

When Ideas meet Organizations
The survival of entrepreneurial ventures
inside the established firm

Christian Czernich



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To Anna-Sara and Nils

Für meine Eltern

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Preface

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“Was mir die Welt ist? Ein Ungeheuer von Kraft, ohne Anfang, ohne Ende, die sich nicht verbraucht, sondern nur verwandelt- vom Nichts umschlossen als von seiner Grenze, ein Meer in sich selber stürmender und flutender Kräfte, ewig zurücklaufend mit seiner Ebbe und Flut seiner Gestaltungen, aus den Einfachsten in die Vielfältigsten hinaustreibend, aus dem Starrsten, Kältesten hinaus in das Wildeste, Sich-selber-Widersprechendste, und dann wieder aus der Fülle heimkehrend zum Einfachen, aus dem Spiel der Widersprüche zurück bis zur Lust des Einklangs, als ein Werden, das kein Sattwerden, keine Müdigkeit kennt-; diese ist meine dionysische Welt des Ewig-sich-selber-Schaffens, des Ewig-sich-selbst-Zerstörens.“

(Friedrich Nietzsche)

Independent entrepreneurship inside the firm and behavioural and evolutionary perspectives on growth

The power of ideas and innovation is the motor of capitalism. The ability and willingness of entrepreneurs to create and commercialize novel products, services and technologies based on novel insights and ideas are key driving forces of economic growth. Schumpeter (1942) has coined the famous notion of the process of “creative destruction” to describe what he considered to be the engine of the capitalist system – the relentless replacement of the old by the new – by new ideas, new insights and innovations. Ever since then, economists and business scholars alike have emphasised how new ideas, inventions and attempts to commercialize them lie at the heart of economic and organizational growth (Schumpeter, 1942; Tushman and Anderson, 1986; Nelson, 1996; Baumol, 2002).

In the course of the last century, organizations have increasingly understood the importance of innovation as a key determinant of success in the competitive market place. Hand in hand with this growing appreciation of the importance of innovation went a change in the way innovations themselves are created. While formerly innovation was primarily the realm of the lone entrepreneur or the small entrepreneurial team outside large corporations and the process of discovery a matter of happenstance or luck, today innovation has more and more become a routinized, almost predictable activity incorporated into the bureaucratic structures of large organizations. This trend led Baumol (2002) to make the important distinction between “routinized” and “independent” innovation. Schumpeter (1942), in predicting this trend, even argued that the role of the entrepreneur as the agent behind the process of creative destruction would eventually become superfluous:

"The entrepreneur's innovative function is already losing importance and is bound to lose it at an accelerating rate for innovation itself is being reduced to a routine. Technological progress is increasingly becoming the business of teams of trained specialists who turn out what is required and make it work in predictable ways." (Schumpeter, 1942, p.132).

Indeed, in dominant perspectives in organizational theory and strategy on how organizations search for novel solutions and innovations, the entrepreneur has been replaced by "routines for search." While in Penrose's theory of the growth of the firm (Penrose, 1959/1995) the entrepreneur still played a key role as the agent who was searching for and applying new combinations of resources inside the firm which eventually lead to new products and services, in later behavioural (Cyert and March, 1963/1992) and evolutionary (Nelson and Winter, 1982) perspectives on organizational search and growth, the entrepreneur has disappeared altogether (Zander, 2001). This view of the organizational innovation process as a routinized process driven by "routines for search" (Nelson and Winter, 1982) was further developed later on by Kogut and Zander (1992), who launched the concept of "combinative capabilities," and by Teece, Pisano and Shuen (1997), who introduced the concept of "dynamic capabilities." All these concepts attempt to transform recombination as the underlying process of innovation into an organizational capability or routine in itself (Eisenhardt and Martin, 2000; Pavitt, 2002; Zollo and Winter, 2002). In other words, in organizational theory and strategy the traditional view that the innovation process is largely driven by individual actors - the entrepreneurs - gave way to the view that the innovation process itself can be routinized and does not necessarily require the ideas and initiatives of individual entrepreneurs.

However, while routinized innovation makes it possible for established organizations to plan for innovation and thus almost introduces an element of predictability into the innovation *process*, this reduction of uncertainty and increase of control typically comes at a cost in terms of innovation *outcome* - routinized innovation tends to produce more incremental innovation rather than radical innovation and can lead to overexploitation and insufficient exploration (March, 1991; Benner and Tushman, 2002). From this perspective, it is argued that established organizations typically tend not to engage in truly exploratory activity. If they do, it is typically discarded as "random mutations" random mistakes within the established system of organizational search routines (Bruderer and Singh, 1996) rather than recognized as a sys-

tematic process (Czernich and Heath, 2001) possibly driven by actors inside or outside firms. In most of the learning literature it is typically assumed that increased routinization and the experience embedded therein tends to lead to convergence in organizational actions and outcomes and thus to reduced variability (Miner, Haunschild and Schwab, 2003).

As a result, behavioural and evolutionary perspectives have often portrayed organizations as risk-averse, conservative and myopic entities that primarily focus on decisions and actions which are closely related to their existing knowledge, capabilities and mental models (Nelson and Winter, 1982; Prahalad and Bettis, 1986; Montgomery and Wernerfelt, 1988; Cyert and March, 1992; Kogut and Zander, 1992)¹. One major implication of this view of the organizational-innovation process is that the growth trajectories of firms are expected to be subject to considerable path dependencies constraining the direction of organizational growth (Dosi, 1988; Teece, Rumelt, Dosi and Winter, 1994; Zander, 1998). Consequently, it is argued that firms frequently fail to adapt to major changes in the organizational environment (Tushman and Anderson, 1986; Henderson and Clark, 1990; Christensen and Bower, 1996). The view that organizations rarely if at all radically change what they do is also echoed in the organization sociology literature, arguing that organizations exhibit structural inertia (Hannan and Freeman, 1977; Carroll and Hannan, 2000).

As opposed to the innovation process driven by routines for search, this study is concerned with a different kind of innovation *process* in large organizations, namely, the entrepreneurial process behind those innovations, which Baumol (2002) called "independent" innovations and which Burgelman (1983, 1991) referred to as "autonomous initiatives." Thus, while routinized innovation are those innovations which are "guided by standard business decision principles" (Baumol, 2002: 21) firmly embedded into existing corporate strategy, are independent or autonomous innovations those which are based on the initiative of one or a small group of people- the in-

¹ These biases -- towards local and related business activities rather than distant and unrelated ones, towards short-term action rather than long term action, and towards routinized rather than ad-hoc actions in corporate resource-allocation decisions in general and internally generated diversification and new venturing activities in particular -- will be referred to in the rest of the thesis as "behavioural" or "evolutionary" perspectives on firm growth and diversification.

trapreneur(s)²- and which, at least originally, fall outside the established routinized innovation system of the firm and which initially lie outside corporate strategy (Burgelman, 1983). Thus, this study is concerned with those instances of innovation in established organizations which do not emerge from routinized and planned innovation activities, but from the *independent initiatives of entrepreneurs inside established organizations, initiatives which, at least initially, were not part of the routinized innovation system of their parent company*. As such, this study is about the kind of innovation process which has typically been defined away in behavioural and evolutionary perspectives on organizations, where the role of the entrepreneur in the innovation process inside firms was replaced by routines for search or dynamic capabilities (see figure 1).³

² The terms "intrapreneurship", "corporate entrepreneurship" and "corporate venturing" will be used interchangeably throughout this thesis, as will be the terms "intrapreneur," "entrepreneur inside established firms," and "corporate entrepreneurs."

³ One point needs to be clarified, though. The *outcome* of the kind of independent entrepreneurial innovation process which is the focus of this thesis *may* result in radical innovations but does not necessarily have to. We know from research on entrepreneurship (Aldrich, 1999; Aldrich and Kenworthy, 1999) that much of entrepreneurial activity is not concerned with the commercialization of radical "Schumpeterian" innovations, but with the commercialization of more incremental innovations. The same is true of entrepreneurship in established organizations. Thus, engaging in and supporting independent "intrapreneurship" is not automatically the same as engaging in radical innovation, just as routinized search does not exclusively produce incremental innovations. However, it is reasonable to assume that, on average, independent entrepreneurial activity in large firms will result relatively more often in radical innovations than routinized innovation activity and that routinized innovation activity, on average, will result relatively more often in incremental innovations.

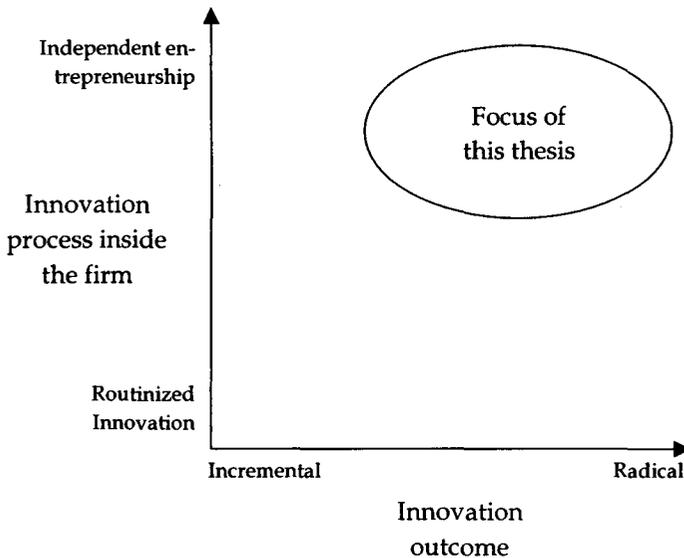


Figure 1. *The focus of the thesis*

While few would debate that occasionally independent entrepreneurship occurs inside established organizations - the literature on corporate venturing provides us with plenty of examples (Burgelman and Sayles, 1986; Block and McMillan, 1993) - much more rarely has it been rigorously studied whether and when independent entrepreneurial ventures, once originated, have also systematically good chances of surviving inside the firm of their origin through gaining the support of their parent company. It is this question the current thesis aims to investigate. More particularly, within the area of focus on independent entrepreneurship inside established firms, this study is aimed particularly at understanding why some of the ventures resulting from independent entrepreneurship survive and thrive within the organization of their origin, while others are terminated or spun-off into entities outside the boundaries of their parent organization. This question opens up a theoretical puzzle: If it is true that organizations are risk-averse, myopic entities, with path dependency guiding their search and growth trajectories and if it is true that experience and routinization actually does lead to convergence and reduced variability, is it then possible that the kind of inde-

pendent entrepreneurial ventures which are the focus of this thesis and which introduce a considerable degree of variability into well established organizations have systematically good chances of surviving? And if yes, which factors can explain *when* independent entrepreneurial ventures have systematically good chances of surviving?

Entrepreneurship inside established firms raises also some interesting questions on a population-level of analysis. Baumol (2002) argued that there is a general trend towards specialization in the creation of innovations on a societal level, where established firms have specialized in routinized and incremental innovations while small start-up firms have specialized in independently created radical innovations. From this perspective we might expect a trend towards increased specialization by which well established firms engage less and less into intrapreneurship and instead leave the development of entrepreneurial ventures to start-up firms outside their boundaries, possibly supported by venture capital investors, however with an option to buy back the start-up firms once its underlying concept and technology has proved successful.

In addition to problematizing the phenomenon of independent entrepreneurship in established organizations, the perspective taken in this study also problematizes the differential adoption of internally created innovations. A fundamental assumption underlying this thesis is that the people in established organizations typically produce more business ideas and inventions than organizations have attention and financial resources to support (Burgelman, 1991; Bhidé, 2000; see also Davenport and Beck, 2000; Hansen and Haas, 2001 for a similar argument in a different context). However, often in studies on innovation and entrepreneurship in established organizations it is implicitly assumed that those innovations perceived and produced by the organization within its rather narrow search space are almost automatically adopted and supported. A result of, as will be argued, a general tendency of studies on innovation to only focus on those ideas, innovations and ventures which actually have been adopted and developed while ignoring those which have not. By contrast, it is an underlying assumption of this thesis that organizations face an important *selection problem*: namely, that of deciding which of the many suggestions for new products and services to support and which to discard. In other words, it is assumed that organizations need to selectively allocate attention and resources and need to constantly select certain ventures for support while ignoring others.

As an illustration of the kind of ventures considered in this thesis, there is the case of Saab Rosemount TankRadar AB, the world leader in radar-based tank-level gauging. This company, which in 2002 had about 300 employees and sales of close to 1 billion SEK, is a pioneer in radar techniques for level gauging. The company goes back to the invention of Olle Edvardsson in the early 1970s. At this time Olle was an engineer specializing in radar technology with Saab's missile division in Linköping. As part of the routinized innovation activities within the division, he was supposed to further develop radar technology for missiles. At one point he realized that radar techniques could also be applied fruitfully to tank-level measuring- a result of a contact with a small group of engineers within Saab working with shipyards in Gothenburg. At that time this idea was certainly considered "crazy" given the prior focus of radar technology on the defence sector, with rather different requirements of precision and cost. And despite a latent demand from Saab management to find new applications for existing technologies within Saab, it was also fairly "crazy" to suggest this idea to Saab management and ask for resources in order to commercialize it, since tank-level measuring was not really part of Saab's strategic focus at that time. Nor could the development of this idea be easily accommodated into the established innovation routines of Saab, which was geared towards the defence industry. Thus, commercializing the idea would require considerable exploration in areas and markets that would be fairly new to Saab. Yet, management supported the venture and invested considerable resources to develop a prototype of the invention and launch the product on the market. The resulting venture would eventually turn into a very profitable business unit within Saab called Saab Marine Electronics. The idea would also revolutionize the tank-level-gauging industry. Today, almost 30 years after the initial invention, it has set a new worldwide standard in tank-level gauging. Thus, this subsidiary has not only introduced a totally new product into Saab's product portfolio, but also opened up a new customer segment for Saab - the oil tanker industry. After almost 30 years, parent corporation Saab decided to sell its Saab Marine Electronics subsidiary to Emerson Electric to form Saab Rosemount in 2001.

Saab Marine Electronics is in many respects an exceptional venture in that it successfully entered the mainstream of Saab's corporate strategy and eventually became a new business unit. Many entrepreneurial ventures outside the routine innovation system of the parent corporation fail to do so and are consequently not retained inside their parent organization. Consider the case

of NextGeneration Broadband⁴. The venture was the result of an attempt to commercialize an invention by Anders Svensson toward the end of 1997. At that time Anders was a software programmer at an R&D lab within W-Communications, a Swedish telecommunications company. The invention was an adaptor that gave private users easy broadband access to the Internet via the established networks of cable-TV operators. Anders developed his invention during working hours, and although it had "nothing to do with the ordinary operations of the research lab" (according to Anders Svensson), the head of the R&D lab supported its development. The customer group NextGeneration Broadband was targeting was also different from the established core customer groups of W-Communications. Later on, the internal corporate venturing unit of W-Communications became involved in setting up a venture based on this invention led by Anders Svensson and aimed at launching the product on the market. Just as in the case of the invention behind Saab Marine Electronics, the invention underlying NextGeneration Broadband emerged outside the routinized innovation activity of the parent company and resulted from the independent initiative of an intrapreneur. And as with Saab Marine Electronics, it also would have introduced a totally new product into the established portfolio and would have given the parent company a totally new customer segment. However, unlike Saab Marine Electronics, W-Communications relatively quickly reduced its ownership interest in the company to only 25% in the middle of 2000. Thus, after only two and a half years the venture was spun-off from W-Communications. It was never linked into corporate strategy, and two years later it was dissolved completely.

These two cases illustrate not only that sometimes certain individuals inside firms develop ideas that lie outside the mainstream of organizational activity, but especially also that established organizations may be willing to support the commercialization of these ideas even though they seemingly do not fit into corporate strategy, despite their demands on a very long time perspective and despite the considerable uncertainty associated to them. Thus, despite the supposedly powerful forces of organizational bias towards exploitation, local search, myopia and uncertainty avoidance, entrepreneurial ventures have, as will be argued, under certain circumstances systematically good chances of surviving and becoming commercialized inside established

⁴ The name of the venture, of the intrapreneur and of the mother company has been changed.

firms. This puzzle has been largely ignored by behavioural and evolutionary perspectives which do not take seriously enough the phenomenon of independent entrepreneurship inside established organizations as a systematic and powerful engine of variation and exploration in organizations. Despite recent efforts to integrate mechanisms which systematically produce variability like improvisation and bricolage into the organizational learning framework (Miner, Bassoff, and Moorman, 2001; Baker, Miner, and Eesley, 2003) the predominant assumption still remains that routinization, learning and the accumulation of experience leads to a reduction of variability and to forces towards exploitation rather than exploration (March, 1991; Czernich and Heath, 2001; Miner, et.al., 2003).

The two cases also illustrate a further puzzle, namely that only some of these entrepreneurial ventures, such as Saab Marine Electronics, succeed and are retained by the parent corporation. Others, such as NextGeneration Broadband are rejected and are subsequently spun-off or terminated altogether. What makes the difference? This question is typically not asked in most studies on innovation and entrepreneurship in established firms. The reason is that studies on innovation tend to over-sample successful cases, thus overlooking the constant need of organizations to select the direction of their innovation efforts by giving different degrees of support to the many possible paths of innovation and growth. I will argue that investigating the question of the differential survival of independent ventures requires a better understanding of the micro-mechanisms driving the internal selection system of organizations.

Finally, these cases also illustrate that the selection problem faced by established organizations may have crucial strategic implications for the corporation. Organizations need to decide which ideas to support and which to avoid, a decision with potentially substantial effects on corporate prosperity and survival. Discarding a venture which eventually would have considerably benefited the corporation, or which could have generated considerable revenue and profit, is as serious a strategic mistake as supporting a venture that requires considerable organizational resources or causes a change of corporate strategy, but turns out to be a blind alley. For instance, one of the ventures in the sample underlying this study was rather quickly terminated inside the organization it originated from. The entrepreneur behind the venture, however, still believed into the potential of the idea, quit his job and pursued the commercialization of the idea outside the mother organization. Today, the resulting company is one of the fastest growing companies in the

Swedish biotechnology industry. Thus, supporting the "right" ventures is an issue of critical strategic importance for organizations. In making these crucial selection decisions, it is extremely difficult for management or what will be referred to as (idea) "selectors" to tell *in advance* which of all the new and "crazy" entrepreneurial ideas are in fact worthless and which are a stroke of genius (March, 1988; Ehrlich, 2001). Yet, decisions need to be taken nevertheless. This makes the selection of ideas and innovations an intricate and fascinating phenomenon to be studied in this thesis.

This thesis analyzes the underlying causes of the varying fates of a sample of 88 ventures comparable to the two cases illustrated above. The analysis is predominantly quantitative and is based on combining data from more than 100 interviews with intrapreneurs, senior R&D managers and senior executives, archival data and survey data. The overall purpose of the study has been to understand why some ventures, such as Saab Marine Electronics, managed to survive for almost 30 years within their organization of origin, while other ventures, such as NextGeneration Broadband, were only briefly retained before being either spun-off as separate companies or terminated altogether. As I will argue in detail below, a better understanding of this question has several important implications for a number of different areas in organization theory and strategy. One straightforward implication is that more thorough knowledge of the inner workings of the organizational selection system sheds light on the following more general question: what determines the direction of corporate growth, and in so far as new ventures lead to new market entry, what determines the direction of corporate diversification?

1.1 Theoretical approaches to explaining the differential survival of entrepreneurial ventures

The simplest explanation for the differential survival of entrepreneurial ventures is of course differences in the financial value of the ventures. From this purely financial perspective, firms will retain those ventures with positive net present value and thus those which maximize shareholder value, while they will not retain those ventures which do not produce positive net present value (Brealey and Myers, 2000). Unfortunately, the explanation is not as simple as that. First, when engaging in new venturing, large organizations pursue not only financial goals, but strategic goals as well (Hellmann,

2002). Since these two kinds of goals are not always perfectly aligned, a venture may be highly rewarding financially, yet conflict with the overall strategy of the corporation. The second reason is that the internal selection system of firms is not always efficient and that, as argued above, the eventual value of an idea is so difficult to judge in advance. Thus, the inefficiency of selection is largely a function of the considerable ex-ante ambiguity related to the "true" nature of the venture and its "true" value and the resulting internal information asymmetries, especially in the early stages of venture development (Czernich, 2003). Another reason for the inefficiency of internal selection is bounded rationality of organizational selectors and the consequent importance of routines for the selection of new ventures. The reliance on routines makes it unlikely that the evaluation and selection of new ventures will be driven by maximization of financial value alone; routines strongly constrain the set of alternatives considered in any decision problem and thus preclude the maximization principle in traditional rational-decision theory (Cyert and March, 1992; Nelson and Winter, 1982).

For these reasons, independent entrepreneurial ventures may survive for a considerable time without being financially rewarding to the parent corporation, or they may survive for only a very short period only to reappear later at a highly profitable firm outside of the parent corporation. This does not imply, however, that there are no systematic patterns underlying the differential survival of independent entrepreneurial ventures inside firms. It just implies that this differential survival is not driven by differences in the financial value of ventures alone. But if differences in financial value do not explain the differential survival of entrepreneurial ventures, what other factors might then explain it?

The explanation tested in this thesis has three components. The analysis departs from resource-based, evolutionary and behavioural theories of organizational growth and diversification as these theories represent the backdrop of this thesis. One major point in these perspectives on growth and diversification is that the direction of organizational search and diversification appears to be guided by some underlying logic and forces which make certain evolutionary paths more likely than others. The overall logic of patterns in the evolutionary paths of organizations is the underlying resource and routine *relatedness* between the various businesses of an organization (Penrose 1959/1995; Rumelt, 1974; Teece, et.al., 1994; Silverman, 1999). Likewise, behavioural theories have emphasized how the search space of organizations is constrained by local linkages to the existing experience and

knowledge-base of the organization (Cyert and March, 1963; Cohen and Levinthal, 1990; Stuart and Podolny, 1996). Thus, when this perspective is applied to the selection of independent entrepreneurial ventures in organizations, the first core component for explaining selection and the differential survival of ventures are the varying resource and routine linkages between the venture and the parent corporation.

Yet, unlike normally rather macro-oriented studies on patterns of organizational search and diversification, the present study will investigate into *micro-foundations* of the determinants of the direction of organizational search and diversification. This will be done through qualitatively based analysis of the internal innovation-selection system of organizations. Inside this system, judgements and evaluations of relatedness by idea selectors is argued to be a major *heuristic* guiding the selection of entrepreneurial ventures. Yet, such evaluations of relatedness are complicated by the fact that there might be varying resource and routine linkages between a venture and the various parts of the organization.

The core of the first part of the argument is thus that selection of innovations in organizations is driven by evaluations and judgements of relatedness to three partly contradictory local selection logics and preferences inside the firm as manifested in the local selection logic of the R&D organization, the local selection logic of the market organization, and the local selection logic of the sourcing and manufacturing organization. I chose those three selection logics because they emerged as the most important relatedness dimensions in the more than 100 interviews that I conducted about the workings of the internal innovation-selection system of firms. This view of the internal-selection system of firms as not being a coherent whole with one single and common goal, but an entity with multiple and partly contradictory goals, is inspired by the old, yet utterly neglected argument by Cyert and March (1963) that firms exhibit several and partly contradictory local goals and preferences.

The argument on the importance of routine and resource relatedness for understanding the differential survival of ideas, largely inspired by two key concepts for understanding the macro trajectories of organizational growth and diversification - local search and related diversification - will then be complemented and integrated with two other key explaining variables. *First*, I argue that the commercialization of independent innovations is risky and that organizational attitudes towards risk are not a constant, but are context-dependent. Thus, when and how parent corporation attitudes toward risk

change should be a crucial factor for understanding differential support and selection of independent ventures in established organizations. Behavioural research on risk-taking has shown that risk preferences are context-dependent. Specifically, they change as a function of current performance relative to a reference point, typically referred to as an aspiration level (March and Simon, 1958; Kahneman and Tversky, 1979; March and Shapira, 1987, 1992; Greve, 2003b). From the interviews it became apparent that this factor is central to understanding the differential survival of independent entrepreneurial ventures in established organizations. Thus, the specific *timing and context* of a venture is of major importance, irrespective of its degree of relatedness. There is substantial research on the impact of risk-attitudes on the variability of firm performance (Fiegenbaum and Thomas, 1988; Bromiley, 1991; Wiseman and Bromiley, 1996) on the macro-patterns of R&D expenditure (Antonelli, 1989), and more directly on the relationship between risk attitudes and innovative activity in large firms (Greve, 1998, 2003a). However, to the author's knowledge, there are very few if any studies on the relationship between changing organizational risk preferences and the fate of independent entrepreneurial ventures inside firms treated in this thesis.

One major conclusion of this thesis is that we cannot understand selective retention of independent entrepreneurial ventures inside established firms without considering the crucial impact of the performance history of the parent corporation. Consequently, we cannot understand when the retention of variability inside organizations is increased and decreased without paying due attention to the crucial impact of organizational performance.

In addition to varying organizational risk-preferences the second component added to the analysis concerns the influence of the intrapreneur and his/her varying strategies for building support for the venture and thus for influencing the chances that her venture will be retained within the parent company. I have stated above that in both evolutionary and behaviourally inspired theories of firm growth, and particularly diversification and search, the importance of the intrapreneur has been replaced by such concepts as routines for search, combinative capabilities or dynamic capabilities. I would argue that such a total neglect of the specific *actors* involved in the intrapreneurial process is unfortunate. Detailed case studies on intrapreneurship (e.g. Abetti, 1997; Fleming, 2002), as well as larger sample studies on intrapreneurship (Howell and Higgins, 1990; Day, 1994), have emphasized the crucial importance of the intrapreneur to the fate of new ventures (see also Burgelman and Sayles, 1986; Block and McMillan, 1993). Acknowledging the

potentially critical role of the intrapreneur, I will investigate and test whether and how the intrapreneur can influence the survival chances of his venture. Here I will focus on two strategies intrapreneurs can use to influence the fate of their ventures: first, the "persuasive efforts" of the intrapreneur, that is, the effort invested by the intrapreneur in convincing others in the organization about the merits of the venture, and second, "social anchoring" or the degree to which the intrapreneur manages to obtain support for the venture within the corporation through building relationships to top-management and generating internal recognition and approval for the venture. Inspired by the literature on issue selling ((Dutton and Ashford, 1993; Dutton, Ashford, O'Neill and Lawrence, 2001) I will also provide some evidence concerning the specific framing strategies used by intrapreneurs to sell their ventures inside the firm (Dean, 1987; Howell and Higgins, 1990).

Taken together these three components of the analysis for explaining the selective retention of independent entrepreneurial ventures inside firms, namely a) resource and routine-linkages between the parent company and the venture, b) context-dependent risk-preferences and c) characteristics of strategies of intrapreneurs to influence the fate of their ventures, are integrated into my overall argument that we conceptually need to understand the internal innovation-selection system of firms as a "multi-layered system." That is, for independent ventures to survive, they must pass through multiple layers of selection systems inside the firm. We can regard these various layers as a set of selection criteria which consciously or unconsciously are repeatedly applied to evaluate entrepreneurial ventures during their lifetime. The layers may be associated with different hierarchical levels inside the firm, but not necessarily so. The first selection layer is based on resource and routine linkages. A venture is selected based on how well it fits into the overall set of corporate capabilities and into the "way things are done in the organization" (Kogut and Zander, 1996) or into the "organizational code" (March, 1991). In other words, how well the venture reflects the specific selection logics in three parts of the organization, the R&D organization, the market organization and the sourcing and manufacturing organization. This first layer is represented in the analysis by the various ways of operationalizing "relatedness."

The first layer of selection is complemented by a second layer that evaluates and selects ventures based on the specific strategies intrapreneurs use to build support for their ventures, such as persuasive efforts and social anchoring. Finally, because of the ambiguity of innovation and the importance of

actors, selection becomes a highly context-sensitive process and timing is a crucial factor one needs to consider. The importance of timing and context also implies that one should not have too high expectations with regard to the *consistency* of organizational selection, which might easily be overestimated if one paid exclusive attention to the importance of routine linkages and prior experience for the selection of ventures and the direction of corporate growth more in particular. In this thesis, the context-dependence of the selection of ventures is reflected in changing risk attitudes as a function of the corporate performance history and is operationalized by the variable "attainment discrepancy." One further effect of performance is that the *permeability* of the different internal selection or filtering systems changes as a function of changes in the current success of the organization. An important implication of the effect of changing organizational performance is that fluctuations in organizational performance lead to *cyclical increases and decreases of retained variations* in the form of independent entrepreneurial ventures inside organizations rather than to a linear decrease of variation and to convergence over time. In summary, the hope of the author is to give the reader a rich and multi-faceted description and analysis of the underlying research question by combining qualitative with quantitative data and by integrating various theoretical perspectives into a coherent whole. The quantitative analysis is based on a Cox proportional hazard model with one time-dependent covariate.

1.2 Delimitations of the study

Before I discuss the reasons for this study and its expected contribution, I shall first explain what this study is *not* about. One crucial distinction in the literature on innovation and entrepreneurship is between invention and innovation. Invention refers to the development of a new idea or an act of creation, while innovation refers to the commercialization of that invention (Schumpeter, 1934; Bhide, 2000). Certainly, the interfaces between the various stages leading from an initial thought to an idea, to an invention and finally to an innovation are all points of selection. Not all thoughts of an entrepreneur lead to an idea, not all ideas lead to an invention and not all inventions are commercialized to become an innovation. Attention and other resources are limited, thus requiring constant filtering and selection, initially from the entrepreneur and subsequently from the organization needed to

provide the resources to commercialize the invention. To track the logic of this filtering process in all its stages would be interesting, but is of course not feasible for a limited study like the present one. This study is not concerned with the selection of thoughts leading to ideas, nor with the selection of ideas leading to inventions, but is only concerned with the selection process between the last two stages – that is, between invention and innovation. In it, I seek to determine which of the many inventions made in large firms lead to innovations that are retained and eventually linked to corporate strategy. The study thus has little to say about which ideas or thoughts of entrepreneurs eventually become inventions. All inventions in this study have passed or reached the prototype stage.

