non-retrospective data such as minutes of meetings (Brockner et al., 1994), and used informants that did not have personal stakes in the projects (Golden, 1997). This second study complements the first survey study by addressing new business development on a project level. The first study investigated how to optimize a firm for new business creation, but there might be large differences between NBD-projects and how they should be managed. To explore this, we investigate in this study how exploration of technological and market knowledge unfolds over the NBD-process and how this affects the performance of NBD-projects. The methodology of this second study is explained in greater detail in chapter 5.

### **3.6 Study III: project level survey**

The second study explored the phenomena of exploration of technological and market knowledge in NBD-projects. By focusing on multiple projects in a single firm increased our understanding of how project management factors and exploration of technological and market knowledge influenced project success, yet limited the generalizability of our findings to other contexts (Yin, 2003). To complement our exploratory case studies, we therefore employed a cross-sectional survey to generalize our findings to other contexts. Such an approach should create sufficient variance between firms and projects to assess the strength of our hypothesized effects in a variety of contexts. A drawback of surveys is that they

can only take a limited number of factors into account (Yin, 2003), making ex ante understanding of the phenomena to select the appropriate variables essential. Based on both theoretical reasoning and the findings from the case study, we were able to identify a more parsimonious model on knowledge relatedness and NBD-project performance and develop a questionnaire. Through the use of previously validated multi-item constructs we were able to increase the validity of our instrument.

The survey was targeted at new business development (NBD-) project managers. Although they are less visible to outsiders than top management team members and therefore more difficult to reach, NBD-project managers were selected as key respondents due to their better insights into an NBD-project as other informants (Li et al., 2007). We gained cooperation from the Dutch association of business development (VBDN) to administer a survey to their database of NBD-project managers. The survey was conducted on a sample of 1074 NBD-project managers. Further screening led to the deletion of 156 potential respondents for various reasons such as not involved in NBD-projects or address change. From our final sampling frame we were able to obtain 139 responses, representing a response rate of 15.1 percent. The survey provided a richer picture of the relations between technological and market knowledge relatedness, project autonomy and NBD-project performance by investigating other industry contexts and creating more variety in how projects were managed in terms of autonomy. The survey design also allowed us to make more fine-grained assessments of moderating relationships and of the discriminant validity of our technological and market knowledge constructs, which we established as separate in the case study.

The case study focused on a single firm, limiting the generalizability of its findings, as heterogeneity between firms is expected (see Table 3.3). The survey was thus conducted amongst different firms to create variety in the ways projects were handled by firms. Yet, we still wanted to control for additional sources of heterogeneity such as industry, dynamism, and firm size and age. In case these controls do not relate to our independent variables, they would at most increase our explained variance. In case they do relate, however, it is vital to include them to assure we are not attributing explanatory power to our independent variables which might in fact come from not-included control variables. As we expect heterogeneity between projects too, we controlled for factors such as project size and experience of the project managers. Such factors could be related to decision-making autonomy, as an experienced project manager might even offset it to some



extent. We complemented our second study that focused on within-firm variety of projects by addressing between-firm variety in projects. This study links firm and project level together, as our main independent variables assess to what extent a project is new and autonomous *relative* to the parent firm. The methodology of this study is explained in more detail in chapter 6.

### **3.7 Conclusions**

In this chapter we argued how we addressed the call for more integrative research approaches that observe a phenomenon from multiple methods and levels of analysis (cf. Davidsson, 2005). We showed how our three studies complemented each other to create a richer understanding of the relation between venture autonomy, relatedness, and venture performance. We investigated from the firm as well as from the venture level of analysis, multiple projects in a single firm and multiple firms in a variety of industries. Furthermore, we assessed senior management as well as project management, not just for the sake of pluralism, but first and foremost because our research questions as posited in chapter 1 required these different approaches. We discussed issues with using multi-method studies and argued that corporate venturing is an intermediate field of research in the framework provided by Edmondson and McManus (2007) warranting both qualitative and quantitative approaches. Next we discussed homogeneity and heterogeneity issues in conducting research on multiple levels. We discussed how this thesis views ventures and firms as homogenous units, but with significant heterogeneity between ventures and firms. Following prior research we elaborated on how this affected our research design to ensure valid and reliable outcomes.

## **4 The effects of autonomy and integration on firm level corporate venturing<sup>1</sup>**

### **Summary**

Research has suggested that corporate venturing is crucial to strategic renewal and firm performance, yet scholars still debate the appropriate organizational configurations to facilitate the creation of new businesses in existing organizations. Our study investigates the effectiveness of combining structural differentiation with formal and informal organizational as well as top management team integration mechanisms in establishing an appropriate context for venturing activities to flourish. Our findings suggest that structural differentiation has a positive effect on corporate venturing. In addition, our study indicates that a shared vision has a positive effect on venturing in a structurally differentiated context. Socially integrated senior teams and cross-functional interfaces, however, are ineffective integration mechanisms for establishing linkages across differentiated units and for successfully pursuing corporate venturing.

### **4.1 Introduction**

Research has increasingly acknowledged that corporate venturing facilitates strategic renewal and increases organizational growth and performance (Burgelman, 1983a; Zahra and Covin, 1995). Corporate venturing refers to the creation of new businesses within existing firms (Sharma and Chrisman, 1999), and involves the creation of new competencies and capabilities underlying new products and services (Block and MacMillan, 1993; Zahra et al., 1999). Despite these beneficial outcomes, scholars have argued that is very complex and difficult to successfully manage venturing activities in incumbent firms (Burgelman and

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<sup>1</sup> This chapter is published as Burgers, J.H., J.J.P. Jansen, F.A.J. Van den Bosch, and H.W. Volberda (2008a). Structural differentiation and corporate venturing: the moderating role of formal and informal integration mechanisms. Accepted for publication in *Journal of Business Venturing*.

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Valikangas, 2005; Hill and Birkinshaw, 2007). Venturing creates paradoxical challenges within organizations, as the explorative processes underlying venturing are at odds with ongoing business operations. However, corporate ventures may also benefit from leveraging knowledge and resources available within mainstream businesses (Covin and Miles, 2007). Although prior research has started to uncover the proper context for venturing through differentiation or integration, our understanding of how organizations may reconcile this paradox in order to effectively pursue corporate venturing, is far from complete.

Exploratory processes in corporate venturing result from search, variation, and experimentation and have been associated with autonomy and structural differentiation, i.e. “the segmentation of the organizational system into subsystems” (Lawrence and Lorsch, 1967: 3-4). The latter serves as a mechanism for decoupling new venturing activities from mainstream businesses to enhance flexibility and local adaptation in venturing units. Studies addressed the importance of structural differentiation in terms of new venture divisions (Fast, 1979), skunk works (Peters and Waterman, 1982) or independent business units (O’Reilly and Tushman, 2004) to facilitate corporate venturing. Leveraging existing competencies, however, requires refinement, efficiency, and improvement, which succeeds by reducing variance, increasing control, and integrating the venture and the parent firm (Benner and Tushman, 2003; March, 1991). Integration refers to “the process of achieving unity of effort among various subsystems in the accomplishment of the organization’s tasks” (Lawrence and Lorsch, 1967: 4), and reflects specific mechanisms through which organizational units are coordinated and facilitated to work together.

Previous studies on venturing have tended to focus on the organizational structure as the appropriate way by which organizations may either facilitate differentiation or integration (Heller, 1999). Lawrence and Lorsch (1967), however, viewed differentiation and integration as complementary instead of a trade-off. In addition, ambidextrous approaches (Tushman and O’Reilly, 1996) have suggested that loose-tight coupled designs create permeability across differentiated units and enable organizations to establish strategic coherence through integrative linkages (Orton and Weick, 1990; Westerman et al., 2006). Ambidexterity and organizational learning literatures pointed to several mechanisms that may achieve integration in more informal ways, such as establishing a shared organizational vision or inducing top management team social integration (Tsai and Ghoshal, 1998; O’Reilly and Tushman, 2004). Such

approaches allow for solving the paradox by developing specific configurations of differentiation and integration mechanisms. There is, however, little systematic evidence about the differential effects of configurations of structural differentiation and integration mechanisms, in particular in the context of corporate venturing.

By addressing this research gap, our study contributes to prior literature in three ways. First, our study not only examines the implicit logic that structural differentiation facilitates corporate venturing, but also explores how structural differentiation *combined with* certain integration mechanisms contributes to corporate venturing. Previous studies have largely ignored the importance of establishing autonomous yet integrated designs to facilitate corporate venturing (Westerman et al., 2006) by focusing either on differentiation (Burgelman, 1985; Fast, 1979) or integration mechanisms (Chesbrough, 2000; Thornhill and Amit, 2001). Based on the ideas of Lawrence and Lorsch (1967), we argue that organizations need to establish both structural differentiation and integration to address multiple conflicting demands. By exploring these contingencies, we provide new insights into how organizations may establish structurally differentiated yet integrated designs capable of enhancing venturing activities within established businesses.

Second, we simultaneously consider the effectiveness of various integration mechanisms in establishing loose-tight coupling to enable corporate venturing. Whereas some scholars have focused on the role of corporate management (Burgelman, 1985; O'Reilly and Tushman, 2004), others have pointed to organizational integration mechanisms (Brown and Eisenhardt, 1997) to increase corporate venturing in differentiated units. Moreover, prior research has tended to differentiate between formal and informal mechanisms in coordinating and integrating business activities (Gupta and Govindarajan, 2000; Tsai, 2002). To deepen our understanding of how organizations may successfully manage interdependencies across differentiated venturing and mainstream units, several authors pled for a simultaneous assessment of multiple integration mechanisms (Collins and Smith, 2006; Westerman et al., 2006). As such, we classify *four types of integration mechanisms* along two aspects: (1) organizational and top management team, and (2) formal and informal integration mechanisms. We examine the moderating effects of organizational level (i.e. formally through cross-functional interfaces and informally through a shared vision) and TMT level (formally through group contingency rewards and informally through social

integration) integration mechanisms on the relationship between structural differentiation and corporate venturing.

Third, although integration mechanisms establish interactions across mainstream units (Gupta and Govindarajan, 2000), we suggest that certain combinations of differentiation and integration mechanisms may lead to rigid and detrimental conditions for corporate venturing. Although prior studies have highlighted the benefits of integration mechanisms for establishing cooperation and interaction across highly interdependent units, we assert that integration mechanisms could also have negative outcomes for more independent units such as corporate ventures. In this sense, we deliver new insights concerning the establishment of a proper organizational context that is conducive to host differentiated yet partly integrated venturing and mainstream units (e.g. Gibson and Birkinshaw, 2004; Tushman and O'Reilly, 1996).

The chapter proceeds as follows. The next section contains the literature review and hypotheses. Next we discuss the research methodology and generation as well as validation of our measures, followed by our empirical findings. We conclude with a discussion of our findings, implications for both scholars and practitioners, and future research issues.

## ***4.2 Literature review and hypotheses***

Studies on venturing have emphasized that corporate ventures are different from mainstream businesses (Burgelman, 1983b; Sykes and Block, 1989). Prior research has therefore argued that venturing activities should be differentiated in autonomous units (Block and MacMillan, 1993; Burgelman, 1985; Fast, 1979) that allows for managing and rewarding ventures and mainstream businesses in different ways (Kanter, 1985). Besides pointing out the differences between venturing and ongoing business activities, scholars have also addressed the importance of available resources and complementary knowledge sources within firms (Chesbrough, 2000; Dushnitsky and Lenox, 2006; Shrader and Simon, 1997; Thornhill and Amit, 2001). Van de Ven (1986) argued that overcoming these paradoxical demands is central to the management of innovations, and suggested that managing part-whole relationships across differentiated units is essential for innovation and venturing. Corporate venturing does “not occur in abstraction from current abilities” (Kogut and Zander, 1992: 391) and involves both reusing existing knowledge and exploring new knowledge (Covin and Miles, 2007; Hill

and Birkinshaw, 2007; Katila and Ajuha, 2002). Structurally differentiating venturing activities in autonomous units may inhibit venture-parent organizational learning (Birkinshaw et al., 2002; Scarbrough et al., 2004) and decrease synergies among units (Tushman and O'Reilly, 1996).

The combination of structural differentiation and integration creates a loosely coupled system, in which structural differentiation facilitates local adaptability and exploration of novel businesses, and integrative mechanisms facilitate strategic coherence and knowledge transfer between structurally differentiated organizational units (Gilbert, 2006; O'Reilly and Tushman, 2004; Weick, 1982). In this sense, integration mechanisms contribute to the effectiveness of structural differentiation in facilitating venturing and innovation. Structurally differentiated corporate ventures are relatively independent of other organizational units with a limited need for knowledge exchange and combination (Burgelman, 1985; Tushman and Nadler, 1978). We argue therefore that only specific combinations of structural differentiation and integration contribute to the pursuit of corporate venturing in established organizations.

#### **4.2.1 Structural differentiation and corporate venturing**

Structural differentiation refers to 'differences among subunits with respect to goals orientation, time orientation, and interpersonal orientation' (Golden and Ma, 2003: 485). It creates 'pragmatic boundaries' (Carlile, 2004) that safeguard venturing activities from dominant managerial cognitions and inertia present in the parent's mainstream activities (Benner and Tushman, 2003; Gilbert, 2005). Structural differentiation provides ventures with a sense of freedom and ownership over their activities. Such spatial separation leads to higher creativity (Amabile et al., 1996) and allows for adaptation to local demands. It facilitates within-venture learning and increases knowledge creation at different venturing locations within organizations (Fiol, 1995; Scarbrough et al., 2004). Establishing local 'thought-worlds' through differentiation leads to creative breakthroughs and more opportunities to venture (Fiol, 1995). Furthermore, it keeps ventures away from reporting and annual budgeting policies (Burgelman, 1985), and protects them from perverse pressures to grow fast (Burgelman and Valikangas, 2005). Moreover, through structural differentiation, venturing units can adopt their own working methods that are better suited for their exploratory processes. Therefore, we argue that structural differentiation has a positive effect on corporate venturing.

*Hypothesis 1: Structural differentiation will be positively related to corporate venturing.*

#### **4.2.2 The moderating role of integration mechanisms**

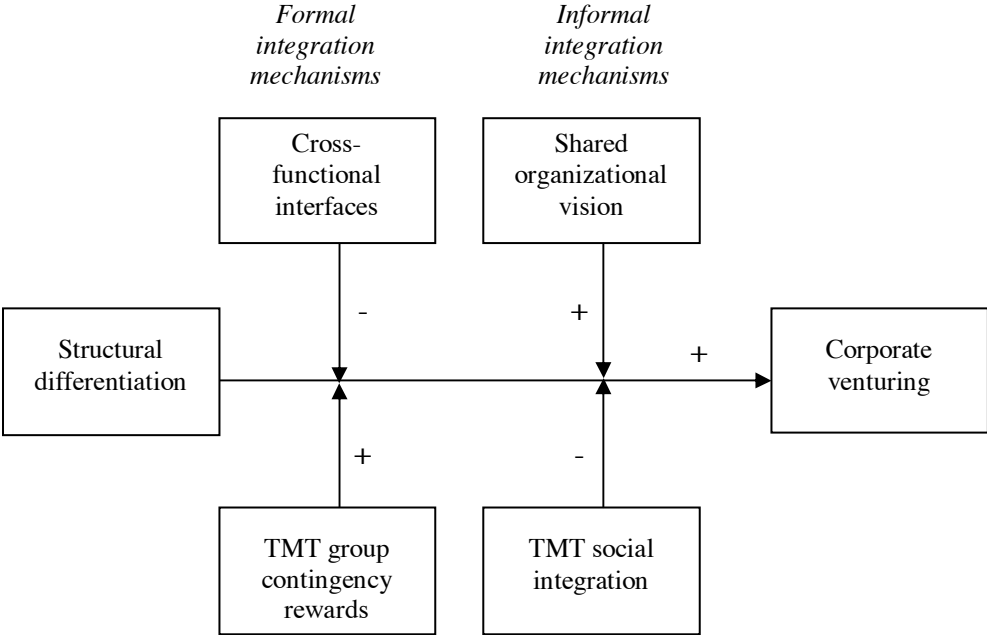
Prior literature has distinguished between formal and informal integration mechanisms, and have shown that both types of mechanisms differentially impact important organizational outcomes such as knowledge sharing, exploration, and venturing (Tsai, 2002; Jansen et al., 2006). Zahra and George (2002: 194), for instance, argued that “informal mechanisms are useful in exchanging ideas, but formal mechanisms have the advantage of being more systematic.” In this sense, formal integration mechanisms provide less flexibility in knowledge exchange and are mostly associated with exploitative learning outcomes, while informal mechanisms lead to more explorative learning (Daft and Lengel, 1986; Zahra and George, 2002). Scholars have argued that ventures involve both exploitative and explorative learning (Hill and Birkinshaw, 2007), suggesting that ventures could potentially benefit from both formal and informal integration. Therefore, we take both formal and informal integration mechanisms into account.

Scholars have also pointed at the distinct role of organizational and TMT integration mechanisms. Organizational integration mechanisms have primarily been linked to knowledge transfer (cf. Gupta and Govindarajan, 2000; Tsai and Ghoshal, 1998), whereas top management team integration has been associated with achieving strategic coherence and facilitating the allocation and combination of resources (O’Reilly and Tushman, 2004). Given the importance of both transferring knowledge as well as achieving synergies, we take into account both organizational and TMT integration mechanisms. Therefore, we classify four types of integration mechanisms along two aspects: (1) formal and informal, and (2) organizational and TMT integration mechanisms (see Figure 4.1).

Following Galbraith (1973), Gupta and Govindarajan (2000) argued that cross-functional interfaces are formal organizational integration mechanisms that generate horizontal linkages between units. Cross-functional interfaces provide formal channels of communication and information processing mechanisms and have been associated with cross-functional teams, task forces, and liaison positions (Gupta and Govindarajan, 2000). In addition to more formal organizational integration (i.e. cross-functional interfaces), organizations may also establish informal integration mechanisms to minimize divergent perspectives and enhance

a sense of mutual interests (Nohria and Ghoshal, 1994). Informal integration mechanisms refer to collective goals and interests captured by a shared organizational vision (Tsai and Ghoshal, 1998). A shared organizational vision generates alignment of goals and values that result into increased access to and interaction between differentiated organizational units (Gupta and Govindarajan, 2000). In line with these prior literatures, we distinguish between (1) cross-functional interfaces and (2) shared vision to uncover the importance of organizational integration mechanisms.

**Figure 4.1 Research framework: structural differentiation, formal and informal integration and corporate venturing**



In addition to organizational integration mechanisms, upper echelon theory has brought forward the importance of top management teams in strategically integrating structurally differentiated venturing and exploitative units (Gilbert, 2006; O’Reilly and Tushman, 2004; Smith and Tushman, 2005). Top management teams need to allow departure from existing knowledge in venturing units, yet establish cross-fertilization and synergies with ongoing businesses. Following



previous literature, we distinguish between formal and informal TMT integration mechanisms that have been associated with managing these inconsistencies and synergies: (1) group contingency rewards and (2) social integration (cf. O'Reilly, Caldwell, and Barnett, 1989; Shaw, Gupta and Delery, 2001; Siegel and Hambrick, 2005; Smith et al., 1994). TMT group contingency rewards are an important formal TMT integration mechanism that creates outcome interdependency across TMT members and provides incentive for cooperation across venturing and mainstream units (Harrison et al., 2002). TMT social integration establishes informal intrinsic values among top management team members to discuss and to motivate cooperation across differentiated units. Both group contingency rewards and social integration are therefore important TMT integration mechanisms for fostering collaboration across differentiated organizational units.

#### **4.2.2.1 Cross-functional interfaces**

Prior studies have shown that establishing formal communication channels is beneficial to exchanging and integrating existing knowledge between highly interdependent units (Daft and Lengel, 1986; Gupta and Govindarajan, 1991). However, given that applying cross-functional interfaces is costly and increases complexity, Tushman and Nadler (1978) argued such mechanisms may have detrimental effects in cases of units with low levels of interdependence. The costs and complexity associated with cross-functional interfaces place an unnecessary burden on venturing activities and reduce the coexistence of multiple time frames across differentiated units by imposing a formal integrative architecture (Mintzberg, 1979; Repenning and Sterman, 2002). Consequently, formal organizational integration might lead to role conflicts between short-term oriented mainstream units and long-term oriented ventures (Burgelman, 1985; Floyd and Lane, 2000) and lessen the contributive natures of structural differentiation on corporate venturing. By reducing the flexibility and the variance of underlying knowledge sources, cross-functional interfaces result in more local search (Benner and Tushman, 2002; Repenning and Sterman, 2002; Zahra and George, 2002). This hinders organizations to venture into new territories (Burgelman, 2002; Gatignon et al., 2002) as corporate ventures are overwhelmed by forces of business-as-usual (O'Reilly and Tushman, 2004). O'Reilly and Tushman (2004) indicated that connecting differentiated units through formal organizational

integration mechanisms led to the development of less breakthrough products. Volberda (1998) argued that cross-functional interfaces reduce the autonomy of differentiated units and inhibit their exploration activities. He suggested that the increased integration led to a more vulnerable system, as “disturbances in one part were reproduced throughout the organization” (Volberda, 1998: 157). Because of their exploratory nature, ventures are very likely to cause such disturbing effects (Block and MacMillan, 1993). In other words, formal cross-functional interfaces diminish the positive effect of structural differentiation on corporate venturing.

*Hypothesis 2: Cross-functional interfaces will have a negative effect on the relationship between structural differentiation and corporate venturing.*

#### **4.2.2.2 Shared organizational vision**

A shared organizational vision may overcome the pragmatic boundaries between venturing and mainstream units by creating a common language and mutual understanding (Tsai and Ghoshal, 1998). A shared language is vital for effective communication (Cohen and Levinthal, 1990), and facilitates knowledge exchange and combination (Nahapiet and Ghoshal, 1998). A shared vision can therefore help corporate ventures to recognize the value of potential organizational knowledge sources (Sinkula, Baker, and Noordewier, 1997). Dougherty (1992) argued that shared understanding is essential to bring forward innovations in firms comprised of separated units with disparate thought worlds. A shared vision increases the willingness of organizational members to consider and incorporate opposing views and facilitates the legitimacy of local venturing activities throughout the organization (Subramaniam and Youndt, 2005). This enables the acceptance of contrasting work methods of differentiated corporate ventures and mainstream businesses (Ashforth and Mael, 1989). In such cases of high ambiguity between units, a shared set of goals will be the only effective way to establish coordination and control (Ouchi, 1980). It leads to a consistent corporate culture that allows employees to coordinate activities and economize on communication costs across unit boundaries (Camerer and Vepsäläinen, 1988). We argue therefore that the configuration of structural differentiation and a shared organizational vision significantly increases corporate venturing.

*Hypothesis 3: A shared organizational vision will have a positive effect on the relationship between structural differentiation and corporate venturing.*

#### **4.2.2.3 TMT contingency rewards**

A key issue for top management teams coordinating structurally differentiated units is to achieve strategic coherence and synergies without losing local adaptability. TMT group contingency rewards compensate TMT members for the overall firm performance instead of rewarding members for their individual performance (Collins and Clark, 2003). By rewarding group outcomes, TMT group contingency rewards foster collaboration and create commitment to organizational goals (Bloom, 1999). They have been shown to increase communication, knowledge sharing and cooperation across TMT members, and motivate them to transcend their unit's direct interests (Collins and Smith, 2006; Shaw et al., 2001). TMT group contingency rewards are particularly important to structurally differentiated venturing units, as the potentially disruptive nature of venturing activities may increase role conflict within top management teams (Siegel and Hambrick, 2005). Team group contingency rewards reduce interpersonal competition and facilitate mutual adjustment between the managers of the differentiated venturing and mainstream units (Pfeffer, 1995). Hence, TMT group contingency rewards cause top management team members to direct attention and corresponding behavior to achieving integrative value across differentiated venturing and exploitative units (Smith and Tushman, 2005). Whereas organizational members located at structurally differentiated units may have difficulty seeing beyond their unit's interests, TMT members are in a much better position to oversee all units (Gilbert, 2006). They are able to identify opportunities to share resources and to establish balanced resource allocation to facilitate the coexistence of venturing and exploitative units. Accordingly, we argue that TMT group contingency rewards positively moderate the relationship between structural differentiation and corporate venturing.

*Hypothesis 4: TMT group contingency rewards will have a positive effect on the relationship between structural differentiation and corporate venturing*

#### **4.2.2.4 TMT social integration**

Social integration within TMTs increases negotiation, compromise, and collaboration between organizational units (Michel and Hambrick, 1992). However, social integration may result into groupthink within top management teams, which leads to selective perception of opportunities for knowledge and resource integration across differentiated units (Janis, 1982). Meta-analytic findings suggest that socially integrated teams are therefore only beneficial to highly interdependent organizational units (Beal et al., 2003). Because of the rather low to moderate interdependency between venturing and mainstream units, we argue that TMT social integration decreases the ability of ventures to break away from existing knowledge sources and competences. Tripsas and Gavetti (2000) and Burgelman (2002) showed that top managers discouraged search activities that were not consistent with the existing business model. Moreover, TMT social integration decreases the willingness of TMT members to discuss conflicting demands and force the confrontation of competing goals of venturing and mainstream units. In such cases the minority opinion of the structurally differentiated venture is often not taken into account (Smith and Tushman, 2005). In other words, the more structurally differentiated a venture is, the less likely a socially integrated TMT is to allocate the required resources to the venture. Conversely, if venturing activities are part of a mainstream business unit, i.e. low level of structural differentiation, they may receive the necessary resources through routine allocation processes associated with mainstream units. We argue therefore that TMT social integration decreases the positive relationship between structural differentiation and corporate venturing.