Second, this study is exclusively concerned with intrapreneurship related to the commercialization of *technological* inventions. Thus, it is not about intrapreneurship related to the implementation of initiatives for change or the creation and implementation of novel management concepts (Abrahamson and Fairchild, 2001; Davenport, Prusak, and Wilson, 2003). Furthermore, practically all the inventions in the sample were conceived and usually driven by people from R&D, not from marketing or any other area of the parent corporation. Thus, they were practically always created by engineers or scientists rather than by employees trained in business or other areas of expertise.

Another distinction frequently encountered in research on entrepreneurship and innovation and already mentioned above is the one between “incremental” innovations and “radical,” “major,” “discontinuous” or “breakthrough” innovations (Tushman and Anderson, 1986; Henderson and Clark, 1990; Methe, Swaminathan, Mitchell and Toyama, 1996; Ahuja and Lampert, 2001, Fleming, 2002; Hargadon, 2003). In the literature on innovation and entrepreneurship, a common thread on distinguishing these different kinds of innovations is that the more changes in knowledge a new product or process needs, the greater the change the innovation requires (Methe, et.al., 1996). Based on this notion and following Methe et.al. (1996), “major” or “radical”⁵ innovations are considered those innovations which “require substantial new knowledge or substantial reconfiguration of existing knowledge” (p. 1182). This notion builds on the arguments by Schumpeter (1934) that major innovation stems from recombining knowledge from previously unrelated uses. Thus, the more the innovation draws upon and inte-

⁵ These two terms will be used interchangeably in the remainder of this thesis.

grates previously unrelated areas of knowledge and competence, the more radical the innovation. Incremental innovation, on the contrary, typically refers to a simple refinement or further development of an existing product that enhances the utility or reduces the cost of an existing product (Abernathy and Clark, 1985).

The major sampling criterion in this study was that the invention had to "add a significant degree of novelty to the company." Thus, the sample does not consist of incremental innovations, at least not from the viewpoint of the parent corporation. The inventions included always represented a fairly significant deviation from the established and dominant business areas of the parent corporation⁶. However, not *all* the inventions in the sample were truly radical ones, even if some, like the above-mentioned case of Marine Electronics, were very significant innovations with the potential to transform whole industries.

Another important distinction underlying this thesis is the one suggested by Baumol (2002) between routine innovation, that is those innovations "guided by standard business decision principles" (Baumol, 2002:21) and independent inventions, those guided by the independent initiative of one or a small group of people. All the inventions in the sample were independent inventions created through the autonomous initiatives of one or a handful of employees in the R&D organization, that is, inventions which were initially pursued the planned and routinized innovation activities of the parent corporation. Thus, this thesis is not concerned with those innovations which resulted from the standard innovation system operating inside the firm.

Finally, I mentioned above that many of the ventures in the sample were eventually spun-off into separate companies outside the boundaries of the parent organization⁷. Such spin-off companies can be created either because the venture was forced to leave the parent corporation or because the management of the venture decided to leave the company. In other words, a distinction should be made between involuntary and voluntary spin-off companies, where the former refers, from the perspective of the parent company, to cases where a group of people leaves the company, often without the approval of the parent company, to form a company outside. This study is predominantly concerned with the latter type of spin-off, or voluntary

⁶ Further details on the characteristics of the "degree of novelty" in the sample will be given in the methods section.

⁷ I define "outside of the boundaries of the parent organization" as a situation in which the parent organization holds less than 50% of the shares in the spun-out company.

spin-offs, which the parent company initially intended to commercialize inside the organization of origin but subsequently voluntarily decided to spin off. Thus, this study is not concerned with those cases, where it was the venture team who decided to leave the firm against the will of the parent. Although in some of these cases venture management was actively pursuing a spin-off, the decision not to retain the venture was ultimately taken in every case by the parent company.

1.3 Research questions

I shall briefly summarize the major research questions addressed in this thesis. The primary research question is:

- Why do some ventures with the purpose of commercializing independent and internally created inventions survive and thrive within the boundaries of their parent organization while other such ventures are terminated or spun-off?

Related to this primary question are two further, secondary research questions:

- What is the process inside firms which determines the differential survival of independent entrepreneurial ventures within the boundaries of the parent corporation?
- How can we account for the systematic survival of such ventures in the evolutionary and behavioural perspectives on organizations?

1.4 Reasons for the study

In a world of Schumpeterian competition, innovation and entrepreneurship are central to organizational growth and well-being. While routinized innovation is certainly the normal "modus operandi" for innovative activity within established firms, the ventures resulting from independent entrepreneurship may powerfully influence the developmental paths of organizations and ultimately their long-term prosperity (Burgelman and Sayles, 1986; Block and McMillan, 1993; McGrath, Venkataraman and McMillan, 1994; Ahuja and Lampert, 2001; Fleming, 2002). Understanding which of these ventures survive is thus a theoretical and strategic issue of critical importance for

corporations. Another primary reason for the study was a personal interest in the phenomenon. Beside having a general interest in the phenomenon of entrepreneurship and intrapreneurship, I am fascinated by the question why certain inventions survive in organizations while others never receive the necessary support and resources to enter the mainstream of the organization.

Unfortunately I could not find any satisfactory answers to this question in the existing literature. One major source of dissatisfaction was that most studies on the determinants of the direction of organizational diversification and growth in general, and on innovation and entrepreneurship in large organizations in particular, suffer from a serious bias: namely, over-sampling of success (Denrell, 2003). Practically all studies on patterns of diversification, for instance, focus on diversification patterns as they had materialized ex-post; very few include both successful and failed diversification *attempts* in their sample (Ramanujam and Varadarajan, 1989). Similarly, studies on the diffusion of innovations in and between organizations typically suffer from a pro-innovation bias (Rogers, 1995; Jonsson, 2002). Thus, studies typically focus on instances of innovation, where the innovation process actually led to a successful outcome, neglecting instances where the outcome was failure or non-diffusion. This limitation prevents us from acquiring a proper understanding of the logic of innovation selection inside firms. The strong focus on successful innovations, to the exclusion of those that failed, is even more surprising in the light of findings from studies on the outcome distribution of innovations. These results, which are reflected in the findings of this study, show that failure rather than success is the norm in entrepreneurship and innovation (Scherer and Harhoff, 2000; Scherer, Harhoff and Kukies, 2000).

Another gap in the literature is that studies on intrapreneurship typically take one of two extreme positions in the trade-off between internal and external validity (Campbell and Stanley, 1966). Either they focus on very large sample studies, typically based on patent data, of inventions and innovations in large organizations (Zander, 1998; Ahuja and Lampert, 2001; Fleming, 2001; Rosenkopf and Nerkar, 2001, Benner and Tushman, 2002) and largely neglect the micro-processes driving the selection of innovations. Or they are based on detailed case-studies of one or a few instances of (typically successful) intrapreneurship (Burgelman, 1983; Badguerahanian and Abetti, 1995; Abetti, 1997; Fleming, 2002; Hargadon, 2003), while failing to test statistically for larger patterns. However, very rarely studies take a mid-range approach and attempt to combine qualitative and quantitative data. The present studies takes such an approach.

1.5 Intended contribution of the study

What are the intended contributions of the study and its implications for established theory? Clearly, routinized innovation is by far a more prevalent mode of organizational innovation than the kind of independent intrapreneurship considered in this study. So why this focus on the exceptions and what might it contribute? The major reason for focusing on the selective retention of independent entrepreneurial ventures in established organizations is that their selective retention represents an important aspect of organizational *exploration*, one which has often been neglected or even ignored in behavioural and evolutionary perspectives on firm growth and diversification which has predominantly focused on routinized innovation.

Exploration is conceived of as consisting of two sub-processes, the production of variation on the one hand and the selective retention of some of the produced variations on the other. The emergence of independent entrepreneurial ventures on the one side and the organizational selection system granting differential support to some of these ventures on the other side represent sources of variation and mechanisms of selection respectively. The logics underlying these two processes are fundamentally at odds with each other (Campbell, 1965). Hence, when independent entrepreneurial "ideas meet organizations" there is a fundamental "clash of logics." I argue that understanding when and why such ventures, once originated, survive in organizations and thus when this "clash of logics" can be reconciled helps to answer the questions *whether and when established organizations retain produced variation*. This is, beside the mere production of variation, an important aspect of exploration. To put it somewhat differently, I want to argue that entrepreneurial ideas and ventures are a major engine of variation in organizations and by studying their selective retention I want to understand what kind and under what circumstances such variation is likely to survive and persist.

These questions are clearly of central importance in both organization theory and strategy research, for it is often argued that – and debated whether – established organizations have, on average, a strong tendency to produce and to retain too little variation and novelty to ensure their long-term survival (Hannan and Freeman, 1977; March, 1991; Benner and Tushman, 2002). Another intended contribution of this study is that it undertakes a fairly detailed and micro-oriented investigation of the inner workings of the organizational selection system. Except for a few, largely conceptual attempts of

this kind (Burgelman, 1991; Baum and Singh, 1994; Miner, 1994; Lovas and Goshal, 2000), studies based on evolutionary and behavioural perspectives have typically taken a more macro approach. Thus, the overall contribution of the study is in its aim to integrate the phenomenon of independent entrepreneurship in established firms - largely under-researched in the behavioural and evolutionary traditions - into these perspectives by fairly detailed investigation of the internal selection system of firms. The analysis, in turn, should significantly aid in our efforts to understand when established organizations are willing to support and retain produced variation and how firms determine the direction of exploration and diversification.

Methodologically, this study follows a mid-range approach. On the one hand, it provides a fairly detailed, qualitatively based analysis of the inner workings of the innovation-selection system, and on the other, it tests statistically for the hypothesized patterns derived from the analysis of these micro-processes. However, it is important to point out that the qualitative part of the study is not meant to provide ethnographic detail about the innovation process and the intrapreneurial process more in particular per se. The qualitative method used would not live up to such intentions. Rather the qualitative data is intended to serve only as illustrations for the major arguments in this thesis, arguments which will then be tested more rigorously in the major quantitative part of the study. Furthermore, applying Cox regression with time-dependent covariates to the study of internal selection processes, as done in the present study, represents a for many reasons highly appropriate, yet still too rarely employed methodological approach in this area. I will come back to a detailed discussion of these issues in Chapter Four.

The answers to the research questions have important implications for three more specific areas in the literature on strategy and organization theory: a) the literature on corporate entrepreneurship; b) the literature on learning, and specifically the question when established organizations overcome biases identified in this literature in favour of exploitation over exploration and what kind of role attainment discrepancy plays in this and finally c) the literature on the determinants of corporate diversification and growth in so far as entrepreneurial ventures lead to entry into new markets. I shall discuss each of these questions in detail more and explain why and how this thesis provides a contribution in these three areas.

1.5.1 Contribution to the literature on corporate entrepreneurship

This study is intended to contribute to the literature on intrapreneurship, or corporate entrepreneurship⁸ (Burgelman, 1983; Burgelman and Sayles, 1986; Block and McMillan, 1993; Stevenson and Jarillo, 1990; Bhidé, 2000; Ahuja and Lampert, 2001), by presenting and testing a theoretically based model designed to explain when to expect entrepreneurial ventures to survive in large organizations. This question is not satisfactorily answered in the literature on corporate entrepreneurship. Either studies in this field take entrepreneurship in large organizations as given and then explore the relationship between corporate entrepreneurship and corporate performance on a fairly abstract macro level (McGrath, Venkataraman, and McMillan, 1994; Dess, Lumpkin and Covin, 1997; Covin and Miles, 1999; Zahra and Garvis, 2000). Or the literature on corporate entrepreneurship engages in detailed, largely descriptive historical case studies of single cases without firmly grounding the description in theory (e.g. Pinchot, 1985; Badguerahanian and Abetti, 1995; Abetti, 1997). The few recent examples of studies which engage in detailed and theoretically well-grounded cases of entrepreneurship in large organizations (Tripsas and Gavetti, 2000; Fleming, 2002; Hargadon, 2003) do not allow for statistical testing of their arguments, and except for the study by Tripsas and Gavetti, they are mostly if not exclusively concerned with explaining successful breakthroughs while ignoring the far more numerous failures. In a new way, the suggested model in this thesis combines and integrates a variety of explanatory variables firmly grounded in different theoretical perspectives. Furthermore, testing for the effects of relatedness on entrepreneurship allows us also to test whether even independent entrepreneurial ventures are subject to constraints imposed by path dependencies in the growth trajectories of firms (Dosi, 1988; Teece, et.al., 1994)

Methodologically, this study, which is intended to enhance our understanding of the kind of and conditions under which established organizations are willing to support corporate entrepreneurship, should contribute to the literature by combining a qualitative and quantitative research design, by not over-sampling in favour of success, and by seeking to base its arguments on firmly established theoretical concepts.

The thesis should also contribute to a larger discussion within the literature on innovation and entrepreneurship. This debate, initiated by Schumpeter, is about whether or not large organizations are an appropriate vehicle

⁸ These two terms will be used interchangeably throughout this thesis

for entrepreneurship and about testing whether and why independent entrepreneurship has a chance of surviving in established firms. Schumpeter himself changed his mind on this subject in the process of his research (Schumpeter, 1934, 1943). Within this larger discussion about an appropriate governance structure for entrepreneurship, there is also the more specific question whether large firms are capable of producing major, radical innovations or can only generate minor, incremental innovations (see the comparison between the position of Tushman and Anderson, 1986 and Henderson and Clark, 1990, on the one hand, and that of Methe, et.al., 1997 and Ahuja and Lampert, 2001 on the other).

Subsequently, I shall argue that the question for discussion is not *whether* large organizations are appropriate vehicles for entrepreneurship, or whether they can produce radical innovations, but under *what conditions* such outcomes are more likely. The variables and processes investigated in this thesis propose a few factors which might be helpful in predicting *under what conditions* entrepreneurship and radical innovation are more apt to occur within the firm.

1.5.2 Contributions to the literature on learning and the literature on context-dependent risk preferences

The study should also contribute to the discussion within the literature on behavioural decision-making and learning concerning the questions whether and when organizations engage in and support exploration (March, 1991; Benner and Tushman, 2002; Denrell and March, 2002). The very fact that the kind of ventures considered in this study emerge *and* systematically survive in large organizations cannot be taken for granted if analyzed from behavioural perspectives on search and growth and more particularly, from the standpoint of the literature on learning (Levitt and March, 1988; Huber, 1991; Argote, 1999). Such ventures require a long-term perspective entail high uncertainty and high degree of novelty, and are sometimes from the beginning little related to existing capabilities and knowledge. These features contrast sharply with various biases, identified in evolutionary and behavioural theories of the firm, in the decisions and actions of organizations, such as uncertainty avoidance, myopia and local search. Thus, knowledge of the circumstances under which such independent ventures can survive in organizations should help us to understanding better when organizations are willing to support true exploration and retain the results thereof and thus when organizations overcome biases towards local search, exploitation and

myopia (Levitt and March, 1988; Levinthal and March, 1993; Denrell and March, 2002).

In other words, if these biases accurately reflected the dynamics of organizational learning and evolution, such ventures would hardly have systematic changes of surviving. Understanding under what conditions some of them survive nevertheless helps us to know when organizations avoid these traps and biases (see Ahuja and Lampert, 2001 for a similar argument). As most of the organizations in the sample are fairly big, old and well established which thus have accumulated considerable experience and exhibit a strong degree of routinization, understanding the survival of independent entrepreneurial ventures might also contribute to a better understanding of the conditions under which experience and routinization leads to increased divergence and variability, rather than convergence (Miner, et.al., 2003).

Another intended contribution of this study is to link the discussion on exploration and corporate entrepreneurship to the literature on context-dependent organizational risk preferences (see Greve, 2003b for a detailed overview). It applies this theory in a context in which it has rarely if ever been applied before, corporate entrepreneurship. While there are a number of studies on the relationship between corporate performance, on the one hand, and innovation and change, on the other (e.g. Greve, 1998, 2003a,b) as well as on corporate performance and R&D expenditure (Antonelli, 1989), there are very few if any studies applying these theories to survival patterns for the kind of independently created inventions considered in this thesis. This gap is unfortunate in view of the obvious relationship between risk attitudes and intrapreneurship, since intrapreneurship is a risky endeavour. Beyond a mere application of the theory of context-dependent risk preferences in a new context, the empirical findings are then linked to a central debate in this specific area of literature: the discussion about the exact relationship between success and failure and attitudes toward increased and decreased risk (see Ocasio, 1995 for an overview of this discussion). In the chapter on implications, I will argue that one way to reconcile this controversy is by adding a second mechanism resulting from fluctuations in performance. In particular, I will argue that success and failure not only cause changes in organizational risk-attitudes, but also cause a shift in the internal allocation of organizational attention from core to non-core business areas and vice-versa.

1.5.3 Contributions to the literature on diversification and growth

Finally, the study also has implications for a third area of research, that relating to larger patterns of organizational diversification and growth (Teece, et.al., 1994). In many cases, the commercialization of the inventions underlying the ventures in this sample caused the firm to enter into a new industry or focus on a new customer segment. Thus, understanding which of those inventions were kept within the firm and led it to enter a new market, and which were not retained, gives us a better view of the determinants of the direction of organizational diversification.

While the importance of resource and routine linkages for understanding larger patterns of organizational growth trajectories is well established in this literature, I add some new aspects. First, I investigate why and how relatedness matters on a fairly micro-level in the case of entrepreneurial ventures. The analysis of the internal selection system of the firm is meant to be an analysis of the micro-foundations of the importance of resource- and routine-relatedness. Thus, this study represents an attempt to follow the call of Ramanujam and Varadarajan (1989) to conduct more research on the level of the single diversification project.

I also seek to extend our understanding of how and why relatedness matters by treating relatedness not as a single, coherent concept, but as a multi-dimensional phenomenon (e.g. Farjoun, 1998) that subjects organizations to partly contradictory demands. A methodological contribution would then attempt to test which of three key dimensions – technological relatedness, sourcing and manufacturing relatedness, and distribution and sales relatedness – matters the most in determining the direction of organizational growth. Also, unlike the usual large-sample surveys, which operationalize relatedness on a very abstract and macro level (see Silverman, 1999), this study attempts to measure relatedness in a very direct and detailed manner by asking key informants to directly evaluate resource and routine linkages in several different dimensions. This approach follows the recommendation of scholars like Nayyar (1992) and Stimpert and Duhaime (1997) to measure relatedness according to the actual perceptions of the actors involved.

Another weakness of most research on diversification, which this thesis aims to remedy, is that studies on the relationship between the direction of diversification and firm performance typically focus on whether and how moves to diversify impact corporate performance (see Palich, Cardinal and Miller, 2000 for an overview). These studies however still typically neglect the importance of organizational performance for understanding patterns of

organizational diversification (Ramanujam and Varadarajan, 1989). (This neglect of corporate performance as an important independent variable is equally true for the literature on corporate entrepreneurship.) One contribution of this study is to show that corporate performance indeed has a crucial and powerful impact on venture survival and thus ultimately also on corporate diversification patterns. This point, which is still much too rarely observed and investigated in the literature on diversification, has also obvious methodological implications for the study of the relationship between diversification and performance. In particular, we can think of the relationship between performance and diversification as a *reflexive* relationship where the one impacts the other and vice-versa.

Finally, the evolutionary and behavioural literature on diversification and growth patterns typically neglects the importance of *actors*. As already argued above, routines are typically substituted for actors. While this substitution might be a powerful approximation in the case of the day-to-day incremental development of the organization, the neglect of actors may be less appropriate in the context of corporate entrepreneurship and radical innovations. This study tries to incorporate important actors into our understanding of diversification patterns by arguing that selection in organizations is a multi-layered system and by testing whether key actors in the process of corporate entrepreneurship - the intrapreneurs - can indeed significantly influence the survival of ventures and thus ultimately the patterns of corporate diversification and search as well.

In summary, the primary aim and intended contribution of this thesis is to link together different theoretical perspectives in proposing a number of mechanisms, such as multiple-layered selection, which might allow us to integrate the phenomenon of intrapreneurship into evolutionary and behavioural perspectives on the firm. In this way, we will hopefully improve our understanding of a key issue in the literature on strategy and organization theory namely: when do organizations support exploration and retain the results thereof?

1.6 Structure of the Thesis

Chapter Two will provide a detailed overview of the literature on corporate diversification and search. This literature forms the theoretical backdrop for this study and gives us some important tools for understanding the re-

search questions of the thesis. I will discuss in considerable detail the various theoretical arguments as well as empirical evidence concerning the determinants of the direction of organizational search and diversification. The review of this literature will reveal a lively debate on whether or not and under what conditions established firms are constrained to related diversification, local search and incremental innovation. It will also uncover a number of methodological shortcomings in this literature, especially with regard to the operationalization of relatedness.

As these studies are typically conducted on a largely macro level with only limited interest in the micro foundations of the larger patterns identified, I will open this "black box" of the organization in Chapter Three and take a closer look at the internal innovation-selection system of firms. This examination will improve our understanding of the micro-processes underlying larger patterns of corporate growth. I will show that the concept of relatedness is not a simple, uni-dimensional variable, but a multi-dimensional concept which places partly contradictory demands upon the organization. I base this analysis of the internal innovation-selection system on the results of some 100 interviews conducted with intrapreneurs, senior R&D managers and CEOs in the course of the empirical study. In this crucial third chapter I will also add the two other components of my analysis - the importance of actors and their various strategies in shaping the fate of ventures, and the importance of context and timing represented by the contexts of corporate success and failure. Based on this analysis, I will then derive the hypotheses which will be tested on a sample of 88 ventures.

Chapter Four contains a detailed description of the methodological approach taken in this study, together with a discussion of the various strengths and potential weaknesses of this particular approach. The chapter also provides an overview of survival analysis and the specific characteristics of the Cox proportional hazards model used to test the hypotheses. Finally, the chapter discusses the operationalization of the various concepts, their reliability and validity. Chapter Five presents the results of the statistical analysis and gives also an overview of the overall performance of the ventures in the sample, and Chapter Six summarizes the findings and discusses their implications for theories of corporate entrepreneurship, organizational learning and context-dependent risk preferences, as well as for our understanding of larger patterns of corporate diversification and growth.

Antecedents of internal selection

Macro forces shaping patterns of organizational diversification, search and growth – conceptual arguments and empirical evidence

2.1 Overview

The direction of organizational evolution and growth appears to be guided by an underlying logic and by forces which make some evolutionary paths more likely than others. Hot-dog stands typically do not eventually evolve into biotechnology companies, and computer firms typically do not evolve into shoe designers. At the outset this statement appears rather obvious, yet understanding which forces constrain the direction of organizational growth and evolution is not as trivial as it seems. Understanding these forces is important for investigating the research question of this thesis, for these forces are the antecedents for the selection mechanisms determining the survival of ideas and the resulting independent entrepreneurial ventures. Forces which shape the direction of organizational evolution powerfully limit the ideas and ventures that are considered valuable in particular contexts and organizations, yet those ideas and ventures which survive these forces will ultimately also shape and change them.

The main purpose of this chapter is to review theoretical arguments and empirical evidence for the overall hypothesis that the relatedness between different areas of knowledge and different organizational business areas is a key concept for understanding the direction of organizational growth, diversification and search. As will be argued, relatedness is thus also a critical element of internal organizational selection mechanisms and for understanding the differential survival of independent entrepreneurial ventures inside established firms. These forces are important for understanding the internal selection system, and consequently the differential survival of ideas, because

they shape the allocation of organizational attention and the internal resource-allocation system. How relatedness matters in the internal selection system will be, once the antecedents to these micro forces have been explored in the current chapter, be further explored in Chapter Three.

The current literature review draws upon two major streams of research both of which have emphasized how organizational actions are guided and constraint by the current resource and knowledge base of the organization. First, I will draw on the resource-based view of the firm (Wernerfelt, 1984; Barney, 1991; Peteraf, 1993) and the resulting arguments about determinants of the direction of diversification within this perspective. Within this tradition it has been emphasized how overall patterns of organizational diversification exhibit a remarkable degree of coherence (Teece, et.al., 1994). Although organizations tend to become more diverse as they grow, typically moving from a single-product strategy to a multi product strategy and thus entering increasingly diverse markets and accumulating more diverse expertise, their overall degree of coherence remains relatively stable. Thus, just because organizations become more diverse does not imply that their portfolio of businesses becomes less coherent. Rather, the overall evolutionary paths of organizations seem to be shaped by some *relatedness* between the different businesses in which it engages. In other words, as a firm becomes more diverse, the average "distance" to other activities increases, yet the average distance to neighbouring activities does not (Teece, et. al., 1994). Thus, there appear to be a pattern and a logic to the diversification choices of firms that are related to their current base of resources (Montgomery, 1994). From this perspective, the concept of "relatedness" is of crucial importance for understanding the direction of the evolutionary growth and diversification paths of organizations (Rumelt, 1974; Lemelin, 1982; McDonald, 1985; Montgomery and Hariharan, 1991; Silverman, 1999).

Second I will draw upon behavioural and evolutionary perspectives on the firm (Cyert and March, 1963; Nelson and Winter, 1982)⁹. In this perspec-

⁹ Bundling the two seminal contributions of Cyert and March, 1963; Nelson and Winter, 1982 and all the later applications of these views later on together into "behavioral and evolutionary perspectives on the firm" is based on the assumption that, at least with regard to emphasizing uncertainty avoidance, myopia, the reliance upon routines and local search as important characteristics of organizational actions they have very similar views upon organizations and heavily built upon each other. Needless to say there are also a number of important differences between these two views on organizations. For instance, while Cyert and March (1963) emphasize how firm behavior and decision making is the result of the

tive relatedness to the existing knowledge-base of the firm has been emphasized as a major determinant of the organizational search space. A central concept in the behavioural and evolutionary theory of organizations is that of "local search" (March and Simon, 1958; Cyert and March, 1963; Nelson and Winter, 1982; Stuart and Podolny, 1996). Local search implies that the search space of firms, -- that is, the set of new solutions that organizations consider when innovating or trying to solve problems in general -- is typically restricted to the neighbourhood of their current expertise and knowledge (Cyert and March, 1963). Typically, in other words, organizations search for new solutions in fields related to their current expertise, and a firm's R&D activity is closely related to its previous R&D activity. This tendency is also reflected in Cohen and Levinthal's (1990) concept of "absorptive capacity," which suggests that a firm's ability to assimilate and integrate new technological knowledge is strongly associated with its past R&D activity.

In the following review of the literature on corporate diversification and organizational search, I will explore in considerable detail the theoretical arguments for letting diversification and organizational search be guided and constrained by linkages to the existing knowledge base of the organization. While the ultimate prediction with regard to the direction of organizational evolution and growth remains largely the same in these two streams of research, the theoretical arguments for the hypothesis that relatedness matters and that firm actions are guided and constrained by its current knowledge-base are substantially different in these two schools. An attempt will be made to dissect these two lines of argumentation. Also, the literature on diversification and the literature on search differ in their focus on different aspects of the organization. The diversification literature is primarily concerned with determinants of the direction of market entry; it investigates relatedness along a number of different dimensions, such as relatedness of distribution channels, of manufacturing capabilities, of input factors or according to some aggregate measure of relatedness based on SIC codes.¹⁰ The literature on or-

resolution of internal goal conflict through bargaining, emphasize Nelson and Winter (1982) how this conflict can be resolved through the reliance on routines which function as a "truce." We will come back to this important difference in Chapter Three where we will adopt a view closer to the view taken by Cyert and March (1963). Despite these differences, I want to argue they share the main prediction concerning path dependency and local search in organizational action, a crucial feature of the literature review in the current chapter.

¹⁰ However, some studies in the diversification literature also focus exclusively on R&D relatedness (e.g. Silverman, 1999).

ganizational search, by contrast, has become predominantly concerned with determinants of the direction of organizational (re)search and focuses mainly on corporate R&D activities¹¹. Both aspects are important for this thesis; in the subsequent operationalization of relatedness, both aspects will be included in the measurement of relatedness, and technological relatedness is an important dimension in my characterization of the internal selection system of organizations. Finally, these two lines of research differ with regard to the nature of the argumentation for why relatedness matters. While the resource-based view emphasises the *normative* advantages for why firms *should* be guided by relatedness in their diversification moves, follows the behavioural and evolutionary perspectives more a *descriptive* line of argumentation of how organizational actions are *constraint* by bounded rationality and routines. Interestingly, in fairly recent developments in strategy research (Teece, et.al., 1997; Eisenhardt and Martin, 2000) the resource-based view and the behavioral and evolutionary view has increasingly been merged.

Overall, the review of the literature will show that there is ample theoretical and empirical support for the notion that relatedness is likely to be a key determinant of venture survival. In many ways, the support of independent entrepreneurial ventures is a "hybrid" form between pure search and actual diversification as the kind of entrepreneurial ventures which are the focus of this thesis are highly R&D intensive on the one hand, yet, if successful, typically also lead to new market entry. Thus, both the literature on search and on diversification is argued to be important for understanding the differential survival of independent entrepreneurial ventures inside firms.

However, as the review of the literature will also show, there is a paradox in the literature on relatedness. While this concept is of critical importance for understanding the broad patterns of organizational growth and search in whole populations of firms, and thus for understanding the *average* growth paths of organizations, there is still considerable variation in the overall de-

¹¹ I suspect that this exclusive focus on R&D activity in the empirical literature on local search is more a result of searching for proper ways to operationalize the concept than of the initial intentions of its creators as to how and where to apply it (March and Simon, 1958; Cyert and March, 1992). Local search was initially an outcome of behavioural decision research, and its initial formulation was related to the more general question how decision makers search for alternatives given their constraints of bounded rationality. Thus, the application of local search could easily be extended to many other questions faced by organizations, such as which markets are worth entering, not just how to acquire a better understanding of the direction of organizational R&D activity.

gree of relatedness of businesses *between* firms, and there are certainly exceptions to this general prediction. Thus, some firms engage in unrelated diversification (Teece, et.al, 1994; Palich, et.al., 2000), or in non-local search and radical innovation (Methe, et.al., 1996; Ahuja and Lampert, 2001; Rosenkopf and Nerkar, 2001).