*Hypothesis 5: TMT social integration will have a negative effect on the relationship between structural differentiation and corporate venturing.*

### **4.3 Methods**

#### **4.3.1 Data collection**

Using the Reach database, we randomly identified a sample of 4,000 firms in the Netherlands that covered a broad range of industries. Reach is the most comprehensive company database in the Netherlands. It provides basic company and financial information for all companies registered at the Dutch Chamber of

Commerce. To deal with potential common method bias, we collected data for the independent and dependent variables at *two different points in time* (Podsakoff et al., 2003). In 2005, a survey assessing structural differentiation and integration mechanisms was administered to the executive directors of the 4,000 firms. To ensure confidentiality, we agreed not to reveal the name of the executive director and asked for the questionnaire to be returned directly to the research team. This reduces the possibility of social desirability bias (Podsakoff et al., 2003). Executive directors from 452 firms returned their questionnaire, representing a response rate of 11.3 percent. In 2006, approximately ten months after the first survey, a second survey was mailed to the same 452 executive directors to assess their firm's corporate venturing activities. We received 240 completed surveys, representing an effective response rate of 53.1 percent. Compared to the original sample, our final response rate of 6 percent is not uncommon in empirical studies targeting executives (cf. Koch and McGrath, 1996; Lepak, Takeuchi and Snell, 2003; Ozgen and Baron, 2007; Simons, Pelled and Smith, 1999). The average size of the firms was 495.39 (s.d. = 3098.15) full-time employees and the average firm age was 40.56 years (s.d. = 34.97). The firms were operating in several industries covering manufacturing (52%), construction (17%), trade (6%), transportation (5%), financial services (7%), and professional services (12%). The respondents of these 240 firms had an average company tenure of 13.57 years (s.d. = 10.17).

#### **4.3.2 Validation of method**

Although partly explained by the separated measurements of our independent and dependent variables, the low final response rate may increase concerns about nonresponse bias, as unobserved determinants of the decision to respond to the questionnaire could have an effect on our study variables (Huselid, 1995). As in such cases of potential nonrandom exclusion of observations a sample selection bias correction technique is warranted (Berk, 1983), we tested for nonresponse bias by examining differences between respondents and nonrespondents in three different ways.

First, we compared sample characteristics of (1) the 452 respondents of 2005 vs. initial sample of 4,000 firms, (2) the 240 respondents of 2006 vs. the initial sample of 4,000 firms, and (3) the 240 respondents of 2006 vs. the 452 respondents in 2005. T-tests showed no significant differences based on the number of full-time employees, firm age, and revenue in all three comparisons.

Second, we compared early and late respondents in terms of demographic characteristics and model variables. These comparisons did not reveal any significant differences ( $p < .05$ ), indicating that nonresponse bias was not a problem. Third, we also formally controlled for possible nonresponse bias by applying a sample selection bias correction technique known as the Heckman procedure (cf. Berk, 1983; Huselid, 1995; Koch and McGrath, 1996; Lepak et al., 2003). The first step of the procedure is obtaining a probit estimation to estimate whether the sample is biased. The dependent is a dummy gauging whether the firm has participated in the survey or not. The explanatory variables are firm size (number of employees), firm age (in years of existence) and industry membership (1-digit SIC-code). The predicted values of the probit estimation are multiplied by -1.0, and then used to calculate the inverse Mill's ratio<sup>2</sup> (Berk, 1983; Koch and McGrath, 1996). As a second step, the inverse Mill's ratio is plugged into the regression analyses as a control variable to correct for possible bias due to nonresponse. If the significance levels and betas of our hypothesized variables would change, this indicates that nonresponse bias is influencing our findings. As shown in the results section, our empirical findings remained the same after including the inverse Mill's ratio, indicating that nonresponse bias was not a concern in our study. For a more detailed description of the procedure we refer to Berk (1983) and Koch and McGrath (1996).

To address potential single-informant bias (Venkatraman and Grant, 1986), we surveyed an additional top management team member in each responding firm for both the 2005 and the 2006 sample. In 2005 the follow-up survey resulted in 36 responses from the 240 firms in our final sample, and in 2006 we received 57 responses from additional top management team members. To statistically demonstrate how consensual raters are within a single organizational context, we calculated the average  $r_{wg}$  for each organization (Kozlowski and Hults, 1987). The  $r_{wg}$  for organizations ranged from 0.72 to 0.99 with a median of 0.92 (mean 0.92) for the independent variables survey, and ranged from 0.78 to 0.99 with a median of 0.96 (mean of 0.95) for the dependent variables survey. Following the procedure of James et al. (1984) we also calculated the average  $r_{wg}$  per variable for differentiation (.89), cross-functional integration (.91), shared vision (.93), TMT

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<sup>2</sup> Inverse Mill's ratio<sub>i</sub> =  $f(z_i)/(1-F(z_i))$  where  $(z_i)$  is the negative of the predicted value,  $f(z_i)$  is the density value, and  $F(z_i)$  is the distribution value.

social integration (.94), TMT group contingency rewards (.86), and venturing (.94). Overall, the  $r_{wg}$  values indicate sufficient agreement within organizations for both the independent and dependent variables.

### 4.3.3 Measurement and validation of constructs

This study used existing multi-item scales that were verified through various analyses (items of constructs are provided in Appendix A).

**Dependent variable.** *Corporate venturing* was measured through five items ( $\alpha = .82$ ) adapted from Zahra (1996). The measure captured the extent to which firms enter into new business fields by creating new ventures. To validate the measure for corporate venturing, we related the scores on the dependent variable to a separate overall four-item scale of innovativeness ( $\alpha = .82$ ) based on Bell (2005). We expect that the extent to which firms create new ventures will be related to the extent to which they pursue innovations and are leading in the market regarding new products and services. Our expectation that corporate venturing would be related to the overall measure of innovativeness was corroborated by significant positive correlations ( $r = .40, p < .001$ ). We also related the score on corporate venturing to the R&D investments as a percentage of annual sales ( $r = .28, p < .001$ ) and to the percentage of revenues in the last three years that is attributable to new products and services ( $r = .33, p < .001$ ). Both significant and positive correlations provide additional evidence for the validity of our measure of corporate venturing.

**Independent and moderating variables.** *Structural differentiation* was measured with a six-item scale ( $\alpha = .79$ ). The items captured the extent to which organizations separate innovation and efficiency activities in different autonomous organizational units. Five items were used to measure *cross-functional interfaces* ( $\alpha = .73$ ). Based on Gupta and Govindarajan (2000), we included multiple items that measured the extent to which firms use cross-functional teams, temporary work groups and liaison personnel. The measure for *shared organizational vision* ( $\alpha = .87$ ) was adapted from Sinkula et al. (1997) and refers to the extent to which firms have collective goals and shared aspirations. *TMT group contingency rewards* ( $\alpha = .80$ ) refers to the extent to which top management team incentives, such as bonuses and profit sharing, were tied to overall firm performance. We constructed a four-item measure for TMT group contingency rewards based on Collins and Clark (2003). *TMT social integration* ( $\alpha = .85$ ) was measured by five

items adapted from Smith et al. (1994). The items reflected the attraction to the top management team, satisfaction with other top management team members, and the social interaction among team members (O'Reilly et al. 1989).

We assessed the construct validity of all items pertaining to our constructs through exploratory and confirmatory factor analysis (CFA). After deleting several items (see Appendix A), the exploratory factor analysis clearly replicated the intended factor structure. Each item loaded on its intended factor (all factor loadings were .55 or above with no cross-loadings above .30), and all factors had eigenvalues greater than one, supporting the six factor solution. An integrated CFA on all remaining items (with each item constrained to load only on the factor for which it was the proposed indicator) yielded a model that fitted the data well ( $\chi^2/df = 1.77$ , goodness-of-fit index [CFI] = .90 comparative fit index [IFI] = .90, root-mean-square error of approximation [RMSEA] = .057). Item loadings were as proposed and significant ( $p < .01$ ). Finally, Cronbach alpha's for our constructs all exceeded the commonly used cut-off of .70. These findings provide strong support for the reliability and validity of our measurements.

**Control variables.** In the empirical study, we controlled for possible confounding effects by including various relevant control variables. As larger firms may have more resources, yet may lack the flexibility to venture, we included the natural logarithm of the number of full-time employees to account for *firm size*. A *firm's age*, measured by the natural logarithm of the number of years since its founding, was also included. Previous studies have argued that inertia may inhibit older firms from developing corporate ventures (cf. Zahra and Hayton, 2008). *Past performance* indicates the degree of slack in a firm, and as such might be an important antecedent to the level of corporate entrepreneurial activities in a firm (cf. Zahra and Hayton, 2008). Past performance was measured with a five-item scale that captured a firm's ROI, sales growth, profit growth, attracting new customers and market share growth ( $\alpha = .82$ ). Based on previous literature, a four-item measure was included that captured *environmental dynamism* (Jansen et al., 2006). The scale for environmental dynamism ( $\alpha = .80$ ) tapped into the rate of change of the competitive environment. Previous studies have shown that dynamism can significantly influence corporate venturing (cf. Zahra, 1993). Finally, to control for additional industry effects, we included seven *industry dummies*: manufacturing, construction, trade, transportation, financial services, professional services, and other industries.



#### **4.4 Results**

Table 4.1 presents descriptive statistics and correlations for the variables. Table 4.2 presents the results of the moderated regression analyses for venturing. Prior to the creation of the interaction terms, we mean centered the independent variables. To examine multicollinearity, we calculated variance inflation factors (VIF) for each of the regression equations. The maximum VIF within the models was 2.6, which is well below the rule-of-thumb cut-off of 10. Model 1 contains the moderators and control variables. The model included 6 of the 7 industry dummies, as manufacturing was used as the reference group. Model 2 introduces the effect of structural differentiation on corporate venturing (hypothesis 1) and model 3 examines the moderating effects of the formal and informal integration mechanisms (hypothesis 2-5). Model 4 added the inverse Mill's ratio to correct for potential nonresponse biases. The results show that nonresponse bias was not of concern in our analysis, as the inverse Mill's ratio was non-significant and the effect sizes and significance of our model variables did not seem to be effected by adding the inverse Mill's ratio. The models showed significant increases in explanatory power. Regarding the control variables we can observe that past performance ( $\beta = 0.306$ ,  $p < 0.001$ ) and environmental dynamism ( $\beta = 0.137$ ,  $p < 0.05$ ) have a positive effect on venturing (see Table 4.2). The identified formal and informal integration mechanisms do not seem to have a direct effect on corporate venturing. Model 2 in Table 4.2 confirmed hypothesis 1 that structural differentiation has a positive effect on corporate venturing ( $\beta = 0.160$ ,  $p < 0.05$ ). The increase in explanatory power compared to model 1 was significant ( $p < 0.05$ ).

**Table 4.1 Means, standard deviations, and correlations<sup>a</sup>**

	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
1. Corporate venturing	3.72	1.23	(.82)															
2. Structural differentiation	4.17	1.24	.24**	(.79)														
3. Cross-functional interfaces	4.22	1.19	.20**	.36**	(.73)													
4. Shared organizational vision	5.37	0.93	.18**	.11	.46**	(.87)												
5. TMT group contingency rewards	4.35	1.56	.19**	.39**	.31**	.16*	(.80)											
6. TMT social integration	5.36	0.91	.08	.14*	.25**	.51**	.12	(.85)										
7. Dynamism	4.37	1.26	.22**	.16*	.16*	.08	.24**	.02	(.80)									
8. Firm size <sup>b</sup>	4.47	1.25	.01	.22**	.19**	.00	.37**	-.01	.05	-								
9. Firm age <sup>c</sup>	3.35	0.93	-.07	-.03	.02	-.04	-.06	.04	-.16*	.14*	-							
10. Past performance	4.62	0.93	.29**	.08	.20**	.32**	.19**	.19**	.04	.01	.00	(.82)						
11. Construction	0.18	0.38	-.18**	-.10	-.12	-.06	-.21**	-.02	-.03	-.20**	.08	-.15*	-					
12. Trade	0.06	0.24	.05	-.01	.03	.02	-.04	.10	-.07	-.10	.01	.00	-.12	-				
13. Transportation	0.05	0.21	-.16*	-.06	-.08	-.03	-.09	-.06	-.18**	.00	.02	-.05	-.10	-.06	-			
14. Financial services	0.08	0.26	.07	.10	.01	.07	.04	.03	.12	.11	-.16*	.05	-.13*	-.07	-.06	-		
15. Professional services	0.11	0.31	.17**	.08	.10	-.03	.09	-.03	.18**	.02	-.30**	-.08	-.16*	-.09	-.08	-.10	-	
16. Manufacturing	0.53	0.50	.04	.01	.09	.03	.13*	-.00	-.04	.14*	.21**	.16*	-.49**	-.27**	-.23**	-.30**	-.37**	-
17. Other industries	0.00	0.06	.00	.02	-.13*	-.01	.04	-.03	.01	-.07	-.11	-.04	-.03	-.02	-.01	-.02	-.02	-.07

\*\* Correlation is significant at the 0.01 level (2-tailed).

\* Correlation is significant at the 0.05 level (2-tailed).

a. N=240. Numbers in parentheses on the diagonal are Cronbach alphas of the composite scales.

b. Log number of full-time employees

c. Log of years since founding

**Table 4.2 Moderated regression results for corporate venturing<sup>a</sup>**

	Model 1	Model 2	Model 3	Model 4
<b>Controls</b>				
Industry dummies <sup>b</sup>				
- Construction	-.339 (.211)	-.348 (.209)	-.325 (.208)	-.375 (.219)
- Trade	.282 (.314)	.265 (.311)	.178 (.308)	.119 (.318)
- Transportation	-.631 (.364)	-.634 (.360)	-.623 (.356)	-.717 (.378)
- Financial services	.214 (.296)	.152 (.294)	.119 (.289)	-.027 (.350)
- Professional services	.587* (.263)	.569* (.260)	.575* (.257)	.441 (.314)
- Other industries	.387 (1.164)	.228 (1.154)	.044 (1.138)	-.178 (1.177)
Environmental dynamism	.137* (.062)	.132* (.062)	.158* (.061)	.162** (.062)
Log organizational size	-.064 (.067)	-.074 (.066)	-.074 (.065)	-.097 (.072)
Log organizational age	.039 (.088)	.039 (.087)	.064 (.086)	.015 (.109)
Past performance	.306*** (.086)	.308*** (.085)	.318*** (.086)	.320*** (.086)
<b>Moderating variables</b>				
Cross-functional interfaces	.082 (.072)	.035 (.074)	-.011 (.076)	-.012 (.076)
Shared organizational vision	.083 (.101)	.103 (.100)	.139 (.100)	.135 (.101)
TMT group contingency rewards	.051 (.055)	.016 (.057)	.009 (.056)	.010 (.056)
TMT social integration	-.058 (.095)	-.077 (.094)	-.087 (.096)	-.087 (.096)
<b>Main effect</b>				
Structural differentiation		.160* (.067)	.141* (.068)	.143* (.068)
<b>Interaction effects</b>				
Structural differentiation* cross-functional interfaces			-.145* (.057)	-.146* (.057)
Structural differentiation*shared organizational vision			.238** (.081)	.239** (.081)
Structural differentiation*TMT group contingency rewards			.034 (.040)	.035 (.040)
Structural differentiation*TMT social integration			-.171* (.074)	-.174* (.075)
<b>Sample selection correction</b>				
Inverse Mill's ratio				-3.528 (4.750)
R <sup>2</sup>	.199	.219	.260	.262
F-value for change in R <sup>2</sup>		5.658*	3.057*	.552

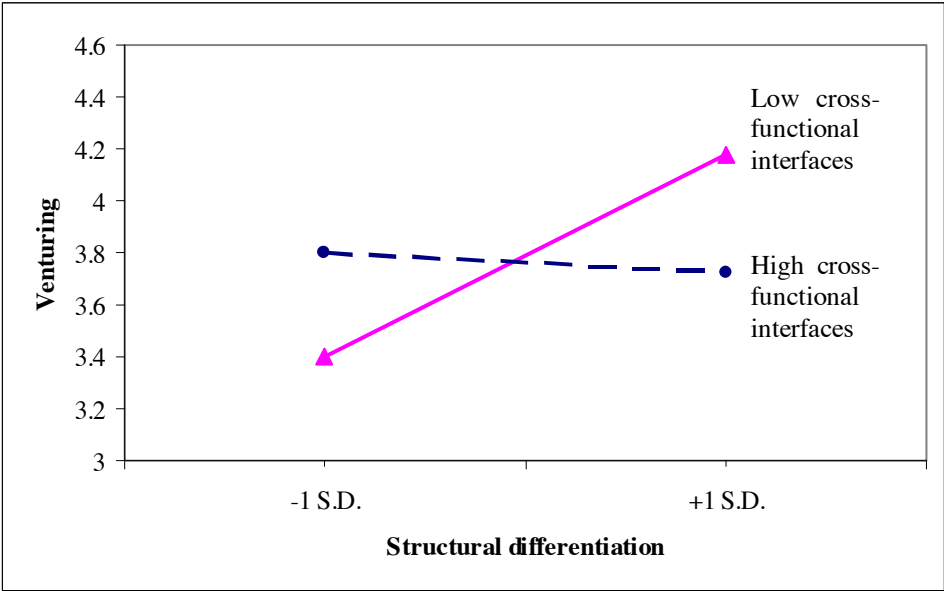
<sup>a</sup> N = 240; unstandardized coefficients are reported; standard errors in parentheses

\* p<.05; \*\* p<.01; \*\*\* p<.001

<sup>b</sup> Manufacturing served as reference group in regression analyses.

The interaction terms in model 3 were all significant except the interaction of TMT group contingency rewards and structural differentiation (see Table 4.2). The increase in explanatory power was significant compared to model 2 ( $p < 0.05$ ). The interaction term of cross-functional integration was significantly negative ( $\beta = -0.145$ ,  $p < 0.05$ ) and confirms hypothesis 2. The positive effect of structural differentiation on venturing turns slightly negative when managers use cross-functional interfaces (see Figure 4.2). For firms that make very limitedly use of cross-functional interfaces, the effect of structural differentiation on corporate venturing becomes much stronger. If managers want to increase the level of venturing in an organization, they should combine low levels of formal organizational integration with high degrees of structural differentiation (see Figure 4.2).

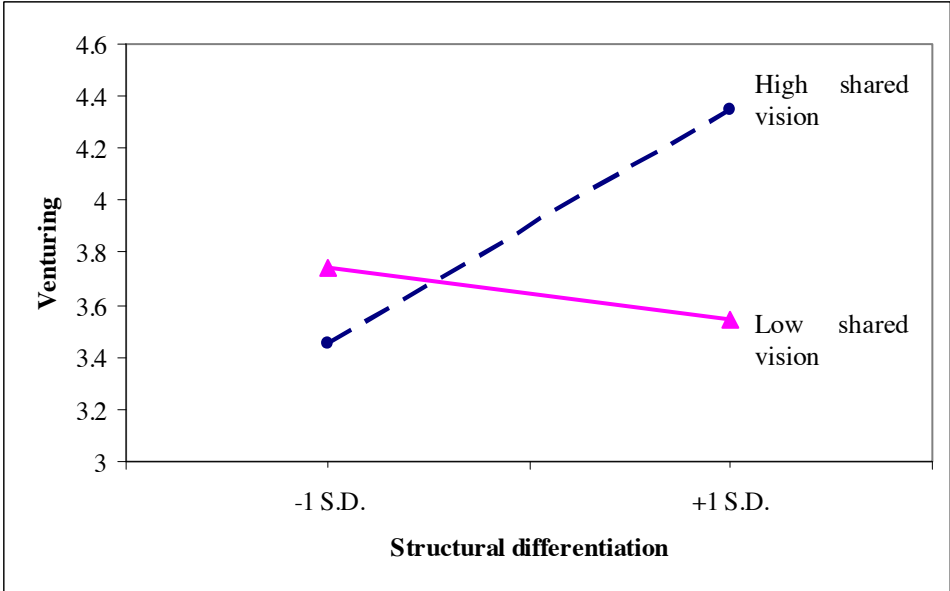
**Figure 4.2 Interaction of structural differentiation and cross-functional interfaces**



A shared organizational vision significantly strengthens the relationship between structural differentiation and venturing ( $\beta = 0.238$ ,  $p < 0.01$ ), thereby confirming hypothesis 3. Figure 4.3 shows that in the case of structurally differentiated units, shared vision is a tool to achieve synergies between the

venture and the rest of the organization. When there is low informal coordination in the form of a shared organizational vision between members of different organizational units, structural differentiation is negatively influencing the level of venturing (see Figure 4.3).

**Figure 4.3 Interaction of structural differentiation and shared organizational vision**

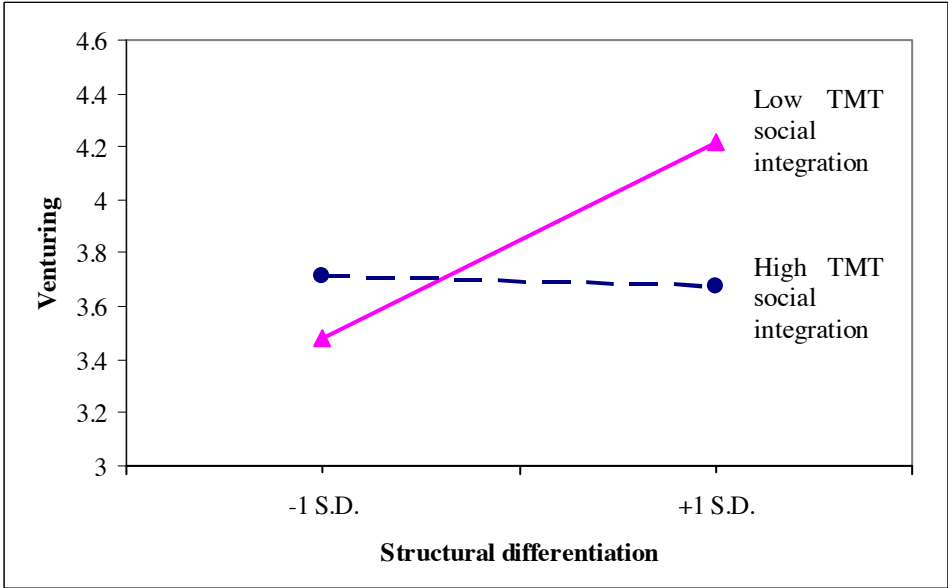


The interaction term of TMT group contingency rewards and structural differentiation was non-significant in our model, thereby not providing support for hypothesis 4. We ran additional regressions without the other moderating effects to observe whether the moderating effect of TMT group contingency rewards was perhaps already explained by the other integration mechanisms, in particular TMT social integration. The additional regressions did not provide a significant moderating effect of TMT group contingency rewards.

The significantly negative moderation effect of top management team social integration on the relationship between structural differentiation and venturing ( $\beta = -0.171, p < 0.05$ ) confirmed hypothesis 5. Thus the effect of structural differentiation on corporate venturing becomes significantly stronger if firms make

limitedly use of TMT social integration (see Figure 4.4). In case of high top management team social integration there is a slight negative effect of structural differentiation on venturing.

**Figure 4.4 Interaction of structural differentiation and TMT social integration**



**4.5 Discussion**

Conceptual arguments assert that -because of the necessity to allow local adaptability while facilitating knowledge-sharing between units- successfully managing corporate venturing in established firms is complex and difficult to achieve. Recent research started to explore how organizations may use configurations of differentiation and integration mechanisms to simultaneously achieve adaptability and coherence (Heller, 1999; O'Reilly and Tushman, 2004). We tested this core idea by exploring how combinations of structurally differentiation and various types of integration mechanisms contribute to establishing loose-coupling architectures that facilitate corporate venturing in established firms. Based on two dimensions, (1) formal and informal, and (2) organizational and TMT, we delineated four types of integration mechanisms.

Our findings indicate that organizations differentiating venturing activities from ongoing business activities enhance their corporate venturing activities, thereby providing support for hypothesis 1. In this sense, our study sheds more light on the debate between those scholars arguing for more autonomy (e.g. Burgelman, 1985) versus those arguing for more integration (Chesbrough, 2000; Thornhill and Amit, 2001). *Ceteris paribus*, our findings support the former arguments that structural differentiation allows exploratory and exploitative activities to coexist and helps organizations to buffer experimentation and the development of new competences from ongoing operations by establishing separate venture units (Burgelman, 1985; Gilbert, 2005). However, our research findings also suggest that the previously asserted effect of differentiation on facilitating corporate venturing is strongly influenced by the use of integration mechanisms. Future studies should therefore focus on configurations of differentiation and integration mechanisms when studying corporate venturing, instead of focusing on a single differentiation or integration mechanism.

Regarding the moderating effects of organizational integration mechanisms, our findings support hypothesis 2 that using formal organizational integration (i.e. cross-functional interfaces) to establish horizontal coordination and knowledge transfer across structurally differentiated units impedes corporate venturing. This finding confirms the claim of Tushman and Nadler (1978), who argued that “more simple mechanisms should be utilized to the fullest possible extent; given their greater cost, the more complex integrating mechanisms should only be used for residual interdependence” (1978: 621). Given the low interdependence of ventures and mainstream units, there will simply be no residual interdependence, while ventures would still incur the costs, time and effort associated with such complex integration mechanisms. Additionally, the reciprocity of knowledge flows associated with formal organizational integration mechanisms could place the venture under close scrutiny, making the venture more susceptible to business pressures in its early stages (Burgelman, 1985). Accordingly, our study provides new insights into venturing and organizational learning theory by showing that cross-functional interfaces have a strong negative effect on the relationship between structural differentiation and corporate venturing. The link with differentiation and corporate venturing enhances our understanding of the complex contingencies associated with integration mechanisms. It points to the relevance for organizational learning theory to not only look at the benefits of integration

mechanisms in terms of enhanced knowledge sharing, but also at the costs involved at establishing and maintaining integrative mechanisms.

Our results support hypothesis 3 that informal organizational integration (i.e. shared organizational vision) contribute to corporate venturing by enabling organizations to achieve strategic coherence and integration of structurally differentiated organizational units. Our results contribute to previous literatures concerning the importance of shared values and collective goals to compensate for structural differentiation to create loosely-coupled systems (Tsai, 2002; Orton and Weick, 1990). A shared sense of direction and collective frame of reference creates a common language that allows differentiated venturing units to communicate and effectively share knowledge with established organizational units (Nahapiet and Ghoshal, 1998; Orton and Weick, 1990).

Our findings regarding cross-functional interfaces and a shared organizational vision point out that there is an important discrepancy in the effects of formal and informal organizational integration mechanisms. Using formal integration mechanisms in combination with structural differentiation results in organizations composed of conflicting *formal* architectures. The complexity and rigidity of formal integration mechanisms have detrimental effects on corporate venturing, while informal integration mechanisms seem complementary to structural differentiation. This provides new insights into the effects of organizational integration mechanisms, which have previously been associated with positive outcomes (cf. Gupta and Govindarajan, 2000).

We expected a positive effect of formal top management team integration (i.e. TMT group contingency rewards) on the relationship between structural differentiation and corporate venturing, yet we found no support for such a moderating effect as predicted in hypothesis 4. Although group contingency rewards have been shown to create outcome interdependencies that necessitate coordination and collaboration among top management team members (Siegel and Hambrick, 2005), our study indicates that they do not enhance corporate venturing activities within structurally differentiated organizations. A possible explanation for the insignificant relationship could be that the creation of collaboration through top management team contingency rewards is not a sufficient condition for establishing strategic synergies among venturing and mainstream organizations units. It might be of influence for what group outcome the top managers are rewarded. Based on prior research we used a measure that focused on firm performance as underlying aspect (cf. Collins and Clark, 2003). Future research



could address other aspects of organizational performance such as innovativeness or growth achieved through venturing that may influence the relationship between structural differentiation and corporate venturing.

We found that informal top management team social integration had a negative impact on the relationship between structural differentiation and corporate venturing, as predicted by hypothesis 5. This underpins prior literatures which suggest that socially integrated top management teams may suffer from groupthink (Janis, 1982). Highly cohesive top management teams decrease the access to divergent perspectives and may decrease the ability of TMT members to evaluate alternative solutions for resource allocation (Srivastava and Lee, 2005). This in turn leads to less understanding of and support for a structurally differentiated venture. This finding also contributes to theory on role conflict. Structural differentiation sends a message that units should stick to their own knitting, but if senior teams are very cohesive, organizational members also receive a signal that integration is positive. Sending mixed signals to employees creates role conflict and weakens interpersonal trust (Floyd and Lane, 2000). Sillince (2005) put forward a theoretical argument that attempts at structural differentiation are, therefore, only successful if they are followed by differentiation rhetoric from top management. Our findings contribute to previous insights by showing that firms wanting to increase their venturing output through structural differentiation should limit social integration across TMT members.

Our study confirms the importance of structural differentiation to enabling the coexistence of exploration and exploitation. However, it also shows that certain integrative mechanisms such as cross-functional interfaces and TMT social integration decrease the development of venturing activities. This is in sharp contrast with recent arguments made in organizational ambidexterity literatures that top management may be in the best position to integrate differentiated units through TMT social integration (Gilbert, 2006; O'Reilly and Tushman, 2004). In this sense, we contribute to literatures on organizational ambidexterity by showing that achieving integration through cross-functional interfaces and socially integrated TMT's has negative outcomes for corporate ventures. Such integration mechanisms might increase cross-fertilization of exploratory and exploitative activities, in which the dominance of exploitative activities may drive out the more explorative activities. Future conceptual development on organizational ambidexterity and learning should address how integrative mechanisms can be tied to the different needs of explorative and exploitative units.

*Several managerial implications* of our findings can be pointed out. First, firms aiming to enhance their venturing efforts should hive off their venturing activities into distinct units. Structurally differentiating venturing activities from mainstream units allows firms to use different reward and control systems that protect the venture from business pressures of more established units in the organization. Second, management can enhance venturing efforts even further if they establish a shared organizational vision. This increases the understanding between venturing units and established businesses, and ensures that ventures do not wander off in unwanted directions but embrace the organizational goals. A third implication of our findings is that management should be careful not to enforce too much integration of the venture and mainstream businesses. Establishing cross-functional interfaces and socially integrated top management teams to integrate structurally differentiated ventures with the rest of the organization has detrimental effects on corporate venturing, as these mechanisms make ventures susceptible to inertial forces present in the parent organization.

#### **4.5.1 Limitations and future research**

Our study presents a first step toward uncovering the specific joint effects of structural differentiation and specific integration mechanisms that are conducive to corporate venturing, and study limitations suggest the need for additional research. Although we took great care in separating the collection of data on the independent and dependent variables to reduce the likelihood of common method bias, the downside is that this had an adverse effect on our final response rate. Low response rates are an increasing problem in contemporary management research, faced with a trend towards over-surveying (Weiner and Dalessio, 2006). Even if data samples are still sufficiently large, as in our case with a final sample of 240 companies, there is still the potential problem of limiting generalizability due to nonresponse biases, which is much more important than the actual response rate (Rogelberg and Stanton, 2007). As such, we checked for differences between nonrespondents and respondents, as well as between early and late respondents. Even though there were no significant differences, we were concerned it could still influence our regression results. Therefore, we applied a Heckman-procedure as outlined by Berk (1983) and Koch and McGrath (1996) to include an inverse Mill's ratio in the regression analysis, which controlled for potential biases in our sample. The low response rate did not affect our results after inclusion of the sample bias correction (see Table 4.2). In other words, what we might lose in

response rate was offset by the increased validity of our applied method of separating the measurement of the independent and the dependent variables.

An issue for future research is to incorporate the relatedness of the venture to the parent firm. Relatedness determines to a large extent the degree to which a venture can benefit from knowledge and capabilities present in mainstream businesses (Sorrentino and Williams, 1995; Burgers et al., 2008b; 2008c). As such, highly related ventures might have stronger needs for integrative linkages with the parent firm than more unrelated ventures. In this research we assumed that ventures are relatively independent, with a small demand for knowledge-sharing possibilities. It would be worthwhile to investigate possible contingency effects of relatedness on the relation between differentiation, integration and corporate venturing. If there are contingent effects of relatedness, the question arises how corporations can adjust their differentiation and integration mechanisms to the individual needs of a venture.

#### **4.5.2 Conclusion**

Corporate venturing is a widely used approach among established firms to foster growth. With this research we set out to investigate the effect of differentiation and integration on corporate venturing. Our findings show that firms seeking to increase corporate venturing efforts should combine structural differentiation with a shared organizational vision to increase the level of corporate venturing. Cross-functional interfaces and socially integrated top management teams, however, appear to have detrimental effects on the level of venturing in a structurally differentiated organization. Instead, management should minimize formal cross-functional interfaces and informal integration of top management if they seek to enhance the firm's venturing efforts.

## **5 The Exploration of Technological and Market Knowledge across Phases of the New Business Development Process<sup>3</sup>**

### **Summary**

Managing through projects has become important for generating new knowledge to cope with technological and market discontinuities. This chapter examines how the fit between the creation of technological and market knowledge and important project management characteristics, i.e. project autonomy and completion criteria, influences the success of new business development (NBD) projects. In-depth longitudinal case research on NBD-projects commercialized during the period 1993-2003 in the consumer electronics industry highlights that project management characteristics focusing only on the creation of technological knowledge contributed to the failure of those NBD-projects that required new market knowledge as well. The findings indicate that senior management support and engaging in an alliance with partners possessing complementary market knowledge can offset this misalignment of the organization of NBD-projects.

### **5.1 Introduction**

In today's fast-paced, knowledge-based environments competitive advantages erode at an ever-increasing rate. Companies need to continuously develop new business opportunities to tackle technological and market discontinuities. However, the managerial and organizational structures of most firms are primarily

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<sup>3</sup> This chapter is published as Burgers, J.H., F.A.J. Van den Bosch, and H.W. Volberda (2008b). Why new business development fails: coping with the differences of technological and market knowledge, *Long Range Planning* 41(1): 55-73.

We gratefully acknowledge the participation of ELECTRA for our case research and their management's constructive comments on previous drafts of our case analysis. We also express our gratitude to the editors of the special issue and LRP, the reviewers, Paul Vlaar, Pieter-Jan Bezemer, participants of a workshop held at Cass Business School, London, March 27, 2006, and of a seminar on NBD-projects organised by the Dutch Association of Business Development Project Managers at the RSM Erasmus University, 25 April 2006 for their suggestions on improving the paper.

catered towards exploitation activities like refining products and processes. These structures do not support the requirements for exploring new business opportunities (Hill and Rothaermel, 2003). Managers therefore increasingly use projects to create new businesses.

A key aspect of New Business Development (NBD-) projects is the management of knowledge (Ahn, Lee, and Lee, 2006). Research has shown that project success is enhanced if project management characteristics are aligned with the project's activity (Lampel and Jha, 2004; Shenhar et al., 2001). Previous studies have made a distinction between projects that develop exploitative or incremental innovations versus exploratory or radical innovations (Dewar and Dutton, 1986; Jansen et al., 2006). Radical innovations require both new technological knowledge *and* new market knowledge, while incremental innovations use and leverage existing technological and market knowledge (De Brentani, 2001).

However, Danneels (2002) suggested that an important distinction should be made between technological and market knowledge, as it has been argued that NBD-projects might create one type of knowledge and leverage another type of knowledge (Chesbrough, 2000; Cohen and Levinthal, 1990; Danneels, 2002). *Technological knowledge* refers to knowledge associated with products, technologies and/ or processes. *Market knowledge* refers to knowledge associated with targeting customer sets, entering markets, distribution channels, marketing approaches, and business models (Abernathy and Clark, 1985; Danneels, 2002). New business development is the process of linking the technological and market knowledge together (Dougherty, 1992). Although the two types of knowledge are intertwined, their project management requirements and implications for the wider organizational context could differ (see Exhibit 5.1) (Garcia and Calantone, 2002).

The distinction between the newness of technological and market knowledge is important for at least two reasons. First, both types of knowledge reside in different departments (R&D versus marketing/ sales). This might have consequences for the autonomy of projects in terms of leveraging knowledge. Second, the timing of development differs for both types of knowledge. Knowledge creation involves learning-by-doing (Lechner and Floyd, 2007). Yet, experimenting with market approaches and distribution channels will take place after market introduction, while practicing with products and technologies is done before market introduction. This suggests that project completion criteria might be different for creating technological versus market knowledge.

### Exhibit 5.1 Technological versus market knowledge: the case of Polaroid and digital photography.<sup>4</sup>

In the 1980s, Polaroid invested heavily in the development of digital technology. Strongly supported by top management, the project developed leading-edge technological capabilities in digital imaging. The company's processes and capabilities were geared towards the development of technological knowledge, which enhanced the successful development of digital imaging capabilities. However, the company did not become successful in digital imaging despite the successful development of technological knowledge. The primary reason was that Polaroid *did not recognise the need for the exploration of market knowledge*. Polaroid was at that time very successful in instant photography. Its business model was a so-called "razor/blade" strategy, in which the firm dropped prices of the camera to stimulate demand and subsequently made money on the film. However, digital imaging does not use film and as such digital camera's needed new market knowledge in the form of new business models and distribution channels. Polaroid was also confronted with a new set of competitors, as (computer) electronics manufacturers also developed digital imaging capabilities. Due to Polaroid's dominant managerial cognition and inertial ways of working that were strongly tied to their existing market knowledge, the company gradually lost its strengths in digital imaging and failed to capture the market.

Given the limited insight in the consequences of technological and market knowledge for NBD-projects, we will address the following *research question*: How does creation of technological and market knowledge influence project management characteristics of NBD-projects? By doing so, we address the role of projects as focal points of knowledge creation and integration and provide insights into the conditions for the successful management of NBD-projects. We focus our longitudinal research on new business development projects in a large incumbent firm in the consumer electronics industry.

Our *findings* highlight that technological and market knowledge should have a different effect on project autonomy. By doing so, we extend previous research that has focused on the distinction between exploitative versus exploratory innovations and its effect on project autonomy (McGrath, 2001). Second, building upon Danneels' (2002) work, we show the timing and duration of development

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<sup>4</sup> See Tripsas and Gavetti (2000) for a more detailed description of the Polaroid case.

differs between market and technological knowledge. Our findings indicate that the creation of market knowledge is likely to continue *after* market introduction, i.e. during the commercialization phase. Extending the managing-through-projects approach to the commercialization phase enhances the success of NBD-projects requiring new market knowledge. Third, our research shows that two strategies can be applied to off-set deficiencies in project management. Top management support can be used to prolong the project approach and to shield the project from organizational pressures to exploit. Our findings also indicate that strategic alliances with partners possessing complementary market knowledge significantly shorten the time to acquire new market knowledge for NBD-projects.

## 5.2 Literature review

Innovation is not only the creation of new knowledge, but also the recombination with existing knowledge (Kogut and Zander, 1992). The processes of creating new knowledge versus leveraging existing knowledge are referred to as exploration and exploitation. *Exploration* is the act of creating knowledge that is *new to the firm* through activities such as experimentation, innovation, search and variation. *Exploitation* is the act of using knowledge *existing in the firm* and is associated with implementation, efficiency, production and refinement (Benner and Tushman, 2003; March, 1991). NBD-projects call for both the exploration and the exploitation of knowledge (Dougherty and Takacs, 2004; Soderquist, 2006). Exploration and exploitation require, however, different styles of management and organizational arrangements (O'Reilly and Tushman, 2004).

Several studies have been investigating how to manage the creation and transferring of knowledge in the context of new business development (Kodama, 2005; Scarbrough et al., 2004). Yet, these studies did not take into account the effect the type of knowledge has on managing NBD-projects, even though it has been argued that technological and market knowledge have different outcomes for organizations (Tripsas and Gavetti, 2000). The benefits of, among others, cross-functional teams, project autonomy, and stage-gated development processes for the successful management of projects are well established (Eisenhardt and Tabrizi, 1995; Hart et al., 2003; Wheelwright and Clark, 1992). This chapter explicitly focuses the relationship between project management characteristics and technological and market knowledge. Success rates of NBD-projects are enhanced if project autonomy is aligned with the degree of exploration of projects

(Burgelman, 1984; McGrath, 2001). This suggests connecting *project autonomy* with the *degree* of exploration of technological and market knowledge. Studies have also shown that exploration and project management practices change over the project's life-cycle (Pinto and Prescott, 1988; Song et al., 1998). This suggests linking *project completion criteria* to the *phase* in which exploration of technological and market knowledge occurs, as a prime objective of NBD-projects is the creation of new knowledge.

### **5.2.1 Degree of exploration of technological and market knowledge and project autonomy**

The degree of project autonomy influences to what extent the exploration and the exploitation of knowledge is enhanced. The higher the project's autonomy, the more precedence the project takes over various functional areas and the development of its knowledge base (Schindehutte, Morris, and Kuratko, 2000). A high degree of project autonomy stimulates the exploration of knowledge, as it shields the project from organizational inertia and knowledge bases (Burgelman, 2002; Leonard-Barton, 1992). At the same time, higher degrees of project autonomy make learning and transferring knowledge between the project and the organization more difficult, because of the relative distance between the project and organizational units (Gupta and Govindarajan, 2000). Providing low degrees of autonomy to an NBD-project limits the ability to explore new knowledge, but enhances the possibility to leverage existing knowledge and resources from the parent organization (Sorrentino and Williams, 1995). Autonomy could, inter alia, be increased by using heavyweight leaders, by placing a project in physically distinct location, or by increasing the reporting level (O'Connor and De Martino, 2006; Schilling and Hill, 1998).

Figure 5.1 depicts a conceptual framework of four idealized types of projects linking the degree of technological and market knowledge newness to project autonomy. Projects requiring new technological and market knowledge (see Figure 5.1, quadrant 1) benefit the most from autonomy, as separating a project from the organizational context facilitates learning within the project (Scarbrough et al., 2004). A typical structure for such radically new projects would be some sort of venture unit (Block and MacMillan, 1993; Burgelman, 1985).



**Figure 5.1 Conceptual framework: knowledge types and project management characteristics**

		<b>Market knowledge</b>	
		<i>New-to-the-firm</i>	<i>Existing-in-the-firm</i>
<b>Technological knowledge</b>	<i>New-to-the-firm</i>	Exploration of both technological and market knowledge <b>Project autonomy:</b> High <b>Project completion criterion:</b> Profitability achieved <span style="float: right;"><b>1</b></span>	Exploration of technological knowledge <b>Project autonomy:</b> Medium <b>Project completion criterion:</b> Market introduction <span style="float: right;"><b>2</b></span>
	<i>Existing-in-the-firm</i>	Exploration of market knowledge <b>Project autonomy:</b> Medium <b>Project completion criterion:</b> Profitability achieved <span style="float: right;"><b>3</b></span>	No exploration of knowledge <b>Project autonomy:</b> Low <b>Project completion criterion:</b> Market introduction <span style="float: right;"><b>4</b></span>

Product improvement projects that exploit both existing technological and existing market knowledge benefit from staying close to the mainstream of the organization to maximize the potential for leveraging knowledge already present within the firm (see Figure 5.1, quadrant 4). For these projects a functional or lightweight project type is preferred, which receives very little autonomy (Wheelwright and Clark, 1992). Project members in this type of project divide their time between ongoing activities in their functional department and the project. As such, these employees are in the best position to leverage relevant knowledge and resources from their functional departments. Several authors argue that NBD-project success is significantly enhanced if projects make use of the firm’s existing sales force and distribution channels (Calantone et al., 2006).

Projects exploring technological knowledge and exploiting market knowledge require a medium degree of autonomy (see Figure 5.1, quadrant 2). These projects need autonomy for the development of technological knowledge (Hill and

Rothaermel, 2003), but need lower degrees of autonomy to exploit the available market knowledge. We suggest, therefore, an intermediate solution with medium degrees of autonomy for the project, which leaves room for both exploitation and exploration.

In a similar vein, projects needing exploration of market knowledge and exploitation of technological knowledge would benefit most from a medium degree of autonomy (see Figure 5.1, quadrant 3). Too close cooperation with marketing and sales might constrain the project's ability to explore market knowledge, and have a negatively impact on project performance (Olson et al., 2001). This suggests that the NBD-project needing exploration of market knowledge should receive a certain degree of autonomy from sales organizations.

Besides exploring new knowledge internally, NBD-projects could also use strategic alliances to develop the missing knowledge and capabilities. Previous research has shown that partnerships with complementary resources and capabilities increase chances for success and competitive advantage (Chesbrough, 2003; Emden, Calantone and Droge, 2006; Harrison et al., 2001). Using a partnership could speed up the development process and significantly reduce investment costs (Wheelwright and Clark, 1992). Furthermore, it could also solve the potential conflict between requirements of technological versus market knowledge in NBD-projects, as partners could be responsible for one type of knowledge, while the project is focusing on the other type of knowledge.

### **5.2.2 Phase in the NBD-process in which knowledge creation occurs and project completion criteria**

Projects are temporary structures created to achieve a certain goal (Pinto and Prescott, 1988). This suggests defining clear *project completion criteria*. NBD-projects have the objective to explore new products/ technologies, and/ or explore new markets, for the firm (Zahra et al., 1999). Project completion criteria should, therefore, be aligned with the process of the exploration of technological and market knowledge. Scholars have previously argued that NBD-projects end when a newly developed product is introduced on the market (Milosevic, 2004). This view limits the exploration of both technological and market knowledge to the development phase preceding market introduction. We argue, however, the exploration of technological and market knowledge end at different points in time.

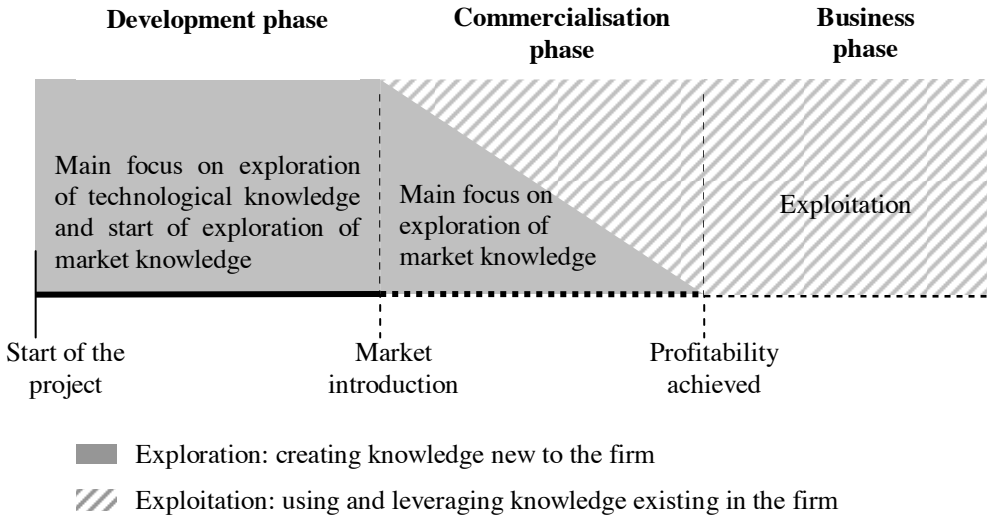
Following Thornhill and Amit (2001), we identify three phases in the process of new business development (see Figure 5.2). The *development phase*, ranging from the conception of ideas to the introduction of developed products or services on the market. When products are introduced on the market, the project enters the *commercialization phase*, running from market introduction until profitability is achieved (i.e. when cumulative profits surpass investment costs) (House and Price, 1991). The final phase is the *business phase*, when the project has become a business and is self-sustainable.

The *exploration of technological knowledge* is mainly confined to the development phase, with exploratory technological activities such as prototype and product development, and building the (trial) production line. Before the product is approved for market introduction, the end result of the technological development trajectory in terms of a working product and process are usually tested on aspects such as durability and quality (Cooper, 1986; 1990). At the moment of market introduction the product and production line are technically complete, requiring little additional development of technological knowledge. The subsequent commercialization phase calls for exploitation of technological knowledge in order to increase the efficiency of the production process and to refine the product. Hence, projects needing only the exploration of technological knowledge should be completed after the development phase ending at market introduction (see Figure 5.1, quadrant 2) (Koners and Goffin, 2005).

The *exploration of market knowledge* also starts during the development phase with activities such as gaining knowledge about customer preferences and how to reach and target potential customers (see Figure 5.2). Yet, exploration requires learning-by-doing, which for market knowledge can to some extent only be learned during the commercialization phase when products are actually sold. This is a prime difference with technological knowledge creation in which case one can experiment before products are actually sold on the market. The exploration of market knowledge continues during the commercialization phase, when for example concepts are tested in the marketplace and distribution channels are developed. Based also on customer feedback the market approach might be frequently changed during this phase (Di Benedetto, 1999; Kotler, 1997; McGrath et al., 2006). NBD-projects requiring new market knowledge should, therefore, only be completed at the end of the commercialization phase (see Figure 5.1, quadrants 1 and 3). At the end of this phase, the project has become self-sustainable and does not need protection of top management or a set of special

criteria to further explore market knowledge. Concluding, the different phases in which exploration of technological and market knowledge occurs (see Figure 5.2) suggests project completion criteria for NBD-projects should be contingent upon the phase in which exploration of technological and market knowledge takes place (see Figure 5.1).

**Figure 5.2 Exploration and exploitation of technological and market knowledge in subsequent phases of an NBD-project’s life cycle**



**5.3 Methods**

The research reported here is based on an in-depth, longitudinal case study of new business development projects at the *DOMUS division* of ELECTRA<sup>5</sup>, a major manufacturer of consumer electronics. Using multiple cases allowed us to replicate our findings and strengthened the validity of our research (Eisenhardt, 1989; Yin, 2003). By selecting projects within a single division, we were able to reduce potential confounding effects of the industry and the firm. This allowed us

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<sup>5</sup> Due to confidentiality agreements, we changed the name of the company.

to best observe our phenomena of interest, namely how the creation of technological and market knowledge and project management practices influence the success of NBD-projects. To observe the changes in organizational behavior over time and to gain deeper understanding of the role of technological and market knowledge creation in managing NBD-projects, we choose qualitative methods instead of quantitative methods. The selected method increases the validity of our study, but at the same time we acknowledge that we might lose possible generalization to other industry contexts.

The cases were selected based on a theoretical sampling logic following our primary object of interest, namely technological versus market exploration in the setting of NBD-projects (see Figure 5.3). In the logic of Figure 5.1, projects were selected in quadrants 1, 2 and 3. Furthermore, we expect the exploration of market knowledge to continue during the commercialization phase. As such, the selected NBD-projects needed to have reached the commercialization phase. Third, the sample had to incorporate both successful and unsuccessful projects. We defined failure in terms of projects that were abandoned and success as projects that became major, profitable businesses - criteria that were only possible due to the long time-span which our study covered (1993-2003).

To measure the degree of exploration we first asked respondents to what extent the product/ technologies and markets were existing to the firm, new-to-the-firm, -industry, or -world. Second, we asked them to explain what aspects were new, because something that is new to the firm does not necessarily involve much exploration. For example, a firm can enter a new market segment, but might use existing distribution channels and market approaches. Third, we investigated company documents to look for statements on actual explorative behavior. For example, if minutes of meetings stated that the project team was developing medical knowledge to sell their products through pharmacies as opposed to electronic retail stores, this would be classified as exploration of market knowledge (see also Table 5.1). Using multiple sources of evidence allowed us to develop a more fine-grained measure of the degree of exploration needed than would be possible through survey research.

**Figure 5.3** Classification of the eight investigated NBD-projects

		Market knowledge	
		<i>New-to-the-firm</i>	<i>Existing-in-the-firm</i>
Technological knowledge	<i>New-to-the-firm</i>	<b>Skin</b> (failed) <b>Health</b> (failed) <b>Oral</b> (success) <b>Cook</b> (failed)	<b>Hair</b> (success) <b>Fem</b> (success)
	<i>Existing-in-the-firm</i>	<b>Drink</b> (success) <b>Air</b> (failed)	<b>Outside scope of this research</b>

**5.3.1 Data collection**

During the 14-month period (2004-2005) in which the research was carried out we first sat down with management to identify the projects and key persons involved. These persons were approached for interviews and to provide documentation on the projects. Snowball sampling helped us to identify additional contacts. The first round of data collection involved publicly available information and divisional level documents, such as annual reports, and strategy and budget documents, to gain insight into the situational context at the time of the projects.

The second round of data collection concerned project-specific documents, like minutes of meetings, progress presentations to top management, strategy documents. For each project, the data was categorized into our main variables such as exploration of technological and market knowledge, relations with other parties (inside and outside the organization), and performance of the projects. Based on the documentation, case narratives were written for each project to describe the development of the projects over time.

To provide a richer view of the projects, the third round of data collection included interviews with key project members, division executives, R&D directors, and sales managers. We developed an interview guide based on the

categories used in the documentation process to cover the main topics. We used open-ended questions to invite respondents to talk about a subject instead of pushing them in a certain predefined direction. The semi-structured interviews lasted around 1½ hour each and were recorded, resulting in over 200 pages of transcripts. The transcripts were sent back to the interviewees for corrections and additions. In total we conducted 21 interviews (2-3 interviews on average per project). We selected key project members that had a good overview of the entire project and its relationship with the parent organization (i.e. the project, R&D and marketing manager). We compared data from different sources to check for potential retrospective biases in our after-the-fact interviews. A retrospective bias seemed to be slightly present with employees still working at that division who had participated in an unsuccessful project. The overall description they gave of the projects was similar, but some of these employees had a tendency to blame others for failure of the project. Using documentation and multiple informants allowed us to triangulate findings and control for retrospective biases in our interviews (Golden, 1997). The findings from the documents and the interviews were combined in a report on our findings. This report was discussed during a workshop with senior management to assess the validity of our findings. The feedback was included in a final report, which was presented to management.