Thus, as will be shown many aspects still remain open with regard to the questions when and under what circumstances relatedness matters for understanding the diversification and search trajectories of firms, and specifically for understanding the differential survival of independent entrepreneurial ventures in established firms. Also, I will show that the literature on local search and related diversification has been investigating these concepts on a fairly broad, macro level, typically using large-sample data. Such data are far removed from the actual micro-mechanisms that can help us to understand the underlying reasons why relatedness is important and whether and why its importance might vary. As intrapreneurship is often engaged in only weakly related activities, which are not always firmly embedded into the organization's established routines and expertise, understanding these conditions is of prime importance for shedding more light on my research question. Such neglect of the micro-processes is unfortunate, and Chapter Three will show more in detail how, when and why relatedness matters for determining the direction of organizational growth and which role actors and context play in the process.

2.2 Theories of diversification and relatedness

2.2.1 The rationale for related diversification- economies of scope and asset specificity

Within the diversification literature inspired by the resource-based theory of the firm, arguments that firms should engage in related diversification, i.e. that they should stick to what they know best, have emphasized the economically rational advantages of related diversification¹². As such, the argu-

¹² Clearly, there are also other theoretical perspectives on corporate diversification, such as the market-power view or agency theory (see Montgomery, 1994 for a useful summary of the arguments). While these perspectives provide very valuable insights into corporate diversification, I will focus in this thesis exclusively on the diversification literature inspired by the resource-based perspective. This choice is partly based on the fact that other perspectives such as the market-power view is more concerned with the consequences rather than with

ments in the literature on diversification within the resource-based view are of a normative character. This stands in contrast to the arguments within the behavioural literature on search which is much more of a descriptive kind.

The perspective on diversification within the resource-based view goes back to the work of Penrose (1995) on the theory of the growth of firms. Penrose argued that the starting point for an analysis of the diversification path of the organization is to view the firm as a "collection of resources bound together in an administrative framework" (Penrose, 1995). In her view, firms diversify because they have excess capacity of productive factors and resources. Firms have an incentive to expand as long as expansion provides ways to apply their underused resources more profitably.¹³

Barney (1996) points out that the rationale behind a diversification strategy should be a) that some synergy or economies of scope between the various businesses exists, so that the combination of the businesses generates more value than each business on its own and b) that realizing these economies of scope is less costly for the firm than for external equity holders, who could simply invest in a diversified portfolio of stocks.

Rumelt (1974) and also Porter (1985) distinguish five different activities that might be shared between businesses and thus might be a source of synergies: Input activities, production activities, warehousing and distribution, sales and marketing, and dealer support and service. Such operational synergies might allow significant cost reductions (such as reaping economies of scale by sharing production facilities, thus also making it possible to move faster down the learning curve) or revenue increases (for example, through offering "product bundles" and reducing search costs for customers or by leveraging the reputation of the firm in one product area within another area.) Thus, firms have strong incentives to stick to what they already know, because of the superior rent potential of strategies which make use of the existing resources of the firm (Conner, 1991; Mahoney and Pandian, 1992).

The resource-based theory holds that in as far as resources and assets are valuable, inimitable, non-substitutable and non-tradable in external markets,

the determinants of diversification (Montgomery, 1994) and partly because the resource-based view is, as argued before, is (despite some crucial differences), in many ways similar to behavioural and evolutionary perspectives on the firm, which represent the overall backdrop of this thesis.

¹³ The contributions of Edith Penrose to the resource-based view of the firm has recently sparked a lively debate (Rugman and Verbeke, 2002; Kor and Mahoney, 2004; Lockett and Thompson, 2004).

they are expected to generate rents and provide the foundation for sustainable competitive advantage (Wernerfelt, 1984; Dierickx and Cool, 1989; Barney, 1991; Peteraf, 1993). Thus, another important theoretical reason for the superior rent potential of related diversification, beside economies of scope and synergies, is asset specificity. This is the case, because an asset's rent potential for the firm generally increases with its specificity to that firm (Conner, 1991; Chatterjee and Wernerfelt, 1991). Specific assets typically fulfil the four conditions mentioned above for an asset to be a likely source of competitive advantage since specific assets cannot be traded on external markets (Tece, 1982). Reliance on specific assets allows firms to create pools of idiosyncratic resources which are worth more inside the firm than if sold on the market (St. John and Harrison, 1999). Thus, related diversification is a means of using the most valuable of these resources as fully as possible. Also, if businesses are more related, experience gained in one business can readily be transferred and applied in the establishment of a new business. As a result of relatedness, this transfer is also likely to be accomplished at lower costs and/or within a shorter period of time than is possible for competitors (Markides and Williamson, 1996). Thus, such idiosyncratic resources accumulated inside the firm are more likely to be a source of competitive advantage; they are probably unique and difficult to imitate as they are embedded in the mother organization. By implication, firms should then be able to reap higher returns if they are engaging in related as opposed to unrelated diversification since high resource relatedness allows firms to leverage their existing resources in a way that their competitors are unlikely to achieve on their own and would have difficulty in imitating. These arguments lead Montgomery and Wernerfelt (1988) to make the normative prediction that the more widely a firm diversifies, the lower its average rents should be; this in turn implies that *ceteris paribus* a firm should always consider first to diversify into the market which is as closely related to the firm's existing resource base as possible.

For these normative reasons, we would expect firms to engage in strategies of related rather than unrelated diversification. The implications for the research question underlying this study -- why do certain internally generated ideas and their resulting ventures survive while others are terminated or spun-off into a separate company -- are quite obvious. There is a clear economic rationale for supporting only those ventures which allow firms to reap some synergies or economies of scope between the venture and the existing set of resources. This is especially the case if the venture can be linked

to core, highly specific resources of the parent organization since such resource-linkages are likely to be a source of competitive advantage for the venture and thus also for the parent company. Potentially, it is also the source of an advantage which can be sustained over a longer period of time.

Yet the theoretical arguments of the Resource Based View (RBV) on the importance of relatedness are fairly abstract. Effectively, little attention is paid to issues such as who decides on specific diversification moves and on whether two businesses are related or not. It seems to be implicitly assumed that "management" decides about these issues, but there is no discussion on who specifically makes the decisions, on the hierarchical level where the decisions are made, or on whether everybody always agrees upon evaluations of relatedness. Given that evaluations of relatedness are subjective, we cannot take for granted that everyone will agree on on these evaluations (Farjoun and Lai, 1997; Stimpert and Duhaime, 1997). It is also implicitly assumed that decisions about directions of growth are made based on the assumption of a profit-maximization goal, yet given the assumption of boundedly rational decision makers, it cannot be taken for granted that managers always know which diversification moves will actually lead to a maximization of profits. Rational and optimal evaluations of relatedness also presume that managers always know which are their most valuable resources and thus which resource linkages are a likely source of competitive advantage. Yet as recent research has shown, we cannot assume that managers know what the firm knows best (Denrell, Arvidsson and Zander, 2004 forthcoming).

If the differential survival of independent entrepreneurial ventures inside established corporations is analyzed from a transaction-cost perspective, the predictions are very similar. Transaction costs are determined by expenditures on items such as costs of searching for an appropriate partner for exchange, negotiation and bargaining costs as well as costs of drafting, enforcing and monitoring contracts (Coase, 1937). Transaction costs typically arise as well since one party to a transaction might be subject to opportunistic behaviour from the other (Williamson, 1975, 1985, 1991). Whether opportunistic behaviour is likely to be a problem is determined by the specific attributes of the underlying asset to be exchanged. Teece (1982) suggests two attributes of assets which typically increase the likelihood of shirking contractual obligations and thus add to search costs and ultimately also transaction costs: (tacit-)know-how assets and specialized and indivisible physical assets. From a transaction-cost perspective, the decision whether to keep an

entrepreneurial venture inside or to spin it off or sell it to an external party should be reached by comparison of the costs of co-ordination if the venture is retained and the likely transaction costs if the venture is spun off or sold (Ito, 1995). Apart from the fact that transaction-cost analysis is typically concerned with the opposite decision, namely which activities to internalize rather than which to spin-off, a transaction-cost perspective on the problem underlying this study would probably lead to essentially the same conclusions as those suggested by a resource-based perspective. This is the case because, as outlined above, highly related assets are typically highly firm-specific as well; thus, the higher the degree of relatedness, the higher the likely transaction costs of a spin-off or sale of the venture¹⁴.

Until now, my argumentation has been purely normative and conceptual. Let us now examine the empirical evidence that firms actually behave according to the predictions to be derived from the resource-based view. Empirical research on the importance of relatedness for understanding diversification can be roughly categorized into two branches. The first is mainly concerned with the relationship between the overall degree of resource relatedness of the organization's portfolio of businesses, on the one hand, and corporate performance, on the other. That is, this branch is concerned with testing one of the principal predictions of the resource-based view, namely that a related-diversification strategy leads to better performance than an unrelated-diversification strategy (for an overview of these findings, see Palich, et.al, 2000; see also Markides and Williamson, 1994; Robins and Wiersema, 1995). The second branch of studies is mainly focused on investigating whether relatedness has descriptive value for understanding the larger diversification paths of organizations. In the following review I will concentrate exclusively on this second branch of studies, because this study is not directly concerned with the performance implications of the differential survival of ventures for the parent company, even if an important indirect implication of the findings in this thesis point towards the fact that the survival of more or less related ventures and corporate performance

¹⁴ This is, of course, a strong simplification since a venture might be related to a number of non-firm-specific assets, making the correlation between relatedness and transaction costs somewhat spurious. Yet, it is likely that those aspects of relatedness which are considered important for the spin-off decision are those which are indeed highly specific, for according to the resource-based perspective, they are the most likely source of competitive advantage. This discussion, however, goes beyond the scope of this thesis, which focuses on resource-based and behavioural theories of the firm.

stand in a *reflexive* relationship to each other, where the one is influencing the other and vice-versa.

2.2.2 Related diversification –empirical evidence

There is indeed a fair amount of empirical support for the concept of related diversification. However, these studies vary considerably in their level of analysis (firm vs. industry level), in their operationalization of relatedness and in the dimension of relatedness on which they focus – typically technological relatedness, marketing relatedness or some overall measure of relatedness as implied by the SIC code. Generally speaking, relatedness has been measured and operationalized on a fairly macro, not very fine-grained level, typically relying upon *indirect* rather than direct measures; that is, the degree of relatedness was inferred from other data rather than estimated directly, for instance by asking managers about the degree of relatedness between the businesses of the firm as they perceive it (see Stimpert and Duhaime, 1997 for this point). As Silverman (1999) points out, relatedness has been typically operationalized in one of the following three ways: In the first approach, it has been assumed that relatedness between two businesses can be inferred from similarities in output, that is, product characteristics of two businesses. Most studies within this tradition used the SIC system to estimate the degree of relatedness between two businesses. The second approach relies upon similarities in the intensity of R&D, advertising or some other kind of investment between two businesses in order to approximate relatedness. A third approach was adopted by Rumelt (1974, 1982), who used a mixture of “objective” and subjective measures and defined relatedness along three different dimensions -- products, markets and technology. In these three dimensions, he then classified firms into one of four categories: single business, dominant business, related business and unrelated business. He found that firms focusing on a related diversification strategy were, on average, more profitable than firms focusing on either a single-line strategy or an unrelated-diversification strategy. Although this study was one of the major works which sparked interest in the degree of relatedness in diversification, for our purposes it is only of minor relevance since here we are, as pointed out above, not primarily concerned with the relationship between diversification strategy and corporate performance. Let us instead review the empirical evidence on the role of relatedness in determining trajectories of organizational growth.

One classic study on the importance of relatedness for understanding the evolutionary paths of organizations is that of Lemelin (1982). Studying diversification at the industry level, Lemelin (1982) found that firms whose main activities were technology-based diversified into other technology-based industries and that similarity between origin and destination industries in marketing and distribution channels were significant predictors for the direction of diversification. Similar findings were made in the study by MacDonald (1985). In line with the findings of Lemelin, he found that similarities in R&D intensity are a significant predictor of diversification patterns, as is the similarity in the share of sales to the consumer market. Within this tradition of studies on the industry level, Farjoun (1994, 1998) tried to refine and extend the operationalization of relatedness. In his study from 1994, he introduced the concept of human-resource-related industry groups. Here he operationalized the degree of relatedness between two industries as the extent to which two industries use the same types and proportions of human expertise. He found that relatedness in human resource requirements is indeed a significant predictor of the diversification path of organizations. In his 1998 study, he then argued that relatedness is a concept which in practice encompasses a multiplicity of dimensions, and that this fact had not been adequately taken into account in previous studies. He took an initial step in this direction by incorporating two distinct dimensions of relatedness into his study: first, the physical characteristics of products, which is the dimension typically reflected in relatedness measures based on SIC codes, and second skill-relatedness. He showed that by applying only two different dimensions of relatedness, assessing the "true" degree of relatedness becomes very complicated, as two industries might be highly related in one dimension but only weakly related in another. Thus, determining whether two industries are related or not depends very much on the particular dimension applied.

Another important study was conducted by Montgomery and Hariharan (1991). In this study, the researchers tested whether there was a clear relationship between the resource base of firms and the resource requirements of targeted industries for market entry by these firms. They found that firms indeed chose to enter industries where the resource characteristics were very similar to their own resource profiles, concluding that existing organizational resources strongly influence the direction of organizational diversification.

In a very interesting study, Chatterjee and Wernerfelt (1991) built upon the argument by Montgomery and Wernerfelt (1988) that the diversification

path of firms depends on the underlying resource profile of firms, especially the degree of resource-specificity. In particular, they predicted that firms with more specific resources prefer a related-diversification strategy, while those with a less specific resource profile would rather follow an unrelated-diversification strategy. On the basis of this argument, Chatterjee and Wernerfelt (1991) predicted that whenever diversification draws upon excess financial resources, which are highly unspecific, firms will engage in unrelated diversification, while whenever diversification draws upon much more specific excess physical or intangible assets, then diversification will be more of a related nature. The results partly confirm their predictions. They suggest that firms exhibiting a high degree of research and marketing intensity, and with highly specific resources, have diversified in a more related fashion, while those with high short and long-term liquidity have diversified in a more unrelated fashion. Excess capacity in physical resources did not have any significant impact on the direction of diversification.

Amburgey and Miner (1992) in their study on strategic momentum found that organizations when making diversification moves through mergers tend to repeat prior strategic actions. In particular, their results show that if firms have made a particular type of merger, be it a horizontal, vertical, product extension or conglomerate merger, they will tend to make the same type of merger again, a phenomenon they call repetitive momentum. Furthermore, Amburgey and Miner (1992) could find evidence for the existence of contextual momentum that is decentralized structures increased the chances of mergers which added distinctively new and separate product groups to the firm's prior activities, from which we can tentatively infer that a decentralized organizational structure tends to lead to less related diversification moves. However, they could only find partial support for positional momentum that is the hypothesis that higher current levels of diversification would lead to more mergers related to distinctively new and separate product groups. While not explicitly concerned with the impact of relatedness on the direction of diversification this study shows that the history of diversification moves and organizational structure might have an important influence on the direction of diversification.

In a rather recent study, Silverman (1999) introduced a completely different way to operationalize resource relatedness. He starts from the observation that traditional methods for operationalizing relatedness, as in the studies reviewed above, are far too broad to yield any meaningful predictions about the evolutionary paths of organizations. As an example, he cites

the frequent finding that firms tend to diversify into areas with similar R&D intensity. While this finding may very well be true, it cannot predict whether a pharmaceutical firm would rather diversify into the biotech or the electronic data-processing industry, since both industries exhibit about the same level of R&D intensity. To remedy these shortcomings, Silverman (1999) relies exclusively on technological relatedness and operationalizes this concept in terms of patenting overlap between two businesses. His findings lend further support to the relatedness hypothesis. The results show that firms are likely to diversify into industries in which their existing technological resources are highly applicable and thus tend to enter markets in which they can best exploit their existing technological resources.

In the literature on corporate entrepreneurship, there have also been a number of studies which have empirically investigated the relationship between resource relatedness on the venture level and venture performance. Because the relationship between relatedness and venture performance is not the major focus of this study, the review of this literature will be kept very brief. Studies on this relationship have come to somewhat inconclusive results. In an early, classic study on the subject, Von Hippel (1977) found that market relatedness was an important correlate for internal venturing success. On the other hand, Miller and Camp (1985) noted that sharing corporate customers, plants, and equipment appeared to hurt the profitability of a new venture, whereas sharing corporate marketing programs had no significant impact upon venture performance. Similarly, Sorrentino and Williams (1995) found no significant differences in venture performance between high-, medium- and low-related ventures. In a more recent study, Thornhill and Amit (2000) however, concluded that the degree of fit between a corporate parent and its venture favourably affects the success of a venture.

These studies in the corporate-venturing literature exclusively focusing on the relationship between relatedness and venture performance, however there have been no studies, to the best of the author's knowledge, on the association between resource relatedness and chances of venture survival. This absence is largely a reflection of the fact that most studies in corporate venturing take the existence of entrepreneurial ventures as a given and are concerned with investigating the determinants of venture performance. Thus, these studies typically do not address the much more fundamental questions whether and when corporate ventures survive at all within established firms, or the implications of these questions for patterns of diversification and the growth trajectories of established firms. Thus, the authors of most literature

on corporate venturing seem uninterested in these more fundamental implications of the existence of independent entrepreneurial ventures. Moreover, this question typically cannot be answered by the studies in this literature since practically all of them have sampled only successful ventures.

In summary, there is substantial empirical support for the relatedness hypothesis. When firms enter new markets, their existing knowledge and resource base determines to a large extent which markets they enter, and there are well-established normative arguments for doing so. As Teece, et.al. (1994) point out, this fairly high degree of coherence remains relatively stable over the life-time of organizations. However, they add that this argument holds only *on average* for the whole American corporate landscape. At the level of the single company, there is considerable variation in the degree of relatedness. This high variability is also a direct implication of a large body of research investigating the impact of relatedness on corporate performance; if the degree of relatedness in the diversification patterns of firms did not vary considerably, it would be impossible to measure the effects of relatedness on corporate performance. The same holds true for the studies on the relationship between relatedness on the venture level and venture performance. Thus, demands on relatedness probably vary between firms and -- as I will argue later on -- across different contexts as well. Context is important because it might influence evaluations of relatedness or affect the attitudes toward risk of the actors making the actual decisions about diversification. Specifically, I will show in the next chapter that whether organizations are performing above or below desired levels of performance changes attitudes toward risk, toward entrepreneurial activity inside the firm and supposedly also towards demands on relatedness and thereby diversification. Similar conclusions will be reached about shortcomings from the following review of the literature on corporate search patterns.

2.3 Local search

2.3.1 Theoretical arguments in favour of local search

From a somewhat different theoretical perspective, namely behavioural perspectives on organizations and organizational learning (March and Simon, 1958; Cyert and March, 1992), as well as evolutionary perspectives (Nelson and Winter, 1982; Dosi, 1988; Kogut and Zander, 1992, Zander, 1998), local search is another key concept for understanding the determinants

of the broad patterns of organizational evolution and growth. (The first such concept was related diversification, discussed above.) While related diversification is mainly based on a number of normative arguments that firms *should* diversify into related areas, local search emphasizes more how cognitive limitations, especially bounded rationality, constrain firms in their search efforts. As such, local search is much more a descriptive than a normative concept.

Evolutionary economics highlights the path-dependence in the innovative process. It is argued that the established knowledge base of the organization strongly limits the direction of organizational search efforts as it represents the natural starting point for new searches. Firms are assumed to rely heavily on their accumulated experience to determine what is important and useful. This point is also crucial to the literature on organizational learning (March and Simon, 1958; Levitt and March, 1988; Huber, 1991; Argote, 1999; Denrell and March, 2001) and central to the concept of absorptive capacity (Cohen and Levinthal, 1990). Let us now examine more closely the concept of local search as well as the empirical evidence to support it.

Local search can be defined as the behaviour of any firm or entity to search for solutions in the near neighbourhood of its current expertise or knowledge (Cyert and March 1963; Stuart and Podolny, 1996). One implication of local search is for instance that a firm's R&D activity is likely to be closely related to its previous R&D activity and that firms typically do not cross boundaries between different technological domains, but rather specialize and concentrate on similar technology areas and tend to produce incremental innovations within these areas (Rosenkopf and Nerkar, 2001). Local search can be viewed as a result of three significant and interrelated features in behavioural and evolutionary perspectives on firm actions: uncertainty avoidance, myopia and the assumption that organizational behaviour is guided mainly by routines and standard operating procedures.

Uncertainty avoidance and myopia: The assumption that firms generally exhibit a strong bias against uncertain alternatives and actions is a fundamental feature of the behavioural theory of the firm and its applications (Cyert and March, 1963; Johanson and Vahlne, 1977; Cyert, Sok-Hyon, and Kumar, 1996) as well as of evolutionary perspectives (Nelson and Winter, 1982). As organizations face strong pressures from their external stakeholders towards the reliable provision of goods and services and the generation of a steady stream of profit (Carroll and Hannan, 2000), organizations tend to avoid uncertain actions that might introduce too high a variance in the reliability and

quality of existing products and services as well as the organization's stream of revenues and profits. Organizations typically avoid uncertainty by generally following existing routines and standard operating procedures (Cyert and March, 1963; Nelson and Winter, 1982).

Another tactic used by organizations to reduce uncertainty is to focus on pressing short-term problems rather than on developing long-term strategies (Cyert and March, 1963; Levinthal and March, 1993). Such myopic behaviour strongly favours investments in short-term improvements in the efficiency of existing operations over investments in novel entrepreneurial ideas and strategies. This myopic predisposition of the organization is constantly reinforced by internal learning dynamics since learning constantly increases the relative value of further refinement of existing practices and decreases the relative value of experimentation. Thus, Denrell and March (2001) argue that uncertainty avoidance and risk aversion are not necessarily a natural trait of individuals or organizations, but are a direct outcome of the reproduction of success inherent in learning mechanisms and adaptive processes (Denrell and March, 2001). This dynamic of the reproduction of success ultimately leads organizations into so-called competency traps, which can be said to arise "when favourable performance with an inferior procedure leads an organization to accumulate more experience with it, thus keeping experience with a superior procedure inadequate to make it rewarding to use." (Levitt and March, 1988:322). Such competency traps lead organizations to over evaluate current expertise at the cost of not exploring enough new possibilities and options, bogging them down in a suboptimal equilibrium. This dynamic can result in the paradoxical situation where organizations are stuck in their current competencies because they have become "too good at them;" making it relatively uninteresting to explore new opportunities. Such a situation can easily turn core-capabilities into core-rigidities (Leonardt-Barton, 1992), organizations will then largely ignore new ideas and strategies not directly related to their current core competencies and thus be unwilling to change and explore.

Routines: A third important feature of organizations in behavioural and evolutionary perspectives is the assumption that organizational actions are driven mainly by routines and standard operating procedures. Routines, or "socially constructed programs of action," are relatively stable, often tacit and heavily influenced by the history of the firm and the individuals who have worked there (Nelson and Winter, 1982; Baum, Li, and Usher, 2000). Routines have at least two important functions in organizations. First, they

operate as a "truce". They provide control and ensure co-ordination of the actions of organizational members without the requirement of formal authority and formal control. In this way, they reduce internal conflict and are thus assumed to reduce the inherent conflict potential arising from multiple and local preferences in the firm (Cyert and March, 1992).

The intense focus upon routines within the evolutionary theory of the firm is also a direct consequence of the assumption of bounded rationality. Thus, routines are important secondly because they reduce the information-processing requirements of organizational members. They limit the set of possible alternative actions to a small, manageable number, and the consequences of actions are often known as they are stored in the routine itself. Routines serve as an important store of the experience and learning of the organization and thus reflect to a large extent the intelligence of the organization (Levitt and March, 1988; Argote, 1999). As such, routines are a "backward-looking" form of intelligence (Gavetti and Levinthal, 2000), a result of the history of the firm. The fact that much of the organization's competence and experience is stored in its routines also gives the organization an identity which is partly decoupled from the people working there. Thus, routines or organizing principles represent in many ways the "soul" of the organization, giving it an idiosyncratic character that differentiates it from other organizations. Routines are thereby an important source of competitive advantage.

This social aspect of organizational routines was especially emphasised by Kogut and Zander in their "knowledge-based theory of the firm." (Kogut and Zander, 1992, 1996; Grant, 1996). They conceptualize the firm as a social community and emphasize how the resulting common relational structures and common schemes that evolved inside the firm, what they refer to as the firm's "organizing principles", enhance the possibilities of creating and transferring new knowledge. Kogut and Zander (1993) have shown that MNCs use wholly owned subsidiaries rather than external markets for the transfer and exploitation of tacit knowledge. Thus, without these idiosyncratic organizing principles and the feeling of belonging to a social community, the transfer of knowledge by such means as market transactions, or unintended "transfer" through imitation by competitors, is much more difficult and is likely to take much more time (Zander and Kogut, 1995).

This reasoning has clear implications for the way that we would expect firms to diversify and decide upon their boundaries; in general, we would expect firms to keep new ideas and technologies inside the firm's boundaries whenever the exploitation of this knowledge is more efficient than by means

of market transactions. However, if we follow the reasoning of Kogut and Zander (1996) and contrary to a transaction-cost perspective, whether the internal transfer is more efficient should be independent of the desire to avoid the costs related to opportunistic behaviour. Thus, from this perspective, market failure is not a necessary part of an explanation for firm boundaries and growth, as decisions on boundaries are driven more by internal economics of transformation than by external economics of exchange (Kogut and Zander, 1995). As a result, internal transfer should be more efficient, i.e. have lower internal transformation costs, whenever the knowledge is deeply embedded in the organizing principles and social community of the firm. On the other hand, transfer or exploitation of knowledge or technologies which are only loosely related to the shared understandings and relational structures of the firm, or of knowledge which is easily codifiable or easy to understand, is not enhanced inside the firm and thus will be exploited outside its boundaries.

While intuitively one would expect routines to be especially important for those tasks of the organization that are fairly stable and recurring, such as the recruitment process, the handling of customer complaints or the treatment of standard problems in production, Nelson and Winter (1982) have argued that even innovation itself is guided by routines, so-called search-routines. Traditionally it has been assumed that the creation of new combinations, which is the underlying process of innovation, is the exclusive realm of the entrepreneur, of human agency, discretion and creativity, but proponents of evolutionary perspectives have argued that the process by which these new combinations are created can be considered routine as well (Kogut and Zander, 1992). Thus, the entrepreneur has been replaced by routines for search. In a merger between the resource-based and evolutionary perspectives, Teece, et.al. (1997) launched the concept of combinative capabilities and contended that the ability to create innovations is a distinct organizational capability; that is, these capabilities are "routines to create routines" (Zollo and Winter, 2002). Given the assumption that innovation is a routinized activity, our primary purpose is to investigate the implications of this concept for the likely search trajectories and selection behaviour of firms. Tushman and Benner (2002) maintained that search routines impact the innovative behaviour of firms by reducing variation of ideas, increasing the intensity of learning and altering the internal selection environment of firms. In other words, search routines support innovation, but only a very special kind of innovation that can readily be accommodated into the established set

of organizational routines. Thus, routinized innovation is likely to contribute strongly to the local nature of organizational search.

In summary, it is the combination of these three factors -- uncertainty avoidance, myopia and routinized search -- that has led adherents of evolutionary perspectives to argue for the existence of *local search*. While in largely descriptive behavioural and evolutionary perspectives on firms local search is typically considered a natural outcome of the internal dynamics of firms, it is less frequently emphasised that there is a clear rationale behind local search. Remaining in the neighbourhood of what is already known restricts the costs of the search process and increases the success rate of search efforts (Rosenkopf and Almeida, 2003). This is the case because it makes it easier for firms to judge the viability of different search attempts and allows them to incorporate them into its existing search routines. As Kogut and Zander (1992) point out, extending the search space beyond the near neighbourhood of the established competency base reduces the odds of a successful search effort to those comparable to a start-up operation.

2.3.2 The potentially self-destructive consequences of uncertainty avoidance, myopia and local search

Despite this clear rationale in favour of local search, the dynamics of learning as portrayed in most of the learning literature and the resulting local search also have potentially self-destructive consequences. This is the case because they ultimately lead the organization into a self-sustaining cycle in which the organization mindlessly reproduces what it already knows without allowing for an adequate level of variation by permitting new ideas to survive inside its boundaries (see Figure 2). In this cycle, what the organization perceives is strongly shaped through local search and the dominant logic by the existing knowledge, capabilities and mental models of the organization. As these perceptions are familiar and related to what the organization knows, they represent the least uncertain alternatives for organizational actions which will bring the most immediate pay-off to the organization. Thus, given uncertainty avoidance and myopia, these perceptions are likely to have a strong influence on what the organization ultimately does, and all deviating perceptions which might emerge despite local search and the dominant logic will probably be selected away. These actions are then fed back into the accumulated experience and learning of the organization, i.e. into what it already knows. While the constant reproduction of this circle certainly leads to a strong increase in efficiency, low variance in

quality and profit and further refinement of what the organization already knows, it is also likely to narrow the focus of organizational attention since the firm has strong incentives to pay attention only to those alternatives it already knows and ignore all other deviating alternatives. Thus, these tendencies clearly should lead firms to prefer the exploitation of existing competencies over the exploration of new areas of competence and knowledge (March, 1991) and thus ultimately have an adverse effect on the long-term well being of organizations. These arguments are in line with a dominant argument in many theoretical frameworks, especially in behavioural and learning theories that increasing organizational experience will produce *convergence* in organizational actions and will lead to a reduction in variability of actions (Miner, Haunschild and Schwab, 2003) and thus supposedly also to a reduction of variability of accepted ideas in organizations.