### **5.3.2 Research setting**

ELECTRA is a large multinational company that consists of several relatively autonomous product divisions. Besides the product divisions, national and regional sales organizations were part of the company. Because many of DOMUS' products are sold through the same retail stores, a single sales person of DOMUS offers the whole range of DOMUS' products to a retail store instead of having different sales persons for each product line.

At the time of investigation, DOMUS consisted of a business group focusing on household products and one focusing on personal care products. The business group of household products had a diverse product portfolio, mostly in increasingly saturated markets. Market growth had slowed down to around 2-3 percent and there was an increasing trend towards commoditization. Sales growth was mainly achieved through market share battles, but management recognized opportunities for entering new markets and for radically redefining existing product/market propositions. The business group of personal care products consisted of a rather narrow, but highly profitable product portfolio that was also

confronted with decreasing sales growth. Yet, the opportunities for boosting growth were markedly different, as growth opportunities were primarily in addressing new product categories.

DOMUS consisted of several business units that each contained a few business lines, which consisted of one or more product lines. Units were defined based on relatedness of product (categories). The business units were responsible for NBD-activities. The NBD-project managers reported to a business line manager within these business units. NBD-projects within DOMUS were cross-functional, and included both engineers as well as marketers. DOMUS used heavyweight projects for the NBD-projects we investigated, but with relatively junior managers leading the projects. The engineers and marketers were assigned fulltime to a project, and had clear responsibilities toward the project manager, although they formally reported to their functional units. The projects were organized and the development activities executed according to a *standardized* approach that was described in a manual. A senior project manager of Skin pointed out: "...we followed a very strict process, which was actually a best-in-class process with all the stages, gates, and milestones, but this was very much driven from the [technological] development side. On the marketing-side it was very loose."

#### **5.4 Case study findings**

We investigated eight NBD-projects within DOMUS. These projects were executed during the period 1993-2003. Table 5.1 presents an overview of the *investigated projects*. Project Drink developed a segment of an existing market, while others targeted a market completely new for ELECTRA (projects Health and Skin), or focused on markets that were geographically relatively new for ELECTRA (project Cook). Several projects (Drink, Oral, and Health) made use of an alliance to build the new business. All projects fitted within the defined strategy of DOMUS to manufacture mass electronic consumer goods for household or personal care use. The projects in our sample provided significant revenues. Projects Hair and Air achieved over 30 million Euros in annual turnover two years after market introduction, while project Drink has sold millions of products in the first four years after market introduction. Projects Fem and Oral have grown into businesses with annual sales well exceeding 100 million Euros.



**Table 5.1 Knowledge creation and project success in the investigated projects**

Project	Newness of technological knowledge	Development of technological knowledge	Newness of market knowledge	Development of market knowledge	Status (duration)
<i>Projects exploring technological and market knowledge</i>					
Oral	Product: new-to-the-firm Technologies: new-to-the-firm Production processes: new-to-the-firm	Internal, brought-in expertise, alliance, acquisition	Market: new-to-the-firm Distribution channels: new-to-the-firm Market approach: new-to-the-firm	Internal, alliance, acquisition	Success (ongoing)
Health	Product: new-to-the-firm/ -world Technological concept: new-to-the-world Production processes: new-to-the-firm	Internal, alliance	Market: new-to-the-firm Distribution channels: new-to-the-firm Market approach: new-to-the-firm	Internal	Stopped (after 3 years)
Skin	Product: new-to-the-world Technologies were leveraged and adapted Production processes: new-to-the-firm	Internal	Market: new-to-the-industry Distribution channels: new-to-the-industry Market approach: new-to-the-industry	Internal	Stopped (after 4 years)
Cook	Product: new-to-the-firm Technologies were leveraged and adapted Production processes: new-to-the-firm.	internal	Market: new-to-the-firm Distribution channels: new-to-the-firm or underdeveloped Market approach: new-to-the-firm	Internal	Stopped (after 4 years)
<i>Projects exploring technological knowledge and exploiting market knowledge</i>					
Hair	Product: new-to-the-firm Technologies could be leveraged and adapted Production processes: new-to-the-firm	Internal	Market: existing, but segment new-to-the-firm Distribution channels: existing Market approach: existing	Internal	Success (ongoing)
Fem	Product: new-to-the-firm Technologies could be leveraged and adapted Production processes: new-to-the-firm	Internal	Market: existing, but segment new-to-the-firm Distribution channels: existing Market approach: existing	Internal	Success (ongoing)
<i>Projects exploiting technological knowledge and exploring market knowledge</i>					
Drink	Product: variation of existing Technologies: leveraged and recombined Production processes: existing	Internal	Market: existing, but segment new-to-the-firm Distribution channels: new-to-the-firm Market approach: new-to-the-industry	Alliance	Success (ongoing)
Air	Product: existing Technology: bought in license Production processes: existing	Internal, technological license bought	Market: existing, but segment new-to-the-firm Distribution channels: new-to-the-firm Market approach: new-to-the-firm	Internal	Stopped (after 5 years)

#### **5.4.1 Degree of exploration of technological and market knowledge and project autonomy**

In the case of *the exploration of technological knowledge*, previous research suggests a heavyweight project-type is preferred (Wheelwright and Clark, 1992). Projects Fem and Hair grew into successful businesses by adopting this structure. All investigated projects and businesses within DOMUS were in the area of consumer electronics, suggesting relatively similar technological bases. This allowed project teams to build on the capabilities of the engineers to create electronic products for household use. The heavyweight structure provided projects with sufficient autonomy to create new knowledge, while the project was still sufficiently integrated with other units to leverage existing capabilities. The projects used employees from the R&D departments which further facilitated the access to relevant knowledge and capabilities. Project Cook received more autonomy than the other investigated projects. Instead of the standard approach of developing the project at one of the operational business units, project Cook was situated in Asia. This limited project Cook's access to organizational knowledge and support, as the project was far away from the company's business units in Europe. As a result, the project had to develop many of the competencies regarding manufacturing and testing the product itself. It did not draw on employees from R&D departments, but hired new personnel. This resulted in long lead times and poor initial product quality, which had adverse effects on the project's performance.

Although the projects' degrees of autonomy were adequate for the exploration of technological knowledge, it did create problems for the *exploration of market knowledge*. Most projects operated autonomously from the sales organizations. A sales manager pointed out: "The BU sometimes developed things without full commitment and involvement of the sales organizations. There was a somewhat isolated attitude, in the sense of wait until it is finished and we'll show you. Here and there were some walls in the organization over which something was thrown from time to time." The task of NBD-projects was to explore *what should be done* regarding the market, in terms of new distribution channels and new marketing approaches. The sales organizations were responsible for exploitation in the sense that they had to sell the products through the new distribution channels etc. The sales representatives had, however, neither the time nor the resources to learn *how* to sell the developed product through new distribution channels. The projects

received time and resources to search new knowledge, but sales employees did not receive time and resources to learn and practice. In an interview a business manager of Oral pointed out: “An important market for Oral was country X. The average age of the sales employees was around 50 and they had been selling kitchen appliances for 25-30 years. Could we ask of these sales employees to suddenly have a talk with specialists about inter-dental cleaning?” This proved to be too difficult and currently project Oral still has its own sales force and is managed autonomously from other business units.

Several projects tried to compensate for their lack of market knowledge by engaging in an *alliance* with a partner possessing the required market knowledge (see Table 5.1). The business manager of Project Oral continued: “That’s one of the reasons we established the alliance and did the acquisition. It proved too difficult to build up our own competences and network regarding professional endorsement by medical specialists.” The alliance partner did have the competences and network. There was, however, some overlap on the technological side, which led to disputes between both parties on how certain parts should be constructed and who should develop it. Combined with the somewhat diverging interests and the lack of alliance experience of both companies, this led to disbanding the alliance. Project Drink’s alliance, however, was a major success. Project Drink used a new business model in which revenues from so called consumables were the main profit drivers instead of the core product (recall Polaroid’s razor/blade strategy discussed in the theory section in which camera prices were kept low to stimulate demand, while the profit was made on the film, i.e. the consumable). But project Drink had limited experience with selling and marketing these consumables. The partner did have a background in these consumables and took care of developing and selling the consumable, while project Drink handled the development and selling of the core product. This complementarity made them ideal partners. Establishing the alliance was, however, a slow and painstaking negotiation process, because of the limited experience of DOMUS with such alliances. The success of this alliance contributed to the establishment of a corporate alliance office to capture and leverage knowledge on establishing alliances.

Concluding, the autonomy of the project influenced to what extent projects were able to explore technological and market knowledge, and benefit from knowledge already existing in the firm. As suggested by the case study, a heavyweight project placed within the operational business units provides sufficient autonomy to develop new products, but is still able to leverage relevant

technological knowledge and capabilities. If a project receives more autonomy (e.g. Project Cook) it needed more time to develop technological knowledge, as it could not draw on available knowledge, skills, and personnel. Regarding market knowledge, however, the investigated projects were too autonomous from the relevant sales organizations. By not being involved in the project, the sales organizations did not receive the time and resources to develop and experiment with novel market approaches. The case study indicates that strategic alliances are useful to decrease the time it takes to acquire new market knowledge and the time to achieve profitability. Projects Drink and Oral demonstrate the impact of such alliances, as they became major successes, while other projects exploring market knowledge (Air, Skin, and Cook) continued their struggle to find the right approach towards the market.

#### **5.4.2 Phase in the NBD-process in which exploration occurs**

A major difference between technological and market knowledge is when the exploration takes place. In our case study, the *exploration of technological knowledge* took place before market introduction. The product development ended with exposing the products to durability tests, which were performed before introduction on the market. Production processes were constructed and many trial runs were done before the project was given the green light to start manufacturing for first sales. Most projects benefited from testing facilities and capabilities the company already possessed. For projects Oral, Cook and Health existing tests were not applicable. A project manager of project Oral stated: “A lot of our standard tests were designed for a kitchen environment. Our product was however used in a bathroom, in which the atmosphere is warmer and moister. We had to learn how to test for this.” Project Cook faced similar problems, as it had to build up testing competencies in Asia. Despite difficulties with testing the product, these projects continued with market introduction. The pressure to launch quickly led projects Cook, Health and Oral to prematurely introduce the products on the market, resulting in high recall rates for their products.

*The exploration of market knowledge* also started during the development phase (see Figure 5.2). A project manager of project Skin commented on the market research: “It is a new business, how do you know how many we can sell? You can improve your guessing with more and better customer research and knowing how to understand the numbers. The problem was that we did not know how to interpret the

numbers we got back, as we had no data to compare it to.” This lack of understanding of the market led to flaws in the project’s assumptions, product positioning and business model, which came to the surface during the *commercialization phase*. In an interview, the project manager of Skin stated: “Two of the major reasons that brought Skin down were marketing and distribution. We found out that the average time it took a consumer to decide to purchase our product was three months, while for the average product DOMUS sold it is more in the area of two days. During that three month period you have to get your message out and convince potential consumers, as they will ask everybody from their friends to their doctor what they think of the product.” A former business manager of Oral also stressed the exploration of market knowledge still taking place: “The traditional way of DOMUS for a market introduction campaign was to execute just one brief mass marketing campaign and that is it. We had to learn that we regularly had to contact medical specialists to achieve professional endorsement.”

From the case analysis it appears there was hardly any time left to create the required market knowledge once products had been introduced on the market, due to the imposed project completion criteria. During the commercialization phase projects were managed according to criteria similar to managing existing businesses within DOMUS. First, projects had to use a mass-introduction strategy in multiple countries, which a project manager labeled the “do-it-right-the-first-time approach”. A second criterion was that NBD-projects had to achieve profitability within 2 years, i.e. investment costs should be earned back within this 2-year period. A third criterion stated that projects needed to use their own revenues if they wanted to make additional investments in exploration once products had been introduced on the market. In other words, projects were considered to be completed at the moment of market introduction. During the commercialization phase these activities were viewed as emerging businesses, which were granted two years to achieve profitability levels comparable to other businesses. A project manager of Cook pointed out: “we performed relatively well on the milestones in the development phase, but that is one of the strengths of DOMUS. The bigger project Cook, however, was not handled in a project-like way. That was more the running of a daily business.”

Of the eight investigated projects, Fem and Hair were the only two projects that did not need significant exploration of market knowledge (see Table 5.1 and Figure 5.3). These projects became instant successes, as they benefited from leveraging existing market knowledge bases. The criteria to view the project as

completed at market introduction were aligned with the exploration of technological knowledge, which took place before market introduction.

Out of the six projects that required exploration of market knowledge, only two projects became a success. The four failing projects were seriously constrained by the before-mentioned business criteria imposed on them during the commercialization phase. Project Air, for example, used a mass-introduction strategy on multiple markets. After market introduction, the project experienced several problems with the business model, marketing approach and distribution channels. As a consequence, demand was far lower than expected and 80% of the production capacity remained unused. The project either needed significant investments to turn the tide or needed to write off the initial investments and continue on a smaller scale. Yet, the criteria imposed by top management did not allow these options, as projects only got two years to become profitable and were not entitled to financial support.

The two successful projects (Drink and Oral) managed to offset these project completion criteria that were not aligned with exploration during the commercialization phase. Project Drink used an alliance for the exploration of market knowledge, i.e. the business model and market, and more importantly used a single test market to further explore if the developed product propositions and marketing campaigns are effective. In an interview an R&D manager pointed out: "What worked very well was using a single test market. It created success, which worked positively towards other markets. The idea was to keep it small, learn and use the experience gained in other markets. Once you have success it is easier to convince management to invest additional resources for launch in other countries." The marketing manager of project Drink explained the exploration of market knowledge: "through project Drink we learned how to do this. Just testing it in the market and learn about optimal product positioning, marketing strategies and then executing it on a larger scale." The number of products sold during the first year was three times higher than the most positive scenario, which shows the advantage of a project approach over a business approach in the case of exploration of market knowledge during the commercialization phase.

Project Oral became a success after almost 10 years of experimentation, learning, and development, resulting in significant investments and losses. The project completion criteria that were established for NBD-projects that reached the commercialization phase (i.e. becoming profitable in two years) were, however, overruled by the responsible business manager. In an interview, a former project

manager of Projects Air and Cook commented: “One of the most important things is creating the right environment and support for the new business. In personal care for example they committed themselves if they spotted an important opportunity. A good example is project Oral. The first five years were basically a disaster. Everybody in the organization yelled that we should stop, as our product quality was inferior compared to the competition. But there was one manager who said these comments were fine and all that, but the project would continue.” The champion had sufficient authority and resources at his disposal to actually allow the project to continue. Other projects needing additional time to develop the markets also had champions, but the problem was that these champions moved to positions in other BU’s or divisions due to job rotation mechanisms. The project manager continued: “Then you see the importance of a long-term champion. He was in that business unit for many years, while for other projects, every couple of years a new business manager arrived.”

Several projects also found that in order to succeed in developing new markets, the sales organizations had to explore new ways of working. Although the autonomy of the project allowed the projects to explore freely and develop innovative approaches, it did not result in workable situations, as the sales force did not get the time or the incentives to learn how to operate successfully in these new environments. A sales manager commented: “At that time sales employees were not rewarded to introduce new products. Our trade partners received incentives to prioritize certain products, but not internally towards our sales force. Management just provided sales targets for each product.” The consequence was that the sales organizations and the individual sales representatives favored existing products over new products, as they required less effort to reach the sales targets than new products. Because neither the business units and projects nor the sales organizations received *incentives* to create the required market knowledge during the commercialization phase, disputes arose frequently about who should pay for it. Fem, Hair and Drink were perceived as logical additions to the product portfolio and did not receive much resistance from the sales organizations. Cook was also a welcome addition to the product portfolio in the eyes of the sales organizations, but the sales organizations did not have the resources to support the market development for project Cook. On the contrary, one of the objectives of project Cook was to strengthen the sales organizations in Asia, which is the other way around. Projects Health, Skin, Oral and Air stretched the portfolio a bit more, as they all had a medical aspect in their business model, and some were a bit more niche marketing than usual within DOMUS. As pointed out, in particular the medical side with new

distribution channels and professional endorsement created major challenges for the sales organizations, but no resources were made available to explore.

In summary, the used project completion criteria at DOMUS to view a project as a business when the commercialization phase starts suited the projects primarily needing exploration of technological knowledge, i.e. quadrant 2 in Figure 5.3. NBD-projects requiring new market knowledge, however, would have significantly benefited from a managing-through-projects approach during the commercialization phase. Extending the project approach until profitability is achieved might have led more of these projects to success, because of the available time and resources to develop knowledge about the intended markets. The case study also points to the importance of including sales organizations in the project. This provides the project with access to the available knowledge stock in the sales organization, and points to the relevance of providing sales organizations with time and resources to explore market knowledge. Our findings indicated that using strategic alliances or top management support could overcome misalignment of project completion criteria with the requirements for new market knowledge.

### ***5.5 Discussion of findings: Managing NBD-projects***

The NBD-projects in our sample were managed and organized in accordance with a focus on the exploration of technological knowledge. NBD-projects were placed in operating business units close to R&D and engineering departments, which gave them good access to technological knowledge. The standardized project management approach treated the NBD-projects as regular businesses after market introduction. This benefited projects that focused on the creation of technological knowledge and did not require new market knowledge (projects Fem and Hair). Projects needing exploration of market knowledge ran into severe problems because they did not receive the autonomy, the resources, and the time necessary to develop market knowledge during the commercialization phase (Adams, Day and Dougherty, 1998). Several NBD-projects requiring market knowledge during the commercialization phase, began cost-cutting programmes and opted for less innovative approaches to achieve profitability within the required two years. Moreover, top management demanded a launch strategy, in which products had to be introduced on many markets at the same time. This type of launch strategy maximizes economies of scale, but leaves little time to experiment with different approaches (Stremersch and Tellis, 2004; Tellis,



Stremersch and Yin, 2003). In line with our conceptual framework, the case findings highlight that a single approach towards NBD-projects does not do justice to the diversity of projects in terms of their required exploration of technological and market knowledge.

### **5.5.1 Managerial implications**

Our findings highlight at least four important *implications for senior and project management* (see Table 5.2). First, senior and project management have to recognize the differences between the exploration of technological versus market knowledge and match the project's autonomy to the degree of exploration of both types of knowledge (see Figure 5.1). The degree of autonomy a project receives should increase when there is a greater need for development of technological and market knowledge. Higher project autonomy facilitates knowledge creation in the project, while tighter links between the project and mainstream businesses are beneficial if the project wants to benefit from existing knowledge (Gupta and Govindarajan, 2000). This suggests companies should have a range of managerial and organizational arrangements for NBD-activities tied to the specific knowledge requirements of projects, instead of applying one standardized arrangement to all types of projects (Burgelman, 1984). Our case findings pointed out that a standardized approach aligned with exploration of technological knowledge significantly constrained NBD-projects requiring the development of market knowledge.

Second, management should enable the exploration of market knowledge taking place during the commercialization phase by setting project completion criteria that include this phase in the project (see Figure 5.1 and Figure 5.2). This protects the project from increasing business pressures to show early results, and provides them with the opportunity to experiment with new approaches; two key aspects for the success of exploratory projects (Burgelman, 1984b). Establishing project completion criteria provides clarity and a point-of-reference to both the organizational context and the project in terms of when exploratory behavior is expected (Lindkvist, 2005; Lindkvist, Soderlund and Tell, 1998). It is, therefore, important to connect the project completion criteria to the timing and duration of the exploration of technological and market knowledge.

**Table 5.2 Recommendations for managing NBD-projects**

- 1) Match the *project's autonomy* to the newness of required technological and market knowledge (see Figure 5.1). The more development of technological and market knowledge is required, the higher should be the project's autonomy.
- 2) Align *project completion criteria* with the development of technological and market knowledge. As the development of market knowledge continues after market introduction, these activities should be managed through projects until profitability is achieved (see Figure 5.1 and Figure 5.2).
- 3) An *organizational champion* can be used to offset deficiencies in the project's autonomy and project completion criteria. However, management support from a champion is often not a sustainable solution due to managerial job rotation.
- 4) To speed up the development of market knowledge, projects can use *strategic alliances* with firms possessing complementary market knowledge.
- 5) Align *sales force incentives* with NBD-project requirements. Proactive sales force involvement and the development of new sales skills are essential for successfully commercializing NBD-projects that require new market knowledge.

Third, senior management support can offset some of these contingencies regarding project completion and autonomy. Figure 5.1 presents an idealized model that provides sufficient protection from business pressures for each type of project. We argued that a mismatch between autonomy/ completion criteria and knowledge requirements could result in increasing business pressure and higher chance of project failure. Yet, senior management supporters (champions) were able to protect projects from too much pressure (Brown and Eisenhardt, 1995; Greene, Brush and Hart, 1999). Project Oral's champion, for example, allowed the project to undertake the necessary exploration even though organizational procedures suggested otherwise. However, support is often not a sustainable solution, as for example job rotation mechanisms can replace champions by new and perhaps less favorable managers (Dougherty and Hardy, 1996). For example, project Air suffered from replacement of their champion. Champions have thus positive effects on NBD-project success, but management should be aware of the potential negative consequences for the project if a champion is promoted or leaves.

Fourth, another way of dealing with the conflicting forces of long development times for market knowledge versus increasing business pressures to

show results is the use of strategic alliances to access complementary market knowledge. This significantly reduces development time and costs (Emden et al, 2006). It reduces the need to explore market knowledge during the commercialization phase, which was one of the main contributors to project failure in our study. In particular if the existing sales force is not equipped for selling the newly developed products, management will have to invest substantial resources to build up a new sales force for the project. Using a strategic alliance (e.g. project Drink) could reduce or eliminate the need to build a new sales force.

Fifth, the case study showed that senior management should devote significant attention to the impact NBD-projects have on the requirements for the company's sales force. In the case of significant exploration of market knowledge, the existing sales force might have to learn new skills to successfully market the new product. If sales employees are judged against exploitative criteria (i.e. the need to achieve a certain amount of sales each year), they have little incentive to invest time and resources selling a product for which success is uncertain. Thus alignment of incentive structures for the sales force with the requirements of an NBD-project is an important factor in the ultimate success of the NBD-project (Hultink and Atuahene-Gima, 2000).

### **5.5.2 Theoretical implications and conclusions**

Several implications for theory also resulted from our findings. Previous studies have shown that project and organizational requirements differ for radical versus incremental innovations (Song and Montoya-Weiss, 1998). Radical innovations have been classified as requiring both new technological knowledge *and* new market knowledge, while incremental innovations use and leverage existing knowledge. We complemented this literature by also addressing projects that either focus on new technological knowledge *or* new market knowledge (see Figure 5.1), and show that the managerial and organizational requirements differ for both types of projects.

This more fine-grained description of NBD-projects contributes to knowledge and innovation literature by showing that technological and market knowledge differ in terms of timing when exploratory activities take place. Danneels (2002) argued that technological and market knowledge differs in terms of competence bases. Our findings indicate that exploring new technological knowledge takes place in the development phase preceding market introduction, while creating

market knowledge takes for a large part place during the commercialization phase (see Figure 5.2). This also points to the importance for more specifically addressing the commercialization phase in product development and project management research.

Finally, we complement project management literature by addressing the under-researched relation between NBD-projects and their organizational context (Engwall, 2003). In particular we show that NBD-projects exploring new markets can place significant demands on the company's sales force to such an extent that it triggers organizational renewal. The demand for organizational renewal may be offset by alliance partners possessing complementary knowledge and capabilities. By doing so, we have contributed to the emerging debate on using alliances in NBD-projects.

Several future research issues also emerged from our findings. A logical next step would be to do large scale cross-sectional research to assess the generalizability of our findings. It would in particular be interesting to investigate the extent to which our findings apply to project-based firms, projects in the service sector, and to firms in the so-called Complex Products and Systems (CoPS-) projects sectors, which develop unique one-off products and are often built to order (DeFillippi and Arthur, 1998; Gann and Salter, 2000; Hobday, 2000; Sydow, Lindkvist and DeFillippi, 2004). In the latter case, we expect the order in which both types of exploration takes place would be different, as selling and marketing would precede actual technological development. We invite further research to investigate possible other contingencies regarding the exploration of technological and market knowledge, like the internal organization of a project and the type of project manager needed.

In conclusion, we have put forward the argument that developing technological and market knowledge have an important impact on managing through projects. Our conceptual framework and case findings provide guidelines to enhance the success of NBD-projects in mass-manufacturing companies. We showed that aligning project autonomy and project completion criteria with the degree of required exploration of technological versus market knowledge is essential for successfully managing new business development projects.



## **6 Enhancing NBD-project Performance: The Dynamic Interplay of Relatedness and Autonomy across Phases of the NBD-process<sup>6</sup>**

### **Summary**

Research on the effects of new business development project relatedness and autonomy on project performance has shown ambiguous results. We develop novel insights into this relationship by addressing the dynamic interplay between these concepts. Our findings indicate that project performance is enhanced if project autonomy is increased for unrelated projects and decreased for related projects. However, the effect is negative for achieving cost objectives, indicating that top management tries to achieve cost objectives at the expense of project performance. Another key finding is that these relationships change over the course of the NBD-process. This implies that projects should be managed differently in the development versus the commercialization phase of the NBD-process.

### **6.1 Introduction**

The effect of project relatedness on project performance remains subject to debate in project and innovation literature (Sorrentino and Williams, 1995; Thornhill and Amit, 2001). Diversification literature and the resource-based view of the firm suggest that relatedness between units might be beneficial for unit performance, as important synergies between units can be realized (Danneels, and Kleinschmidt, 2001; Markides and Williamson, 1994). Synergies can be attained by sharing knowledge, resources and skills between units. Researchers have

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<sup>6</sup> This chapter is based on Burgers (2008a), The Dynamic Interplay between Autonomy and Relatedness: Implications for NBD-Project Performance, presented at the Annual Meeting of the Academy of Management 2008, Anaheim: USA, and Burgers (2008b), Managing the Dynamic Interplay Between Knowledge Relatedness and Autonomy in New Business Development Projects, paper accepted for presentation at the Strategic Management Society Conference 2008, Cologne: Germany.

therefore argued that new business development (NBD) activities that are more related to the firm's existing activities would outperform more unrelated NBD-activities (Thornhill and Amit, 2001; Chesbrough, 2000). However, findings are ambiguous in this respect. Sorrentino and Williams (1995), for example, find no effect of relatedness on project performance.