The implications of these tendencies, if correct, for the survival of independent corporate ventures in established organizations are fairly clear. If the tendencies described in the behavioural and evolutionary perspectives on firm growth are correct descriptions of the internal dynamics regulating the search efforts of organizations, then there should be a clear bias against supporting entrepreneurial ventures, and the kind of independent entrepreneurial ventures which are the focus of this study should barely survive in established organizations.

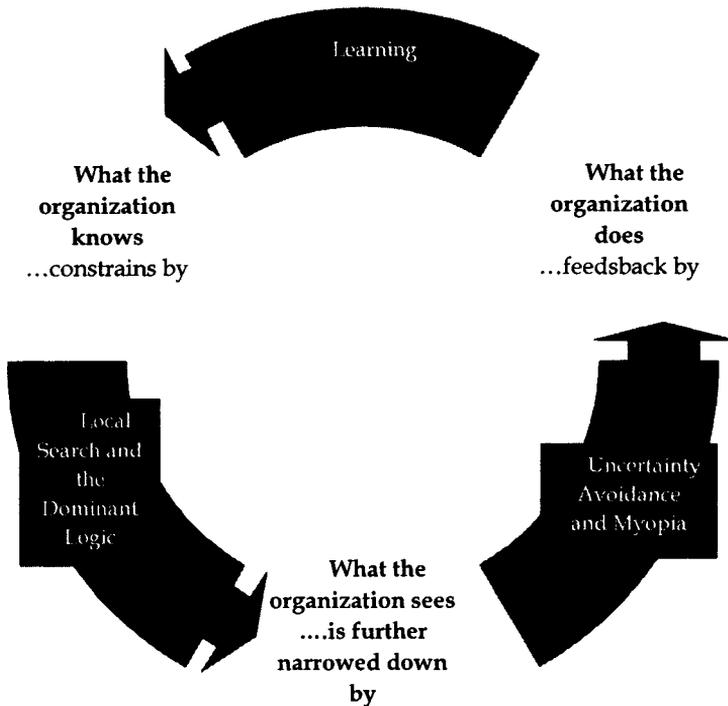


Figure 2 - The self-sustaining circle of uncertainty avoidance, myopia, local search and learning

We will take a closer look at the characteristics of independent entrepreneurial ventures when discussing the characteristics of the intrapreneurial process in greater detail in Chapter Three. This examination will demonstrate that the demands of the intrapreneurial process in practically all aspects represent an "antipode" to the biases that supposedly exist within organizations as discussed above. Specifically, this review of the intrapreneurial process will suggest that the intrapreneurial process can be characterized by four key features: the introduction of a considerable degree of novelty, long time horizons for reaching profitability, an extremely high degree of uncertainty and a high degree of ambiguity with the existence of information asymmetries. Thus, from a behavioural and evolutionary perspective, it is not self-evident that such ventures have consistently high chances of surviving inside estab-

lished organizations for considerable periods of time. Indeed, as has been pointed out earlier (Czernich and Heath, 2002), there has been a tendency in these perspectives to disregard processes which systematically create and sustain variation and novelty as "random mutations" (see for instance Bruderer and Singh, 1996) or as phenomena not frequent and important enough to be worth closer theoretical scrutiny.

In other words, the literature in the behavioural and evolutionary perspectives has provided normative and descriptive arguments for us to expect established organizations to be strongly biased against new entrepreneurial ventures. *Thus, from these perspectives we cannot assume that the kind of independent entrepreneurial ventures which are the focus of this study have consistently good chances to survive in established organizations.* Instead, we might expect that biases towards uncertainty avoidance, myopia and an extensive reliance upon established routines and procedures would make it rather unlikely that established firms would engage in independent entrepreneurship in the first place; if they mistakenly did so, such ventures would soon be terminated or spun off.

Moreover, there is the widespread theoretical argument that established organizations are not appropriate vehicles for entrepreneurship, especially the commercialization of radically new innovations (Henderson and Clark, 1990; Stevenson and Jarillo, 1990; Christensen and Bower, 1996). As the following review of the empirical evidence on the concept of local search will show, there is quite a strong empirical support for the concept of local search which, as pointed out earlier, typically also implies incremental innovation (Rosenkopf and Nerkar, 2003). However, as will also be shown these arguments have not gone unchallenged.

2.3.3 Local search- empirical evidence

The notion of local search has received a fair amount of empirical support. Let us review the evidence. Generally speaking, while local search is a very old concept, launched in the very first edition of the behavioural theory of the firm in 1963, efforts to operationalize and test the empirical validity of this concept is relatively recent, and therefore the number of empirical studies is rather limited (Fleming, 2001). In one of the early studies on organizational search, Helfat (1994) investigated the R&D behaviour of petroleum firms. This study showed that R&D spending by petroleum firms varied little between years and technological areas, supporting the notion that firms tend to search in the neighbourhood of their established knowledge base. In an

early approach to a more rigorous test of the local-search hypothesis, Stuart and Podolny (1996) used patenting data to investigate inter-firm technological overlap in the Japanese semiconductor industry. Their results show that this overlap between Japanese semiconductor firms has remained relatively stable over time, with patenting by these firms tending to focus on the same technological areas as before, thus providing support for the local-search hypothesis. The findings also suggest that one way to overcome the constraints of local search is through alliances and partnerships with firms who have knowledge that one wants to assimilate.

In a longitudinal study of the entry and exit behaviour of all publicly traded manufacturing firms in the US, Chang (1996) found that the applicability of a firm's knowledge base plays an important role in predicting which businesses a firm enters or exits. In particular, he found that firms enter businesses with similar human-resource profiles and exit businesses with different profiles. Martin and Mitchell (1998) concluded that new designs introduced by product-market incumbents in the diagnostic imaging equipment industry were very similar to their prior designs, providing further support to the local-search hypothesis (Martin and Mitchell, 1998). In a more recent study, Fleming (2001) used patent-citation data to investigate the search trajectories of firms across many different industries during a two-month time window. He also found support for the local-search hypothesis and attributes this bias largely to the reduced uncertainty associated with making local combinations of existing competencies (Fleming, 2001).

Kogut and Zander (2000) identified an extreme case of how firms are locally bound in their search efforts as a result of their historical heritage even when exposed to major environmental change. They demonstrated how the break up of the Zeiss company into two companies, Zeiss Jena and Zeiss Oberkochen resulting from the separation of Germany after the Second World War did *not* significantly affect the patenting areas of the respective companies. Even during forty years of separation and despite being exposed to two fundamentally different environments, both companies essentially continued to patent in the same technological areas as the Zeiss company did before the break up.

Taking a behavioural perspective on the innovation process, many studies have also attempted to show that established firms typically miss out on major technological changes and are unable to produce significant innovations which would require them to extend their search efforts beyond the near neighbourhood of existing knowledge. For instance, re-

search by Cooper and Schendel (1976) and Tushman and Anderson (1986) shows that sweeping technical changes with the potential for triggering the process of creative destruction within an industry typically do not originate in industry incumbents, but in firms outside the established industry or from new start-up companies. Similarly, Henderson and Clark (1990) suggest that organizational inertia due to heavy reliance on routines constrains an incumbent's ability to develop capabilities needed for radically new technologies. These arguments have received further corroboration, for instance by Christensen and Bower (1996) and Christensen (2000).

Thus, there is a fair amount of support for the local-search hypothesis, including the argument that established firms are not typically the source of major innovations. The typical source is more likely to be in a small start-up firm somewhere in a garage funded by a gang of venture capitalists. The tendency towards local search and uncertainty avoidance also suggests that established firms are not a very supportive environment for entrepreneurship. However, the findings of these studies have been challenged; several other studies have shown that established firms in fact extend their search efforts beyond local limits and that these are a number of studies have attempted to do more than merely test whether organizational search efforts are, on average, restricted to the neighbourhood of existing knowledge. These studies have introduced independent variables to explain under what circumstances local search should be more or less prevalent. They start from the assumption that local search is not a given, but might vary as a function of certain variables.

Sorensen and Stuart (2000), for instance, investigated the effects of age on the innovative behaviour of firms. They showed that age has two distinct effects on innovation. On the one hand, the number of innovations produced by organizations increases with age. As organizations grow older, they develop routines for search and become more effective at producing novelty. On the other hand, age also leads to widening divergence between the innovations that organizations produce and the demands of the market. In other words, firms tend to lose touch with environmental requirements in their innovative efforts and tend to be more biased towards local search the older they become (Sorensen and Stuart, 2000). This finding suggests that age is one variable affecting the bias towards local search.

The study by Benner and Tushman (2002) also attempts to introduce variables to explain differences in the local limitation of organizational search. In this study of the photography and paint industry, the authors investigate the

effect of adopting the ISO 9000 norm; they use that norm as a proxy for the degree to which routinization in the innovation system of firms affects the kinds of innovations produced. Their results show that the adoption of product-development routines in the form of the ISO 9000 norm strongly reduced the variation in the search activities of firms. While the adoption of the routines did not reduce innovative activities in themselves, it changed the kind of innovations in which the firms studied engaged, and their search efforts became more incremental and local (Benner and Tushman, 2002). This study thus also suggests that the local character of organizational search is not a constant, but might vary as a function of the particular kind of search routines adopted.

There are also studies casting doubt on the hypothesis that established firms always miss out on major technological changes and suggesting that these firms may instead be a systematic and important source of such innovations and an appropriate vehicle of entrepreneurship. For instance, Banbury and Mitchell (1995) found that industry incumbents were common sources of major innovations in the pacemaker industry. Also studying the role of established firms in the creation of new product markets, Methe, et.al. (1996) sought to identify the initial entrants into 12 new product markets in the telecommunications and medical device sectors. They found that diversifying established firms constituted 63% of the first entrants and 74% of the first five entrants in the 12 new product markets, with similar proportions in both sectors. The proportions were also similar for major innovations in established product markets, namely 68% of the first entrants and 73% of the first five entrants.

In their study on corporate entrepreneurship and breakthrough inventions in large corporations, Ahuja and Lampert (2001) show that large corporations can be a source of breakthrough inventions if they experiment with novel, emerging and pioneering technologies, thus overcoming the forces favouring local search and uncertainty avoidance. Furthermore, proceeding from the argument of Stuart and Podolny (1996) that firms might be able to explore beyond local search by forming building partnerships and alliances with other firms, Rosenkopf and Nerkar (2001) and Rosenkopf and Almeida (2003) show that established firms can systematically overcome the constraints of local search through engaging in such boundary-spanning activities. In addition, Fleming (2002) shows how Hewlett and Packard enabled an intrapreneur to develop and commercialize the fairly radical innovation of the thermal ink-jet printer. Several other such cases of breakthrough inven-

tions in established organizations have also been studied by Hargadon (2003). Furthermore, Wallmark and McQueen (1986) in their study on 100 major Swedish innovations in the period between 1945 to 1980 showed that a large proportion of these major innovations emerged and where commercialized inside major, large and established Swedish corporations.

In summary, while there is substantial scholarly work in support of local search and of the argument that established firms are unable to produce radical innovation and provide a fertile ground for corporate entrepreneurship, almost as many studies show the opposite: namely, that established organizations can indeed overcome local search, create radical innovations and thus provide a vehicle for entrepreneurship. These conflicting findings represent a theoretical puzzle similar to the one that emerged from our review of the literature on patterns of diversification. While relatedness generally seems to be a factor in broad macro patterns of corporate diversification, its importance tends to vary considerably in corporate diversification strategies if one shifts the analysis to the firm level.

The existence of this puzzle is also corroborated by the kind of independent entrepreneurial ventures which are the focus of this study. If related diversification and local search perfectly characterized decision-making by established firms about allocating scarce resources into diversification and search, then independent entrepreneurial ventures which typically contradict these constraints could barely survive in established organizations. Consequently, knowing when they do survive will help us to determine how local search can be overcome and what factors might contribute to a better understanding of variability in the requisite degree of relatedness.

Penetration of these questions, however, calls for a much more detailed investigation into the inner workings of the organizational selection system. It also requires the introduction of variables other than organizational demands for relatedness. These compensating or complementary variables would give us a more detailed understanding of differential venture survival; in particular, they could help to explain why requirements of relatedness and biases towards localized search exist and how they might be overcome. In the following chapter, such a detailed analysis of the inner workings of the organizational system of selecting new ventures will be undertaken. This analysis will refine our understanding of the micro foundations for why and when relatedness matters for the growth trajectory of firms. Furthermore, this analysis is intended to remedy some of the major shortcomings of the literature on diversification and search reviewed above.

It should also make it possible to derive a number of novel hypotheses about determinants of venture survival and thus also the direction of corporate growth. These hypotheses go beyond the general notion that "relatedness matters," that "search is local" and that growth trajectories are "path-dependent" by adding an investigation of the role of specific actors and the role of the performance history of firms to the discussion. Let us briefly review and summarize the shortcomings in the existing literature.

2.4 Setting the stage for the further analysis: A critique of the studies on related diversification and local search

The studies on diversification and search reviewed above have some conceptual and methodological weaknesses. On the most general level, the major weakness of the studies within behavioural and evolutionary perspectives on growth and diversification is that they investigate their research questions on a very abstract, macro level. Typically, studies in both traditions have focused either on investigating the overall diversification or search profiles of firms or a whole population of firms, or on detailed case studies, typically of one project. Hardly ever have there been systematic detailed quantitative studies on the level of single diversification or research projects (Ramanujam and Varadarajan, 1989; for a rare exception see the study of Pennings, Barkema and Douma, 1994). Furthermore, these studies obviously include only those search and diversification attempts that actually led to a tangible and measurable outcome, omitting the probably numerous failed attempts that did not lead to an ex-post equally observable outcome.

These biases are somewhat unfortunate. Aside from the problem that these studies can provide only a very rudimentary insight into what is actually going on inside the firm, macro studies biased towards successful trials can only investigate the broader, *average* patterns of search and diversification. They do not allow more refined analysis of the differences between the failed and successful search and diversification moves of firms. Nor does such a biased sampling approach allow us to conclude that firms never engage in unrelated diversification or non-local search. Thus, the fact that we ex-post do not observe any non-related projects in firms does not mean that organizations do not engage in such projects; it simply means that these pro-

jects had not led to any successful and/or equally visible diversification and research projects at the time the study was conducted.

These problems are further aggravated by the specific way in which relatedness and "localness" has been measured. Generally speaking, relatedness has been measured in two different ways (Ramanujam and Varadarajan, 1989; Silverman, 1999). One way is with "objective" measures such as SIC codes or similarities in investment intensity between different industries, such as R&D intensity or intensity in marketing expenditure. The other way, following the lead of Rumelt (1982), has been with subjective, yet still very macroeconomic measures of relatedness. Silverman (1999) was one of the first use patents to measure "technological relatedness." The same is true for the search literature, which has almost exclusively relied on patenting overlap to operationalize local search. Patenting data suffer from general weaknesses, such as variation in the propensity to patent in different industries (see Fleming, 2001 for an overview). In addition, patenting data, like the operationalization of relatedness in the diversification literature, are a crude, ex-post measure of localness at a very general, macro level of analysis, often spanning several industries and hundreds of companies within one study. Nevertheless, using patenting data is certainly a very powerful approach for systematically assessing the search space of organizations.

One further problem of these measurement approaches is that they do not capture the actual *perceived* degree of relatedness inside the firm, which is the most relevant for understanding the role of relatedness in search and moves to diversify (Stimpert and Duhaime, 1997). Similarly, Nayyar (1992) distinguishes between potential and actual degree of relatedness. He argues that traditional measures of relatedness only capture what could potentially be perceived as related, whereas only by empirically assessing actual perceptions inside the firm can one draw any meaningful conclusions about the actual importance of relatedness for the diversification and search decisions of firms.

A further problem in both studies on diversification and search is that they typically only investigate one aspect of relatedness at a time; hardly ever do they recognize and incorporate the fact that relatedness in reality is a multi-dimensional construct. Thus, two businesses or search areas might be related along a technological dimension, they might share demands on manufacturing capabilities or they might share common distribution channels; however, just because two businesses are related along one dimension does not automatically imply that they are also related in other dimensions.

Thus, assessments of relatedness between two businesses are likely to vary depending on which specific dimension of relatedness is investigated. Yet, with rare exceptions like the study by Farjoun (1998), this multidimensional character of relatedness is often not investigated further.

Patenting data, for instance, obviously allow only for an assessment of one dimension of relatedness, technological resource linkages; it cannot be used to study the role of other dimensions. The multidimensionality of relatedness, however, might help to explain why we observe variation in the degree of relatedness in the diversification profiles of firms. For instance, one dimension of relatedness may be a dominant "pipeline of growth" (Zander and Zander, 2003) -- an example would be sharing common market and distribution channels; firms would then care only about a high degree of relatedness along this one dimension in deciding about the direction of diversification. A high degree of relatedness along one dominant dimension might then compensate for a lesser degree of relatedness along other dimensions, like manufacturing. These kinds of hypotheses cannot be explored with methods focusing on only one relatedness dimension at a time.

On a more conceptual level, Farjoun and Lai (1997) investigate the implications of the argument that relatedness is a cognitive, subjective and constructed concept (see also Prahalad and Bettis, 1986). Given the subjective character of relatedness, managers can be expected to make errors in their assessment of relatedness; firms might therefore exhibit much more inconsistency and variation in their diversification moves than generally assumed. In particular, these scholars argue that judgements about relatedness are highly dependent on the *specific context* in which they are made and highly sensitive to the way in which the judgement task is *framed* (Farjoun and Lai, 1997). These influencing variables can lead to specific biases in assessments by managers. Particularly, they can cause managers to systematically over-or underestimate the true degree of relatedness. These biases have direct implications for the diversification strategy of firms, as managers who overestimate the true degree of relatedness between the resources of the organization and the resource requirements of the target business might decide to enter an unrelated business with unjustified expectations of relatedness and synergy.

Assessments of relatedness by key decision makers in the case of entrepreneurial ventures might be especially open to influence and context-dependent. As will be discussed more in detail in the next chapter, such assessments are, further complicated by the presence of internal information asymmetries. The intrapreneur has a very good understanding of the true

degree of relatedness of the venture. He who knows by far the most about the actual nature of the venture and especially during the resource-mobilization process, works with the venture on a daily basis. In other parts of the organization, by contrast, managers are exposed to the venture only on an occasional basis and thus might not be equally well informed. Nevertheless, it is these managers who have to approve the allocation of resources to ventures, supposedly based on their assessment that the venture is aligned with the overall resources, goals and strategies of the parent organization.

One further conceptual weakness of the studies in the evolutionary and behavioural perspectives on firm growth is that they almost exclusively focus on the role of knowledge and routines for understanding the search and diversification trajectories of firms. Hardly ever are other variables integrated into the explanation. I already argued in the introduction that the role of individual actors, the strategies employed by key actors such as intrapreneurs to persuade and to build social support as an important explaining variable are totally neglected in these studies. Yet especially in more exceptional and strategically critical actions of firms, such as entering a new market or supporting a new internal venture, individual actors probably play a considerable, if not crucial, role. Furthermore, studies on diversification and search within the behavioural and evolutionary perspectives typically do not consider the impact of the specific *context* in which decisions about the direction of diversification and search are taken. Thus, these studies might *overestimate the consistency of organizational actions*, probably because of a strong focus upon capabilities and routines and a total neglect of actors. Hardly ever it is considered in these studies that search and diversification decisions of firms might be highly context-dependent and thus vary considerably. Both the context-dependency of action and the importance of actors might in turn help to explain the variability in requirements of relatedness and to indicate when and why firms might overcome biases towards local search.

In addition to the specific design of the research in this study, the following conceptual chapter is intended to address these shortcomings. The conceptual chapter provides a qualitatively grounded analysis of the workings of the internal selection system of firms. This analysis provides the basis for the hypothesis which will then be tested with a Cox proportional hazards model. Chapter Three explicitly addresses the issue of the multidimensionality of relatedness and investigates its implications for the kind of ventures that might survive in a multidimensional selection environment. Furthermore, it is argued that internal selection works like a multiple-layered sys-

tem, with new explanatory variables for investigating the role of actors and context. The problems related to the measurement of relatedness are treated, with relatedness in this study measured according to the actual perceptions of key informants inside the firm in regard to relatedness along a number of different dimensions. The problem of over-sampling success is addressed by including in the sample a balanced collection of successful and failed ventures, or more specifically of ventures that are retained and not retained.

The Micro Perspective

The clash of logics: The entrepreneurial process and the internal selection system for ideas

3.1 Overview

The previous chapter has provided an overview of the broad macroeconomic tendencies in organizational growth and evolution as well as the macro forces shaping the direction of growth. In this chapter I will attempt to investigate on a fairly detailed level the micro forces which give rise to these macro patterns. It is argued that ultimately ex-post observed patterns of organizational growth and diversification are the result of the micro-processes in the internal selection system of organizations - that is, the interrelated set of factors which selects one direction of growth over another. In this thesis this selection system is investigated in the context of intrapreneurial ventures, an important source of internally fuelled corporate growth and thus an important phenomenon influencing the direction of corporate growth and diversification. Selection is important because the people in organizations give rise to many more entrepreneurial ideas and initiatives than organizations have the attention and financial resources to support (Burgelman, 1991; Bhidé, 2000; see also Davenport and Beck, 2000; Hansen and Haas, 2001 for a similar argument in a different context). Thus, organizations need to allocate attention and resources selectively and hence to decide constantly which directions of growth manifested by new ventures to pursue and which not to pursue.

The chapter is organized in two parts. The first part provides a brief characterization of the intrapreneurial process and illustrates how the demands of this process stand at odds with the various biases inside organizations re-

viewed in the former chapter. In the second part, which is more substantial, the three layers of selection, or filters, of the organizational selection system are investigated -- evaluations of relatedness, filters related to the specific context in which selection takes place, and filters related to the actors involved in the process. The discussion suggests ways in which the actors themselves can strategize to increase the chances of passing through these filters. From an evolutionary perspective, the intrapreneurial process, on the one hand, and the organizational selection system on the other, represent sources of variation and mechanisms of selection, respectively. The logics underlying these two processes are fundamentally at odds with each other (Campbell, 1965). Hence, when entrepreneurial "ideas meet organizations" there is a basic "clash of logics." Yet, at the same time *processes of variation and selection in organizations are highly dependent upon each other*. Entrepreneurial ideas need the attention and resources of organizations in order to be realized, and organizations need the ideas and initiatives of entrepreneurs as an important source of growth and development. In this interplay between processes of variation and selection inside organizations, the R&D department, at least in the cases analyzed in this thesis, plays a crucial role, for this department is both the major source of variation for organizations and the first hurdle of selection.

The purpose of the following chapter is threefold: a) to describe more in detail the nature of the intrapreneurial process; b) to describe the nature of the internal organizational selection system and how it gives rise to the basic tendencies shaping the direction of organizational growth as identified in Chapter Two; c) to derive predictions for the conditions where the clash of logics between entrepreneurial ideas and organizations can be reconciled and the two can be linked to each other. The purpose of such reconciliation is to enable new entrepreneurial ideas to survive, to amend and change the established organizational system of rules, routines and local interests and to shape the direction of organizational growth. These predictions result in a number of testable hypotheses about the conditions where one can expect entrepreneurial ideas and ventures to survive in established organizations. It is hoped that a better understanding of these mechanisms can ultimately contribute to a better understanding of a number of controversies identified in the former chapter. These controversies concern local search, related diversification, whether and when organizations engage into entrepreneurship and radical innovation, and more generally the determinants of the direction of corporate growth and the consistency of the organizational growth paths.

The analysis is to a large extent based upon 103 interviews which were conducted in the course of the empirical research project. Further details on these interviews will be provided in the Chapter Four, which is devoted to research design and method.

3.2 Intrapreneurship as a process of resource-mobilization, recombination and persuasion

Entrepreneurs want to make their ideas happen. Yet in order to transform their ideas into ventures and eventually into whole new business areas, they need organizational support and critical resources. Such support does not come naturally. However brilliant their idea and however beneficial its implementation for the whole organization might be, entrepreneurs can expect considerable resistance from within the organization when trying to build their ideas into businesses (Howell and Higgins, 1990; Day, 1994; Dougherty and Heller, 1994; Dougherty and Hardy, 1996).

Starting a new venture is about mobilizing a set of different resources, recombining them in a new way and putting them to work for the benefit of the new venture (Shane and Venkataraman, 2000; Sorenson and Sorenson, 2002). This basic nature of the entrepreneurial process is the same irrespective of whether it is conducted in the market or inside large organizations (Starr and McMillan, 1990). Just as entrepreneurs need to mobilize resources from different transaction partners in the market place, so intrapreneurs must put together and mobilize resources from different places inside the organization. On the most general level, what entrepreneurs do is to link together factor markets and product markets in a new way.

Despite these basic commonalities between the entrepreneurial process inside and outside organizations, however, there are also a number of major differences. Intrapreneurs do not have as much leeway as entrepreneurs in pursuing their personal visions and goals. Rather, an intrapreneur is forced to align her/his personal visions and goals with those of the organization (Hellman, 2002). While the only relevant selection criterion for an independent entrepreneurial idea outside organizations is the potential success of the venture on the marketplace¹⁵, the intrapreneur and intrapreneurial ideas are

¹⁵ We exclude here those ventures which manage to secure funding from venture capitalists and which hence were forced first to pass the selection hurdles in the venture capital industry in order to get access to their attention and funding.

exposed to a number of other control and selection mechanisms. These evaluate the viability of an idea and the alignment between the idea and the vision and strategy of the parent organization before the venture can be commercialized and put on the market (Bhide, 2000). Indeed, this evaluation of the alignment between the goals and strategies of the parent organization and those of the venture is an ongoing process throughout the life-time of a venture. A number of ventures in the sample underlying this study were sold, spun-off or terminated long after their product was launched on the market.

In exchange for this restriction on the freedom to pursue the visions and goals of a venture, the intrapreneur can obtain, at least theoretically, access to the vast pool of resources, routines and experience available within the mother organization. Instead of first having to build a brand, customer relationships, distribution channels, manufacturing facilities, supplier relationships etc., established multinational organizations, especially large ones, normally have these resources already in place. Potentially, this gives independent ventures inside organizations a huge advantage over independent ventures on the market place. Yet gaining access to these resources and putting them to work for the benefit of the venture is highly challenging since it might require the various resource providers inside the firm to take action that would conflict with their goals and interests. For instance, the manufacturing unit of the organization might be reluctant to invest time and resources in adapting the established manufacturing system to the entrepreneur's new product, for the relative value of producing more of the same established products is much higher for the manufacturing unit than that of investing time and resources in learning to produce a new product in initially very small volumes.

The mobilization of necessary resources includes the construction of a prototype in order to demonstrate the technological feasibility of the idea, sourcing and logistics of the necessary components for the product, the establishment of manufacturing facilities, and the establishment of market and distribution channels and of marketing support. Moreover, this resource-mobilization process must respond to a number of partly contradictory demands and logics inside the organization. Thus, evaluating the alignment between the goals and strategies of the venture and those of the parent organization is far from straightforward, since the parent organization pursues multiple, local and partly contradictory goals (Cyert and March, 1992). Each kind of resource -- be it supplier relationships, manufacturing

facilities or the sales force -- is under the control of different areas and departments of the organization, each with its own local logic and interests and each representing a part of the internal selection system of the firm. With this assumption of multiple local and partly contradictory goals and logics our view differs from Nelson and Winter (1982) and Kogut and Zander (1996) who assume that such internal goal conflict is resolved through routines and organizing principles who function as a "truce."

We envision the internal selection system of the firm as a system in which each local unit evaluates an idea based on the *relatedness* to its established system of resources and routines. This makes the value of ideas very local as ideas might easily be linked to some established resources and routines in one part of the organization, while not fitting into the established resources and routines of another area of the organization, where it would demand a greater investment of time and resources. As a result, some units might consider a venture to be highly interesting and valuable, finding it is closely related to their local interests and competencies, while another unit might regard the venture as not relevant at all and thus decline to provide support or resources. I envision the intrapreneurial process as one by which the entrepreneur tries to overcome the possible resistance within each local selection system originating from a possible lack of relatedness between the idea and local interests and resources. In this process, the entrepreneur tries nevertheless to gain support and mobilize resources for the venture (Starr and McMillan, 1990; Day, 1994). This mobilization is further complicated by an additional factor: the demands of the intrapreneurial process stand in sharp contrast to biases towards avoiding uncertainty and novelty, toward myopia, and toward local search. These biases arise from external competitive pressures for fast and reliable provision of products and a steady stream of profit, and from the internal dynamics of learning.

Such a view of the internal selection system and the necessity to mobilize resources for support within it raises a number of important questions with regard to the differential survival of ideas and ventures, namely: What kind of ideas and their resulting ventures are likely to pass through, mobilize resources and survive in such a system of multiple local selection logics and what kind of strategies by intrapreneurs might enhance the chances of ventures to pass such a system? Will it be the ventures that by somehow being related to all local logics *simultaneously* can satisfy all local demands, or will it rather be the ventures which are strongly linked to one local logic at the cost of having weaker linkages to the other local selection logics? Furthermore:

Are survival chances of ventures enhanced if the intrapreneur manages to build direct relationships to top management or if the intrapreneur invests considerable effort and time to convince others about the viability and value of the venture? Finally, are chances to survive in such a system significantly different if the parent organization is currently performing above or below its aspired level of performance and if yes, why? After further characterizing the different local selection logics inside the firm, it is these kind of questions which will be investigated in the current chapter.