McGrath (2001) extended this line of research by arguing that there might not be a direct relationship between relatedness and project performance. She showed that the effect of relatedness on project performance is moderated by the degree of project autonomy. Projects that are highly related with the parent organization could draw on existing resources and knowledge in the firm, which is facilitated by providing lower degrees of autonomy to the project. Conversely, the performance of more exploratory projects is enhanced through higher degrees of autonomy (McGrath, 2001). Other studies have argued that relatedness consists of a technology and market dimension (Abernathy and Clark, 1985; Burgers et al., 2008b; 2008c; Danneels, 2002).

Thornhill and Amit (2001) argued that parent firm-project relations are not static but evolve over time. Their findings suggest that the joint effect of autonomy and relatedness on project performance may be different for earlier compared to later stages of the NBD-process. Case research from Burgers et al. (2008b) showed that exploration of technological knowledge as opposed to exploration of market knowledge takes place in different phases of the NBD-process. Yet, this proposition has never been tested on a larger sample of firms, resulting in insufficient knowledge on how to manage a project across the phases of the NBD-process.

We address this research gap by addressing the following research question in this chapter: *What is the joint effect of different types of relatedness and project autonomy on project performance in the various phases of the NBD-process?* This research contributes to the literature in several ways. First, we extend prior research on relatedness and project performance by taking into account different types of relatedness. Prior research tended to focus on projects that were either new on both the technological and market dimension or were related to the firm on both dimensions (cf. De Brentani, 2001). The (un)relatedness of both types of knowledge may coincide within certain projects, but this is not necessarily the case. Separating both dimensions allows us to also incorporate projects that either develop a new product/ technology or a new market. This provides a richer understanding of how to manage different types of NBD-projects.

Second, we build upon the ideas of Thornhill and Amit (2001) by investigating the dynamic effects of autonomy and relatedness on project performance. Studies have argued that the degree of exploration of technological and market knowledge changes over time (Burgers et al., 2008b). Following this logic, we also expect the effect of autonomy to change over the course of the NBD-process. By assessing the project before and after market introduction, we develop novel insights into the dynamic interplay between relatedness and autonomy and their performance effects. Moreover, measuring project performance for each phase of the business development process allows us to use a more fine-grained assessment of the effects on project performance. By doing so, we build on previous research (e.g. Hart et al., 2003) arguing that each phase in the NBD-process requires a distinct set of performance measures.

The chapter proceeds as follows. The next section elaborates on our theoretical model and hypotheses, while the third section describes our research methods and sample. The fourth section is about the analysis of the results and the chapter concludes with a discussion of the implications of our main findings for theory and practice.

## **6.2 *Theoretical development***

New business development is the creation of new businesses within existing firms. It involves generating new competencies and capabilities that result in the development of new products and technologies for both new and existing markets (Block and MacMillan, 1993; Zahra et al., 1999). Innovation literature has since long recognized that NBD-projects possess different degrees of newness. Projects have been classified as incremental versus radical innovations (Dewar and Dutton, 1986; Atuahene-Gima, 1995), incremental versus really new (Song and Montoya-Weiss, 1998) or exploitative versus exploratory innovations (Jansen et al., 2006). Project newness has been assessed from both macro- and micro-level perspectives (Garcia and Calantone, 2002). A macro-level perspective views the highest degree of newness as innovations that are new-to-the-world (cf. Bonner et al., 2002; Olson et al., 2001). Studies using a micro-level perspective focus on the degree of project newness relative to the firm (cf. Danneels and Kleinschmidt, 2001; McGrath, 2001). The latter view suggests a project's innovativeness is contingent upon the parent firm's knowledge and capabilities (Garcia and Calantone, 2002). What is new for one firm is not necessarily new to the other. Because we address



the development of new businesses and their organizational arrangements and not their acceptance in the market, we view project newness also relative to the firm. This construct has also been labeled relatedness (e.g. Block and MacMillan, 1993; Sorrentino and Williams, 1995; Thornhill and Amit, 2001). The more unrelated a project is to the firm, the newer the project. As such, in this chapter we view newness as the inverse of relatedness.

Many studies on innovation, exploration, and venturing literature have viewed relatedness as a unidimensional construct (cf. He and Wong, 2004; Hill and Rothaermel, 2003; Jansen et al., 2006; Sorrentino and Williams, 1995). Yet, a growing body of research on new product development recognizes that relatedness of NBD-projects is composed of a technological and a market component (Abernathy and Clark, 1985; Block and MacMillan, 1993; Calantone et al., 2006; Danneels, 2002; Danneels and Kleinschmidt, 2001; Garcia and Calantone, 2002). *Technological relatedness* refers to the newness of products, technologies and/ or processes of the project relative to the parent organization. *Market relatedness* is associated with targeting customer sets, entering markets, distribution channels, marketing approaches, and business models (Abernathy and Clark, 1985; Danneels, 2002).

Assessing how projects are related to the parent firm is important, because it points to potential synergies (Calantone et al., 2006). Technological synergies could be achieved by sharing, for example, production facilities, while benefiting from the firm's distribution and sales systems drives marketing synergies. Diversification literature has shown that relatedness has a positive effect on performance (Ansoff, 1965; Bettis, 1981; Markides and Williamson, 1994; Rumelt, 1974). The advantage of related diversification is based on scale and scope economies. The more related the new activity is with the firm's existing activities, the more possibilities to share resources, distribution channels, etcetera (Markides and Williamson, 1994). The resource-based theory of the firm added the possibility to share idiosyncratic, inimitable resources that lead to the potential for sustainable competitive advantage (Barney, 1991; Dierickx and Cool, 1989; Wernerfelt, 1984). This suggests that projects should leverage the firm's core competences (Markides and Williamson, 1994; Prahalad and Hamel; 1990). Chesbrough (2000) argued that this ability to draw on the firm's knowledge and resources is the primary advantage internal corporate ventures have over independent start-ups.

Although NBD-projects are by definition new and relatively unrelated to the parent firm, previous studies suggested that all NBD-activities emerge from the combination of both reusing existing knowledge and exploring new knowledge (Covin and Miles, 2007; Katila and Ajuha, 2002). As such, new business development does “not occur in abstraction from current abilities” (Kogut and Zander, 1992: 391). Drawing on an existing knowledge base prevents the project from reinventing the wheel. This could speed up the development process, and drive down development costs. Despite these clear theoretical arguments, empirical findings are much more ambiguous. Some found a positive effect of relatedness on project performance (Danneels and Kleinschmidt, 2001), while Miller and Camp (1985) found that relatedness was negatively related to project performance. Miller, Spann and Lerner (1991) showed that product quality benefited from relatedness, but it seemed to hurt cost objectives. Sorrentino and Williams (1995) found no relation between relatedness and performance.

### **6.2.1 Phases in the NBD-process**

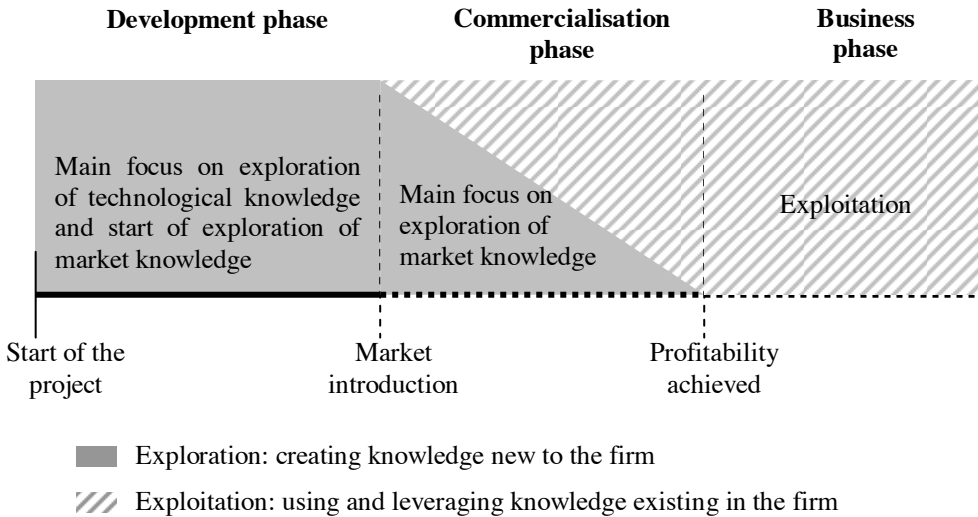
The studies mentioned above measured relatedness at one point in time and ignored the dynamic nature of NBD-projects over time. Pinto and Prescott (1988) showed for example that success factors vary for each stage in the new business development process. Others have shown that the relation with the parent firm in terms of project independence changed over time (Kazanjian and Drazin, 1990; Thornhill and Amit, 2001). Moreover, during the project life cycle the emphasis shifts from technological to market development activities (Burgers et al., 2008b; Kazanjian, 1988; Utterback, 1971). In other words, the technological versus marketing synergies are realized at different points in time. Following Thornhill and Amit (2001) we distinguish between two phases in the NBD-process before the project has evolved into an established business.

The first phase is the *development phase* that runs from project initiation to market introduction. In this phase the emphasis is on technological exploration (see Figure 6.1), with exploratory technological activities such as prototype and product development, and building the (trial) production line. Before the product is approved for market introduction, the end result of the technological development trajectory in terms of a working product and process are usually tested on aspects such as durability and quality (Cooper, 1986). At the moment of market introduction the product and production line are technically complete, requiring

little additional development of technological knowledge. Market exploration also starts during the development phase with activities such as gaining knowledge about customer preferences and how to reach and target potential customers (see Figure 6.1).

The development phase is followed by the *commercialization phase*, which starts at market introduction and ends when profitability is achieved. This phase calls for technological exploitation in order to increase the efficiency of the production process and to refine the product. The exploration of market knowledge, however, continues during the commercialization phase, when for example concepts are tested in the marketplace and distribution channels are developed. Based also on customer feedback the market approach might be frequently changed during this phase (Di Benedetto, 1999; McGrath et al. 2006). Exploration requires learning-by-doing, which for market knowledge can to some extent only be done during the commercialization phase when products are actually sold. This is a prime difference with technological knowledge where the testing of the product and technology can take place in a laboratory during the development phase preceding market introduction.

**Figure 6.1 Exploration and exploitation of technological and market knowledge in subsequent phases of an NBD-project’s life cycle**



### **6.2.2 Project autonomy**

Relatedness indicates to what extent the project can leverage the firm's existing knowledge and resources and to what extent it needs to explore new knowledge. Exploring new knowledge has been associated with fundamentally different learning modes than exploiting existing knowledge (Benner and Tushman, 2003; March, 1991). Explorative NBD-activities require experimentation and the generation of new knowledge, while exploitative activities result from reducing variety and the efficient application of existing knowledge sources (Benner and Tushman, 2003; Levinthal and March, 1993). To facilitate knowledge acquisition and development, it has been suggested to use different levels of autonomy for exploitative and explorative projects (McGrath, 2001).

Unrelated innovations lie far outside the company's base of core competences, and hence the project cannot draw on capabilities and knowledge available within the parent firm. It has therefore been suggested to provide more autonomy to radically new NBD-projects (Burgelman, 1985; Drucker, 1985; Hill and Rothaermel, 2003; McGrath et al., 2006). Autonomy provides projects with a sense of freedom and ownership over work activities. This leads to higher creativity (Amabile et al., 1996) and allows for adaptation to local demands. Moreover, the project can adopt its own work methods that are better suited for the explorative NBD-process, resulting in faster development. Autonomy creates 'pragmatic boundaries' (Carlile 2004) that safeguard NBD-activities from dominant managerial cognitions and inertia present in the parent's mainstream activities (Benner and Tushman, 2003; Gilbert, 2005). More unrelated projects also require a higher degree of autonomy to prevent intrusions in the mainstream businesses (Block and MacMillan, 1993; Burgelman, 1984; Hill and Rothaermel, 2003). It facilitates within-project learning and increases knowledge creation at different locations within organizations (Fiol, 1995; Scarbrough et al., 2004). Establishing local 'thought-worlds' leads to more creative breakthroughs (Fiol, 1995). Providing autonomy to exploratory NBD-projects would therefore result in the creation of more optimal solutions and better product quality.

In the same logic of reasoning, related projects would benefit from tighter integration of the projects and mainstream businesses. Lower degrees of autonomy facilitate knowledge sharing between the project and the parent firm (Gupta and Govindarajan, 2000; Scarbrough et al., 2004). It prevents the duplication of efforts and increases strategic coherence (Birkinshaw et al., 2002; O'Reilly and Tushman,

2004). Thus we expect the quality of the product and ultimate profitability of the project to be higher when the degree of project autonomy is aligned with the degree of project relatedness. This suggests the following hypothesis:

*Hypothesis 1: Project performance in the development phase will be increased when related NBD-projects receive less autonomy and unrelated projects receive higher levels of project autonomy.*

Project autonomy should be contingent upon the extent to which projects can exploit and leverage knowledge available within the parent firm versus the exploration of new knowledge (McGrath, 2001). In the previous paragraphs we established how we expect this relation to play out in the development phase, in this paragraph we will focus on the commercialization phase. In the commercialization phase the emphasis shifts to exploration of market knowledge (see Figure 6.1). During this phase the project still needs to learn how to approach the market in terms of product positioning, advertising, etcetera. It might need to learn how to operate in new distribution channels and could even have to develop a new sales force. ELECTRA, for example, experienced in the 1990s that success in the oral care market was strongly dependent on getting access to medical specialists. ELECTRA's mature sales force, however, was used to dealing with electronic retail stores, and it proved too difficult to train their sales force on how to effectively communicate with medical specialists. Tripsas and Gavetti's (2000) research on Polaroid also showed that exploration of market knowledge is often underestimated. To facilitate the exploration of market and marketing knowledge, managers should provide more autonomy to unrelated projects in the commercialization phase. In a similar vein, projects targeting related markets, should receive less autonomy to maximize the potential for leveraging existing market(ing) capabilities. This suggests the following hypothesis.

*Hypothesis 2: Project performance in the commercialization phase will be increased when NBD-projects with higher market relatedness receive less autonomy and projects targeting unrelated markets receive higher levels of project autonomy.*

Thus far we have hypothesized the interaction effect of project relatedness and autonomy on project performance. We suggested that unrelated projects

should receive more autonomy to increase chances of project success, and related projects should be tighter integrated with the parent firm to realize potential synergies. We argue, however, that an important distinction should be made between project performance in general and the extent to which projects stay within budget and achieve their cost objectives. Regarding the cost dimension of project performance we expect a negative interaction effect. This implies that if unrelated projects receive more autonomy they would give precedence to time-to-market and product performance issues over staying within its budget. When brought under tighter top management control, such projects would receive perverse pressures to achieve their cost objectives (Burgelman, 1985). One of the main arguments used in venturing literature to provide autonomy to NBD-projects is that it allows them to escape from close scrutiny by top management, which prefers projects to adhere to annual budgeting policies (Burgelman, 1985). We expect this effect to be less in the commercialization phase, as the emphasis will shift there to other financial measures such as profit margins, ROI and sales growth (Hart et al., 2003).

*Hypothesis 3: Autonomy has a negative moderating effect on the relation between project newness and achieving cost objectives (i.e. higher newness and lower autonomy increase performance on the cost dimension). This effect will be stronger in the development phase than the commercialization phase.*

## **6.3 Data and methods**

### **6.3.1 Sample**

The research was conducted by means of a questionnaire. The questionnaire was administered to a sample of NBD-project managers compiled from the database of the Association of Business Development Netherlands (VBDN). Project managers are frequently selected as respondents regarding innovative projects, as they are considered the most knowledgeable about the project and its relation with the organizational context. The database consisted of 1074 persons affiliated with business development activities. An initial investigation of our database led to the deletion of 33 persons who were not involved in NBD-projects. This led to a sampling frame of 1041 potential respondents.

### 6.3.2 Questionnaire

The questionnaire was developed to follow up on the exploratory case study of several NBD-projects within ELECTRA, which was discussed in chapter 5. During this case study we had interviews with a vice-president, several directors, managers of the projects and managers responsible for the technological and market development of the projects to gain input for our questionnaire. A critical examination of the corporate entrepreneurship, product development and project management literature led to a large database of potential constructs and items. The selected items and scales were based upon previously validated measures whenever possible. The first draft of the questionnaire was evaluated by nine management scholars to assess the validity of the items and the constructs. After several rounds of refining and editing the questionnaire, we pretested the questionnaire in interviews. We conducted several interviews with managers of NBD-projects and business development directors, and made further revisions to the survey. After several iterations, we performed a pilot test among ten NBD-project managers within a single firm. When results were satisfactory, we sent the survey to the full sample.

We collected the data in 2007. We sent our intended respondents a personalized cover letter, inviting them to participate in the survey. This cover letter clearly stated the purpose of the study, its relevance, and the importance of their participation. The letter also ensured confidentiality and provided elaborate contact information. We offered the possibility for participants to offer a copy of the results and conclusions and a personalized set of implications. Within a couple of weeks, the non-respondents were reminded of the survey and several weeks after that they received a final mailing to complete the survey. These methods are in line with recommendations of previous research on enhancing the effective response rate (Westphal, 1998). The respondents were asked to answer the question with regard to the last NBD-project they worked on that had actually generated sales, and approach consistent with prior studies (cf. Moorman and Miner, 1997).

Of the 1041 surveys we sent to the potential respondents in our sample, 88 surveys were returned because of address change. 35 surveys were returned by participants who were mistakenly included in our sample, primarily because the participants were involved in an NBD-project that was effectively an independent start-up, instead of an NBD-project in an existing firm. Thus our effective sample size was 918, of which we received 139 surveys. This represented an effective

response rate of 15.1 percent, comparable to those obtained in previous studies on product development projects (Li et al, 2007).

### **6.3.3 Adequacy of the methods and measures: biases, reliability and validity issues**

*(Non-)response bias* A potential bias is that of non-response and early versus late response. We compared respondents and non-respondents with regard to firm size in terms of employees and type of industry. We found no significant differences. Furthermore, we analyzed potential differences between early and late respondents. The assumption is that late respondents tend to be more like non-respondents (Armstrong and Overton, 1977). Early respondents were the first one-third of all respondents in the data set and late respondents were the last one-third of all respondents (Joshi and Stump, 1999). T-tests revealed no significant differences between the groups, apart from the fact that early respondents had on average longer company tenure than late respondents (mean of 7.4 versus 4.6 years).

Another type of potential response bias is that respondents with different backgrounds, e.g. technical versus marketing, might have different perceptions of some core constructs. Among the respondents, 28.3% was the project manager, 12.3% was brought in because of their technical expertise, 38.4% was responsible for the market development, 11.6% was brought in from outside the corporation, 8.7% was involved as business management, and .7% was involved in the project for other reasons. With the use of ANOVA we checked for differences between the groups but found no significant differences. This indicates that (non-)response biases were not a problem in our study.

*Social desirability bias* Respondents might also tend to select the more successful projects for responding to the survey's questions, resulting in a potential bias towards more successful projects. We applied two procedural remedies to deal with this bias. First, we asked respondents to answer the questions regarding the last project they had participated in that had actually generated sales. The latter was a necessary condition because we wanted to compare the phase before market introduction with the actual implementation phase taking place after market introduction, but it also limits the respondents' freedom to select any project they preferred. Second, by promising a management report that allowed the respondents to compare their scores with the best practices,



the results would actually lose value for the respondents if they would answer in a socially desirable way (Li et al., 2007).

*Common method bias* An often addressed problem in management research is the presence of common method bias, which seems to be particularly prone to survey research (Podsakoff et al., 2003). Common method bias can be observed as the variance attributed to the method itself rather than the underlying traits. Providing respondents with a management report might prevent some of the social desirability, leniency and acquiescence biases as mentioned by Podsakoff et al. (2003). We also broke down complex constructs in easier to understand items and made sure there was no right or wrong answer regarding the questions and assured anonymity to the respondents. Furthermore, different scale anchors were used for independent, moderating and dependent variables to reduce biases attributable to communalities in scales. Besides these procedural remedies we also applied Harman's single factor test, for which we included all the items of our constructs in a single factor test. In the case of common method bias a single factor will emerge that explains a significant part of the total variance. The factor analysis showed 11 factors with the first factor explaining 15.6% of the variance for the development phase, and 12 factors with the first factor explaining 15.9% of the variance for the commercialization phase, indicating that common method bias is not a serious concern in our research.

*Validity and reliability* We employed several remedies and techniques to address reliability and validity issues. First, we extensively pre-tested our questionnaire and used previously validated measures if possible. Second, we investigated the missing values. Little's MCAR test showed insignificance (Chi-square 4492,  $p = 0.185$ ), suggesting that data are missing completely at random. In principle, this allowed us to use any kind of imputation technique or listwise / pairwise deletion. Given the relatively small data set, using listwise deletion would reduce the N too much. Several studies have shown that listwise deletion in fact throws away significant amounts of information, thereby reducing reliability of the study (Bernaards and Sijtsma, 1999). Studies have shown that under conditions of limitedly missing data such as ours, the EM-algorithm produces the most reliable results (Bernaards and Sijtsma, 1999). Therefore we used the EM-method to impute missing values (cf. Ajuha and Katila, 2004; Geyskens et al., 2006; Glomb and Liao, 2003).

### 6.3.4 Variables

All the scales and the items are provided in Appendix B. An exploratory factor analysis was conducted to assess unidimensionality of all constructs. Cronbach Alpha's were calculated to assess the reliability of each scale.

Project performance was measured with a scale based on McGrath (2001). Unlike previous studies, we separated the performance of the development phase preceding market introduction and the commercialization phase following market introduction. Previous research has shown that both phases require different performance metrics (Hart et al., 2003). Moreover, whether a project is allowed to grow into a success will partly depend on their performance, but also on the importance assigned to that particular performance metric by top management. We therefore used a weighted performance index, where each performance item was weighted with the importance assigned by top management to that particular item. Factor analysis of the weighted constructs revealed two dimensions of performance for the development phase. *General performance* ( $\alpha = .80$ ) was measured with a 4-item scale tapping into the quality of the developed product and how well the project met its deadlines. *Cost performance* ( $\alpha = .82$ ) was a two-item scale measuring how well a project stayed within budget and achieved its cost objectives. For the commercialization phase, three dimensions of project performance were identified. *General performance* ( $\alpha = .91$ ) was measured with a 3-item scale gauging the product's quality and customer satisfaction. *Financial performance* ( $\alpha = .88$ ) was a 4-item scale measuring the extent to which expectations were met regarding market share, sales growth, profit margins and time to break even. *Cost performance* ( $\alpha = .85$ ) was a two-item scale measuring how well a project stayed within budget and achieved its cost objectives.

Project newness was measured with 17 items based on Danneels and Kleinschmidt (2001). Consistent with their findings we extracted 3 dimensions of project newness. *Product/technology newness* ( $\alpha = .79$ ) was measured with a 5-item scale gauging to what extent the technologies, production processes and aspects of the developed product were new to the firm. *Marketing newness* ( $\alpha = .79$ ) measured to what extent aspects of the project's marketing, such as distribution channels, advertising, sales force were new to the firm. Marketing newness was measured with six items. *Market newness* ( $\alpha = .61$ ) was measured with a 3-item scale tapping into the extent the market, the competitors and the users were new to the firm.

*Decision-making autonomy* was adapted from Bonner et al. (2002). The 7-item scale measured to what extent decisions regarding the project's budget, goals, strategies, and project members were taken by top management or by the project team. The level of decision-making autonomy was assessed for the development ( $\alpha = .93$ ) and for the commercialization phase ( $\alpha = .91$ ).

**Control variables** *Project manager experience* was measured with a 6-item scale based on Souder et al. (1997). It gauged the level of experience and skills the project manager had regarding, marketing, technology, project management and business building. The level of experience of the project manager was measured for the development phase ( $\alpha = .79$ ) and for the commercialization phase ( $\alpha = .81$ ). Such a split measure yields more valid results, as project managers are often replaced over the course of a project. *Project size* might confound the results, as the complexities of coordinating large projects may decrease the effects of project autonomy (McGrath, 2001). Project size was measured by the number of employees working on a project in the development and commercialization phase respectively. *Firm performance* indicates the degree of slack in a firm, and as such might be an important antecedent to the level of corporate entrepreneurial activities in a firm (Tan and Peng, 2003). Past performance was measured with a three-item scale that captured a firm's ROI, sales growth and profit growth ( $\alpha = .84$ ). *Firm size* is commonly found to influence variables such as autonomy, available slack and innovativeness. We included the natural logarithm of the number of full-time employees to account for firm size. *Firm age*, measured by the natural logarithm of the number of years since its founding, was also included. Previous studies have shown that older firms may encounter problems in keeping abreast with external developments (Sorensen and Stuart, 2000). *Environmental dynamism* ( $\alpha = .91$ ) was measured with five items tapping into the rate of change in the competitive environment (Jansen et al., 2006). Previous studies have shown that firms in dynamic environments are more involved in new business development. Finally, to control for additional *industry* effects, we included three industry dummies: manufacturing, services and other (McGrath, 2001).

**Table 6.1 Means, standard deviations and correlations<sup>a</sup>**

	mean	S.D.	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1. General performance development phase	23.78	9.45	(.80)							
2. Cost performance development phase	18.35	8.87	.220*	(.82)						
3. Financial performance commercialization phase	23.68	10.21	.533**	.181*	(.88)					
4. General performance commercialization phase	28.72	10.53	.664**	.026	.537**	(.91)				
5. Cost performance commercialization phase	14.24	6.84	.364**	.639**	.442**	.187*	(.85)			
6. Marketing newness	4.66	1.33	-.010	.128	.092	.061	.190*	(.79)		
7. Market newness	4.40	1.58	.109	.145	.072	.046	.133	.341**	(.61)	
8. Prod/ technological newness	4.09	1.29	.061	-.047	.093	.087	.025	.294**	.211*	(.79)
9. Autonomy development phase	3.76	1.69	-.258**	.004	-.031	-.224*	-.121	-.098	-.081	-.247**
10. Autonomy commercialization phase	3.57	1.54	-.208*	.031	-.094	-.236**	-.130	-.138	-.070	-.204*
11. Project mgr development phase	5.11	1.02	.359**	.163	.174*	.209*	.145	-.114	.045	-.057
12. Project mgr commercialization phase	5.03	1.11	.261**	.065	.210*	.214*	.125	-.042	.013	.040
13. Project size development phase	8.58	14.37	.004	-.097	.033	.094	-.052	.053	.003	.001
14. Project size commercialization phase	9.91	17.15	.129	.050	.170	-.018	.123	.013	.103	.175*
15. Firm size	2.39	1.39	-.195*	-.038	-.006	-.175*	-.002	-.085	-.132	.138
16. Firm age	1.36	.32	-.058	-.047	.003	.076	.027	.073	.116	.240**
17. Dynamism	4.41	1.21	.163	.108	.256**	.174*	.189*	.223*	.138	.107
18. Firm performance	4.66	1.13	.308**	.108	.247**	.212*	.141	-.098	.025	.010
19. Manufacturing	.15	.35	-.071	-.265**	-.137	-.041	-.195**	.031	.018	.198*
20. Services	.60	.49	.183*	.197*	.129	.082	.258**	-.042	-.029	-.097

\* Correlation is significant at the 0.05 level (2-tailed); \*\* Correlation is significant at the 0.01 level (2-tailed). a N=131. Numbers in parentheses on the diagonal are Cronbach Alpha's of the composite scales.