3.2.1 The basic characteristics of the intrapreneurial process

A review of the literature on intrapreneurship suggests that the intrapreneurial process can be characterized by four main features: novelty, long time horizons until profitability, an extremely high uncertainty and a high degree of ambiguity with the existence of information asymmetries. I shall briefly discuss each feature more in detail.

Novelty: Internal ventures differentiate themselves from other research and development projects inside the corporation by introducing a considerable degree of novelty into the set of established businesses (Burgelman, 1983; Block and McMillan, 1993). Thus, new entrepreneurial ventures, unlike other R&D projects embedded in the established lines of businesses, are not about a simple extension or refinement of an existing product line. Rather, their purpose is the development of a major new product, a substantial extension or change of an already established product line, the development of new markets or the development of a significant new technology (Block and McMillan, 1993). These new products, markets or technologies may be more or less related to the existing set of products, markets and technologies of the mother organization.

Long time horizon: The introduction of a significant degree of novelty into the established organization also implies that internal venture projects normally take much longer to develop than a standard R&D project whose purpose is simply to refine an existing product. Burgelman (1983) has shown that the development of a new venture goes through a number of stages. It starts with the initial definition of a new business opportunity, typically by people in rather low hierarchical positions hidden and independent from top management (Burgelman, 1983). In the later, so-called impetus stage, venture management attempts to obtain the official approval of top management. Once approved, the venture forms its own organization and officially receives resources from the firm (Burgelman, 1983). It is typically not until this

stage that an initial product is launched on the market. It normally takes at least another 3 years from product launch until the product can gain some significant market share, and even longer until the venture breaks even. Big-gadike (1979), for instance, has shown that it took on average 12 years for the ventures in his sample to break even.

High uncertainty: In addition to the long time required until the venture becomes profitable, it is highly uncertain whether a venture will actually manage to survive to this stage. New ventures have a significantly higher degree of uncertainty and risk than projects aimed at further developing the base business of the mother organization. (Burgelman and Sayles, 1986). For instance, estimates of the performance distribution of investments in the venture capital (VC) industry have shown that only 6.8 percent of the portfolio companies of VC funds account for 50 percent of the returns, whereas 34.5 percent of company investments result in partial or total loss (Gompers, 1994). A general rule of thumb in the VC industry is that only 1 out of 10 start-ups become highly successful; the remaining nine either do not manage to grow significantly or lead to outright failure. This data on the performance distribution of ventures in the venture-capital industry are also confirmed more generally for the performance distribution of innovative activity inside and outside organizations, for instance in the research by Scherer and colleagues (Scherer and Harhoff, 2000; Scherer, Harhoff and Kukies, 2000). Thus, internal venturing is an extremely uncertain endeavour with low odds for success.

Ambiguity: Finally, the whole internal venturing process is characterized by a considerable degree of ambiguity and cognitive complexity, while at the same time it is firmly embedded in an inherently social environment (Lounsbury and Glynn, 2001; Aldrich and Fiol, 2001). Especially during the early stages of development, no one knows exactly what the venture eventually will turn out to be. Ideas are typically very fragile and ambiguous concepts which allow for a vast range of possible interpretations and paths of further development (Shane, 2000). Bhide (2000) has shown that ventures sometimes change considerably during their course of development. Baker, Miner and Eesley (2003) have argued that the founding process of new ventures outside established organizations can be described as a process of improvisation and bricolage. This is confirmed from my own interviews with entrepreneurs inside and outside organizations. They often mention that during the early phases of development, it is highly unclear what the product actually will deliver to which customers and thus how the new venture in fact relates to

the existing knowledge and resources of the mother organization. This ambiguity is further amplified by the existence of information asymmetry in which the intrapreneurs know more about the underlying technology as well as the further planned path of development of the venture than the resource allocators who decide about the fate of the venture (Day, 1994; Smith and Smith, 2000).

Hence, the nature and demands of the entrepreneurial process are fundamentally at odds with the overall forces impinging on the internal selection system, such as uncertainty avoidance, myopia and routines as assumed in the behavioural and evolutionary perspectives on firm growth. This view is consistent with the argumentation of Campbell (1965) which has argued that processes of variation, represented in this thesis by the emergence of independent entrepreneurial ventures on the one side, are fundamentally at odds with processes of selection, represented in this thesis by the demands of the internal selection system of firms on the other. In order to understand when these ventures nevertheless can survive and succeed inside established organizations, despite this fundamental clash of logics when ideas meet organizations and thus in order to better understand when organizations are willing to support variation and exploratory activity we need a better understanding of the dynamics of internal selection.

3.3 The characteristics of the internal selection system

In order to understand the process from an entrepreneurial idea to the eventual launch of a new product or entry into a new market, and in order to understand why some ideas survive this process while others do not, we need to separate this process into three different stages, where moving from one stage to the other is regulated by a set of different selection mechanisms. I argue that selection process in each stage of development is driven by a different logic with somewhat different goals and preferences. Thus, in order to understand overall organizational selection, we need to first understand that this overall selection system is not a coherent, sound and consistent system, but a *nested system driven by a set of different and partly contradictory local logics and preferences* (Cyert and March, 1992). Such local logics shape decision making by determining what kind of issues and alternatives are attended to by decision makers (March and Olsen, 1976; Ocasio, 1997). In as far as these lo-

cal logics vary, attention paid to and support given to the same ideas and ventures might vary within the same organization, or to put it the other way round, depending on the local logics present in certain parts of the organization the allocation of attention and the support given to entrepreneurial ventures might considerably vary. We will argue below that a major dimension along which such preferences might vary regard the *degree of relatedness and hence also the degree of novelty* of the venture. It will be argued that while the R&D department not only tolerates but even demands considerably new and different ideas and ventures, demands the market organization novelty, but of a much more incremental kind, while the sourcing and manufacturing unit does not tolerate any novelty at all unless it can immediately be produced in large volumes. Thus, selection logics stand in considerable conflict to each other.

This nested and incoherent system of internal selection is, as already explicated above, in place in three different locations in the corporation: the R&D organization, the market organization and the purchasing and production organization¹⁶. I focus on the local logics of these three sub-organizations because they incorporate all the major aspects of organizations which link factor markets to product markets and which intrapreneurs need in order to commercialize their ideas and launch the resulting products on the market. It is also these three parts of organizations that the diversification literature has identified as the main drivers of the direction of organizational growth, as demonstrated in the review of this literature in the former chapter. Thus, linkages to sourcing and manufacturing resources, to technological and R&D resources and to sales and distribution resources are likely to be the most important predictors for the directions of organizational growth, search and diversification. These were also the three aspects to which interviewees most frequently referred when discussing the importance of relatedness for understanding the differential survival of entrepreneurial ventures. Finally, these three aspects emerged out of a factor analysis of all the items aiming at assessing the degree of relatedness of the venture to its parent included in the survey.

A second important feature of the internal selection system is that selection needs to be considered as a process taking place over time. Thus, ven-

¹⁶ In contrast to trying to pass each local selection system, intrapreneurs and ventures might also attempt to surpass these different local selection logics which are likely to be most present on the level of middle management (Burgelman, 1983) by directly building up relationships to top-management. This possibility will be considered later on in the chapter.

ture selection is *not* a decision taken at a certain point in time by a distinct group of people. Selection as a process implies that an innovation project at every point in its lifetime is at risk of being terminated. Thus, projects and also new products or new processes in organizations are never fully "internalized" into the organization. They exist until they are terminated or replaced by a new product or process. The fact that we observe project X to exist at time *t* does not imply that the organization has ultimately selected the project as part of corporate strategy; it simply implies that the organization has not yet terminated it¹⁷.

The time dimension is important, because the nature of the project and the nature of the underlying innovation -- in other words, the object of selection -- change over time. In particular, as the venture goes through different stages of development, the clarity, focus and transparency of the venture is step-by-step increasing. Over time it becomes more and more clear what the eventual innovation and the resulting product will look like, what functions it will fulfil, how it needs to be produced and how it needs to be marketed, sold and distributed. Thus, the degree of relatedness to the various resources and routines of the organization becomes increasingly evident. Venture development is also a process of gradually decreasing information asymmetries between those who suggest innovations and those who decide whether to support them -- that is, between intrapreneurs and selectors. In very early stages of development, such information asymmetries are likely to be severe, while they are reduced the further the project proceeds. The ambiguity surrounding new ideas and ventures opens up an "*interpretive space*" which especially in early stages of venture development gives the intrapreneur the opportunity to shape the image of the venture in the mind of the selector and thus influence the survival chances of the venture. I will come back to this point later on.

Burgelman (1983) distinguishes between different stages of the internal corporate venturing process. The definition of new business opportunities normally takes place in corporate or business-unit R&D labs¹⁸. This pre-venture stage is largely an autonomous process, initiated by particular individuals or a small group of individuals, hidden from management and independent of management direction. In this stage, new technologies are

¹⁷ This also has important methodological implications for a quantitative study of organizational selection processes, to which we will return in a later part of the study.

¹⁸ Other locations for the emergence of new business ideas are equally possible.

conceptualized, and at the end of this conceptualization phase, new technologies are further elaborated in the form of prototyping (Christensen and Bower, 1996). Sometimes, out of this process of pure research and experimentation, a new business idea evolves. In order for the idea to become an official venture, it needs the official approval of management. At this point, it enters the critical impetus stage, which determines whether the autonomously formed business idea will receive approval and funding or be rejected and/or ignored by top-management. Once the idea is formally approved, the venture forms its own organization, with its own management and official allocation of resources by the firm (Burgelman, 1983). *In this way, the autonomous business idea has taken a first important step towards becoming linked into the mainstream of corporate strategy.* However, the alignment between the venture and corporate goals and strategies will be evaluated on an ongoing basis even after the idea has received an official venture status.

This discussion also highlights a third dynamic of internal selection, namely that selection takes place across various hierarchical levels, especially from middle to top-management. The positions of selectors vary from the heads of R&D departments to the heads of the various organizational divisions to staff members and the CEO. Over time, selection is likely to take place at ever-higher levels of the corporate hierarchy. This tendency is important to understand because survival of projects without a natural home in the organizational budgeting process is to a large extent ultimately an interpersonal matter. The fate of a project is to a considerable extent decided in interaction between the originator of the idea and the small group of people working with the venture, on the one hand, and a group of organizational "selectors", on the other. These selectors are typically corporate R&D managers and later on staff members until the process reaches the CEO-level. This, however, does not mean that selection is arbitrary. Selectors are largely driven by a set of rules, criteria and experiences that they have absorbed in the socialization process of their careers. Thus, even at higher hierarchical levels, including that of the CEO, the three local logics are likely to influence the judgement of selectors through their experiences in the course of their careers. As one CEO of a high technology company (Firm 1) pointed out when asked about how he selects proposals for new ventures.

"The evaluation of new projects is based on...a number of iterations in the personal world of experience.... from the product idea to the first sales of the product.....if you have done this a thousand times, you know where

the hidden obstacles areyou go through all components in the realization of a product.....this type of judgment is constantly made in the boardroom." (CEO, Firm 1)

Thus, also at higher hierarchical levels, where managers at least in theory have the influence to overrule possible opposition inside the various departments of the firm, selection is certainly driven by an organizational "logic" or "organizational code" (March, 1991; Kogut and Zander, 1992, 1996). This overall selection logic is likely to incorporate judgements about relatedness and the possibility of leveraging the existing organizational resources and routines.

Yet the fact that in the final analysis selection is also an interpersonal and thus highly subjective process implies that it is not quite as rigid and "hard-wired" as the concept of a common organizational code, or as in the case of innovation, common "search routines" would imply. Thus, the concept of "search routines" or organizing principles to explain the scope of organizational search is useful, though incomplete, concept. Especially with early-stage innovations which the organization has neither planned nor budgeted, established search routines might fail. In these cases, selection of innovation and opinions about relatedness are ultimately a matter of human (and thus fallible) judgement (Farjoun and Lai, 1997). We can think of selection in the early development of an idea as a "peer-review process," one conducted by highly qualified people who nevertheless are strongly influenced by their personal opinions and judgements. For these reasons, selection is never fully consistent, and ventures might pass the selection system even if they exhibit varying levels of relatedness; even very poorly related ventures might be approved and thus clearly deviate from the established system of routines and resources. One highly successful innovator at a major Swedish corporation (Firm 2) who today is a professor takes a radical position on this issue. As he stated in an interview:

"Judgement of new ideas and new technologies is nothing to vote about. It is not a democratic or objective process, but highly subjective and individualistic."

Thus, sometimes the personal judgement of a small number of people might "overrule" the selection system as represented by linkages to the various areas of the organization. For the study of selection processes, this implies that we would expect to find some broader patterns in organizational

selection of innovation projects, and that these patterns are likely to reflect relatedness to the three local selection logics inside firms. However, it also implies that these patterns are likely to be highly dependent on the specific context in which we observe them and that they may also be influenced by personal relationships between intrapreneurs and selectors, a point to which I will return later in the chapter. Let us now have a closer look at the three major local logics of selection inside large established firms¹⁹.

3.4 The first layer of selection – Relatedness and the local selection logics inside the firm

3.4.1 The creation of variation and the first stage of selection: The R&D department and the selection logic of engineers and scientists

“In all exploratory behaviour, whether artistic or scientific, there is the ever-present battle between the neophilic and neophobic urges. The former drives us on to new experiences, makes us crave for novelty. The latter holds us back, makes us take refuge in the familiar. We are constantly in a state of shifting balance between the conflicting attractions of the exciting new stimulus and the friendly old one.”(Morris, 1983: 140).

This tension characterizes very well the selection logic in the R&D organization. New ideas outside the realm of planned and routinized innovation typically originate in the R&D department, even if they potentially can originate in every other part of the organization (though they much more seldom do). Thus, the R&D department represents the primary source of variation for organizations. The ideas and ventures in the present sample are typically grass-roots, bottom-up initiatives started by a particularly creative or motivated employee or a small team of employees (seldom more than two). I would like to submit that such persons are found in every organization. Just as a certain percentage of people in every society are entrepreneurs, so a certain (very small) percentage of employees in large organizations are intrapreneurs. At least in my sample, virtually all originators of new ideas were

¹⁹ Clearly, not all of these three logics are always present simultaneously at all firms. In service industries, for instance, manufacturing and also sourcing might play a minor role at most in the selection of ideas. Yet, practically all ventures in this sample were in fact exposed to all three logics and virtually all of the firms in the sample had all of these three functions in-house.

engineers. The former Head of R&D of a major Swedish high-technology company told me that among the 1500 employees in the R&D organization for which he was responsible, there were about 50 engineers and scientists who came up on their own with new ideas not directly related to their current work assignment. Nevertheless, the emergence of new ideas is quite a frequent phenomenon in the R&D organization. Indeed, one might argue that the autonomous creation of ideas is part of what an R&D organization is all about. According to the former Head of corporate R&D at another major Swedish corporation, he received about 600 suggestions for new ideas and projects from engineers during the year 2001.

Where do these people get their ideas? This question was asked in the survey, and Table 1 shows the frequencies and percentages of the answers from respondents in seven different categories. The answers were drawn from the full sample of 88 cases which represent more than 20 companies in many different industries in Sweden²⁰. Respondents were asked to characterize the primary source of their ideas for two alternatives.

Sources of Ideas	Alternative I		Alternative II	
	Frequency	Percent	Frequency	Percent
Daily work and internal contacts	41	46.6%	12	13.6%
Customers	10	11.4%	17	19.3%
Suppliers	0	0.0%	3	3.4%
Observations outside daily work	22	25.0%	15	17.0%
Technical and scientific magazines	6	6.8%	11	12.5%
Prior employers	5	5.7%	5	5.7%
Competitors	2	2.3%	4	4.5%
Missing	2	2.3%	20	22.7%

Table 1 - Sources of ideas

As can be seen, intrapreneurs in the sample underlying this study obtained their ideas from three major sources, namely (in order of importance) from a) their daily work and internal contacts, b) observations and thinking outside their daily work and c) customers. Suppliers, competitors, magazines

²⁰ Details on the sample will be given in Chapter Four.

and scientific publications and prior employers did not seem to play a substantial role. What may be somewhat surprising is that relatively few ideas originate from interaction with external transaction partners, such as customers, suppliers and competitors, especially in light of prior arguments (e.g. von Hippel, 1986) that customers are the major source of new ideas at firms. Instead, most of the ideas have emerged in the daily work inside the organization and to a much smaller extent from personal observations and thinking outside daily work. However, this data should be seen as only an indication rather than a rigorous test about the sources of ideas, and one must be aware of various potential biases in the answers, such as probable underestimation of the importance of competitors.

Once a basic idea about a new product or technology has been envisioned, entrepreneurs need first to solve the technical problems associated with the development of the product. This is often a long and hazardous process. Solving these problems is typically associated with the construction of the favourite toy of every engineer: a prototype. Once a prototype is constructed, the major technical challenges have been overcome as the entrepreneur can demonstrate the technical feasibility of the idea. Resources required for the construction of a prototype are typically available within the R&D organization of the firm and are relatively limited. Constructing a prototype typically does not demand massive financial or human resources. In this early phase of development, typically not more than 3-4 people from the R&D department are working on the construction of the prototype. Given these relatively small resource requirements, an entrepreneur only needs to pass the local selection system inside the R&D organization in order to construct a prototype and thus receive support from their immediate superiors inside the R&D organization and possibly also the Head of R&D. Involvement from other parties inside or outside the organization is normally not required. At this stage ventures still operate very much like "skunkworks", that is small, rather isolated development teams operating in isolation from the selection pressure of the larger organization (Kidder, 1981; Brown and Eisenhardt, 1995).

Weeding out some of these ideas in the R&D department is the first stage of selection. For instance, clearly not all of the 600 ideas proposed to the above mentioned R&D Director were granted support for the development of a prototype and certainly not all of them resulted in skunkworks. A very important point for understanding how ideas are selected in the R&D organization is that those people controlling R&D funds and thus with the

power to support and finance a new idea at least until a certain stage of development are typically engineers and scientists themselves. Consequently, selection in the R&D department is very much driven *by the logic and preferences of engineers and scientists*.

What kind of criteria are important for selectors at the R&D level; that is, what is the selection logic of engineers and scientists? At this stage the technology itself still plays the critical role. Issues about the technological feasibility of the idea take precedence over questions about its economic viability. Engineers are largely driven by what is technologically possible and what is fun to develop and less so by what is necessary or useful. They support new technological opportunities because they constitute a novel solution to an important *technological* problem, rather than because it would help solve an *organizational* problem of immediate strategic relevance for the firm. Thus, this selection logic causes engineers and scientist *to pay especially attention to novel and different ideas*. As such it stands in conflict to the kind of ventures and ideas other departments inside the organization prefer and pay attention to.

This logic of engineers and inventors motivated by the search for novelty and experimentation *for its own sake* is well described by a number of scholars, including Diamond (1997) in his discussion on the evolution of technology, Himanen (2001) in his account of the work ethic of software developers and, in more general terms, by Morris (1983) in his biologically based account of the human drive to explore -- the latter is the source of the quote at the beginning of this section. Thus, inside the R&D organization there is likely to prevail a "culture of exploration" created and sustained by the curiosity of engineers and scientists and their preferences for novelty and experimentation.

In the interviews, R&D managers point out that the degree of novelty of the idea is a major selection criterion. Important questions are whether the idea adds any substantial *novelty*, whether it is significantly *different* from known technological solutions and even whether the technology is "cool". In fact, engineers and scientists are driven not so much by a general aversion against novelty, but more by a preference for it. Yet this preference for novelty and drive for exploration is at the same time embedded in the limitations imposed by scarce organizational resources and an awareness of corporate strategy. Corporate R&D managers often sit on the executive committee of the corporation. For this reason, they also consider strategic aspects in their selection decisions, even in very early developmental stages of an idea. They

point out that the relationship between the ideas and innovations proposed to them and the resources and core competencies of the organization is another central determinant. They typically try to classify innovations according to consistency with the core business of the corporation. However, even if an idea does not fit into the core business, they may still support it if it is technologically interesting. Thus, R&D selection is a relatively *weak filter* when it comes to the relationship between the idea and corporate strategy. Questions about novelty, technological differentiation and the "coolness" of the technology itself interfere with a purely strategic selection decision.

The possibility for unrelated ideas to pass through the innovation filter is further enhanced by the extremely high ambiguity of the selection environment in this early stage. As noted above, ideas in an early stage are typically ill-defined. It is not at all clear what an idea eventually will turn out to be. Also, in an early stage of development, information asymmetries are likely to be significant, improving the survival chances of ideas whose true nature can be hidden and distorted by the innovators. These two points are well illustrated by an interview with a staff member responsible for coordinating the venturing activities of Firm 3, a Swedish multinational company specializing in medical equipment. He told me about a venture which after a couple of years of internal development turned out not to fit the strategic intentions of Firm 3 at all. When I asked him why they invested in its development for such a long time in the first place, he explained that in the beginning it was not at all clear what kind of product and what kind of resource requirements would eventually emerge from the development effort.

As discussed above, R&D departments provide a relatively secure shelter for new ideas because selection is driven more by a logic of engineers and scientists with a preference for novelty and variety (Kahn, 1996; Ratner, Kahn and Kahneman, 1999) and by curiosity (Loewenstein, 1994) than by a purely calculative, novelty-averse rationality, and also because at an early stage new ideas are protected by a considerable degree of ambiguity and information asymmetries. While some selection clearly takes place, many more ideas are likely to survive in the R&D department than are later seen as relevant to overall organizational strategy.

In summary, given these characteristics of the selection logic in R&D departments, how would we expect relatedness to matter in predicting the survival chances of new ideas? On the one hand, relatedness between the technological resources and expertise required for developing the idea and the existing technological expertise and technological resources of the mother

organization should matter; such expertise is necessary for constructing a prototype in the first place and because senior R&D managers are, because of their corporate role, likely to support only ideas with a reasonable fit into overall organizational strategy. On the other hand, the very nature of the work and logic of engineers and scientists is to explore, to extend the current knowledge base of the organization and to play with novelty for its own sake, thus reducing the potential importance of a priori technological relatedness.

Interestingly, the construction of the prototype per se was never portrayed in the interviews as an important problem in the process of commercializing ideas, which might indicate that the existing technological resource base does not play a major role in determining which ideas eventually reach the prototype stage. However this might also be explained by a considerable degree of pre-selection in my sample. Such pre-selection with regard to technological novelty in my sample resulted from two factors. First, research on entrepreneurship tells us that the knowledge and expertise of the entrepreneur determines to a considerable degree the kind of ideas that he is likely to propose (Aldrich, 1999). Engineers are likely to propose only ideas which are already related to the technological expertise of their department. This conclusion is supported by the findings in Table 1 above, which suggest that most ideas originate in the daily work and internal contacts of intrapreneurs. Second, my sample consists only of ventures which actually passed the prototype stage. As a result, it is difficult to draw any conclusive inferences from the interviews. Nevertheless, my theoretical arguments might also provide reason to expect that purely technological relatedness would not play the major role in explaining the differential survival of ideas in the R&D organization, but that relatedness becomes more important in the next stages of the resource-mobilization process.

Ideas cannot be hidden forever in the R&D department. After a prototype has been developed and the technological feasibility of the idea has been verified, the question is what to do next with the idea. Is it worth investing any more time and money in the idea, developing it further, perhaps testing it with some customers and then eventually trying to launch it on the market and mass-produce it? This step makes it necessary to bring the idea out into the larger organization and to mobilize the support and resources for producing, marketing and distributing the product or service. In other words, the idea needs to be confronted with a set of new local selection mechanisms, especially inside the market and production organizations. It also implies

turning the idea into venture, with much greater demands for financial and human resources and with a higher degree of visibility throughout the firm.

3.4.2 Selection in the market organization

"Many or most inventions were developed by people driven by curiosity or by a love of tinkering, in the absence of any initial demand for the product they had in mind. Once a device had been invented, the inventor then had to find an application for it." (Diamond, 1997: 242.)

The selection logic in the R&D organization stands at odds with the selection logic in the market organization. The market organization is much more driven by a logic of market analysis, customer needs and efficiency in sales and distribution than by a preference for experimentation and "tinkering." Furthermore, it is no longer engineers and scientists, but mainly people trained in business and economics, that judge the potential of ideas turned into ventures. The preference for quickly reaching large sales volumes within the established sales and distribution system is a powerful selection mechanism; it weeds out novel and fragile innovations which cannot plausibly demonstrate a large market potential reachable in a reasonably short time (Christensen, 2000).

One of the fundamental dilemmas in the commercialization of radically different innovations is that they typically do not respond to an articulated customer need (Christensen and Bower, 1996). New technologies are often best termed as what Diamond (1997) called "necessities mother." They often create an emergent customer preference rather than responding to it. People start to understand that they want an innovation after they see others using it. Yet, the market organization typically evaluates the potential of new products based on an analysis of existing markets and of articulated customer needs (Christensen and Bower, 1996). Even if the innovation is less radical and the market organization can identify a latent customer need for the product, there are still other selection forces impinging upon the innovation.

One such selection force affecting innovations once they leave the shelter of the R&D department is that they typically represent a new opportunity for the organization and not a response to a threat to the organization. Adding a new product to the existing product portfolio might possibly leverage organizational resources in a new way, but *not* adding the new product generally does not pose an immediate threat to the organization. We know from earlier

research that organizations pay much more attention to threats than to opportunities. Already Vernon (1966) in his analysis of investment decisions of firms pointed out that a threat to the established position of an enterprise is a more reliable stimulus to action than the pursuit of a new opportunity is likely to be. This view is also confirmed by later more systematic research on the kind of issues organizations are likely to pay attention to (Jackson and Dutton, 1988). *Therefore, there will be a natural tendency towards selecting ventures as responses to threats rather than to new opportunities.* Furthermore, pursuing yet another opportunity is certainly not as urgent as responding to declining sales of an existing product in an existing market. Since urgency is a predominant consideration in setting organizational priorities (Simon, 1997), commercializing new products will automatically end up low on the priority scale of the market organization.

Beside these two general problems related to all innovations, there is a third selection force acting on innovations in the market organization. This force, which is specifically linked to the degree of relatedness between the venture and the established sales and distribution system of the organization, is the relative efficiency and "return on effort" of new and unrelated products in comparison to established and/or highly related products. To sell and distribute products which do not fit well into the established system of resources and routines in the distribution and sales organization, there must be changes and adaptations in the established market and distribution system. Established sales routines might need to be altered and new distribution channels established. These adaptations are required despite the absence of an immediate threat if these changes are not made. *Thus, commercializing new innovative projects requires change while not a response to an immediate threat or problem for the (market) organization.* The outlook for the innovation becomes even less favourable when we consider the incentives of the sales personnel to invest time and effort in learning to sell a new product which at least initially will be sold in much smaller volumes than a new generation of an established product. Establishing new products on the market takes time, as they first have to run through all the various stages in the diffusion process of innovations (Rogers, 1995), while a new generation of an existing product will diffuse much more quickly on the market. As sales personnel are typically remunerated on the basis of units sold, adopting a radically different product therefore requires sales personnel to accept a reduction in pay as they sell fewer units while investing effort in changes and learning. Thus, new products are at a fundamental disadvantage over established products

in passing the selection criteria of the market and sales organization. This obstacle was mentioned in almost every interview with innovators and is well illustrated by the following statements.

"It is difficult for the sales organization to convince others to buy something new. It is simply impossible to sell equally much at once if one sells a new product. Therefore, there is no incentive for a sales person to sell a new product."(Innovator at Firm 4 in the tooling and mining industries).

"The sales organization is not willing to sell products they are not familiar with. They are afraid of making a fool of themselves and furthermore they have to first search for the right customers, which is of course much harder than selling an existing product to existing customers."(Senior R&D manager at Firm 5 in the machine-tool industry)

"In order to get the attention of the market organization for a new product, it is important to have a more attractive product than the other products they are supposed to sell."(Former senior R&D manager at Firm 6 in the pharmaceutical industry and later independent entrepreneur with a spin-off company)

"It is much easier to win approval for a project that will make an existing product cheaper than for a project that means developing a new product with new features. The sales organization wants to have the same products that we have today, only a bit cheaper and better than competitors' products. It is much more difficult for them to sell a totally new product." (R&D manager at Firm 2).

These statements-- admittedly by engineers and not by people in the market organization-- go at first sight against the generally held view that the market organization wants to have new products. However, it can be speculated that marketing wants novelty, yet the kind of novelty the market organization wants is different from the novelty engineers and scientists in the R&D organization prefer. In particular, the selection logic of market people makes them prefer "variants of the old", that is minor changes of the features of established products, a speculation supported by one of the statements above, while many scientists and engineers and especially intrapreneurs are essentially "bored" by only developing variants of the old, they rather want to develop entirely new products and technology. Thus, the logic of the mar-

ket organization and the logic of engineers and scientists in the R&D organization vary in terms of demands of "different kinds" of novelty.

In summary, selection in the market organization is governed by a fundamentally different logic than selection in the R&D organization. These quotes provide evidence that the market organization is far from being driven by the kind of novelty-seeking and curiosity characterizing the logic in the R&D organization, but rather is driven by a preference for satisfying existing market needs within the existing framework of the sales and distribution system, possibly by demanding minor changes in the feature of products. By contrast, commercializing innovations requires a belief in the potential of a product without any direct evidence of an articulated customer need, and it requires investments in change and adaptations without an immediate threat or urgent need. From this perspective, innovative new projects are most likely to survive and pass through the selection barriers of the market organization if they can plausibly demonstrate either that not adopting the product will pose an immediate threat to the organization or that the changes and adaptations required by the product can be reduced to a minimum. In other words, the champions of the project must show that the new product can relatively easily be integrated into the established system of resources and routines by demonstrating a high degree of fit or relatedness to these resources and routines, i.e., that there is considerable potential for economies of scope. One possible way to achieve economies of scope is by selling a new product in combination with established product lines through essentially the same distribution channels. If this possibility is presented convincingly, there might be relatively little resistance to a new product. Thus, one might expect that relatedness in the sales and distribution system would have a highly significant positive effect on the survival chances of new ventures.