**Table 6.1 Continued**

	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
9. Autonomy development phase	(.93)										
10. Autonomy commercialization phase	.685**	(.91)									
11. Project mgr development phase	-.137	-.104	(.79)								
12. Project mgr commercialization phase	-.118	-.085	.808**	(.81)							
13. Project size development phase	-.048	-.036	-.111	-.116	-						
14. Project size commercialization phase	-.087	-.042	.017	.020	.253**	-					
15. Firm size	.081	.182*	-.271**	-.204*	.163	.182*	-				
16. Firm age	-.039	-.104	-.137	-.055	.188*	.054	.031	-			
17. Dynamism	-.164	-.113	.237**	.216*	.073	.066	.018	-.086	(.91)		
18. Firm performance	-.113	-.098	.009	-.021	.130	.137	.093	-.009	.089	1	
19. Manufacturing	.073	.071	-.200*	-.096	.077	-.045	.191*	.071	-.112	.015	-
20. Services	-.150	-.033	.173*	.117	-.093	.086	-.171	-.035	.173*	.038	-.500**

\* Correlation is significant at the 0.05 level (2-tailed); \*\* Correlation is significant at the 0.01 level (2-tailed). a N=131. Numbers in parentheses on the diagonal are Cronbach Alpha's of the composite scales.

## 6.4 Results

Table 6.1 presents descriptive statistics and correlations for the variables. Table 6.2 presents the results of the moderated regression analyses for the development phase. Prior to the creation of the interaction terms, we mean centered the independent variables (Aiken and West, 1991). To examine multicollinearity, we calculated variance inflation factors (VIF) for each of the regression equations. The maximum VIF within the models was 1.6, which is well below the rule-of-thumb cut-off of 10 (Neter et al., 1990). Model 1 contains the control variables. The model included 2 of the 3 industry dummies, as “other industries” was used as the reference group. Model 2 introduces the main effects of the moderating variables, and model 3 examines the moderating effects of project newness and autonomy on project performance in the development phase (hypothesis 1).

Regarding the control variables we can observe that company performance ( $\beta = 2.376$ ,  $p < 0.001$ ) and project manager experience ( $\beta = 2.494$ ,  $p < 0.01$ ) have a positive effect on project performance in the development phase (see Table 6.2). More experienced project managers perform better with their projects than their less-experienced counterparts. Project autonomy has a significant negative effect on project performance ( $\beta = -1.076$ ,  $p < 0.05$ ). Hypothesis 1 is strongly supported for the interaction between market newness and project autonomy ( $\beta = 0.771$ ,  $p < 0.05$ ). Related projects result in increased performance with less autonomy, while projects targeting new markets achieve higher performance in the development phase when receiving more autonomy (see Figure 6.2). Figure 6.2 shows that high degrees of autonomy is only warranted for very high degrees of market newness (+1 S.D. and above).

Table 6.3 presents the regression results for the effects of project newness and autonomy on project performance in the commercialization phase. Models 7-9 and 10-12 test hypothesis 2 about the interaction effect of marketing newness on project autonomy on project performance in the commercialization phase. Both models 9 (general project performance) and 12 (achieved profitability) show significant effects of company performance (model 9:  $\beta = 1.767$ ,  $p < 0.05$ ; model 12:  $\beta = 1.913$ ,  $p < 0.05$ ) and project manager experience (model 9:  $\beta = 1.547$ ,  $p < 0.10$ ; model 12:  $\beta = 1.499$ ,  $p < 0.10$ ) on project performance respectively profitability. These results are in line with the results in the development phase (see model 3 of Table 6.2). In line with the findings of model 2, project autonomy

has a significantly negative, direct effect ( $\beta = -1.325$ ,  $p < 0.05$ ) on project performance in the commercialization phase (see model 9, Table 3). This implies that projects with more autonomy perform worse with respect to achieving deadlines and product quality than projects with less autonomy.

**Table 6.2 Regression results for development phase<sup>a</sup>**

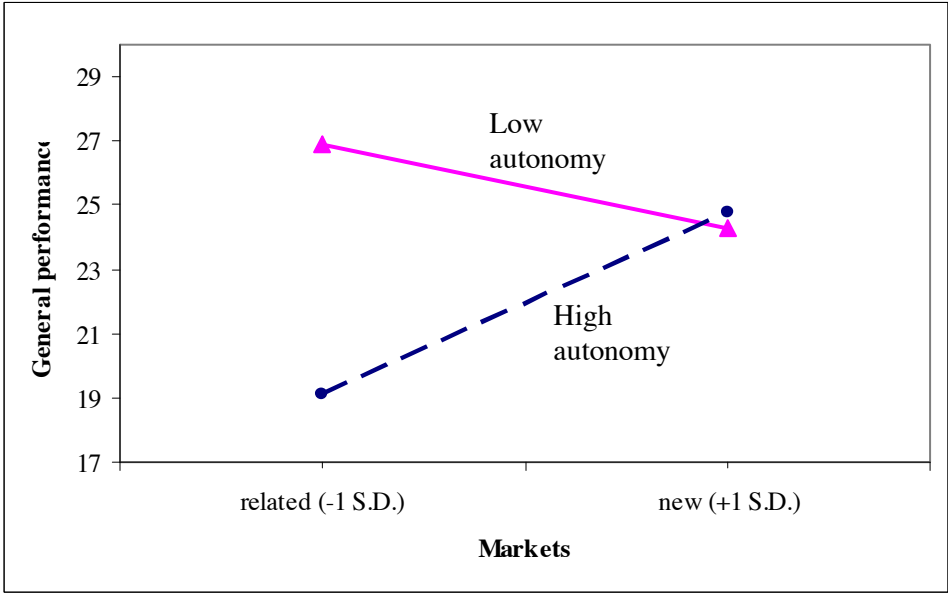
Controls	General performance development phase			Cost performance development phase		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Firm size	-.952 <sup>+</sup> (.569)	-.879 (.587)	-.844 (.584)	.275 (.584)	.569 (.599)	.673 (.580)
Firm age	-.345 (2.406)	-1.211 (2.489)	-.750 (2.509)	.125 (2.472)	-.094 (2.542)	-.094 (2.489)
Manufacturing dummy	2.136 (2.446)	1.785 (2.470)	1.947 (2.456)	-5.352* (2.513)	-5.184* (2.522)	-4.447* (2.437)
Service dummy	2.456 (1.761)	2.219 (1.771)	2.425 (1.760)	1.088 (1.809)	1.561 (1.808)	1.403 (1.746)
Dynamism	.397 (.642)	.145 (.673)	.085 (.679)	.339 (.660)	-.040 (.687)	.275 (.674)
Company performance	2.550*** (.666)	2.410*** (.673)	2.376*** (.669)	.876 (.684)	1.038 (.687)	.857 (.664)
Project size	.016 (.054)	.016 (.054)	.016 (.054)	-.055 (.055)	-.058 (.055)	-.066 (.053)
Project mgr experience	2.787** (.790)	2.658** (.807)	2.494** (.821)	.869 (.811)	1.205 (.824)	.873 (.815)
<b>Moderating variables</b>						
Marketing newness		-.062 (.638)	-.365 (.663)		1.095 <sup>+</sup> (.652)	.663 (.658)
Market newness		.339 (.508)	.479 (.509)		.651 (.519)	.674 (.505)
Product/ technology newness		.389 (.661)	.473 (.681)		-.405 (.675)	-.511 (.675)
Project autonomy		-.806 <sup>+</sup> (.468)	-1.076* (.502)		.338 (.478)	-.305 (.499)
<b>Interaction effects</b>						
Marketing newness x autonomy			-.311 (.334)			-.624* (.331)
Market newness x autonomy			.771* (.338)			.339 (.335)
Prod/tech newness x autonomy			-.348 (.377)			-1.066** (.374)
<b>R<sup>2</sup></b>	<b>.256</b>	<b>.285</b>	<b>.317</b>	<b>.109</b>	<b>.155</b>	<b>.237</b>
<b>Δ R<sup>2</sup></b>		<b>.029</b>	<b>.032</b>		<b>.046</b>	<b>.082</b>

<sup>a</sup> n = 131. + p < .10; \* p < .05; \*\* p < .01; \*\*\* p < .001; Standard errors in parentheses





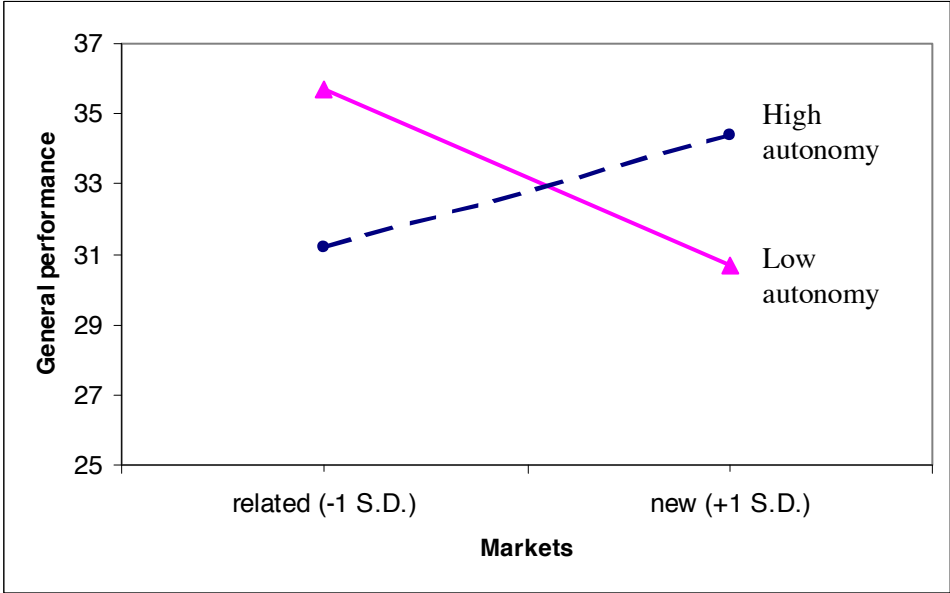
**Figure 6.2 Interaction effect of autonomy and market newness on project performance in the development phase**



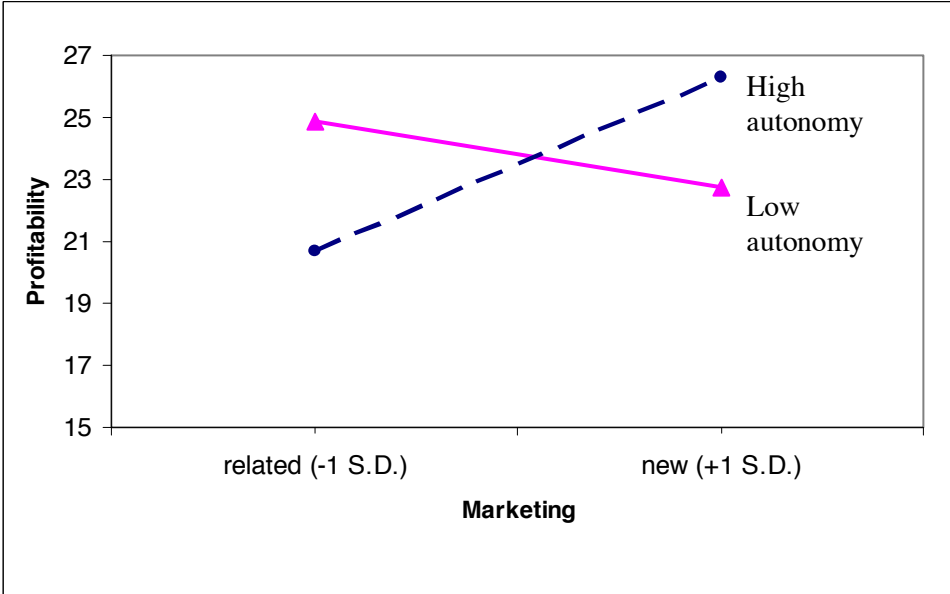
The interaction effect of market newness and project autonomy is significantly positive ( $\beta = 0.843, p < 0.05$ ) on project performance in the commercialization phase (see Table 6.3, model 9). Projects targeting related markets achieve higher project performance when they receive relatively little autonomy, while projects developing new markets benefit from higher degrees of autonomy (see Figure 6.3).

Model 12 in Table 6.3 shows that the interaction effect of marketing newness and project autonomy has a positive and significant outcomes for the profitability of the project in terms of profit margins, market share etc. This implies that NBD-projects developing related markets achieve better performance if top management tightly controls the project (see Figure 6.4). NBD-projects entering new markets for the firm obtain higher financial success if the autonomy of the project is increased during the commercialization phase. These results provide support for hypothesis 2.

**Figure 6.3 Interaction effect of autonomy and market newness on project performance in the commercialization phase**

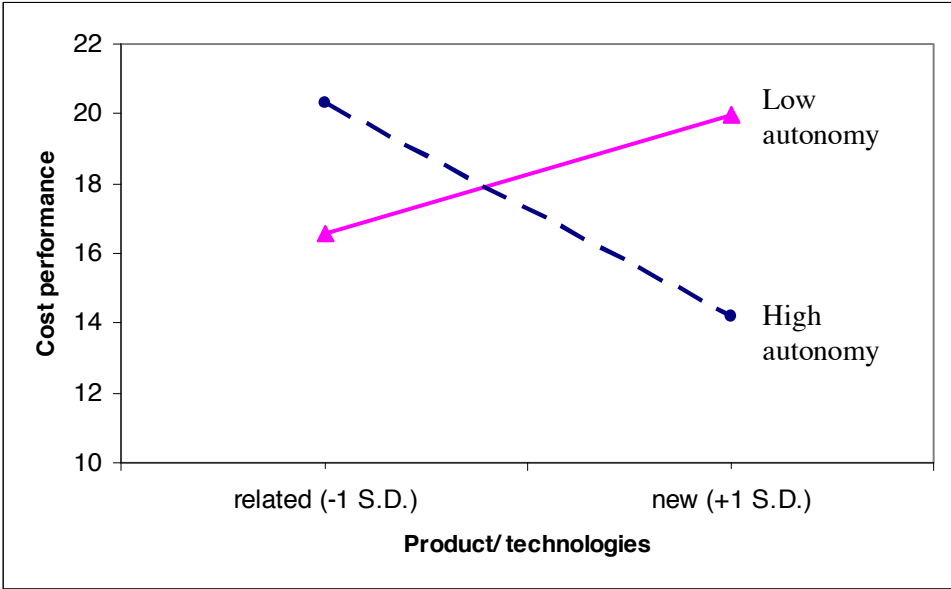


**Figure 6.4 Interaction effect of autonomy and marketing newness on project profitability in the commercialization phase**

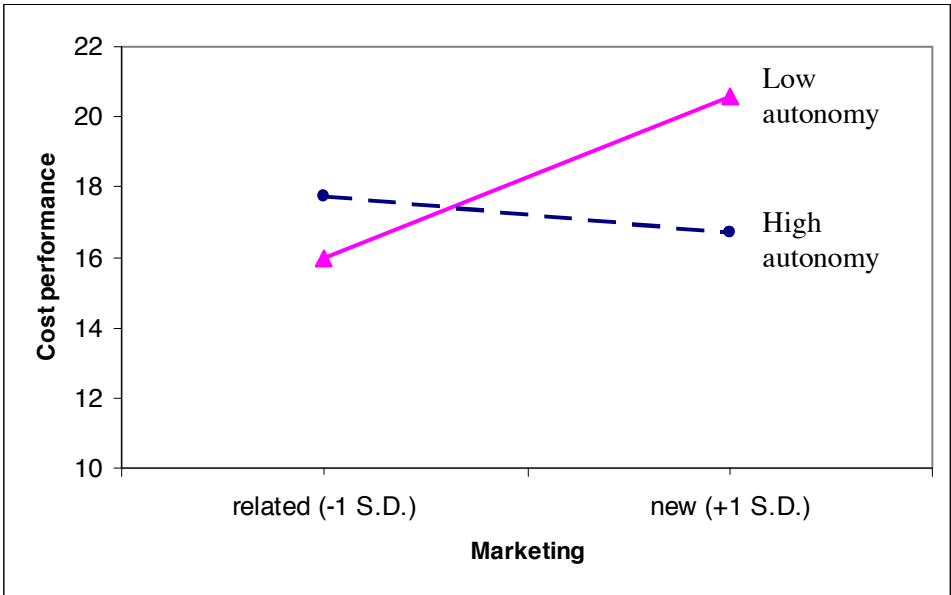


Hypothesis 3 predicted that the interaction between autonomy and project newness would have negative effects on cost performance of NBD-projects. This was tested for the development phase in models 4-6 of Table 6.2 and the results for the commercialization phase are shown in models 13-15 (see Table 6.3). The results indicate that projects in the manufacturing sector in general perform worse on the cost dimension in the development phase ( $\beta = -4.447$ ,  $p < 0.10$ ) and NBD-projects in the service sector perform relatively better on the cost dimension in the commercialization phase ( $\beta = 2.671$ ,  $p < 0.10$ ). It must be noted, however, that the support for this finding is weak, given the .10 significance levels. There are no significant direct effects of the moderating variables on cost performance in the development phase (see model 6, Table 6.2). There are, however, strongly negative interactions between marketing newness and project autonomy ( $\beta = -0.624$ ,  $p < 0.10$ ) and between product/ technology newness and project autonomy ( $\beta = -1.066$ ,  $p < 0.01$ ). This implies that projects developing new marketing methods keep better control of their costs when top management keeps a close eye on these projects. When projects can make use of existing marketing methods, they benefit from more autonomy in the development phase (see Figure 6.5). The same logic applies to product/technology newness and autonomy (see Figure 6.6). Projects developing related products and technologies benefit from higher autonomy, while projects developing new products/ technologies can perform better on the cost dimension if they receive little autonomy in the development phase. We did not find any significant main or interaction effects on cost performance in the commercialization phase. These results provide support for hypothesis 3.

**Figure 6.5** Interaction effect of autonomy and marketing newness on cost performance in the development phase



**Figure 6.6** Interaction effect of autonomy and product/ technology newness on cost performance in the development phase



## **6.5 Discussion**

Scholars and practitioners alike strive to understand which organizational and managerial attributes drive the performance of new business development projects. Conceptual arguments –derived from diversification, organizational learning, and resource-based literatures- assert that related NBD-projects would outperform their unrelated counterparts (Danneels and Kleinschmidt, 2001; Miller et al., 1991; Thornhill and Amit, 2001). Yet, empirical findings regarding the effect of relatedness on NBD-project performance remain mixed. It has been argued that these findings are blurred because of several contingencies that change the effect of relatedness on project performance. With this chapter we set out to test several of these contingencies.

First, we distinguished between product/ technological and market newness of NBD-projects, as these might have differential effects on project performance. Second, we addressed the moderating role of project autonomy on the relation between the newness of projects and project performance. Third, we argued that the interplay between project autonomy and project relatedness is dynamic in nature. We investigated whether the effects on project performance are different for the development versus the commercialization phase of the NBD-process. Fourth, we addressed multiple dimensions of project performance to investigate whether the interaction between relatedness and autonomy has different effects on these dimensions.

### **6.5.1 Implications**

The findings do not reveal a direct effect of project relatedness on project performance. Our findings do show, however, that there are significant interactions between the degrees of relatedness and autonomy on project performance. McGrath (2001) obtained similar results. These effects differ for marketing, market, and product/ technology newness. This confirms earlier studies which argued that there are conceptual differences between technological and market newness (Block and MacMillan, 1993; Danneels, 2002). This has strong implications for management. Instead of assessing the newness of the project in general and adjusting the managerial and organizational arrangements accordingly to maximize the performance of the project, our research shows they have to assess the newness of the product/ technology, market, and marketing methods

used. This could lead to conflicting requirements as a project might need autonomy to develop new technologies, and simultaneously need tighter coupling with mainstream businesses to benefit from available marketing expertise. Gibson and Birkinshaw (2004) showed that business units were ambidextrous by simultaneously engaging in exploration and exploitation. Our findings suggest that NBD-projects are in that sense also ambidextrous regarding being explorative on the technology side and more exploitative regarding the market for example. It would be an interesting topic for future research to investigate which managerial and organizational arrangements allow projects to deal with such conflicting pressures.

Hypothesis 1 suggested that the interaction effect between project newness and autonomy would be positive regarding project performance in the development phase. This finding is confirmed only for market newness (see Table 6.2). Projects that target new markets for the firm should receive more autonomy to boost project performance, while projects targeting related markets benefit from tighter integration with the firm. Considering that many firms group their units according to target markets, could explain why projects targeting new markets need more autonomy. An unrelated market might fall outside of the dominant logic of the unit's management and strategy (Tripsas and Gavetti, 2000). Such a dominant logic could create coevolutionary lock-in effects that sustain the existing, but prevent new markets to emerge within the boundaries of the firm (Burgelman, 2002). Increased project autonomy would be the solution to protect the project from such inertial forces (Burgelman, 1985). Interestingly the interaction between product/ technology newness and project autonomy was not significant, indicating that providing more or less autonomy to projects developing new technologies does not increase project performance. This contradicts some conventional wisdom that radical technological innovations should be developed autonomously from mainstream businesses (cf. Hill and Rothaermel, 2003). However, several authors suggested that such disruptive technological projects would be killed by top management anyway, whether or not they are managed autonomously (Campbell et al., 2003; Christensen, 1997). Another explanation could be that more autonomy is only warranted for very radically new technological projects, which might be very limitedly present in our sample. Future studies could investigate this further by specifically targeting radical technological projects and comparing them with other NBD-projects.

Hypothesis 2 asserts that the positive interaction effect between autonomy and relatedness in the commercialization phase holds only for market(ing) newness. The results confirm this hypothesis (see Table 6.3). Projects developing new market knowledge benefit from higher degrees of project autonomy in the commercialization phase. The argument is that exploration of market knowledge still continues in the commercialization phase (Burgers et al., 2008b). This suggests that managers should extend the project approach in this phase by providing autonomy to projects developing new market knowledge, as opposed to the conventional wisdom that NBD-projects become a business at market introduction (Burgers et al., 2008b). Figure 6.1 suggested that for the technological dimension the emphasis shifts to exploitation in the commercialization phase for all projects. Hence, regarding product/ technology relatedness all projects would benefit from staying close to the organizational core to facilitate the transfer of knowledge and resources. This could explain the direct negative effect of autonomy on project performance in the commercialization phase we found, because tighter integration of the project with the parent firm should facilitate sharing of knowledge and resources.

Hypothesis 3 suggests that for cost performance (as opposed to general project performance), the interaction effect between project relatedness and autonomy would be significantly negative. Our findings confirm this hypothesis for the development phase. The results indicate that if top management is gaining more control over an unrelated NBD-project, the project is performing better on achieving cost objectives. However, at the same time top management control is decreasing general project performance for unrelated projects (see the discussion surrounding hypothesis 1). In other words, top management involvement in the project is emphasizing the short-term by achieving cost objectives at the expense of the long-term. This confirms earlier notions that unrelated NBD-projects benefit from more autonomy (Burgelman, 1985; Burgers et al., 2008b). It would be a worthwhile avenue for future research to investigate what the effect of an emphasis on cost performance versus general project performance is on the survival rate of these NBD-projects. It might well be that a focus on achieving cost objectives enhances the internal survival rate, as top management would favor these type of projects. But at the same time an emphasis on general project performance would boost the market survival rate, as the project is focusing on aspects such as product quality and time-to-market.

Another avenue for future research concerns the direct effect of relatedness on NBD-project performance. Conceptually there is widespread consensus that relatedness has positive performance effects, as it creates opportunities for realizing synergies. Empirically, however, the findings are mixed at best. Applying more fine-grained methods on large samples could possibly resolve this issue. A theoretical explanation for these (non-)findings could be that the benefits of these synergies accrue to other parts of the organization (Miller et al., 1991). Thus for the firm in general it could still be beneficial, but not for the performance of the individual project. This suggests relating project relatedness and autonomy to firm performance. However, a potential problem is that NBD-projects are in terms of revenues in earlier stages negligible compared to mainstream businesses, making it extremely difficult to detect these synergetic effects in the company's performance.