3.4.3 Selection in the purchasing and manufacturing organization

The selection logic driving the purchasing and manufacturing operations of large corporations stands equally much at odds with the selection logic in the R&D department as the selection logic of the market organization. It stands also at odds with the demands of the market organization for "variants of the old." Purchasing and manufacturing seek primarily to achieve efficiency, large volumes of very similar products and a minimum of learning and time to reach the scale required for efficient production. The main selection logic is one of seeking large scale and volume. The overall aim is to

optimally exploit synergies in manufacturing across the various businesses of the corporation (St. John and Harrison, 1999). Allocating capacity to new products requires costly and time-consuming adaptation of the manufacturing process and, more importantly, it generally entails much smaller initial production volumes, with higher manufacturing costs. These smaller volumes make the learning curve for the production of new products much flatter than for products which can reach high-volume production quickly. Thus, there is a dilemma: One way to make manufacturing of the new product efficient is to increase the volume quickly in order to reap economies of scale and learning efficiencies. But, volume for radically new products is not likely to be high, market demand is initially small, though it might increase, if the price of the product was reduced. One way to confront this dilemma is either to take the considerable risk of producing large volumes in the absence of high market demand or to produce small volumes at high costs. Due to myopic tendencies emerging from a logic of large volumes and scale it is likely that there is going to be considerable resistance against both of these alternatives for confronting this fundamental dilemma.

In view of this fundamental disadvantage of new, innovative products against established products which can quickly reach large volumes, selection decisions are likely to be guided by two criteria: a) whether there is currently any spare capacity and b) whether the product can easily be accommodated into the existing manufacturing system. Consequently, approval of the new venture might depend on the timing of the request. If a product of a new venture can easily be included in the existing system at a time when there is spare capacity, then the manufacturing organization might be more willing to support the venture even if the product will only be manufactured in very small volumes. However, if the product requires the construction of completely new equipment and considerable testing, probably only someone powerful enough in the organization can force the manufacturing units to make the product and take initial losses. This step would be based on the hope of establishing a virtuous cycle of increased demand, increased production efficiency and lower prices which further increase demand (for similar arguments, see Christensen, 2000). As in the market organization, these decisions need to be taken even when there is no immediate threat if the new product is not produced. This dilemma re-emerged several times in my interviews. Consider the following two statements as an illustration:

"Implementing a new technology and reaping its benefits often require major restructuring in the established manufacturing system of a given business unit. This obviously demands a lot of effort from the head of this business unit, and a lot of changes. And then they ask themselves- why should we implement any changes, if we deliver satisfying financial results, i.e. if we can meet the internal requirement of profitability for the business unit with the existing manufacturing system?" (Innovator at Firm 7 in the pulp and paper industry).

"The manufacturing department obviously prefers to produce big volumes of established products over producing small volumes of new products. They need to meet the internal requirement of profitability. To get new things through an organization, other forces are needed." (Innovator at Firm 4)

Given this characterization of the selection logic in the sourcing and manufacturing department and given the fact that most of the people working in this part of the organization are engineers as well, I need to somewhat qualify my prior statements about the "logic of engineers and scientists" as driven primarily by novelty seeking and experimentation. It might be possible that it is the identity evoked by the specific department (be it R&D or manufacturing) which activates different preferences of people working therein rather than the specific professional background of the people, that is whether they are engineers or people trained in business. Thus, while engineers in R&D are "supposed to experiment" are engineers in manufacturing "supposed to increase scale and efficiency." Obviously, further research is required to probe deeper into how this "logic of appropriateness" (March, 1994) influences the selection of departments inside firms and whether it is the professional background or rather the specific identity evoked by a certain department, or any other factor which is the source of variance of the various selection logics inside the firm. This goes, however, far beyond the scope of this thesis. For the purpose of the present thesis it suffices to have argued for the existence of such local logics and how they stand in conflict with each other.

Before I investigate these "other forces" which are supposedly required to get new ventures through an organization mentioned in the last quote above, I will summarize. From this discussion on the selection logic of the sourcing and manufacturing department one can draw conclusions somewhat similar to those in the discussion of the selection mechanisms in the market organi-

zation. These conclusions concern the importance of relatedness for understanding the differential survival of ideas. In the sourcing and manufacturing organization, a high degree of resource-relatedness makes it possible to reap economies of scope and scale. A high degree of relatedness to existing manufacturing routines allows the organization to integrate the new product into the established manufacturing and sourcing system without any major changes, with the potential of gaining a competitive advantage by embedding the new product in a (supposedly) highly efficient and "unique" system of routines and resources. Thus, one might hypothesize again that the higher the degree of relatedness to the established resources and routines in the sourcing and manufacturing areas of the mother corporation, the better the survival chances of the venture.

3.5 The interplay between the three local logics and the survival of ventures

For a venture to eventually be launched on the market, it needs to pass all three selection barriers. This raises some interesting questions about the interaction between these three local logics. For instance, does a venture have to demonstrate a high degree of relatedness by all three logics simultaneously, or can a high degree of relatedness on one dimension compensate for a low degree of relatedness along another?

Cyert and March (1992) suggested that one mechanism for reconciling the conflicting local preferences and logics in organizations is through sequential attention towards one goal at a time. Thus, one might hypothesize that certain local logics are more dominant during some periods than others, depending upon which local goals and logics are currently in the focus of attention within the organization. At times the organization might emphasize the selection logic of the R&D organization, causing the other two logics to adapt to the outcomes of this particular logic; at other times, it might focus more on the selection logic of the distribution and sales organization, which would take precedence over the selection logic of the other areas of the organization. This approach obviously would lead to very different outputs of new products at the end of the "pipeline." For instance, while the dominance of the selection logic of the R&D organization might lead to a considerable increase in the variability of products launched might a focus on the selection logic of the market organization lead to a strong decrease in the variability of

the products launched, as only such products are likely to pass the internal filter which can satisfy a proven customer need, preferably of existing customers. What would cause the focus of attention to shift? According to some evidence, one way to explain the shift of attention to different goals and preferences might be the current performance situation of the mother organization. Take the following quote of an R&D manager at Firm 2, which enjoyed several years of high performance before suddenly encountering serious financial trouble at the time of the interview:

Today, when we are facing economic decline, the market organization interferes earlier with our (that is the R&D organization's) projects. As a result, we do more "cheaper and faster" projects and there is much less playfulness. But when the corporation comes back into an economic upturn, then playfulness will become more appreciated again."

This quote suggests that if a company gets financial trouble, the logic of the market organization, which seeks cheaper and faster development of products which are "variants of the old", products with known market size and known customer demand, becomes more dominating within the organization. On the other hand, if the company is performing strongly (as did Firm 2 for several years), then there is a greater acceptance of the playful spirit inherent in the logic of the R&D organization, with increased production and acceptance of variation. Such possible effects of high and low performance will be discussed in a later section of this chapter.

Another interesting issue which arises from the discussion above concerns the effects on the venture's survival chances of the specific "path" followed by a venture through the different dimensions of the internal selection system. Such a path can vary across three different dimensions - the location of selection (i.e. R&D, sourcing and manufacturing, or sales and distribution), the hierarchical level of the selectors involved and the time at which ventures are exposed to these different locations and hierarchical levels. Thus, one can think of different *sequences of selection*. In one case, a venture might first be exposed to the R&D organization; only much later, when the venture has gained some foothold in the organization and at least partly proved its viability, would it be exposed to the sales and marketing organization. Or one can think of a selection sequence where a venture might be exposed at an early stage of development to the selection logic of the sales and distribution or the sourcing and manufacturing organization. Given the much tighter selection criteria in these two parts of the organization, the sur-

vival chances of ventures might decrease the earlier it is exposed to these logics. It is then likely that only ventures which easily fit into the established organizational system of resources and routines would have any chances of survival.

One can also imagine ventures that follow various paths with regard to the hierarchical level of the selectors involved. Ventures might first be exposed to selectors on lower hierarchical levels and only much later to selectors at the top of organizations. The opposite is also conceivable: ventures might be exposed early on to selectors at the very top of an organization. In as much as attitudes towards relatedness and exploration in general differ depending on the hierarchical level, the particular path followed might have a powerful influence on the survival chances of new and more or less related ventures. For instance, Burgelman (1983) has suggested that middle management tends to be particularly hostile towards new ventures. Thus, when a venture is exposed to middle management at an early stage, its survival chances might decrease. By contrast, my interviews gave the impression that people at the top of organizations especially CEOs, have a fairly positive attitude towards ventures, even if the outcome is very uncertain. It seems as if CEOs are less caught up in defending the interests of a certain local preference and logic, are more willing to see the larger picture and perhaps better understand the strategic importance of new venturing.

3.5.1 Hypotheses about the relationship between relatedness and venture survival

Although an analysis of the influence of such specific paths through the internal selection system might be highly fascinating rigorous quantitative testing of the above-explicated ideas goes beyond the scope of this thesis. Instead, the focus here is on only two alternative hypotheses for the influence of relatedness on the chances of a venture's passing through the internal selection system and thus of surviving.

One important issue is whether the degree of relatedness to one particular local selection logic has a significantly stronger and more important effect on venture survival than relatedness to the other local logics. The predominance of certain local logics may be "hard wired", and certain resource and routine linkages may be consistently more important than others for understanding the differential survival of ventures and the direction of organizational growth in general. This would imply for instance that a high degree of relatedness to one of the three organizations -- market, sourcing and manufactur-

ing, or the R&D -- is always the most important predictor of the differential survival of ventures and thus can compensate for a low degree of relatedness to other dimensions. But which dimension would we expect to matter the most? From the interviews the impression emerged that the linkage to the sales and distribution system of the organization is the most crucial for new ventures. In this linkage, the criterion is whether a product, even if it is fairly novel, can be sold to existing customers through the existing distribution system. This argument echoes a rather recent paper by Zander and Zander (2003), who emphasized that the linkage and integration of new products with the existing sales and distribution system is an important "pipeline for growth" and thus powerfully shapes the direction of organizational evolution. The importance of linkages to the sales and distribution system is also reflected in the emphasis given in the diversification literature to this relatedness dimension.

A second alternative view is that a low degree of relatedness in one dimension *cannot* compensate for a high degree of relatedness in another; moreover, no one local logic predominates over another, but all logics are equally powerful at the same time in weeding out ventures. In this view, what counts is the "holistic" profile of the venture with regard to all local selection logics simultaneously. Thus, the venture must be related "on average" to all local logics at the same time. This would suggest that surviving ventures represent a good "compromise" between all the local selection logics. This view is supported by the following quote of an intrapreneur:

"When you look at what's required to get a new product through all the red tape and the opposition, a major problem is that virtually a hundred people have to sign off on an idea. If anyone of them says no, the idea is dead." (Quoted in Brown, 1988).

These two alternative views on how relatedness matters for understanding the differential survival of ideas leads to the following two hypotheses:

Hypothesis 1a: There will be a negative effect of the average overall degree of relatedness of a venture on its hazard rate of non-retention.

Hypothesis 1b: There will only be a negative effect of sales and distribution relatedness of a venture on its hazard rate of non-retention. Neither the sourcing and manufacturing relatedness nor the technical relatedness of the venture will alone have any effect on the hazard rate of non-retention.

3.6 The second layer – the effects of corporate performance, social anchoring, and persuasive efforts

3.6.1 Imperfect, inconsistent selection sensitive to context and influence

My argument thus far has been that we need to understand outcomes of organizational exploration in general and organizational selection of innovations in particular as an interplay between the partly contradictory local logics and preferences of the R&D, sales and distribution, and the purchasing and manufacturing organizations of large, established corporations. While the organizational search space is largely determined by the selection logic of the R&D department, the organizational diversification space is further narrowed by the barriers and hurdles of the selection logics in the market and production organizations. The discussion above strongly emphasizes how the logics of the market and production organizations weed out innovation. Surprisingly, however, intrapreneurship and the commercialization of fairly radical innovations nevertheless occur at large corporations, and such ventures have systematically good chances of surviving the internal selection system. Thus, in some way ventures and their champions manage to circumvent the various obstacles to selection, even if initially they do not naturally fit into the organization and thus require major changes in the established distribution and sales system or sourcing and manufacturing system.

Despite the numerous cases identified in research where large organizations failed to commercialize radical innovations, there are also many cases in which large organizations succeeded at such efforts. In other words, intrapreneurship has in fact led to successful launching of radically new products and services (Bartlett, 1983; Block and McMillan, 1993; Abetti, 1997; Hamel, 2000; Ahuja and Lampert, 2001). Perhaps one of the greatest successes in the history of technology was the development of the transistor at AT&T (Nelson, 1996). This suggests that in some cases ventures succeed despite internal selection logics that are powerful mechanisms for weeding out unrelated and radically novel and different innovations

In the current sample, almost half of the innovations identified survived for more than five years, and about 60% were eventually launched on the market before an event in the form of termination, spin-off or sell-off had happened, though usually on a very small scale. Seven ventures eventually led to the creation of a new unit at large corporations with turnovers up to 70

million USD. Thus, the general conclusion of many organizational researchers that large organizations are unable to launch and commercialize radical innovations may be due to misinterpretation of the basic probability of succeeding in new venturing. Clearly, if one assumes that there should be more successes than failures in organizational attempts to engage in the commercialization of radical innovations, then organizations are utterly bad at entrepreneurship. But so is any other governance structure for the commercialization of innovations. As already pointed out, we know from data on the success of venture capital investments or on the success ratio of innovation in general generally only one out of ten ventures actually succeeds. As I will show in the next chapter, this ratio reflects fairly well the success ratio in my sample.

How can we account for these surviving cases of independent intrapreneurship in established firms? I already opened one line of analysis above by arguing that a high degree of relatedness along one resource and routine dimension might compensate for a low degree of relatedness along another. I also suggested that some parts of the organization or people at certain hierarchical levels, especially higher ones, or with particular backgrounds, especially engineering and science, might have a more positive attitude towards venturing and towards risk-taking in general. Hence, ventures might survive because they travel along the "right" path inside the organization and are exposed to the "right" selection logics and "selectors" at a favourable stage of their development. Indeed, such systematic differences in the paths of ventures might be the underlying cause of what we ex-post tend to call "serendipitous" development.

In the following section I want to open the discussion of the internal selection system to two further aspects. The interviews showed that relatedness is certainly not the entire explanation of differential venture survival. I will argue that one other essential aspect for understanding venture survival is the imperfection, instability and ambiguity of selection (Denrell and March, 2001, Czernich and Heath, 2002). Imperfection and instability of selection result primarily from the ambiguity of innovation and relatedness as well as from the existence of internal information asymmetries between those who propose and those who select ideas in organizations (Day, 1994). This results in an "interpretative space" (Czernich, 2003), leaving room for agency, influence, instability and context-dependence of selection. From this perspective the established system of resources and routines is a powerful, yet imperfect system for the selection of ideas. Selection takes place not only through

weeding out ideas which do not fit into the established system of resources and routines, but also in the relations between key decision-makers. Thus, judgements on relatedness are to a considerable degree also the result of the personal opinions of a few people in the organization and as such subject to instability and influence (Farjoun and Lai, 1997). These factors represent what I would like to call the "second layer of selection," that is a second filtering system which complements the filtering system based on evaluations of relatedness.

The assumption of this second layer of selection attributes considerable impact to the innovator or product champion in influencing the fate of new ventures, an aspect often emphasised in research on intrapreneurship (Schon, 1963; Burgelman, 1983; Shane, 1994; Day, 1997; Royer, 2001). One direct implication of this view is that the innovator's network of contacts inside the corporation becomes important (Schon, 1963; Frost and Egri, 1991; Dougherty and Hardy, 1996). To the extent that the innovator is well connected to members of the top-management team, he might be able to influence their opinions about the potential of his idea, win their support for it and in this way might be able to surpass the local selection logics which are supposedly the strongest on the level of middle management. Hence, once the support of a powerful person inside the organization is gained, it might become much easier to break through the local filtering systems of the market and production organizations and receive their support and resources as well. This development becomes more plausible in light of our speculation above that people at the very top of the organization might have more favourable attitudes towards new venturing and towards risk than people in the middle management positions. Thus, such linkages to top management might protect the venture from exposure to selection by middle management, thus increasing its chances of survival.

Another implication is that entrepreneurs might use specific strategizing techniques in order to convince others in the organization about the viability and value of the venture. The existence of ambiguity and information asymmetries which open up an "interpretive space" lay the foundation for a possible effect of such strategizing on the survival chances of ventures. Strategizing might take the form of "persuasive efforts" in which the entrepreneur tries to convince others of the value of the venture without changing the image of the venture in their mind. It might also take the form of more sophisticated framing and persuasion tactics in which the intrapreneur tries to change the image of the venture in the mind of others in order to enhance

the survival chances of their ideas (Dean, 1987; Howell and Higgins, 1990). For instance, as I argued above, organizations generally pay more attention to opportunities than to threats. Intrapreneurs might exploit this bias by emphasising how commercializing the new idea would help the organization to respond to some environmental threats and how not doing so would endanger the success of the company. These factors will be investigated more closely in the section on "social support and persuasive efforts" as well as in the section on "framing" below.

A further implication of the second selection layer, as represented by the importance of personal judgement and agency and the existence of ambiguity and information asymmetries, is that selection becomes context-dependent. Since selection mechanisms are likely to be unstable, selection will probably be partly inconsistent. In other words, ideas which, *ceteris paribus*, would be rejected in one context as "crazy" and without value might be considered in another context as quite reasonable or even brilliant in the same organization. I will investigate one contextual variable: namely, whether selection decisions are taken in contexts of success or failure. The impact of performance will be investigated more closely in the section on "selection of ventures in contexts of success and failure" below.

Double-layered selection is a two-edged sword when it comes to normative implications. On the one hand, imperfect and instable selection, or what Denrell and March (2001) have called "weak" selection, has potentially beneficial effects as it increases the variation of ideas and surviving ventures; on the other, however, it can lead to disastrous consequences such as entry into fields of business which have nothing to do with the competencies and strengths of the organization. Thus, organizations might systematically overestimate the degree of relatedness of ventures, possibly causing firms to enter actually unrelated businesses with expectations about relatedness and synergy (Farjoun and Lai, 1997).

3.6.2 The impact of success and failure on the selection of ideas and ventures

In this subsection I will investigate the impact of one particularly important context-dependent factor influencing the survival of ideas: namely, whether selection takes place in a context of organizational success or organizational failure. My argument is that success and failure influence overall organizational selection of ideas in at least two distinct ways. First, and most importantly, it changes the *nature of the selection logic* itself within the various

organizational departments and with top-management and thus changes attitudes towards innovation, novelty and risk. Second, it may also change *the relative power of influence* of one selection logic compared to the others. In other words, I suggest that success and failure activate certain organizational goals and preferences at the cost of others. This second mechanism is similar to the sequential attention-to-goals mechanism suggested by Cyert and March (1992) as a way of reconciling the conflicting demands of the various local preferences in organizations without dragging the organization into anarchy and chaos. Before I proceed with my arguments, I shall review the literature on the impact of success and failure on individual and organizational decisions, and on the actions required.

The literature has suggested a number of ways in which success and failure influences organizational decision-making and actions, as well as a number of consequences which follow from this influence. As a short review of this literature will demonstrate, the arguments concerning the impact of success and failure on organizational decision-making have not been uncontroversial. The controversies open up interesting possibilities for testing the effects of success and failure on the selection of new ventures. Also, the effects of success and failure as important independent variables have largely been neglected in the diversification literature (Ramanujam and Varadarajan, 1989) and in the evolutionary-growth literature altogether.

3.6.2.1 *The impact of success on the selection of new ventures*

Success has a strong impact on at least three core aspects of organizational decision-making: namely, on organizational risk-attitudes, on the confidence with which organizational actors make decisions, and on the accumulation of spare resources, or slack. However, there is considerable controversy about the exact manner in which these effects of success influence the funding of innovation and strategic change.

Behavioural research on decision-making under uncertainty (Kahneman and Tversky, 1979; March and Shapira, 1987, 1992) has shown that risk-taking varies as a function of the difference between the actual and aspired performance of an individual or organization. Arguably the most influential model within this school of organization theory is the model of March and Shapira (1987). In line with Prospect Theory (Kahneman and Tversky, 1979), this model predicts that firms will exhibit a decrease in risk-taking if their actual performance exceeds their aspirations. Firms are expected to decrease their risk-taking during periods of relative success since with performance

exceeding targets they see no reason to change their strategy. In addition, they are afraid of making any "wrong moves" which might lead to poorer performance. It has been argued (Miller, 1994; Audia, Locke and Smith, 2000) that this decrease in risk-taking is accompanied by an increase in the confidence of organizational decision-makers in the the current strategy of the organization. Managers thus become satisfied and complacent and overestimate their abilities (Audia, et.al., 2000). The focus of managerial attention becomes considerably more limited as managers concentrate on only a few salient internal practices which they consider essential to the success of the company, thus defining the area of competence of an organization in a narrower way (Miller, 1999). As a result -- from this perspective -- managers are expected to become more reluctant to take new or different strategic moves, and there is considerable simplification of the strategic actions of firms (Miller, 1993). These tendencies have been shown to bring strategic persistence and inertia. For instance, Lant, Milliken and Batra (1992) found in their study of the American software and furniture industries that organizations whose performance was above the industry average were not as likely as less successful firms to reorient their strategies in response to major changes. Similarly, in their study of the airline industry, Miller and Chen (1994) observed that highly performing firms exhibited more competitive inertia than less successful rivals in their responses (or the lack thereof) to deregulation. Finally, in a more recent study of the American airline and trucking industries Audia, et.al. (2000) noted that prolonged periods of success lead to increased strategic persistence. Furthermore, they found that the greater the strategic persistence the greater the decline in performance in the face of radical environmental changes, resulting in what they called "the paradox of success."

Following this kind of argumentation, we would expect firms either to neglect or to spin off new, risky and sometimes only loosely related entrepreneurial ventures. As risk-taking decreases, and as managers become overconfident about their current strategy and consequently perceive the competencies of the organization more narrowly, they are unlikely to see a need to change the current strategy through a major investment in new business areas (Burgelman, 2002). As a result either ventures will be neglected, or there will be a higher probability of spin-off. For the core competencies will be defined in a more restricted way, thus making it more likely that ventures will be perceived as unrelated.

However, these perspectives on the effect of success on change and the funding of innovation have not remained unchallenged. While success on the one hand may strengthen managerial belief in the status quo, success also leads to the accumulation of slack (Cyert and March, 1992). Slack, which can be loosely defined as a surplus of resources beyond the combination of demands made on the organization (Cohen, March and Olsen, 1972), buffers an organization against failure and constitutes additional resources which might be used for experimentation and playfulness (Nohria and Gulati, 1996). From this perspective, success through the mediating role of slack might actually facilitate innovation and creativity. As Bourgeois (1981) points out (p.35), "*Success breeds slack, which mutes the problem of scarcity and provides a source of funds for innovations that would not ordinarily be approved in the face of scarcity.*" The notion that success leads to decrease in risk-taking has also been challenged. Contrary to the predictions of Prospect Theory, studies on gambling behaviour have found that when people have experienced (wind-fall) profits they are willing to take more and not less risks in subsequent gambles since they feel as if they were playing with "the house money" (Thaler and Johnson, 1990). Following this argumentation, success should actually have a positive impact upon the survival and support of new entrepreneurial ventures; successful organizations accumulate excess resources which might be considered "house money" to be spent on risky and unrelated "crazy" projects.

Empirical findings on the relationship between slack and risk-taking and innovation are, however, mixed. For instance, while Singh (1986) found that a higher level of absorbed slack had a positive effect on risk-taking, neither Bromiley (1991) nor Wiseman and Bromiley (1996) could find such an effect. These mixed results led Nohria and Gulati (1996) to suggest that the relationship between slack, on the one hand, and risk-taking and innovation, on the other might in effect be shaped as an inverted U. Slack would be conducive to innovation until a certain threshold level, beyond which the effects of slack on risk-taking might be negative.

3.6.2.2 *The impact of failure and decline on the selection of new ventures*

As in the case of the effects of success on organizational decision-making and organizational actions, scholars investigating the effects of failure and decline on decision-making agree that making decisions in a context of failure has a major impact on the kind of decisions taken. However, they do not agree on the kind of effect that decline will have on organizational actions,

especially whether it will lead to change or to inertia, to risk-seeking or risk-aversion.

Reasoning according to the behavioural theory of the firm, (Cyert and March, 1992) suggested that decline leads to an increase in organizational search and risk-taking. March and Shapira (1987, 1992) that firms will take greater risks if their performance is below their aspirations. They reasoned that as firms begin to perform poorly, they start to question the value of their current strategy and become more willing to take risks in order to change and improve strategy and products. From this perspective, low performance is conducive to change and innovation and thus should have a positive impact on the odds for survival of entrepreneurial ventures. These ventures might be considered as "lottery tickets" which if successful will save the firm from further decline. This line of argumentation is consistent with Singh (1986), who found that low performance had a positive impact on risk-taking. Singh suggested that firms faced with decline tend to take major gambles in the hope of reversing their fortunes. This "lottery-ticket" view is consistent with the story by one of my interviewees about the R&D portfolio of an acquired firm which was having serious financial problems at the time of acquisition:

"One of our competitors, which we later acquired, ran into serious financial problems. After we had acquired them, we discovered that all their research projects in their R&D lab were extremely high-risk projects, projects we would have never invested in because they are too risky. They considered these projects as their lottery ticket, which manifested their dream of saviour." (Senior R&D manager at Firm 5).

Systematic support for the positive impact of declining performance on risk-taking was found by Bromiley (1991), Wiseman and Bromiley (1996) as well as Antonelli (1989) who observed that Italian companies at the beginning of the 1980's increased their R&D expenditure in the face of financial adversity. Greve (1998) also found that radio stations were more likely to change their format when facing financial decline than when enjoying success.

However, other scholars have suggested the opposite effect of organizational decline on organizational decision-making and on risk-taking in particular. For instance, research on gambling behaviour has shown that after experiencing a financial loss, people become less willing to take risks, a phenomenon called the "snake-bite" effect (Nofsinger, 2001). Applying this hy-

pothesis to organizations, Staw, Sandelands, and Dutton (1981) suggested that firms respond to decline with a threat-rigidity bias. From this perspective, failure leads to decreased information-processing, decreased risk-taking and in turn to persistence and inertia as the focus of attention narrows to include only well-learned beliefs and practices. As a result, organizations tend to define their competencies in a more restricted way (Ocasio, 1995). As organizations concentrate on the problems associated with the perceived threat and try to solve them with proven practices and recipes, they neglect other, seemingly unrelated problems and issues which might represent major opportunities for the firm (Starbuck, Greve and Hedberg, 1978). Furthermore, it has been suggested that firms respond to decline with an increased focus on efficiency, restructuring and cost containment (Freeman and Cameron, 1992), not the least in reaction to pressure from financial markets, which will likely call for quick improvement in company performance. Thus, the temporal perspective of firms and their actions is drastically shortened, and myopic tendencies become even stronger, during periods of decline. On this line of reasoning, financial adversity clearly should have a negative effect on the odds for survival of new entrepreneurial ventures. When organizations are facing financial problems, their time horizon shortens and their main concern becomes to cut costs and to refocus. In this situation, long-term investments in new ventures not strongly related to the core competencies of the firm are considered unnecessary or even counterproductive to a reversal of the financial situation of the company.

Figure 3 gives an overview of one of the most highly developed models on the relationship between risk-taking and corporate performance - that of March and Shapira (1987; 1992) -- which summarizes much of the discussion and controversies in the literature.

Performance << Aspiration Level Focus on Survival	Performance < Aspiration Level Focus on Aspiration Level	Performance > Aspiration Level Focus on Aspiration Level
Risk averse Risk aversion decreases with increase of performance	Risk seeking Risk seeking decreases with increase of performance	Risk averse/Risk seeking Risk aversion turns into risk seeking with further increase of performance

Figure 3 - Summary of the March and Shapira Model (1987, 1992)

Overall, scholars generally agree that the performance situation of the mother organization has a major impact on the way organizations make decisions and on the kind of decisions made. However, there is considerable controversy about the particular effects of success and failure and about the implications of these performance-induced biases for organizational action and inaction, such as strategic persistence, inertia or change, or -- as in our case -- the evaluation and support of new entrepreneurial ventures. As the review above demonstrated, some scholars have suggested that success leads to decreased risk-taking, increased focus on currently successful practices and decreased interest in novelty caused by overconfidence in the value and merits of the current beliefs, practices and strategy of the organization. These biases lead in turn to increased inertia and strategic persistence. Such effects of success should clearly have a negative impact on the viability of new entrepreneurial ventures, whose very purpose is to introduce novelty and thus to add to or change the strategic position of the mother organization. Yet, other scholars have suggested that success also leads to accumulation of slack which in turn buffers the organization against failure, thus allowing for greater risk-taking and providing the necessary excess resources required for experimentation and playfulness. From this perspective, success should clearly have a positive impact upon the viability of new entrepreneurial ventures.

The same controversy emerges from the review of the literature on the effects of failure and decline. Some scholars have suggested that failure leads to an increase in risk-taking and problematic search and thus towards greater

acceptance of novelty and change, with a positive impact on the viability of new ventures. By contrast, other scholars have suggested that failure leads to a threat-rigidity response, where organizations narrow their focus of attention towards old, core, and well-proven practices and beliefs and are mainly concerned with short-term action such as cutting costs as much and as quickly as possible. This response should have a highly negative impact upon strategic change in general and the viability of new entrepreneurial ventures in particular, as they are likely to be perceived as unnecessary cost drivers instead of investments in the future.

From my own interviews, the impression emerges that success and failure are major determining factors for understanding the differential survival of new ventures, and the responses indicate a clear direction in terms of effect: success and high performance have a strong positive impact upon the viability of new ventures. It seems as if firms become risk-seeking and less restrictive in their selection decisions when performing strongly. This shift in attitude allows increased internal experimentation. The responses also suggest that when companies run into financial trouble the odds for survival of new ventures strongly decrease. Companies start to cut costs drastically and to refocus their strategy, narrowing down the knowledge and business areas considered to be "core." As a result, they strongly reduce investments in new entrepreneurial ventures and tend to terminate existing ones²¹. Consider the following statements as illustrations of the findings from the interviews:

"During good times there is a tendency in companies to start new projects while at the same time they do not terminate bad projects. This is often one of the reasons why it starts to go downhill for the whole company. But if the company runs into financial trouble, it will need to set priorities. Therefore it is healthy for companies to sometimes run into financial trouble, because then it is forced to weed out a number of projects." (Senior R&D manager I at Firm 8, pharmaceuticals industry)

²¹ One issue, however, is at which organizational level performance leads to the suggested effects. Particularly, whether it is overall corporate performance or rather performance on a divisional or departmental level. As will be seen in Chapter Four, here only the effects of performance on the corporate level are investigated into. This is partly the result of data availability problems, of accepted research practice in this literature and partly also the result of the information received from interviewees. One respondent for instance suggested that it is indeed performance on the corporate level that matters the most, since departmental resource allocation decisions are, in order to ensure internal consistency, typically taken in the light of overall corporate performance and not based on departmental performance.

"During bad times one tries to polish up strategy and tries to focus only on core areas. When profits are going down then the hunt after costs begins. The financial market wants to see drastic measures. All this talk that one should build the future during times of financial adversity exists unfortunately only in theory." (Intrapreneur at Firm 9, heavy trucks)

"The research department in large organizations expands and contracts as if it was breathing. Companies can go from big visions to extreme short-sightedness within a short period of time, very much depending upon the financial situation of the company. When the company is breathing out, then researchers and their ideas are also blown out of the company.....If the company is facing decline even stronger arguments are required to justify investing in a new project. Companies require less risk in such situations.If a company is performing very strongly and is earning a lot of money, then it may grow less careful about projects, one simply is more willing to take risks if the company is earning high margins. That was also the case at company x. We were earning a lot of money, and we were extremely tolerant; one could present really crazy project proposals." (Senior R&D manager II at Firm 8).

"The more money we have, the more we invest in innovation. Higher profits result in more innovation, lower profits in less innovation. It is as simple as that. The problem is rather that (if we are successful), we invest in too many projects at the same time. So, success causes us to become unfocused, and our projects are too widely scattered. If we had less money, would we be forced to focus more." (Senior R&D manager at Firm 5).

"If a company is performing very well, then it has a tendency to branch out, often too thinly into too many different areas. If the company is doing really fine and there is a lot of free cash flow, then it is hard to re-invest all the money in core areas. Then one invests instead in new and less related areas. There is also a hubris effect – in a situation of high profits, there is a huge temptation to make unrelated investments." (Former CEO of a Swedish chemical company, Firm 10).

"If the company is facing decline, then executive management has very little scope for discretionary action, while if profits are high then it is easier for them to take risks and encourage independent initiative. But it is

also about the propensity of individual executives to take risks." (Intrapreneur at Firm 2).

All these quotes from different people at different hierarchical levels at different companies which are active in different industries suggest that if companies are successful they become more tolerant toward innovation, novelty and risk-taking. Companies seem to start new and often unrelated projects, while highly reluctant to terminate or jettison projects that are either unsuccessful or incompatible with the articulated strategy of the corporation. The quotes lead to the speculation that the net effect of this tendency is for the search and diversification space of organizations to branch out and be spread more thinly. As the first quote suggests, this tendency might also erode the very basis of overall company success. These quotes suggest that success breeds failure, but not because it leads to inertia, as indicated by Audia, et. al. (2000), for example, but because it leads to undisciplined investments in unrelated areas²². Failure, on the other hand, does not increase the willingness to take risks in the form of new investments in entrepreneurial ventures. Rather, it tends to shorten the time horizon of decision-makers, to narrow the definition of the organization's "core" areas, to strengthen the focus on cost-cutting and to create a general aversion to innovative new projects. The view that low performance leads to a narrower definition of organization's core competencies implies that particularly the most unrelated ventures will fall prey to this redefinition. This view on what determines the organizational search and diversification space is different from an evolutionary perspective on growth, which puts strong emphasis on the stability and coherence of the internal innovation system as embodied by the existing resources and search routines of the mother organization.

²² Some of the quotes suggest that the tendency of firms to become undisciplined during periods of success and to have a more positive attitude towards venturing is the result of an abundance of free-cash flow which cannot be re-invested into core areas. Instead of distributing the excess cash to shareholders it is instead invested into ever more unrelated areas. Such an argument is in line with agency theory (Jensen, 1986). On the other hand most of the quotes suggest that there clearly are psychological processes at work influencing investment decisions which is more in line with the arguments in this thesis about the effects of success taken from behavioural decision theory. The data does not allow for a separation of these two arguments and it thus cannot be excluded that agency problems do play a role in the differential survival of ideas. Yet, the main argument of this thesis with regard to this variable, namely that the evaluation of ventures and attitudes towards venturing and exploration more in general is highly context-dependent is not affected by this possibility.

Taken together, these arguments lead to the following two hypotheses about the effect of success and failure on the survival chances of entrepreneurial ventures:

Hypothesis 2a: Whenever the parent company is performing above its level of aspiration, the hazard rate of non-retention will decrease.

Hypothesis 2b: Whenever the parent company is performing below its level of aspiration, the hazard rate of non-retention will increase.

3.6.3 The effect of persuasive efforts and social anchoring on the survival of new ventures

The concept of double-layered selection implies that the survival of new ventures is not only a function of "fit" with the existing system of resources and routines, but also to a high degree a function of the personal relationships and the personal judgement of the people involved in the selection process. As argued above, the literature on intrapreneurship puts considerable emphasis on the importance of so-called "champions" for the fate of new ideas and ventures, and thus ultimately in determining the search and diversification space of organizations. However, this role of the intrapreneur and her/his personal relationships inside the organization in influencing search and diversification moves of organizations has been largely neglected in behavioural and evolutionary perspectives on firm growth and innovation (Zander, 2001).

Thus, one of the central insights provided by the literature on internal venturing is that just having a brilliant idea or inventing a new technology is not enough to ensure support and resources for their development, especially as the inventors of ideas typically do not command the resources required to develop them. However great the idea, support for it does not emerge naturally. Thus, the intrapreneur must navigate her/his idea or venture through the socio-political environment inside the corporation and actively mobilize support for the venture (Day, 1994). The literature on entrepreneurship and intrapreneurship has identified a number of strategies used by entrepreneurs to build the support they need to commercialize their ideas. Starr and MacMillan (1990) argue that entrepreneurs and intrapreneurs alike use a number of co-optation strategies to obtain legitimacy and mobilize resources, such as endorsement, association, or building social capital. For instance, one intrapreneur used the *promise* of a potential customer to

buy the venture's product once it was developed and demonstrated its superiority over other products. The purpose of this endorsement before the product actually existed was to build credibility with other potential customers and resource allocators. In other cases Starr and MacMillan (1990) show how intrapreneurs build social capital, for instance by solving problems for potentially important supporters of the venture or by utilizing existing networks and friendships, which ultimately allow them to access resources and gain support for their ideas. Likewise, Bhide (2000) discusses a number of ways in which entrepreneurs without official financing by venture capitalists, for instance, or substantial resources of their own use bootstrapping strategies to finance their ventures.

Such strategies require a high degree of commitment and "persuasive effort" by the intrapreneur. These persuasive efforts might ultimately compensate for a lack of direct resource-relatedness. In other words, if support and resources cannot be mobilized easily through a high degree of relatedness, intrapreneurs might try to persuade others to support their ventures nonetheless. By persuasive efforts is meant the efforts that entrepreneurs invest in convincing others about the value of the venture and in securing their support. Such persuasive efforts must be distinguished from framing efforts, which are intended to alter the perceived nature of the venture in conversations with other people by using a number of rhetorical devices. These strategies will be discussed in a subsequent section. In the literature on entrepreneurship and intrapreneurship, there is considerable emphasis on the degree of commitment of the person championing the venture and her/his persistence in pursuing the venture despite resistance from other parties in the company. The variable termed "persuasive efforts" is intended to assess systematically whether such efforts have any effect on the survival probability of an entrepreneurial venture in the context of a sample which includes both successful and failed ventures. It is not self-evident in which direction the effect of this variable should point, though. On the one hand, one might expect that persuasion actually increases the survival chances of a venture, yet on the other hand it might equally likely have a negative effect. This is the case for two reasons. First, others could become annoyed and suspicious about the value of the venture if the intrapreneurs invests so much effort in trying to convince them of its merits. Second, such persuasive efforts may be positively related to poor venture performance or to a low degree of relatedness -- this possibility will be considered in the statistical analysis. Thus, per-

suasive efforts might be related to two other confounding variables which are likely to influence the survival chances of ventures in a negative way.

Beside these general "persuasive efforts," a factor of key importance is the way in which the intrapreneur manages to obtain social support for his ideas in the organization. One way of gaining such "social nachoring" is by establishing or exploiting existing personal linkages to top-managers. The importance of personal contacts and mentors in top-management has been emphasised in the literature on intrapreneurship (Frost and Egri, 1991; Dougherty and Hardy, 1996; Hamel, 2000), and it emerged many times in my interviews. As the following quote by a senior R&D manager at Firm 5 suggests, such mentorship from higher management might indeed be the only way how to overcome the fundamental handicaps of new ventures and products by comparison to established products:

"It is very difficult for new and innovative projects to win against the big projects within the established organization, because they are always less profitable as they initially involve much smaller volumes while demanding much more time to develop. The only way such projects can succeed is with the help of senior managers who are very interested in technology and who have the power to push the projects through." (Senior R&D manager at firm 7)

Another example emerged from an interview with the former CEO of Firm 11, a global leader in office supplies. He told me for instance that Firm 11 had established a "mentor system" in which each innovative project was assigned a "mentor" to help provide legitimacy and support for the project throughout the organization. Similarly, the former CEO of Firm 10 told me that they had introduced what they called a "CEO fund," which gave the CEO the discretion to put a certain amount of money directly into promising ideas that never would have received any funding or support from the divisions and business areas, that is, from middle management. This would allow the CEO "to understand what the idea is all about, because most of the time one does not understand what an idea is about until one has seen a prototype or something similar."

Such linkages to top-management can help overcome resistance where it is likely to be the strongest, namely in the sourcing and manufacturing as well as the distribution and sales organizations. They also signal to the rest of the organization that the venture is considered to be of major strategic importance for the organization.

Social anchoring can also be gained through getting attention for the venture in company-wide publications and journals. Such publication can have a positive, legitimizing effect on new ideas (Jonsson, 2002) and are likely to be associated with the contact network of the intrapreneur.

Given this discussion one might expect social anchoring to have a positive effect on the survival of new ideas in general. One issue, however, is whether social anchoring can also compensate for a lack of relatedness. On the one hand, one might indeed expect that social anchoring can compensate for a low degree of relatedness, yet on the other hand, social anchoring may be correlated with a high degree of relatedness. In other words, only people who suggest mainstream ideas also have linkages to top management and manage to get attention for their ventures. The effect of social anchoring may disappear once relatedness is considered, implying that the effect of relatedness supersedes the effect of social anchoring, and further that social anchoring cannot compensate for a lack of relatedness.

Here are two additional quotes from the interviews which provide further support for the arguments about the importance of persuasive efforts and especially social support.

"I can tell you, the actual quality of the idea or the new business concept is only of limited importance for understanding this question (of why certain ventures survive and thrive while others do not)... those who are good at negotiation and at winning support for their ideas within the existing organization have better chances of making an impact." (President of a new venture unit).

"It is absolutely crucial that some higher-ranking people who make the actual decisions think the idea is good. But one generally underestimates how much effort it takes to convince others about the value of a new idea. You can have the best idea, but this absolutely does not mean that people will automatically support it." (Intrapreneur at Firm 4)

The last quote suggests that persuasive efforts should actually have a positive effect on survival chances of new ventures. Thus, the arguments and quotes about the effect of persuasive efforts and social anchoring on venture survival leads to the following two hypotheses:

Hypothesis 3a: Persuasive efforts by the intrapreneur will have a negative effect on the hazard rate of non-retention.

Hypothesis 3b: Social anchoring by the intrapreneur will have a negative effect on the hazard rate of non-retention.

3.6.4 The framing strategies of intrapreneurs

A third strategy that intrapreneurs might use to increase support and thus the likelihood for the retention of their idea is the way in which the intrapreneur attempts to position ideas. He/she *frames them in such a way that they seem more attractive and less controversial to the mother organization than they otherwise would be*. In other words, the intrapreneur might use a number of rhetorical devices to influence the opinions and beliefs of resource allocators in the venture's favour. In this way, he/she compensates for a lack of actual fit in terms of resource linkages between the mother organization and the venture. Framing is made possible and important by the ambiguity of innovation and by internal information asymmetries, which enable intrapreneurs to shape beliefs in the potential of the ventures and influence the image of the ventures in the minds of selectors (Czernich, 2003).

The power of framing in influencing people's beliefs and decisions has been shown in a number of studies in social psychology. Cialdini (2000) gives a thorough overview of various tactics that can be used to influence people's beliefs, opinions and actions. He suggests six such tactics: reciprocity, commitment and consistency, social proof, liking, authority, and scarcity. The studies that he reviews convey a somewhat frightening picture of the potency and efficacy of these tactics and of the frequency with which we are exposed to them. The power of framing was also demonstrated in a classic experiment by Tversky and Kahneman (1981). They asked subjects to choose between programs to combat the outbreak of an unusual Asian disease which was expected to kill 600 people. When asked to choose between Program A, which would save 200 people with certainty, and Program B, which with probability $p=0.33$ would save 600 people, most subjects chose Program A. However, when subjects were asked to choose between Program A, which would cause the certain death of 400 people or Program B, which with probability $p=0.67$ would cause 600 people to die, most people chose Program B. Please note that the two versions of the problem are identical, yet subjects made different choices solely because the problem was framed differently.

The power of framing in organizations was demonstrated in the literature on "issue-selling" (Dutton and Ashford, 1993). In a recent study, Dutton, Ashford, O'Neill and Lawrence (2001) showed that so-called issue-sellers in organizations are very conscious about their manner of framing the issue that they would like to sell to top management. More importantly, they showed that the way "issue entrepreneurs" packaged the issue, for instance by making it appear more incremental than it actually was, and the way issue-sellers connected it to other salient issues or to important organizational goals, influenced the likelihood that the issue would make an impact. Jackson and Dutton (1988) discovered a threat-bias in their study of strategic issues, suggesting that organizational decision-makers pay more attention to threats than to opportunities.

While not particularly considering framing efforts with regard to resource relatedness, the literature on entrepreneurship and intrapreneurship has provided increasing evidence that intrapreneurs actually make use of this interpretive space in various ways. Consider the following statement by Art Fry, the legendary intrapreneur and inventor of *Post-It Notes* at 3M:

"My father, an engineer, gave me some good advice while I was still in college. He said that engineers have to deal with people over whom they have no authority. If they want to get their programs accepted, they have to sell their ideas. I sold pots and pans and luggage door-to-door while I was in college. The lessons I learned were valuable, and I was about to use them selling the Post-It Note idea to the new business development groups." (Fry, 1987).

Another example of framing by intrapreneurs is given by Pinchot (1985). He describes how the main champion of developing the Pontiac Fiero, a rather sporty car, managed to frame the Fiero to top management as a fuel economizer rather than a sports-car, thus relating it to one of GM's highest priorities at this time, namely to improve fuel efficiency of its cars.

More systematic evidence of the importance of framing within the realm of entrepreneurship can be found in the study by Burgelman (1983). He showed that intrapreneurs actively influenced the opinions of top managers about their venture and made them see the strategic importance of it. Likewise, Howell and Higgins (1990) showed that champions make use of a number of framing tactics to capture the attention of resource allocators and to try to convince them about the future potential of the innovation. Innovators do so not only by formulating a compelling vision for what the venture

might become, but also by linking the venture to larger principles and values held by the organization. This linking might well be a way of compensating for a lack of actual resource relatedness. Hargadon and Douglas (2002) show how Edison, when attempting to introduce the electric light, actively shaped people's perception of the innovation by framing it in a way that made it seem less novel and threatening to the existing gas-lighting system than it actually was -- a tactic that resonates well with the arguments and results in the study by Dutton, et.al. (2001) mentioned above.

As these studies demonstrated, entrepreneurs and intrapreneurs seem to use a number of different framing strategies -- linking them to current strategic goals as in the case of the Pontiac Fiero; linking them to larger organizational principles and values as reported by Howell and Higgins; downplaying their novelty and their potential threat to existing interests as in the case of Edison -- in every case to increase their attractiveness and make them less controversial within the organization. Framing also emerged several times in my interviews. However, it became obvious that this area was a fairly sensitive one that innovators were reluctant to discuss unless actually pushed to do so. Below are two quotes which illustrate some of the attitudes towards framing within the organizational innovation system; the first is by an innovator; the second, by an R&D manager.

"It is all about adapting to the flavour of the day. Sometimes one tries to emphasise the new business opportunities the project has to offer, or one tries to demonstrate how the project can support and improve the existing core business areas. At other times one tries to emphasise possible threats from competitors, like saying that other competitors have already started to invest in this technology and we are in danger of lagging behind." (Intrapreneur)

"One can sell projects like used cars. But if one does so then it gets difficult to sell a project a second time. It is best to use mostly facts mixed with the right amount of advertisement." (R&D manager at Firm 2)

As the second quote illustrates, employees might also be aware of the potentially destructive consequences of framing since they might lose their reputation once it becomes obvious what the venture actually is about. While organizations might be forgiving in case the venture succeeds, such a discovery might have highly adverse effects in the case the venture fails.

Given the sensitive character of this topic, I also included in the survey several questions about a number of different framing strategies²³. The questions in the survey were inspired by the literature on “issue-selling” and the various strategies uncovered by these studies, such as the threat bias and trying to link an issue to other important or successful issues. From this literature it may be expected that intrapreneurs will generally try to gain support for the venture by framing it as a response to a possible threat to the company rather than as an investment in a new opportunity. It may also be expected that intrapreneurs will try to link their venture to other successful ventures. Furthermore, as with the threat bias and in line with the concept of “loss aversion” (Tversky and Kahneman, 1981), intrapreneurs seeking attention and support for a venture could be expected to frame it as a way of avoiding losses rather than as a way of increasing profits. Guidance was also provided by the arguments of Hargadon and Douglas (2002) about the value of downplaying the novelty of new ideas. Especially in view of the discussion on the selection logics inside the market and the sourcing and manufacturing organization, it might be wise for intrapreneurs to downplay the novelty of the venture in order to make it appear more in line with the existing strategy, resources and routines than it actually is.

Table 2 summarizes the results from the survey, which provides some systematic data on the framing tactics used by intrapreneurs. Unfortunately data on these question were only available on about half of the sample, as these questions were included into the survey at a later stage of the data collection process.

²³ Unfortunately these questions were only included into the survey at a relatively late stage (details will be discussed in the methods chapter) so that data on framing strategies is only available for about half the sample. Thus, it does not make much sense to test for the effects of these strategies on survival time. Consequently, the results from this part of the survey are presented in this chapter and will be excluded from the statistical models.

Question (Likert scale from 1 "do not at all agree" to 7 "fully agree")	N	Mean	Median	Std. Dev.
In conversations with people inside the company (but outside the venture team):				
1) It was attempted to downplay the degree of novelty of the concept during early stages of development	49	2.43	2	1.66
2) It was attempted to emphasize the degree of novelty of the concept during early stages of development	49	4.73	5	1.89
3) The concept was portrayed as a response to a new market opportunity for the company	49	5.41	6	1.8
4) It was emphasized how the concept could contribute to increasing profits for the company	48	5.29	6	1.74
5) The concept was portrayed as a response to a threat against the company	48	2.27	1	1.87
6) It was emphasized how the concept could counteract a decline in company profits	48	3.27	3	1.92
7) Similarities to earlier successful projects were emphasized	48	2.35	2	1.73

Table 2 - Framing strategies of intrapreneurs. Means and standard deviations

There are several interesting findings in this table. Intrapreneurs are certainly engaging in the various framing strategies suggested, yet in a way opposite to that predicted by theory. First, intrapreneurs do not seem to downplay the degree of novelty of the ventures, but strongly emphasize it in conversations with other people inside the company (t-test for comparing means between Questions 1 and 2 significant at 0.001 level). At first sight this finding is somewhat surprising. Given the strong pressure towards relatedness and towards "fitting into" the existing system of routines and resources, and given a purported bias against uncertainty in companies, downplaying the novelty of a venture would appear to be a better strategy for selling it. Yet, intrapreneurs do the opposite. One possible explanation, which is consistent with my argument about the selection logic of engineers and scientists in the R&D department, is the following: as practically all the respondents in the survey were engineers and scientists from the R&D department themselves, it seems natural for them, given their preference for novelty, to emphasize how the venture is new and different. For an engineer it would feel strange to downplay the degree of novelty of her/his invention. As I argue,

creating novelty and exploring is one of the major motivating forces of any engineer in the R&D organization and part of her identity. Engineers might tend to forget that such is not always the case with other people in other parts of the organization outside the R&D lab.

The finding is also consistent with the argument of Czernich and Heath (2002) that people and organizations alike do not exhibit a general aversion to uncertainty and novelty. Rather, there are two countervailing and contradictory forces at work simultaneously: conservative pressures towards uncertainty-avoidance and old ways, on the one hand, and curiosity and a preference for novelty, on the other. From this perspective it is not necessarily rational always to downplay the degree of novelty when trying to sell a new idea. A better approach is to find the balance between these two countervailing forces in the minds of the people who are supposed to adopt new ideas. Intrapreneurs might intuitively follow this strategy in trying, at least to some extent, to highlight the novel aspects of the concept in order to gain the attention of those who make decisions about allocating resources.

Another interesting finding illustrated in the table is at odds with the research showing that people generally allocate more attention to threats than to opportunities. This finding is that intrapreneurs tend to portray their ventures as a new market opportunity for the parent company rather than as a response to a threat (t-test for comparing means between Questions 3 and 5 at the significant at 0.001 level). One would expect that if an intrapreneur managed to convince her/his managers that the organization was facing an immediate threat and that their venture would be an appropriate response to that threat, the survival chances of the venture, given threat aversion, would increase considerably. Yet, intrapreneurs generally try to position their ventures as responses to a new market opportunity. One explanation for this finding is that it might seem more natural to sell an idea as an opportunity than as a response to a threat, especially for an entrepreneur who is normally portrayed as a person who is pursuing new opportunities rather than responding to immediate threats. Also, it might be easier to argue for the existence of an opportunity than to argue for the existence of a threat. The findings on these questions are also supported by the findings concerning the questions about framing the venture as an opportunity to increase profits rather than a way to counteract declining profits. It seems that intrapreneurs tend to frame their ideas rather as opportunities to increase profits than as a means to counteract declining profits (t-test significant at 0.001 level). The latter question, however, might be somewhat problematic since it requires

that the company was actually facing a profit decline at the time when the intrapreneur was attempting to sell the venture.

Finally, the relatively low mean of 2.35 for Question 7 suggests that intrapreneurs are reluctant to associate their venture with prior successful ventures. This finding, too, is fairly surprising. It appears rational to try to show how and why a venture resembles other successful ventures since such an association might build legitimacy for it. However, intrapreneurs do not use this tactic. One explanation for this finding might be that intrapreneurs prefer to portray their venture as totally unique rather than to emphasize similarities with other ventures, an argument consistent with the finding that intrapreneurs try to emphasise the degree of novelty of the venture.

Before the results of the tests of hypotheses 1a-3b are reported in Chapter Five, I will discuss in some detail the methodological approach of this study and the specific statistical method used to test the hypotheses. This discussion will be presented in Chapter Four. At the end of that chapter, the hypothesized effect of the variables discussed in the present chapter will be recapitulated.

Research design, statistical model and data

4.1 Research strategy and design

This study takes a middle-range approach between the large-scale quantitative studies usually reported in the literature on diversification and search and the generally single or multiple in-depth case-study approach taken in the literature on intra-preneurship.

Choosing between a quantitative and qualitative research approach is one of the major decisions in designing a research study. Beside a number of philosophical issues concerning assumptions about ontology and epistemology, the choice between a qualitative and a quantitative research approach represents in a more pragmatic sense a choice between emphasising external or internal validity in the research design. Internal validity is the basic minimum without which any experiment is impossible to interpret (Campbell and Stanley, 1966). In other words, internal validity is concerned with the extent to which a test measures what we actually intend to measure and the extent to which differences found with a measuring tool reflect true differences among the respondents being tested (Hair, Babin, Money and Samouel, 2003). As such, internal validity is concerned with a minimum of in-depth knowledge and with understanding a particular observation and the actions that may have affected it. Yet, an increase in internal validity comes normally at the expense of external validity. External validity is concerned with the issue of generalizability of the results across persons, settings or times (Campbell and Stanley, 1966). Generalizability can typically be increased by a larger number of observations in a study and by making sure that the sample is free of systematic bias. Yet, increasing the number of observations typically entails a decreased in-depth understanding of each single observation.

Given this basic trade-off between internal and external validity and given the fact that both criteria for judging the quality of a study are obviously important, an ideal research design would be strong in both types of validity (Campbell and Stanley, 1966). Having this trade-off and this ideal study in mind, I tried to combine both qualitative interview data with quantitative data in my research approach, but with a clear emphasis on quantitative analysis. Such "triangulation" (Jick, 1979) hopefully made it possible to obtain a reasonably detailed overview about each venture and the underlying problems and challenges encountered. At the same time, it hopefully

yielded quantitative data on each venture that allows a more rigorous and systematic analysis of the underlying causes of their differential survival within their mother corporation. Triangulation also makes it possible to interpret more consistently and correctly both the findings which confirm the hypotheses and those which do not.

4.2 Sampling

Research on innovation and entrepreneurship generally suffers from a pro-innovation bias (Rogers, 1995). Hardly ever is it attempted in larger quantitative studies to identify a balanced sample of both successful and failed attempts of commercializing inventions and of engaging in entrepreneurial activity. Such over-sampling of success can lead to serious biases and distortions (Denrell, 2003). To circumvent these problems, a major element of the sampling strategy was to seek a fairly balanced mix of cases which were kept inside the parent organization and those which at some point during their life-time were either terminated, spun-off or sold.

In addition to this overall requirement of a balanced sample of successful and failed ventures, any venture included in the sample had to fulfil three criteria:

- The ventures had to be based to a significant extent upon the autonomous initiatives of employees, mostly engineers. Thus, following the distinction suggested by Baumol (2002), they needed to be "independent" and not "routinized" innovations. The sample did not include ventures which originated as part of strategic planning, which were initiated by top management and which from their inception had a natural "home" in the existing strategy and budgeting system of the mother corporation.
- The ventures needed to be based on a significant innovation or invention and thus were required to add *a significant degree of novelty* to the existing business portfolio of the mother corporation. Either by introducing a totally new product or service, or by adding something significantly new in terms of technology or functionality. Ventures which aimed at simple refinement of an existing product or product line were not relevant for this study. In this sense, the innovations underlying the venture were certainly more "radical" than "incremental." However, as already mentioned in the introduction, I would not go so far as to call *all* the ventures in the sample "radical." Thus, there is substantial variation in terms of how tightly the various ventures are linked to the core strategy, core products and core capabilities of the mother corporation.
- The ventures must have passed what Burgelman (1983, p.226) calls the "conceptual" or "pre-venture stages." Thus, all the ventures in the sample had at least to have passed the prototyping stage and thus demonstrated technological feasibility. Having passed the prototyping stage also implies that for

most ventures a more or less formal business plan had been prepared in which a reasonably well-defined business opportunity had been identified²⁴.

In summary, the sample consisted of significant, often but not always radical innovations based upon the autonomously created ideas and inventions of employees. Furthermore, these ideas and inventions, at least initially, did not fit naturally into the top-down strategy of the mother corporation (Burgelman, 1983) and were not part of routine corporate innovation activities.

The reasons why I focused exclusively on this special kind of ventures were already explained in the introduction. One reason is that such autonomously initiated ventures are, in my view, archetypical instances of corporate entrepreneurship and corporate support of exploratory activity. Since one of the major purposes of this thesis is to determine whether and when large organizations support exploration and intrapreneurship and retain the results thereof, it is most relevant to study independent and fairly "deviant" ventures, not ventures which are the result of the routinized and planned innovation activity. The other reason is that commercialization of autonomously created inventions often requires the firm to enter a new market; this criterion would also make it possible to study patterns of corporate diversification.