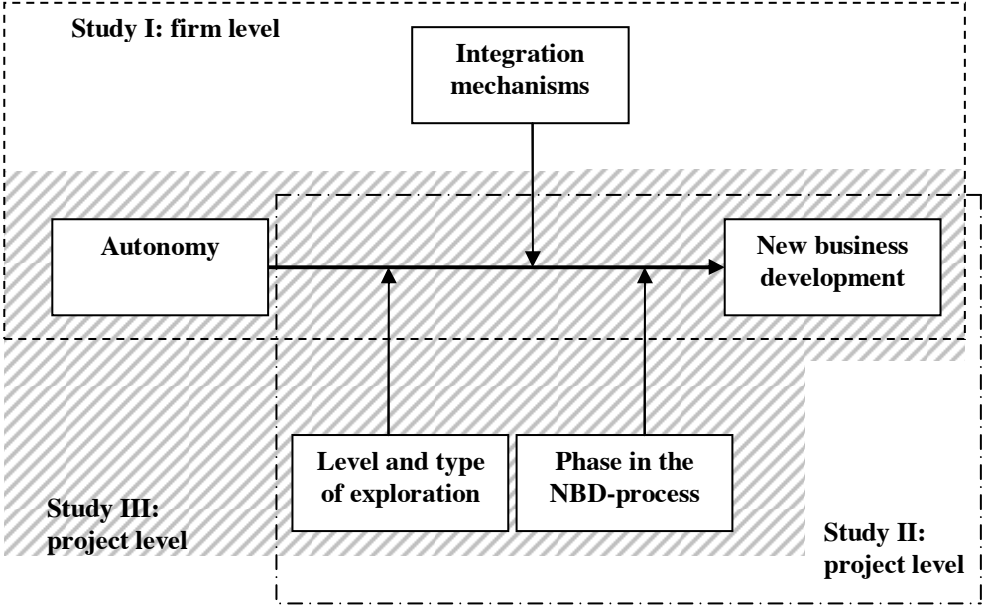




## **7 Discussion and conclusions**

Despite decades of research, performance of corporate ventures within existing companies is still mediocre at best (Burgelman and Valikangas, 2005; Campbell et al., 2003). One of the central problems is how to manage corporate ventures and mainstream businesses in a single firm, as their management processes and activities are inconsistent with each other (Birkinshaw, 1997; O'Reilly and Tushman, 2004). Although separating ventures from mainstream businesses allows for having multiple conflicting activities to coexist within a single firm, it creates problems with reintegration and sharing knowledge (Burgers et al., 2008a). With this research we set out to address the issue of managing ventures in established firms by investigating the relations between project autonomy, knowledge relatedness, phases of the NBD-process and their consequences for project performance in a new business creation setting. We investigated how firms can simultaneously use differentiation and integration mechanisms on firm level, while at project level we look at whether the fit between the autonomy a project receives and the extent to which it is related to the parent firm's technological and market knowledge base. We created a richer understanding of managing corporate ventures in established firms through three studies (see Figure 7.1) using multiple levels of analysis (firm and project) and multiple methods (cross-sectional surveys and longitudinal case study). The next paragraph will discuss our main findings and theoretical implications, followed by the implications for management. We will conclude with some study limitations suggesting future research.

**Figure 7.1 Research framework**



**7.1 Theoretical implications of our main findings**

A first theoretical implication concerns the notion that providing autonomy to venturing activities within established firms is necessary for successfully engaging in corporate entrepreneurial activities (Burgelman, 1985; Fast, 1979; Hill and Rothaermel, 2003). The findings from all three studies challenged this notion by showing there are multiple contingencies which can have detrimental outcomes for new business development activities when inappropriately managed. We found that the relationship was moderated by integration mechanisms on firm level (study I), by the degree of technological and market relatedness (study II and III), and on project level by phases in the business development process (study II). The outcomes for project performance also differed (study III), see Table 7.1. This suggests it is important to address phenomena such as autonomy and venturing through multiple methods and levels.

**Table 7.1 Theoretical implications of the dissertation**

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<b>Differentiation and integration</b>
<ul style="list-style-type: none"><li>• Differentiation and integration mechanisms have joint effects on corporate venturing</li><li>• The presence of a shared vision has a positive moderating effect on differentiation and venturing to create a loosely coupled system</li><li>• Cross-functional interfaces and TMT social integration have negative effects on venturing in structurally differentiated ventures</li></ul>
<b>Exploration of technological and market knowledge</b>
<ul style="list-style-type: none"><li>• Exploration of technological versus exploration of market knowledge have different implications for project management characteristics</li><li>• Exploration of technological and market knowledge took place in different phases of the NBD-process</li><li>• The relation between NBD-projects and their organizational context, in particular sales organizations, is essential for successfully managing NBD-projects</li></ul>
<b>Relatedness and autonomy in NBD-projects</b>
<ul style="list-style-type: none"><li>• Project performance is enhanced when the level of autonomy fits with the degree of relatedness (i.e. more related projects need low autonomy, more unrelated projects require higher degrees of autonomy)</li><li>• TMT involvement in more unrelated projects had a positive effect on achieving cost and budget objectives</li></ul>

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### **7.1.1 Theoretical implications study I**

The first study investigated the relations between structural differentiation, integration mechanisms and its effect on firms' portfolios of corporate ventures. An overview of the major findings is presented in Table 7.1. Prior theoretical and case evidence pointed to the benefits of structurally differentiating corporate ventures from mainstream units (Block and MacMillan, 1993; Burgelman, 1985; Fast, 1979; Hill and Rothaermel, 2003; Kanter, 1985). We provide further evidence for this positive relation through our cross-sectional survey research. The findings, however, show that the effect of structural differentiation on corporate venturing is strongly moderated by integration mechanisms. This implies that further studies on venturing should not only take into account the extent of differentiation, but also moderating influences of integration mechanisms to create a better understanding and provide more accurate findings. We extend ambidexterity literature by being the first study that explores the simultaneous effects of differentiation and multiple integration mechanisms on a larger scale, thereby addressing the call of Westerman et al. (2006).

A major finding is that cross-functional interfaces had a negative moderating effect on the relation between structural differentiation and corporate venturing. This contributes to organizational learning theory that has primarily argued for positive outcomes of integration mechanisms (cf. Gupta and Govindarajan, 2000). However, some authors have suggested that a formal integration mechanism such as cross-functional interfaces may have positive outcomes only for highly interdependent units (Daft and Lengel, 1986; Tushman and Nadler, 1978). Our findings suggest that cross-functional interfaces may have different outcomes in other contexts such as venturing. Further investigation is necessary of potential contingent effects regarding the use of cross-functional interfaces. Our findings indicate that in the case of relatively little interdependence between units, such as between venturing and mainstream units, the costs, complexity and rigidity of such formal organizational integration mechanisms may outweigh the potential benefit of enhancing knowledge sharing.

A third implication of our findings relates back to ambidexterity literature. Several authors argued that top management should be socially integrated, as they are in the best position to integrate the differentiated units (Gilbert, 2006; O'Reilly and Tushman, 2004; Westerman et al., 2006). Our findings show that the effect of top management team social integration is significantly negative regarding corporate venturing in structurally differentiated organizations. Previous literature on ambidextrous organizations tended to look at firm outcomes, i.e. optimizing the joint outcomes of exploitation and exploration, while our focus was solely on corporate venturing. Taken together, these findings could indicate that TMT social integration might have preferable outcomes for mainstream businesses, but have detrimental outcomes for corporate venturing. For example, socially integrated top management teams have been associated with groupthink, which causes a selective perception of opportunities (Burgelman, 2002; Tripsas and Gavetti, 2000). Our findings could indicate that the downside of TMT social integration in the form of groupthink is more problematic for venturing, which often falls outside the dominant logic of management (Burgelman, 1983a), than for more exploitative, mainstream activities. More research is needed to investigate the effects of our proposed configurations of differentiation and integration mechanisms on mainstream businesses.

### **7.1.2 Theoretical implications study II**

In study II we investigated the exploration of technological and market knowledge in new business development projects. Our findings from longitudinal case research indicate that exploration of technological and market knowledge takes place in different phases of the NBD-process (see Table 7.1). In that way we extend previous research which has mainly confounded exploration to the development phase preceding market introduction. Our findings indicate that both types of exploration take place during this phase, but exploration of market knowledge continued during the commercialization phase. Thereby we extend the works of Danneels who has created increasing recognition that the innovativeness of projects should be looked at in terms of technology and market relatedness instead of a more general classification of knowledge relatedness such as incremental versus radical or exploitation versus exploration (Danneels, 2002; 2007; Danneels and Kleinschmidt, 2001). Our findings point to the relevance of taking a time dimension into account when researching knowledge relatedness and exploration in NBD-projects, for example through longitudinal or event-driven research, a largely neglected type of research in innovation and entrepreneurship research (Van de Ven and Engleman, 2004).

By linking project management characteristics to the exploration of technological and market knowledge, we developed new insights in how to manage NBD-projects. Our findings suggest that it is in particular important to match project completion criteria to the degree of exploration of technological and market knowledge. A “traditional” view of completing a project after the development phase significantly contributed to failure of NBD-projects exploring new market knowledge during the commercialization phase. Such projects neither received the time nor the resources to explore new market knowledge due to increasing business pressures. The implication for project management literature is that it should address the under-researched commercialization phase when investigating NBD-projects. Ignoring the dynamics of the commercialization phase might leave out an important explanatory factor for success and failure of NBD-projects.

A third theoretical implication concerns the role of the sales organization’s capabilities. Prior innovation research has primarily paid attention to the technological side of NBD-projects by pointing at the necessity to draw upon existing or acquire new technological capabilities. Extending Tripsas and Gavetti’s

(2000) work on Polaroid, we show that the capabilities of a firm's sales force to successfully sell the newly developed product was of vital importance to the success of NBD-projects. Accessing new markets, new distribution channels etc. proved to be beyond the capabilities of a firm's sales force, while building a new sales force was too large an investment for NBD-projects. Our findings indicate that firms were able to overcome these problems in the commercialization phase by engaging in an alliance with a firm possessing the required market capabilities. This contributes to earlier findings that have shown that alliances in new business development settings move from exploration in the development phase to more complementary alliances during the commercialization phase, in which ventures can exploit the knowledge available at the partner (Rothaermel and Deeds, 2004).

### **7.1.3 Theoretical implications study III**

The third study followed up on the case study by seeking to generalize some of its findings to other contexts. Moreover, to investigate the performance effects of the interaction between relatedness and autonomy, we needed a larger sample than we could obtain through the case study. Our findings indicate that the fit between market relatedness and project autonomy has a significant positive effect on project performance in the commercialization phase. This provides evidence for our suggestion that the exploration of market knowledge continues during the commercialization phase, and that projects developing new market knowledge should receive more autonomy during the commercialization phase. For the development phase this relation marginally holds, as it is only significant for market newness and not for the expected technological and marketing newness. These findings contribute to prior product development literature who found inconclusive evidence on the relatedness-autonomy-performance relation (cf. Sorrentino and Williams, 1995) by pointing to two possible contingencies: the distinction between technological and market relatedness, and the differences between the development and commercialization phase of the NBD-process. Future research should further address these contingencies to validate our findings.

Secondly, our findings suggest that top management involvement in newer projects leads to better achievement of cost and budget objectives, while at the same time it seems to be detrimental to long-term financial and market performance of the NBD-project. This suggests that top managers favor the short-term outcome of costs over the long-term performance of NBD-projects. This

confirms some prior notions on innovation and venturing literatures that NBD-projects should be shielded off from top management influence, which may pressure towards showing early results (Burgelman, 1985; Kanter, 2006). It extends these same literatures by using more fine-grained measures of project performance, as previous studies tended to use a single dimension of project performance instead of a multi-dimensional construct.

## **7.2 Implications for management**

Besides contributions to theory, the results of this thesis also have practical implications for managers (see Table 7.2). The studies' results have consequences for managing portfolios of ventures on a firm level as well as how to manage individual projects. First, we showed that while separating venture units from mainstream units has a positive effect on a firm's venturing activities, the effect is strongly influenced by integration mechanisms a firm uses. The results indicate that firms wanting to increase their venturing activities should separate venturing from mainstream units but at the same time integrate them by establishing a shared vision for the organization. Moreover, firms wanting to increase their venturing output in this way should avoid using cross-functional interfaces or creating a socially integrated top management team, as that has very negative outcomes for venturing activities.

**Table 7.2 Managerial implications**

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- Managers aiming to increase the venturing output of their firms, should simultaneously provide autonomy to ventures and integrate them through a shared organizational vision, whilst avoiding the use of cross-functional interfaces and TMT social integration.
  - To increase the performance of new business development projects, managers should align project management characteristics to the degree of exploration of technological and market knowledge of individual projects.
  - Management should pay in particular attention to the development of new markets and marketing knowledge in NBD-projects through adjusting project completion criteria, developing the capabilities of the company's sales force, or allying the project with a partner possessing complementary market skills.
- 
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Second, the first study suggested that certain organizational configurations have better outcomes on portfolios of ventures than others and that this is important to address given the rigidity of organizational mechanisms. The results of our second and third study show that some aspects of managing ventures can be adjusted. The case study showed that having a standardized approach towards new business development projects had devastating outcomes for certain NBD-projects while being favorable towards others. An approach that significantly improves the performance of individual NBD-projects is to link the autonomy NBD-projects receive to the relatedness of technological and market knowledge of NBD-projects. NBD-projects that are new to the firm should receive more autonomy, while NBD-projects that are related to the parent firm's existing businesses should receive less autonomy. This has a positive effect on product quality aspects and on ultimate financial performance in the market. Moreover, the findings indicate that if top management gets involved in unrelated NBD-projects, this has a positive effect on performance of cost objectives, while a negative effect on product quality and market performance of the project. This shows that newer projects are better off if they are protected from top management pressures to focus on cost management. Management should carefully balance their concerns about costs and budgets with the long-term performance of the NBD-project in terms of profits, market shares and quality.

Third, the research highlights that in particular the development of new markets and marketing knowledge in NBD-projects requires attention of management if they seek to improve their success rate of NBD-projects. We not only show this has stronger implications for project performance than the technological newness of projects, but also that the exploration of market knowledge continues during the commercialization phase. Management should therefore adjust project completion criteria to the degree of required exploration of technological and market knowledge. Projects needing new market knowledge should be allowed to continue their project approach during the commercialization phase. Moreover, the importance of market knowledge also points to the relevance of assessing the capabilities and reward systems of companies' sales forces. In case new market knowledge is required, management should allow sales employees to learn the newly required skills. In case that seems to difficult or costly, our findings show that acquiring a firm or engaging in an alliance with a partner that possesses the necessary capabilities can significantly speed up the NBD-process.

### ***7.3 Limitations and future research issues***

We recognize that our study has its limitations, which merits further research. First, our study focused on corporate venturing, which is regarded as only one of the three components of corporate entrepreneurship (Sharma and Chrisman, 1999; Yiu, Lau, and Bruton, 2007; Zahra, 1996). Previous research has shown that innovation, venturing and strategic renewal are different processes, but share similar antecedents (Yiu and Lau, 2008; Zahra, 1996), and might even be intrinsically linked to each other (Burgelman, 1983a; Stopford and Baden-Fuller, 1994). Future research should investigate to what extent our findings apply to the other components of corporate entrepreneurship: innovation and renewal or include the effects of innovation and strategic renewal in our studies on venturing to build more sophisticated models.

Second, based on prior literature our study assumes that relatedness is tied to knowledge-sharing. Projects that are more related to the parent firm will benefit more from sharing knowledge with the parent firm. However, there could be a difference between the potential for absorbing knowledge (as indicated by our measure of relatedness) and the realized knowledge absorption (Jansen, Van Den Bosch, and Volberda, 2005; Zahra and George, 2002). A worthwhile avenue of future research is to investigate the extent to which corporate ventures and their parent firms actually engage in reciprocal knowledge transfer and if ventures are able to absorb this knowledge by putting it into use. Related to this, studies may also examine knowledge sharing of corporate ventures with external partners. Our case study indicated that knowledge sharing with an external partner had a very positive effect on the performance of NBD-projects. Meta-analytic research from Van Wijk, Jansen, and Lyles (2008) showed that both intra- and interorganizational knowledge sharing had positive effects on innovativeness. Although there has been research on alliances of start-ups (Rothaermel and Deeds, 2004), there is still limited insight in alliances of internal corporate ventures with external partners.

Third, in our studies we drew primarily on literatures related to knowledge sharing. Although this provided valuable insights into the performance and management of corporate ventures, future studies could use other theoretical perspectives to further uncover key drivers to successfully developing new businesses. For instance, study II's findings indicated that a powerful

organizational champion was able to overcome misalignment of project management characteristics and the degree of exploration of market knowledge, while the results of study III suggested the influence of a heavyweight project leader on the performance of NBD-projects. An alternative explanation for some of the negative moderating effects of integration mechanisms in a structurally differentiated organization could be found in theory on role conflict (cf. Floyd and Lane, 2000; Sillince, 2005). Cross-functional interfaces may for example lead to intrapersonal role conflict as employees could simultaneously be assigned to an explorative as well as an exploitative unit. Silince (2005) pointed out that differentiating units can only be effective when it is followed by differentiation rhetoric of top management, i.e. TMT's should be differentiated too. Vermeulen, Van Den Bosch, and Volberda (2007) pointed in this respect to the relevance of studying innovative activities from a micro institutional perspective. Their findings show that even incremental innovation may be seriously constrained due to institutional forces that exist within the parent organization. These findings provide some notions for the relevance of studying corporate venturing and NBD-projects from theoretical perspectives addressing power, politics, institutional pressures, and managing role conflicts for which we find some indications in our findings.

Fourth, we studied NBD-projects cross-sectionally in our first and third study. Although it increases generalizability across different industries, it limits the potential to track developments over time. Considering the several years it might ventures take to achieve profitability (Biggadike, 1979), we stress the need for longitudinal studies incorporating longer time spans, such as in our case study design. Moreover, our case study showed the potential for comparing multiple projects within a single firm. Future studies might complement our studies by investigating the whole portfolio of ventures of a single firm through more quantitative analysis. This allows keeping firm effects constant and comparing the different ways in which a single firm might manage all its projects. A drawback is that firms need to be sufficiently large to make meaningful statistical comparisons between projects.

Fifth, the case study of eight NBD-projects was conducted in the consumer electronics industry, which might limit the generalizability of our findings to other contexts. One such context that has been associated with different ways of operating is the engineering and construction industry which are typified by project-based organizations. The project-based organization distinguishes itself

from more functionally structured firms in the sense that there are no clearly distinguishable departments such as R&D or marketing that can act as repositories of knowledge (Lindkvist, 2005; Sydow et al. 2004). This might call for a different set of integration mechanisms to share available knowledge. Moreover, development processes in such industries are often driven by direct requests from clients instead of a more push-strategy that firms in the consumer electronics industry. This could have a profound influence on the development of market knowledge when developing new products. In such demand-driven industries, firms might not have much capability in developing market knowledge, which might seriously constrain the development of NBD-projects. Future research could address how and to what extent our findings are applicable to project-based organizations in the engineering or construction industry.

Finally, although we used three different studies to address our focal object of interest from different viewpoints to gain complementary insights, we used three different samples for our studies. Such a design may decrease potential biases attributable to a single sample, it makes it also more difficult to link our findings from the different studies together, as the firms are not the same. Future research could design multiple studies addressing the same sample, thereby linking the different levels of analysis together for each firm. However, initial samples should be sufficiently large considering the trend towards decreasing participation of firms in research, especially when administering surveys (Weiner and Dalessio, 2006). Our first study showed that even when response rates of the follow-up survey are a meritorious 53%, this effectively means the initial response rate is cut in half.

#### **7.4 Conclusion**

New business creation through corporate ventures is a major engine for organizational growth and performance (Zahra, 1993; Zahra, Neubaum, and Huse, 2000). The investigated relations between differentiation, integration, technological and market relatedness over the phases of the new business development process created important new insights into the management of new business development projects. Through multiple levels of analysis and multiple methods we examined several contingencies that significantly enriched our understanding of the effect of autonomy on the performance of NBD-projects. We showed that the effect is moderated by organizational and TMT integration

mechanisms (study I), by the relatedness of technological and market knowledge (study II and III), differed for the development and commercialization phase (study II and III) and for different types of project performance (study III). This provides important new avenues for both further research and management of new business development activities. The insights we delivered with through this research may help managers in strategically renewing their firms through the development of new businesses. Although the development of new products and businesses may only provide a temporary advantage, the capabilities to do so repeatedly may be a source for achieving sustainable competitive advantage. By showing how differentiation and integration mechanisms, the exploration of technological and market knowledge, and the phases in the new business development process should be managed to enhance corporate venturing, this thesis delivers significant contributions to building such sustainable business development capabilities.

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# Appendices

## Appendix A Measures and items of independent and dependent variables of study I<sup>a</sup>

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### Corporate Venturing (Zahra, 1996)

Over the past three years...

- Our organization has entered many new industries
- We have expanded our international operations significantly
- We have acquired many companies in very different industries
- Our organization has created various new lines of products and services
- Our organization has established or sponsored various new ventures
- We have focused on improving the performance of our current business rather than entering new industries<sup>®i</sup>

### Structural Differentiation

- Our organization has autonomous units to enhance innovation and flexibility
- Innovation and production activities are structurally separated in our organization
- We have departments that are either focused on the short term or the long term
- Our organizational units are specialized in certain functions and/ or markets
- We use distinct organizational units to serve different customer needs
- Line and staff departments are clearly separated in our organization

### Cross-functional interfaces (based on Gupta and Govindarajan 2000)

- Employees are regularly rotated between different functions
- There is regular talk about possibilities for collaboration between units
- Our organization coordinates information sharing between units through a knowledge network
- We have cross-functional teams to exchange knowledge between departments
- We have standardized work processes for cooperation between units<sup>i</sup>
- We often involve multiple organizational units in strategic decision-making<sup>i</sup>
- Our organization uses temporary workgroups for collaboration between units on a regular basis

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<sup>a</sup> All items were measured on a seven-point scale, anchored by 1 = strongly disagree and 7 = strongly agree

**Shared organizational vision (Sinkula et al., 1997; Tsai and Ghoshal, 1998)**

There is commonality of purpose in my organization

There is total agreement on our organizational vision

All organizational members are committed to the goals of this organization

People are enthusiastic about the collective goals and mission of the whole organization

Our unit shares the same ambitions and vision with other units at work

**TMT group contingency rewards (Collins and Clark, 2003)**

Top management team members' variable pay...

is based on how well the organization as a whole is performing

consists of multiple performance related elements

is based on the average performance of our organization<sup>1</sup>

is linked to performance measures on the organizational level

is dependent on the performance of the organizational unit a team member is responsible for ®

**TMT social integration (Smith et al., 1994)**

The members of the top management team are quick to defend each other from criticism by outsiders<sup>1</sup>

Everyone's input is incorporated into most important company decisions

The members of the top management team get along together very well

The members of the top management team are always ready to cooperate and help each other

There is a great deal of competition between members of the top management team®

The members of the top management team really stick together

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<sup>1</sup> Item deleted after factor analysis; ® reversed item

## Appendix B Measures and items of the variables used in study II<sup>b</sup>

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### **Project newness (based on Danneels and Kleinschmidt, 2001)**

To what extent are the following project characteristics new to your firm?

#### *Marketing newness*

- The needed sales force
- The distribution channels for the product or service
- The form of advertising and promotion
- The customer service or service facilities offered<sup>ii</sup>
- The marketing research or gathering of market information
- The strategic positioning of the product or service on the market
- The used business model

#### *Market newness*

- The intended users of the product or service
- The competition faced
- The clients' needs to be met<sup>ii</sup>
- The served markets

#### *Product/ technology newness*

- The developed product or service<sup>ii</sup>
- The production processes
- The technologies of the product or service
- The used resources (e.g. personnel, equipment) to create the product or service
- The engineering and design work involved
- The functionalities of the developed product or service

### **Decision-making autonomy (adapted from Bonner et al., 2002) ®**

To which extent were the following decisions regarding the project made by the project team or upper management?

- Defining the project's goals and objectives
- Specifying deadlines
- Selecting project members
- Determining the project's budget
- Determining the project's strategy
- Selecting the intended markets
- Determining the project's profit and growth objectives

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<sup>b</sup> All items were measured on a seven-point scale

## **Project performance (adapted from McGrath, 2001)**

### **Development phase**

#### *Cost performance*

- Meeting budget objectives
- Meeting cost objectives

#### *General project performance*

- Performance of the developed product or service
- Meeting major deadlines
- Meeting quality objectives
- The time-to-market

### **Commercialization phase**

#### *Cost performance*

- Meeting budget objectives
- Meeting cost objectives

#### *General project performance*

- Performance of the developed product or service
- Meeting major deadlines<sup>ii</sup>
- Meeting quality objectives
- Meeting customer satisfaction objectives

#### *Profitability*

- Meeting profit objectives
- Meeting market share objectives
- Meeting sales growth objectives
- The time to break-even

## **Environmental dynamism (Jansen et al., 2006)**

- Environmental changes in our local market are intense
- Our clients regularly ask for new products and services
- In our local market, changes are taking place continuously
- In a year, nothing has changed in our market®
- In our market, the volumes of products and services to be delivered change fast and often

## **Project manager experience (based on Souder et al., 1997)**

### The project manager...

- Had a lot of authority
- Had a lot of knowledge of the intended markets
- Was regarded as a senior manager in the organization
- Had the necessary technological skills
- Had a lot of experience as project manager
- Had much experience with developing new businesses

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<sup>ii</sup> Item deleted after exploratory factor analysis  
® reversed item

## Nederlandse Samenvatting (Dutch Summary)

De snelheid en mate van veranderingen waar managers tegenwoordig mee geconfronteerd worden, zorgt ervoor dat managers actief op zoek moeten naar nieuwe businessmogelijkheden. Het ontwikkelen van nieuwe businesses staat echter op gespannen voet met het managen van bestaande businesses (Birkinshaw, 1997; Block and MacMillan, 1993; Burgelman, 1983b). Verscheidene auteurs hebben daarom voorgesteld om het ontwikkelen van nieuwe businesses in een organisatie te scheiden van bestaande business activiteiten (Burgelman, 1985; Drucker, 1985; Hill en Rothaermel, 2003). Dit beschermt Nieuw Business Ontwikkelings (NBO-)projecten tegen inertie en geeft ze de vrijheid om te innoveren (Dougherty, 1995; Kanter, 2006). NBO-projecten hebben daarnaast ook baat bij het gebruikmaken van bestaande kennis en middelen in de organisatie (Chesbrough, 2000). Dit delen van kennis en middelen wordt echter bemoeilijkt wanneer projecten een grotere mate van autonomie hebben (Scarbrough et al., 2004).

Er is daarom grote behoefte aan verder onderzoek naar de rol van autonomie bij NBO-projecten. Middels dit onderzoek proberen wij daaraan een bijdrage te leveren. Aangezien *autonomie* projecten de noodzakelijke vrijheid geeft en integratie de kennis- en middelenuitwisseling tussen NBO-projecten en de moederorganisatie bevordert, is onderzoek gewenst naar de mogelijkheid om projecten tegelijkertijd te scheiden en te integreren in de organisatie (Burgers et al., 2008a). Een tweede mogelijkheid is te onderzoeken in hoeverre projecten gebruik kunnen maken van kennis en middelen in de organisatie. Dit wordt tot uitdrukking gebracht in de mate van *gerelateerdheid* van een NBO-project tot de kennisbasis van de onderneming. Gerelateerdheid wordt gelinkt met de mate van benodigde autonomie voor een project. Gerelateerde projecten hebben minder autonomie nodig om te kunnen profiteren van bestaande kennis, terwijl ongerelateerde projecten meer autonomie nodig hebben om nieuwe kennis te kunnen exploreren (McGrath, 2001). De inzichten in de literatuur over de invloed van gerelateerdheid zijn tot dusverre echter onduidelijk (cf. Sorrentino en Williams, 1995).

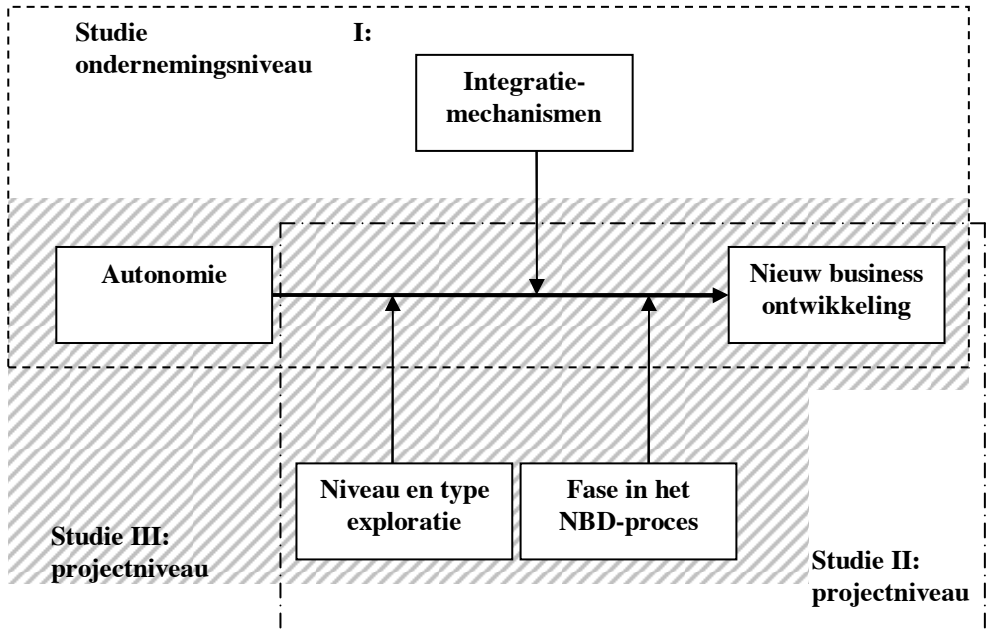
Een reden hiervoor zou kunnen zijn dat gerelateerdheid bestaat uit meerdere dimensies, bijvoorbeeld een technologie- en een marktdimensie (Abernathy and Clark, 1985; Burgers et al., 2008b; Danneels, 2002), die een verschillende relatie

hebben met autonomie en de prestaties van NBO-projecten. Daarnaast kan het zijn dat dit type onderzoek onvoldoende rekening heeft gehouden met de ontwikkeling van een project middels achtereenvolgende *fasen*. Elke fase in een NBO-project heeft zijn eigen dynamiek en kan verschillende manieren van managen vereisen (Kazanjian, 1988; Kazanjian and Drazin, 1990; Thornhill and Amit, 2001; Westerman et al., 2006). Ten einde het inzicht te vergroten in hoe organisaties succesvol nieuw business ontwikkelingsprojecten kunnen managen beogen wij

*de samenhang tussen de mate van autonomie, gerelateerdheid en fasen in een NBO-proces en de effecten daarvan op de prestaties van NBO-projecten te onderzoeken.*

Voor het onderzoeken van deze relaties ontwikkelen wij een conceptueel raamwerk op verschillende analyse niveaus (organisatie en project) en onderzoeken we dit raamwerk met verschillende methoden (surveys en casestudie). Door verschillende methoden en analyse niveaus te hanteren in drie verschillende studies (zie Figuur 1) verkrijgen we een breder inzicht in de relaties tussen autonomie, gerelateerdheid en fasen in het NBO-proces en de effecten daarvan op projectprestaties. Studie I onderzoekt de effecten van gelijktijdige differentiatie en integratie van NBO- en bestaande businessseenheden op NBO-activiteiten van ondernemingen door middel van een cross-sectionele survey. Studie II onderzoekt verschillende dimensies van gerelateerdheid (technologie en markt) en in hoeverre de effecten daarvan op NBO-activiteiten verschillen per fase van het NBO-proces. Dit is onderzocht middels een longitudinale casestudie van acht NBO-projecten binnen één “Fortune 500” onderneming. De derde studie bouwt verder op de bevindingen van studie II. Studie III gaat specifiek in op de relatie tussen autonomie en de diverse vormen van gerelateerdheid en het effect hiervan op verschillende vormen van projectprestatie. Hiervoor wordt een cross-sectioneel surveyonderzoek uitgevoerd.

**Figuur 1**    **Onderzoeksraamwerk**



***Studie I: De effecten van configuraties van autonomie en integratiemechanismen op corporate venturing***

Configuraties van autonomie en integratie kunnen in potentie een positief effect hebben op het ontwikkelen van nieuwe businesses oftewel corporate venturing, aangezien autonomie bijdraagt aan de ontwikkeling van nieuwe kennis en integratie een positief effect kan hebben op de uitwisseling van bestaande kennis. Onderzoek naar “ambidextrous” organisaties heeft aangetoond dat zulke configuraties mogelijk zijn (Gilbert, 2006; Jansen et al., 2006; O’Reilly en Tushman, 2004). Er is echter nog onvoldoende onderzoek dat verschillende integratiemechanismen vergelijkt en de effecten van deze configuraties op NBO-activiteiten analyseert (Westerman et al., 2006). Inzichten uit eerder onderzoek wijzen op de verschillende effecten van formele versus informele en organisatie versus top management team integratiemechanismen (Gupta en Govindarajan, 2000; Tsai, 2002). Op basis hiervan selecteerden wij vier organisatiemechanismen:



(1) een gedeelde visie en (2) cross-functionele interfaces als respectievelijk informele en formele *organisationale integratiemechanismen* en (3) top management team sociale integratie en (4) top management team groepsbeloningen als respectievelijk informele en formele *integratiemechanismen op top managementniveau*. Autonomie wordt uitgedrukt in de mate van structurele differentiatie, dat is de mate van scheiding van activiteiten in verschillende organisatie-eenheden (Lawrence en Lorsch, 1967).

De opgestelde hypothesen zijn getest door middel van surveyonderzoek op een sample van 4000 bedrijven in Nederland. Alle onafhankelijke variabelen zijn gemeten in 2005 en de afhankelijke variabelen in 2006. De analyses op de waarden van de 240 uiteindelijke respondenten laten zien dat structurele differentiatie een positief effect heeft op corporate venturing, maar dat dit effect sterk beïnvloed wordt door integratiemechanismen. Een gedeelde visie heeft een positief effect op de relatie tussen structurele differentiatie en corporate venturing. Dit draagt bij aan eerdere studies die wezen op het belang van een gedeelde visie om de coherentie en communicatie tussen gescheiden units te verbeteren (Nahapiet and Ghoshal, 1998; Tsai, 2002). Cross-functionele interfaces hebben een negatief modererend effect op structurele differentiatie en corporate venturing. Een verklaring hiervoor kan worden gevonden in de relatieve onafhankelijkheid van ventures en mainstream businesses die wijzen op een geringe noodzaak tot kennisuitwisseling. Cross-functionele interfaces zijn echter vrij complexe en kostbare integratiemechanismen die meer geschikt zijn voor kennisuitwisseling tussen sterk afhankelijke units (Tushman and Nadler, 1978). Onze bevindingen zijn een extensie van eerdere studies die onderzoek hebben gedaan naar met name de voordelen van cross-functionele interfaces door ook te wijzen op het belang van de kosten die geassocieerd zijn met bepaalde integratiemechanismen waardoor het totale effect negatief kan uitvallen.

De bevindingen wijzen ook op een negatief effect van top management team sociale integratie op de relatie tussen structurele differentiatie en corporate venturing. Dit correspondeert met eerdere studies die beargumenteerden dat integratie van top management teams tot groepsdenken kan leiden. Dit maakt top management teams minder ontvankelijk voor mogelijkheden die buiten het domein van de bestaande businesses liggen (Burgelman, 2002; Janis, 1982; Tripsas and Gavetti, 2000). Deze bevindingen vormen ook een aanvulling op studies over “ambidextrous” organisaties, welke stellen dat met name top management team integratie een positief effect heeft op de onderneming in termen van het creëren

van een balans tussen exploratie en exploitatie. Onze resultaten geven aan dat de effecten soms negatief zijn op meer exploratieve activiteiten zoals corporate venturing.

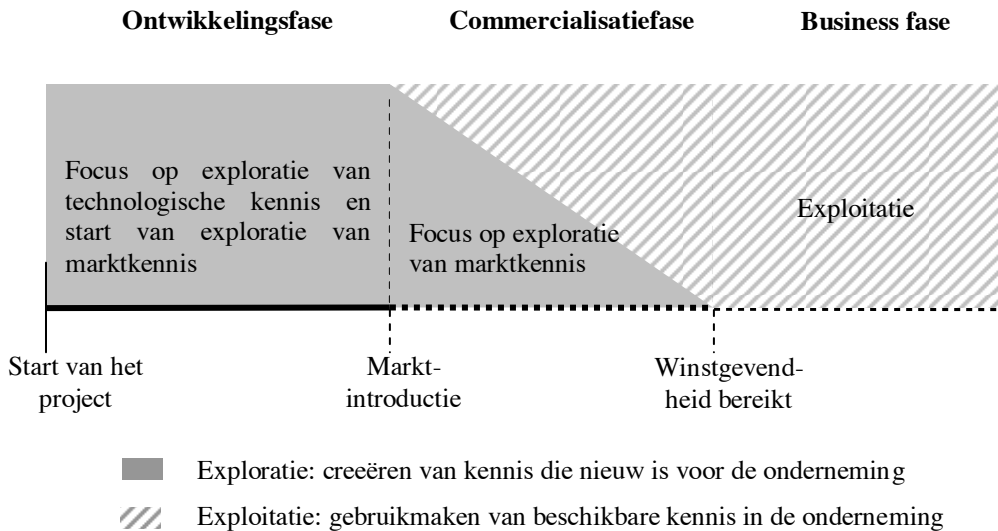
### ***Studie II: Exploratie van technologische en marktkennis in de verschillende fasen van het nieuw business ontwikkelingsproces***

Gerelateerdheid van NBO-projecten met de moederonderneming bepaalt in belangrijke mate de synergieën die een onderneming kan behalen. Chesbrough (2000) stelde dat het behalen van synergieën door bijvoorbeeld kennis en middelen te delen het enige concurrentievoordeel is dat NBO-projecten binnen bestaande ondernemingen hebben ten opzichte van een start-up. Tot dusverre hebben de meeste studies gerelateerdheid als één construct gezien (cf. Sorrentino and Williams, 1995), maar deze zienswijze wordt in toenemende mate bekritiseerd door auteurs die stellen dat gerelateerdheid uit een technologie- en een markt dimensie bestaat (cf. Danneels, 2002; Tanriverdi and Venkatraman, 2005). Er is echter nog weinig inzicht in de verschillen tussen technologie- en marktgerelateerdheid. Middels deze studie proberen wij meer inzicht te verschaffen in de effecten van technologie- en marktgerelateerdheid door met name te focussen op de exploratie van de benodigde technologie- en marktkennis in NBO-projecten. Exploratie van *technologische kennis* omvat het ontwikkelen van nieuwe producten, technologieën en productieprocessen. Exploratie van *marktkennis* heeft betrekking op het ontwikkelen van nieuwe markten, distributiekanaal, business modellen en dergelijke.

De bevindingen uit ons case studie onderzoek naar acht NBO-projecten binnen één onderneming in de huishoudelijke electronica in de periode van 1993-2003 gaven aan dat er grote verschillen zitten tussen het ontwikkelen van technologische en marktkennis en dat dit ook verschillende implicaties heeft voor zowel NBO-projecten als de moederonderneming. Een belangrijk verschil is dat de exploratie van technologische kennis beperkt blijft tot de ontwikkelingsfase voorafgaand aan marktintroductie, terwijl de exploratie van marktkennis doorgaat tijdens de commercialisatiefase na marktintroductie (zie Figuur 2). Dit wordt mede veroorzaakt doordat de uitkomsten van technologische kennis in termen van nieuwe producten uitgebreid getest kunnen worden voordat ze op de markt geïntroduceerd worden, terwijl dat veel moeilijker is voor marktkennis. Het leren opereren in nieuwe distributiekanaal en markten is een proces dat tijd kost en

veelal alleen in de praktijk geleerd kan worden, waardoor de exploratie van marktkennis voortduurt tijdens de commercialisatiefase.

**Figuur 2 Exploratie en exploitatie van technologische en marktkennis in opeenvolgende fasen van het NBO-proces**



De verschillende tijdstippen in het NBO-proces waarop kennisexploratie eindigt suggereert dat projecten die technologische danwel marktkennis ontwikkelen op verschillende tijdstippen zouden moeten eindigen (zie Figuur 2). De bevindingen uit onze casestudies gaven aan dat beoordelings- en controlesystemen die gericht zijn op NBO-projecten die technologische kennis ontwikkelen beperkend zijn voor NBO-projecten die nieuwe marktkennis moeten ontwikkelen. De toenemende druk vanuit management om snel resultaten te laten zien tijdens de commercialisatiefase had negatieve effecten op de exploratie van marktkennis en op de kans op succes voor NBO-projecten die dit type kennis nodig hadden. In ons conceptueel raamwerk beargumenteren wij daarom om de criteria voor projectbeëindiging te linken aan de mate van exploratie van technologie- en marktkennis (zie Figuur 3). Projecten die focussen op exploratie

van technologiekennis eindigen dan na de ontwikkelingsfase, terwijl NBO-projecten die ook nieuwe marktkennis benodigd hebben pas beëindigd zouden moeten worden na de commercialisatiefase. Daarnaast zou ook de mate van autonomie gelinkt moeten worden aan de mate van exploratie van technologische en marktkennis. NBO-projecten die een hogere mate van exploratie nodig hebben, hebben baat bij een hogere mate van autonomie ten opzichte van meer exploitatiegerichte NBO-projecten (zie Figuur 3).

**Figuur 3 Conceptueel raamwerk: typen kennis en projectmanagementkarakteristieken**

		Marktkennis	
		<i>Nieuw-voor-de-onderneming</i>	<i>Bestaand-in-de-onderneming</i>
Technologische kennis	<i>Nieuw-voor-de-onderneming</i>	Exploratie van zowel technologische als marktkennis <b>Projectautonomie:</b> Hoog <b>Projectbeëindigingscriterium:</b> winstgevendheid bereikt <b>1</b>	Exploratie van technologische kennis <b>Projectautonomie:</b> Gemiddeld <b>Projectbeëindigingscriterium:</b> Marktintroductie <b>2</b>
	<i>Bestaand-in-de-onderneming</i>	Exploratie van marktkennis <b>Projectautonomie:</b> Gemiddeld <b>Projectbeëindigingscriterium:</b> winstgevendheid bereikt <b>3</b>	Geen kennisexploratie <b>Projectautonomie:</b> Laag <b>Projectbeëindigingscriterium:</b> Marktintroductie <b>4</b>

Andere implicaties van onze bevindingen zijn dat exploratie van marktkennis gevolgen kan hebben voor een verkooporganisatie van een onderneming. Wanneer een NBO-project ook het betreden van nieuwe markten en het gebruiken van distributiekanaal omvat, kunnen de benodigde vaardigheden daarvoor nog niet aanwezig zijn in de verkooporganisatie. Uit een van onze cases bleek bijvoorbeeld dat het voor verkopers die gewend waren om met electronica retailers zaken te doen een te grote stap was om met medici zaken te gaan doen. Het investeren in nieuwe verkoopkanalen is echter zeer kostbaar die de investeringen in een NBO-

project tot dan toe ver te boven kunnen gaan. Het aangaan van een alliantie met een partner die over complementaire vaardigheden met betrekking tot marktkennis beschikt, vermindert niet alleen de noodzaak tot exploratie van marktkennis, maar kan tevens het commercialisatieproces sterk bespoedigen. Naast het aanpassen van de projectbeëindigingscriteria aan de technologische en marktexploratie behoeften van NBO-projecten is een andere manier om een NBO-project te beschermen tegen premature invloeden van top management het hebben van een sterke supporter in de organisatie. Het gevaar is echter dat dit type oplossing niet echt duurzaam is, aangezien supporters door job rotatiemechanismen regelmatig van baan veranderen, terwijl een NBO-project voor vele jaren bescherming nodig kan hebben. Ons raamwerk waarin projectbeëindigingscriteria aan de mate van exploratie van technologische en marktkennis wordt gelinkt biedt daarvoor een meer duurzame oplossing.

Concluderend, deze studie toont aan dat het zinvol is een onderscheid te maken tussen exploratie van technologische en marktkennis in NBO-projecten. Niet alleen vinden de processen plaats in verschillende fasen van het NBO-project, maar ze hebben ook verschillende consequenties voor de onderneming en het managen van NBO-projecten. Het ontwikkelde conceptuele raamwerk laat zien dat het linken van projectautonomie en projectbeëindigingscriteria aan de mate van exploratie van technologische en marktkennis de kans op succes voor een NBO-project wezenlijk vergroot.

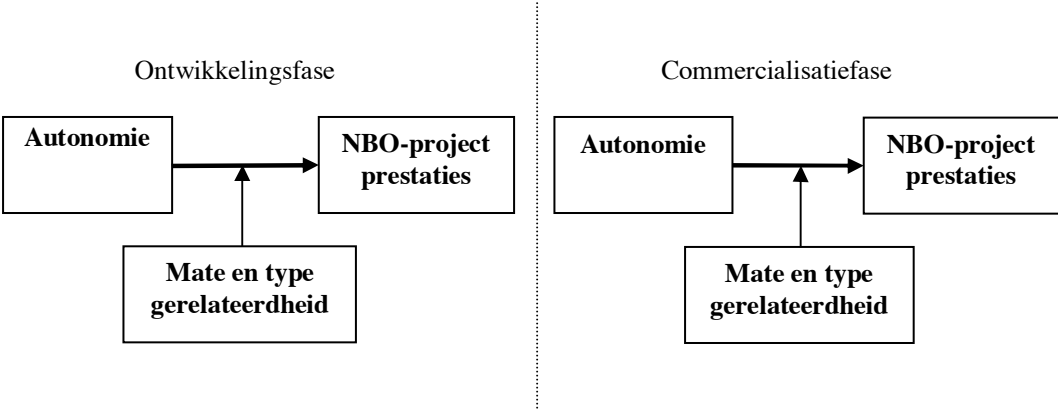
### ***Studie III: Het verhogen van NBO-projectprestaties: de dynamische interactie tussen projectautonomie en gerelateerdheid over fasen van het NBO-proces***

Onze exploratieve casestudie toonde het belang aan om onderscheid te maken tussen technologische en marktkennis in NBO-projecten. Daarnaast wees onze studie ook op het belang van het in acht nemen van de verschillen tussen fasen in het NBO-proces en mogelijke relaties tussen projectautonomie en gerelateerdheid. In onze derde studie hebben we een aantal van die relaties verder onderzocht. Bevindingen uit een studie van McGrath (2001) laten zien dat de fit tussen de mate van gerelateerdheid en projectautonomie een positief effect heeft op de prestaties van NBO-projecten. Dat wil zeggen ongerelateerde NBO-projecten zijn gebaat bij een grotere mate van autonomie en projecten die gerelateerd zijn aan de onderneming hebben meer baat bij een lagere mate van autonomie. Eerdere studies die de relatie tussen autonomie en gerelateerdheid onderzochten maakten echter

geen onderscheid tussen technologische en marktkennis en namen de fase in het NBO-proces niet mee in het onderzoek.

Wij adresseren deze lacune in de huidige literatuur door de interactie te onderzoeken tussen projectautonomie en technologische en marktgerelateerdheid in zowel de ontwikkelings- als commercialisatiefase (zie Figuur 4). Dit maakt een dynamisch perspectief mogelijk wat analyseert of de projectautonomie zou moeten veranderen tijdens het NBO-proces. Daarnaast is het ook van belang verschillende prestatimaatstaven voor NBO-projecten mee te nemen, aangezien onderzoek van Hart et al. (2003) aantoonde dat managers de gebruikte prestatimaatstaven aanpasten aan de fase van het NBO-proces waarin het project zich bevond.

**Figuur 4      Onderzoeksraamwerk voor studie III**



Het onderzoek is uitgevoerd door middel van een cross-sectioneel surveyonderzoek. De survey is uitgezet onder een sample van 1074 business developers uit een database van de Vereniging Business Development Nederland. Na initiële opschoning bleven er 918 potentiële respondenten over, waarvan er 139 uiteindelijk gereageerd hebben. De resultaten laten zien dat er voor individuele projecten geen direct verband bestaat tussen projectautonomie en de prestaties van NBO-projecten noch tussen gerelateerdheid en projectprestaties, maar dat er wel een sterk interactie-effect is tussen autonomie en gerelateerdheid op

projectprestaties. Onze bevindingen geven bijvoorbeeld aan dat de fit tussen marktgerelateerdheid en projectautonomie een positief effect heeft op de projectprestaties in de commercialisatiefase. Dit bevestigt onze eerdere bevindingen uit casestudieonderzoek dat de exploratie van marktkennis ook plaatsvindt tijdens de commercialisatiefase (Burgers et al., 2008b), waardoor een grotere mate van autonomie voor het project benodigd is. Hiermee dragen wij bij aan de literatuur dat het van belang is onderscheid te maken tussen technologie- en marktgerelateerdheid en dat er beter inzicht wordt verkregen in de effecten op projectprestaties als de fasen in het NBO-proces worden meegenomen in de analyses.

Een opmerkelijke bevinding is dat de interactie tussen projectautonomie en gerelateerdheid verschillende effecten heeft op de verschillende prestatie maatstaven die wij gebruikten. Het interactie-effect was positief op de winstgevendheid van NBO-projecten, maar negatief bij kostenbeheersing. Dit betekent dat een grotere invloed van top management bij ongerelateerde projecten leidt tot betere kostenbeheersing van het project in termen van het behalen van budgetdoelstellingen, maar dat dit ten koste gaat van de winstgevendheid en prestaties in de markt van NBO-projecten op de lange termijn. Deze inzichten laten zien dat het zinvol is voor onderzoek naar NBO-projecten om onderscheid te maken naar verschillende prestatie maatstaven.

### ***Conclusie***

Het creëren van nieuwe businesses is belangrijk voor het realiseren van groei en winst (Zahra, 1993; Zahra et al., 2000). De onderzochte relaties tussen autonomie, integratie, technologische en marktgerelateerdheid en fasen in het NBO-proces hebben belangrijke nieuwe inzichten met betrekking tot het succesvol managen van NBO-projecten opgeleverd. Hiermee bouwen wij verder op eerdere inzichten die voornamelijk de effecten van de afzonderlijke variabelen onderzochten. Door gebruik te maken van verschillende analyseniveaus en methoden (surveys en casestudies) hebben we aangetoond dat de gezamenlijke effecten van voornoemde variabelen een belangrijke invloed hebben op de prestaties van NBO-projecten. Onze bevindingen laten zien dat het effect van autonomie op corporate venturing gemodereerd wordt door organisationele en top management team integratiemechanismen (studie I). Verder tonen onze bevindingen aan dat er een interactie-effect is tussen autonomie en technologie- en marktgerelateerdheid wat betreft NBO-projectprestaties (studies II en III), dat deze

effecten verschillen voor de ontwikkelings- en commercialisatiefase (studies II en III) en dat de invloed afhangt van het type prestatimaatstaf die gebruikt wordt (studie III).

Wij leveren daarmee belangrijke handvatten voor zowel vervolgonderzoek als het managen van NBO-projecten. De verkregen inzichten kunnen managers helpen bij het strategisch vernieuwen van ondernemingen door het ontwikkelen van nieuwe businesses. Hoewel de ontwikkelde businesses misschien maar een tijdelijk concurrentievoordeel oplevert, kunnen de competenties om herhaaldelijk succesvolle nieuwe businesses te ontwikkelen een bron zijn van meer blijvend concurrentievoordeel. Deze dissertatie levert belangrijke contributies voor het bouwen van zulke blijvende businessontwikkelingscompetenties door aan te tonen hoe differentiatie- en integratiemechanismen, exploratie van technologische en marktkennis en de fasen in het NBO-proces gemanaged moeten worden om corporate venturing succesvol te managen.





## **Curriculum vitae**

J. Henri Burgers (Noordoostpolder, January 20, 1977) received his B.Sc degree in Management of Technology from the Amsterdam Polytechnic University and an M.Sc degree in Business Administration from the Erasmus University in Rotterdam. Henri Burgers is currently a research fellow at the School of Management, Queensland University of Technology and an assistant professor at the department of Strategic Management and Business Environment of the Rotterdam School of Management, Erasmus University. His research interests include (corporate) entrepreneurship, new business development, strategy, and the management of knowledge and innovation. He has been involved in research projects at several major multinational companies. His research has been published or is forthcoming in *Journal of Business Venturing*, *Long Range Planning*, *Maandblad voor Accountancy en Bedrijfseconomie*, and in two edited books from Elsevier. He has presented his research at major international conferences such as Annual Meeting of the Academy of Management, Babson College Entrepreneurship Research Conference, Strategic Management Society Annual International Conference, European Academy of Management Conference, and the Annual Conference on Corporate Strategy. Henri Burgers also serves as an ad-hoc reviewer for the *Journal of International Business Studies*, *Journal of Business Venturing*, *Journal of Management Studies*, and *Long Range Planning*. He has taught several courses on strategy and corporate entrepreneurship. During his PhD trajectory, Henri Burgers has been actively providing services to the faculty by acting as chair of the Faculty Council and the ERIM PhD Council, and by being a member of the representative board of the Erasmus PhD Association Rotterdam.



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**MANAGING CORPORATE VENTURING**

Developing new businesses is a critical factor for strategically renewing firms in today's dynamic environments. Although autonomy has frequently been addressed as a major factor in successfully managing corporate ventures, several critical contingencies remain unexplored. The results of our multilevel study show that at firm level autonomy should be combined with integration mechanisms to enhance corporate venturing. When managing new business development projects the degree of autonomy should be matched with the extent to which these projects are related to the knowledge base of the parent firm. Our findings from case and survey research show that an important distinction should be made between technological and market knowledge. These types of knowledge have different effects on project management characteristics such as project autonomy and project completion criteria. Our results demonstrate that the relation between autonomy and technological and market knowledge relatedness and their effects on project performance are different in the development and commercialization phase of the new business development process. These findings enhance corporate venturing efforts by showing how firms should manage autonomy and knowledge relatedness over the different phases of the new business development process.

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