Table 3 provides a more detailed overview of the characteristics of the innovations underlying the various ventures. This characterization of the degree of novelty of the ventures is guided by Schumpeter's (1934) typology of different forms of "new combinations." Since the distribution is quite skewed, the median is also reported. As can be seen, the sample consists mostly (Mean=5,81; Std.Dev.=1,69; on a 7 point Likert scale) of ventures that attempted to introduce a totally new product or service to the company, but also of ventures which attempted to significantly improve and change existing products and services along a number of different dimensions (Mean=5,06; Std.Dev.=2,09). There is a significant negative correlation of 0.303 between these two characteristics, suggesting that these two categories tend to be substitutes for each other. Frequently, though not necessarily, the ventures also sought to open up an entirely new customer segment for the firm (Mean=4,42; Std.Dev.=2,29). However, they usually were not concerned with entering a new geographic market for the firm (Mean=2,14; Std.Dev.=1,8). The latter finding is not espe-

²⁴ As will be further explicated in Chapter Five one major shortcoming of this approach is that there has been a significant amount of "pre-selection" with regard to the technological relatedness dimension of the venture as this sampling approach implies that all ventures in the sample had already passed some filtering with regard to technological relatedness. Thus, the really "odd" cases with regard to the technological idea underlying the venture have probably already been filtered out as such technologically poorly related ventures are, on average, less likely to reach the prototype stage. As a result of this sampling bias there might be the possibility that we systemically under estimate the effect of technological relatedness on the hazard rate of non-retention as compared to an approach by which ventures in an even earlier stage of development had been included into the sample. However, if ventures had been sampled in an even earlier stage of development, then it would have been less likely that they would have "left" the R&D department thus making it more difficult, if not impossible to assess relatedness to the market and the sourcing and manufacturing departments.

cially surprising since most of the companies in the sample are already extensively internationalized. Further characteristics include the introduction of a new way of manufacturing (Mean=3,36; Std.Dev.=2,26), a new form of organizing (Mean=2,45; Std.Dev.=1,962) and new components and supplies (Mean=4,07/Std.Dev.2,217). As the table demonstrates, there is a fairly strong variation in the kind of novelty introduced by the various ventures into the parent company.

Question	Mean	Median	Std.Dev.
The new concept			
1) Introduced an entirely new product or service	5.81	7	1.694
2) Improved existing solutions on a number of points	5.06	6	2.086
3) Introduced an entirely new way of manufacturing	3.36	3	2.26
4) Introduced an entirely new organizational form	2.45	1	1.962
5) Opened up an entirely new geographic market	2.14	1	1.802
6) Opened up an entirely new customer segment	4.42	5	2.288
7) Utilized entirely new components or inputs	4.07	4	2.217

Table 3 - Sample characteristics

Table 4 provides further important details on the sample composition. As can be seen, the sample represents a fairly balanced collection of retained cases, i.e. of ventures which were still operating within the boundaries of the mother organization at the time the interview was conducted (43.2%), ventures which had been terminated (22.7%), and ventures which had been spun-off and led to the founding of a new, separate company outside the boundaries of the mother corporation or sold to another company (34.1%)

Event type	Number	Percent
Censored/Still retained	38	43.2%
Terminated	19	21.6%
Spun-off, Sold-off	31	35.2%
Total	88	100

Table 4 - Sample composition by event type

Another characteristic of the sample is that all the ventures included originated and were based in Sweden. The restriction to Sweden is a result of the otherwise prohibitive costs of data collection since a personal interview was an important part of the sampling procedure. It is also a reflection of the increased ease with which contacts could be established in Sweden as compared to abroad. The exclusive focus on Sweden is also a result of the fact that R&D and also new venturing is still mainly conducted in the home country of large, established and extensively internationalized companies which present the majority of the companies in the present sample and which all are Swedish companies.

A closer look at the distribution of survival duration (see Figure 4) shows that it ranged from 1 to 29 years with a median of 7 years. For 60 of the 88 ventures, the survival duration was 10 years or less, and 76 had a survival duration of 15 years or less. Six ventures had a survival duration of more than 20 years. The figure shows the dispersion of survival duration for all ventures in the sample, that is, not only for those which had been spun-off or terminated, but also of those which were retained, i.e. for the censored cases. In the section on control variables, there will be a detailed discussion on the possible effects of this age distribution on the results and on ways to check whether ventures started more than 20 years ago bias the results in any way.

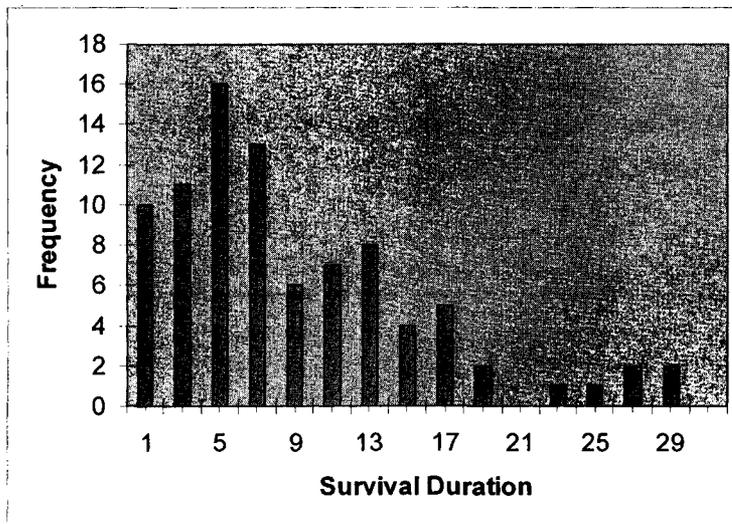


Figure 4 - Histogram of survival duration

A final important characteristic of the sample is the dispersion of the ventures across companies and industries. The total number of parent companies in the sample is 29. This is a sufficiently large number of companies to allow for enough varia-

tion in performance histories, an important aspect of the quantitative analysis in the next chapter. These 29 companies operate in a fairly diverse set of industries including IT and telecommunications, pharmaceuticals, machine tools and heavy trucks. These different industries are a fairly good cross-section of the principal areas of economic activity in Sweden, and the companies represented include most major Swedish corporations²⁵. The various industries and the number of ventures in each industry can be found in Appendix 1. As the list of industries shows the sample somewhat biased towards IT and especially towards one company in this industry, from which a total of 26 ventures were taken (29,5% of the total sample). The possibility that this potential overrepresentation of ventures from one single company might bias or distort the results will be examined in the analyses. This will be discussed at greater length in the section on control variables at the end of this chapter. Except for the special case of this one company, the number of ventures at the same company was typically two or three.

4.2.1 The ideal sampling approach and the actual sampling approach

There are significant problems in identifying and gaining access to ventures which fulfil the sampling criteria of this study. These problems required a rather pragmatic approach towards sampling. In an ideal sampling approach one should have access to an official register of all ventures fulfilling the above-mentioned criteria -- successful, failed and divested -- within a chosen population of corporations during a certain period of time. Once the register had been accessed and the population defined in terms of a "list" of relevant ventures, one could then either analyze the whole population or choose a random sample of the population of ventures for analysis.

Such a list could be created with relative ease for portfolio companies of venture capital firms, for instance, since the names of these ventures are published on the VC-firm websites and since there are fairly good databases on VC-backed start-up firms. The problem with research on new ventures in large corporations however, is that there are no official registers on the population of new, fairly radical and independently initiated ventures in this category. Thus, in comparison to start-ups, one is even less likely to find internal ventures in business registers. A second major problem is that the kinds of ventures which are appropriate for this study are relatively rare. The vast majority of all new projects in large organizations are initiated at the top and strictly in line with the articulated strategy of the corporation.

In a situation in which the researcher faces a rare population for which no official "list" exists or is accessible, snowball sampling is the most appropriate approach (Hair, teal., 2003). Snowball, or referral, sampling is an approach in which the researcher uses one initial respondent to help identify other respondents by referrals in the target population until the desired sample size is reached (Saunders, Lewis and Thornhill, 2003). Such a snowball-sampling approach was combined with a convenience-sampling approach; that is, cases were included in the sample whenever a ven-

²⁵ For reasons of anonymity the names of the companies included in the sample are not disclosed.

ture which fulfilled the sampling criteria was identified in the course of the study. Observations were gathered from two sources. The primary source of relevant observations was personal contacts with managers and engineers who were directly asked whether they knew about any ventures which could fit the sampling criteria. As I will explicate more in detail below many ventures were identified through contacts built up during Executive MBA programs at the Stockholm School of Economics (SSE). As the SSE is the leading business school in Sweden such courses are attended by managers of all the major (typically multinational) companies in Sweden. These people thus gave fairly unique access to important and publicly not (yet) known innovation projects within the major companies in Sweden. Another, less frequently used approach was to search secondary data sources like newspapers and magazines. Both sources pose some challenges to the researcher.

The only time when information about ventures is actually available publicly in the press is either when their products are officially launched on the market or when the ventures are sold or spun off, since these actions are typically communicated in press releases and sometimes in annual reports. Thus, relying exclusively on publicly available information for creating the sample would have led to a bias towards late-stage, highly successful ventures and towards spin- or sell-off's.

A problem with directly asking managers or engineers about the existence of new ventures is that no single individual can be expected to be knowledgeable about the complete portfolio of recent or ongoing ventures within the corporation. Indeed, in the course of the interviews with senior managers, it became clear that they typically lack an exact overview of all the ventures in which the corporation is currently involved and has been involved in in the past. Another major problem with asking managers and engineers directly about the existence of ventures is that information about new ventures is highly sensitive and often secret. If a venture is considered to have great potential, it clearly has strategic importance to the firm; therefore, its existence is typically kept secret until it is officially launched on the market-place. In cases where a venture has failed, firms are typically reluctant to talk about them since these ventures have often cost firms considerable sums; also, people seldom like to talk about their own failures.

Considerable effort was invested in overcoming these problems and convincing managers to grant access to these ventures. All participants were assured that their names and the names of the venture would not be disclosed without their consent, and in several cases the research team signed a secrecy agreement about the information received in the interview and the survey. Despite these efforts there is no guarantee that the sample represents a random draw from the full set of ventures in which the various corporations have been or are currently involved. However, since the sample consists to a considerable extent of both failures and spin-off's, it is not biased towards highly successful cases. This balance alone represents a considerable step forward in relation to other, comparable studies which typically over-sample successful cases or neglect failures altogether. Furthermore, the sample collected in

this study was taken from a combination of sources, magazine searches and information from managers and scientists. Biases likely to arise from the different sources should have cancelled each other out. In the following section, we will examine the actual data-collection process more closely.

4.3 Data-collection process

4.3.1 Phase 1: Identification of sample

Because of the considerable difficulties mentioned above, the actual sampling process took more than two years. The overall sampling process consisted of two stages²⁶. In the first stage, e-mails were sent out to previous participants in Executive Education programs at the Stockholm School of Economics. Many of these first sampling targets had engineering backgrounds and were personally known by members of the research team. In a mailing of 131 letters, the people contacted were asked to identify "products that have been introduced recently and represent something significantly new in terms of technology or functionality", and "not predominantly be improvements of existing products". They were explicitly asked to think also of projects which had failed or led to a spin-off or sell-off.

A total of 83 persons (63%) responded to the inquiry. Of this number, 31 stated that they did not know of any products that matched the description, sometimes adding that they would continue to look for possible observations, or suggested names of other people in their organization who would possess the relevant knowledge. In 36 cases, the people contacted suggested one or several specific products for further investigation, in the majority of cases (75 per cent) connected to their own organizations. In addition, four leads were given to people who could be considered generally knowledgeable about the existence of products that matched the sample criteria (these people were associated with investment companies and labor unions in the engineering-products industries). The remaining 16 e-mails were returned as undeliverable.

A number of the cases so identified were not pursued further. For example, some had been acquired from outside sources and thus did not originate in the mother corporation; others represented close imitations of existing technical solutions. In still other cases, the prospective respondents were working in a foreign-based firm; they were ruled out because of the prohibitive costs of the personal interviews required for data collection. In total, this part of the sampling resulted in the identification of 16 cases which were included in the sample underlying this study²⁷.

²⁶ It is the result of a joint research effort of Associate Professor Ivo Zander and me.

²⁷ This first stage of the study was funded and supported by a grant from HSFR, the Swedish Council for Research in the Humanities and Social Sciences. By this stage the core questionnaire to be used throughout study had already been defined. However, during the second part of the data-collection process, several new questions were added to the questionnaire and sent back to the initial respondents for completion. Thus, new theoretical issues and angles have been added to the question-

After this first stage of the sample-identification process, multiple other sources were added to identify further cases. This second stage of the data collection took place primarily between June 2002 and September 2003. The most important of these new sources were obtained through co-operation with the Royal Swedish Academy of Engineering Sciences (IVA), which is supporting this project. IVA was contacted because it was suspected that they could be of great help in providing new sources for the identification of relevant cases. They furnished a list of more than 50 IVA members, who typically were senior executives from a broad spectrum of Swedish industry, and from more than 35 different companies regarded as potential sources of information on relevant projects. These people were then contacted and asked to identify potentially interesting ventures. These tips and contacts leading to many different companies in Swedish industry were then followed up until appropriate ventures were identified. This sampling effort led to the identification of 35 cases.

In addition to this approach, extensive searches of the Swedish business press were conducted to identify spin-off or sell-off companies which could be potentially relevant. These initial names were then followed up and contacted by telephone to determine whether the ventures identified fulfilled the sampling criteria of the study. Systematic searches of secondary data sources produced a total of 15 cases. Finally, and very importantly, a number of other cases were identified through personal contacts of the members of the research team and a range of occasional and unplanned encounters. This led to the identification of 28 cases, 20 of which were from a single contact that provided ample access to the internal venturing activities at one single company²⁸.

In summary, this second part of the sampling process led in total to the identification of 78 additional suitable cases. Once relevant cases and the name and contact information of a key informant had been identified, this person was contacted either by telephone or via e-mail and asked to participate in the study. Since the key informants had usually been identified through personal referrals, there were only three cases in which the informant was contacted but was not willing to participate in the study. There were another three drop-outs in a subsequent phase of the data-collection process, when the respondents were contacted and met for an interview, yet never completed the survey. In sum, only about 7% dropped out of the study

naire and to the study as a whole during the second stage of the research project. Also, from this stage onward I took the primary lead in identifying 72 new cases as well as in conducting the interviews and collecting the questionnaires.

²⁸ The way by which the researchers gained access to these twenty cases which represent the full portfolio of corporate ventures within a major Swedish corporation is worth mentioning here, since it represents well how research is sometimes dependent on lucky encounters: One morning a member of the research team picked up a person waving on the side of a street because his car had been broken down. As it turned out in the course of the conversation while bringing the person to his work this person was a senior manager of a corporate venture unit. In the course of the conversation the person got interested into the ongoing research project on corporate venturing and promised to arrange so that the research team could get access to the full portfolio of ventures.

during this stage of the data-collection process. Table 5 summarizes the sources of data, the number of cases identified from each source and the number who dropped out for each data source.

Data Source	Total number of identified cases	Drop-outs after identification
Initial Survey	16	-
IVA contacts	35	3
Secondary data sources	15	2
Personal contacts of researchers	28	1

Table 5 - Data sources in the sampling process

This short description of the sampling process makes clear that the job of sample identification in this study can aptly be compared to that of a detective guided by personal contacts, referrals and a steady lookout for suddenly arising possibilities to identify yet another venture, combined with extensive searches of the business press. This pragmatic approach towards sampling is virtually dictated by the problems of doing research in this area. Clearly, this approach can be associated with a number of problems and biases as there is a definite possibility that the sample is not fully representative; however, there were also the benefits that it could be assured that each case has the desired characteristics (Saunders, et.al. 2003) and that the drop-out rate was extremely low. Also, as Table 5 above demonstrates, there is a fairly wide dispersion across the different data sources, making it unlikely that the sample is overly biased towards one specific network or one specific subpopulation. Nevertheless, the possibility that the sample is not sufficiently representative warrants caution in the interpretation and generalizability of the results. These issues will be summarized in a critical evaluation of the data set, and I will return to issues of generalizability in the final chapter of this dissertation.

4.3.2 Phase 2: Conducting the survey

The data gathered consist of a combination of interview data, survey data as well as archival data from annual reports about the performance of the mother corporation. Interview and survey data were obtained from key informants. Key informants were usually the primary inventors of the new technology or product. In case the inventor was not also the primary champion of the technology and/or was not at all involved in the process of commercializing his invention, the project leader who had taken over management of the venture from the inventor was used as a key informant instead. (See, for instance, the recent study by Green, Welsh and Dehler, 2003 on the use of key informants in a similar setting.) Key informants served as the sources of two kinds of data: interview data and survey data. The interview was typically conducted immediately before the completion of the survey. The possible

effects of this procedure on the validity of the answers in the questionnaire will be discussed below.

4.3.2.1 Interviews

In total, 103 interviews were conducted. Of these, 90 were held with key informants working directly with the various ventures. Except for two cases for which two interviews were conducted, one interview per case was made. In one case, no interview was conducted, and key data, such as start date, current status and date of a possible event (a designation for terminating, spinning off or selling the venture) was received by e-mail. Furthermore, 13 interviews were conducted with senior R&D managers or former CEOs who were highly familiar with the workings of the internal idea- and invention-selection system of their firms. In addition, many further discussions were held with several different people in the course of the study, particularly during the case-identification process.

Since the purpose of the interviews was twofold they always consisted of two parts. In the first part the key informant was asked about some critical background information concerning the venture, such as the start date of the venture, its current status and, in case the venture was terminated or spun off, the date and kind event concerned. A "Background Information Sheet" (see Appendix X) was used as a guide for the first part of the interview. This sheet includes crucial questions about the current status of the venture (i.e. active/terminated/spun-off/sold-off), the date of its "birth" and the date of the termination or spin-off, in cases where such an event had occurred prior to the interview. This information obtained during the interview thus made it possible to construct the life history of the various ventures, the dependent variable of this study. The key informants were not told about the exact purpose of the study and the variables, either before or during the interview.

In the second part of the interview, key informants were asked about the origins of the venture and particular challenges faced during its existence and in case of an event, the reasons for it. As parts of the survey had already been specified during the early phase of the data-collection process, the interviews were not conducted in the spirit of a purely "grounded theory approach" (Glaser and Strauss, 1967) with few preconceived views of theoretical explanations. Also, the dependent variable and the research question had already been clearly defined before the data collection process started. However, especially in the early stages of data collection, interviews were as open and unstructured as possible in order to check whether any major explanatory variables had been missed in the original survey instrument. This approach led indeed to two revisions of the survey instrument. In the first revision, more detailed questions about venture performance were added. Once the questions had been added and the survey redesigned, the initial respondents were contacted again and asked to complete the new questions. All respondents contacted answered the new questions. The second revision, at a later stage of the data-collection process, resulted in the addition of a number of questions about the various framing strategies of the

intrapreneurs, who turned out to be using these strategies frequently. However, because of time constraints and a desire to avoid having to contact key informants yet another time, these questions are only available for about half the sample and are thus not included in the Cox regression models. Finally, interviews also made clear that corporate performance played a major role for understanding the survival patterns of new ventures. As a result of this finding from the interviews, archival data about corporate performance was then collected.

Thus, the interviews powerfully influenced this study in a number of ways. First, the quotes used in the previous chapter have demonstrated that they can be considered as illustrations of the major theoretical arguments made in the thesis. Second, the interviews were used to check whether other major explanatory variables were missed. Indeed, the interviews led to revisions of the initial survey instrument. Thus, the combination of qualitative and quantitative data led to a dynamic, iterative process between these two kinds of data, which hopefully has increased the validity of the theoretical arguments and findings of this study. It inspires confidence that no crucial variables have been left out of the analysis, an important aspect given the potentially drastic effects of such *unmeasured variables* on the validity of the kind of explanatory research conducted in this study (Saunders, et.al, 2003).

A total of 78 interviews were conducted face-to-face; each lasted between 1 and 2.5 hours. The remaining 25 interviews were made by telephone and required between 20 minutes and 1 hour each. During the interviews, detailed notes were taken, and quotes judged to be important and/or interesting were written down. The notes and quotes were then transcribed immediately after the interviews (see Burgelman, 1983 for a similar procedure). Because of the often sensitive information provided in the interviews, they were not taped. During the research process it became obvious that many respondents would not have felt comfortable if a tape recorder had been used. In order to avoid this unpleasant effect, the decision was made not to use a tape recorder. In 19 interviews two researchers were present; both took detailed notes and immediately wrote down interesting quotes as accurately as possible. Notes were then compared directly after the interview. Since no tape recorder was used, the exact wording of the quote as replicated in the dissertation may sometimes have been missed, but the overall meaning of the various statements was certainly conveyed. Most interviews were held in Swedish, and the quotes from these have been translated by the author. Table 6 below summarizes this information on the interviews.

Telephone interviews have a number of advantages with regard to access, speed and lower cost and thus make it possible to interview people even if a face-to-face interview would have been impossible (Saunders, et.al., 2003). Indeed, telephone interviews were only relied upon when a face-to-face interview was not feasible either due to distance or due to time constraints of the respondent. However, telephone interviews have also a number of disadvantages, especially the increased difficulty to build trust over the phone and the decreased willingness of respondents to engage into exploratory discussions (Saunders, et.al., 2003). For these reasons the qualitative

data from telephone interviews can generally be expected to be of lower quality than the data from the face-to-face interviews. Awareness of this fact caused me for instance to virtually only use quotes from interviews conducted face-to-face.

	Face- to-face	Duration	Telephone	Duration
Interviews with key informants	69	1-2h	21	20 min.-1h
Interviews with senior R&D personnel and CEOs	11	1.5-2.5h	2	30 min

Table 6 - Interviews

4.3.2.2 The survey

The survey was carried out in a controlled setting in that the great majority (about 75%) of respondents filled in the questionnaire in direct connection with the personal interview. The setting was typically the office of the respondent, and occasionally at the homes of respondents or at the Institute of International Business.

The survey, which consists of 128 questions in total, contains fairly direct questions about the following principal areas: the origin of the idea, the degree of novelty of the idea, the degree of relatedness of the venture to various dimensions of the mother corporation, various details about the person and the process driving the venture, such as linkages to top management, the amount of effort allocated to persuasion, the extent of the intrapreneur's prior experience, the various framing tactics used by the intrapreneur (only available for about 45 ventures) and about the details of the venture's performance. The major part of the questionnaire is devoted to the assessment of relatedness.

The questionnaire was developed in a number of different stages. The first draft of the questionnaire was based on a detailed review of the literature on corporate venturing, on the resource-based theory of the firm and on the knowledge-based theory of the firm. Most of the measures used in this literature are highly abstract. Owing to dissatisfaction with this general approach, one of the basic purposes of the questionnaire was to pose some very direct and simple questions concerning relatedness to resources and knowledge. The development of the questionnaire was guided by the literature on survey design (Converse and Presser, 1986; Peterson, 2000) and also by preliminary discussions with two people knowledgeable about the corporate venturing process. After complementing the questionnaire with additional questions that were identified as relevant through the interviews, the pilot questionnaire was then pre-tested (a) on individuals knowledgeable about the construction of questionnaires and (b) on two company representatives. This pre-testing resulted in further improvements to the general design of the questionnaire and identified questions that needed clarification and re-formulation.

In almost all cases, respondents were left to fill out the questionnaire without involvement by the researchers and thus could not ask for clarifications of individual questions. While introducing a risk of non-reliable responses to some questions, the resulting bias is likely to have been systematic across the responses. In a few cases, given the circumstances surrounding the interview, the researchers were nevertheless asked about the meaning of certain questions; this tended to happen three to four times during the course of the questionnaire, or about once every 50 questions. From the contact with respondents immediately after the completion of the survey, one can be quite confident about the suitability of the questions used. Rarely, as noted above, did respondents ask for clarification of the questions, and frequently the researcher was given positive feedback about the simplicity and understandability of the questions. In one exceptional case, the interview consisted of a conversation concerning the answers provided in the questionnaire since the respondent had already filled in the questionnaire at the outset of the interview. This conversation strongly confirmed that the questions were understood in the manner intended, and that few (if any) questions had been misinterpreted by the respondent. In practically all cases, however, the interview was conducted *before* the completion of the survey.

In all probability, asking respondents about some historical events around the time that the new concept was introduced made it easier to remember the specific questions asked in the questionnaire. When introducing the respondents to the questionnaire, they were informed that because of the general nature of the questionnaire some questions might be non-relevant in their particular case, and thus reminded of the "Don't know" or "not relevant" alternative.

Filling out all 128 items in the questionnaire took about 20-25 minutes. Since here the respondents showed no signs of fatigue questions are likely to have received about equal attention.

4.4 Some critical remarks on the use of key informants

The use of key informants is a rather frequently used research tool in the social sciences, yet the use of this tool is not without problems and can be the source of considerable biases, potentially distorting the validity of the results (Bagozzi, Yi and Phillips, 1991). In general, it is most appropriate to rely on key informants when complete or in-depth information cannot be expected from representative survey respondents (Kumar, Stern and Anderson, 1993). Thus, informants are not normally selected in any statistical sense as representative members of a studied organization. Rather, they are chosen because they are supposedly knowledgeable about the issues being researched and able and willing to communicate about them (Kumar, et. al., 1993).

There are a number of drawbacks to using key informants. One is informant bias. The views and perceptions of informants may be biased by their specific organizational roles. Thus, depending on the position of the key informants, their interpreta-

tions of a certain event might vary significantly from those of another person with a different role or position within the same organization. Furthermore, informant reports might be distorted by individual memory failure, inaccurate recall or hindsight bias (Golden, 1992). This is a very common problem in survey-based research (Doz, Olk and Smith-Ring, 2000).

Another potential problem with using key informants is common-method bias. Common-method bias can be a potential problem if dependent- and independent-variable data are collected from a single informant or more generally when the same person provides the researcher with measures of two or more different constructs and the researcher assesses the correlation between those constructs (Podsakoff and Organ, 1986). One major problem is that any defect in the source, i.e. the key informant, contaminates all measures simultaneously. In a worst-case scenario, common-method bias can cause the researcher erroneously to infer a substantive relationship where in reality there is no such relationship (Bagozzi, et.al., 1991) or can cause respondents to produce such a relationship. One of the most important reasons for common-method bias is the consistency motive (Podsakoff and Organ, 1986). Respondents apparently have an urge to maintain a consistent (from their point of view) line of argumentation in a series of answers. Measures can be distorted by such striving for consistency, because many people have (often false) theories of their own about the interrelation of different variables. According to the consistency motive, answers of respondents might then reflect these personal theories rather than provide an isolated assessment of each question. The possibility cannot be excluded that such a consistency motif also caused respondents to bias their answers in the survey in a way that makes them appear consistent with the account given in the personal interview. Another issue is the social-desirability problem (Podsakoff and Organ, 1986). This problem arises from the likelihood that respondents may answer questions in a way that presents them in a favourable light. It also might cause respondents to tell the researcher what he seems to want to hear. In the present study, this problem might especially be present with regard to the self-evaluation of venture performance, where respondents might distort the account in a way that exaggerates the success and the potential of the venture.

In summary, there are a number of potential problems associated with the use of key informants. In view of these problems, researchers have urged the use of multiple informants to increase the validity and reliability of key-informant accounts (Schwenk, 1985; Bagozzi, et.al, 1991; Golden, 1992).

In this study, both the dependent variable, i.e. the duration of venture survival and some of the independent, and control variables were collected from the same key informant. However, other key independent and control variables such as corporate performance and corporate size were collected independently from the survey. Thus, there is a potential for various problems and biases, such as common-method bias, for at least a part of the data. However, for several reasons I did not use multiple in-

formants in this study, and a number of procedural precautions were taken to reduce the potential for bias from using only one key informant.

First, and as one of the procedural precautions against common-method bias suggested by Podsakoff and Organ (1986), the dependent variable and the various independent and control variables were collected in two different questionnaires and thus in two different situations. As described above, survival duration, the dependent variable, was collected during the interview, which was guided by the standard background information sheet. All the independent and control variables were then assessed in a separate survey instrument, the questionnaire, which key informants typically completed immediately after the interview. This separation of the collection of dependent and independent variables should have reduced the potential problems arising from the consistency motive, one of the major causes of common-method bias, since key informants were unlikely to have understood which were the dependent variables and which were the independent variables in the study. Also, since the assessment of these variables was separate in time, survival time was unlikely on the mind of respondents while answering the questions in the survey.

The procedure of preceding the completion of the survey with an interview also reduces problems of hindsight bias and selective recall, as the key informant is obliged during the interview to review the history of the venture in considerable detail. This was likely to activate the respondent's memory and permit more accurate assessment of the various questions in the survey. Another factor favouring recall was that respondents were asked about (what was very likely) a major event in their career. Such a major event was likely associated with emotions, excitement and, independent of the actual outcome of the venture, pride of having been involved in a new venture, all factors which can be expected to enhance recall (Zander, 1991).

Concerning the social-desirability problem, especially with regard to the evaluation of venture performance, there is reason to believe that it is not too serious in the case of this study. First, in so far as this bias only causes a uniform upward shift in the distribution -- i.e. respondents systematically exaggerate the performance of the venture -- it obviously does not lead to serious problems in interpreting correlations. Furthermore, the mean values of the performance measures were so low that respondents probably could not have strongly exaggerated the performance of the ventures. Rather this result suggests that they were fairly honest about the generally disappointing performance of the venture. The willingness to admit failure might have been enhanced by ensuring respondents total anonymity of their responses. Moreover, since venture performance was not used as the dependent variable in this study, it is thus not one of the central variables.

Thus, several procedural precautions were taken which should have reduced from the outset biases associated with common method and selective recall. Yet these precautions do not explain why multiple informants were not employed. A major reason for not using several key informants was severe shortage and inaccessibility of extremely well-informed and competent informants. It is quite important that key in-

formants be highly competent and directly involved as response errors are likely to be higher for informants whose roles are not closely associated with the phenomena under study and who are not extremely knowledgeable about the phenomenon (Kumar, et.al., 1993). Thus, the difficulty of identifying highly competent informants can be considered as one of the major reasons to forgo using multiple informants (Kumar, et.al., 1993). Or to put it the other way round, the lack of competent and knowledgeable key informants is one principal explanation why researchers are sometimes forced to rely on only one key informant (Heide and John, 1990; Provan and Skinner, 1989). The lack of multiple knowledgeable informants is certainly a major issue in this study. Nobody knows as much about the details of a venture as the intrapreneur. He/she works with the venture on a daily basis and can be expected to have the most detailed and accurate knowledge about the venture and its linkages to the various parts of the mother corporation. According to Pinchot (1985: 41-42):

"The intrapreneur must cross the barriers that divide the organization into functions, such as marketing, engineering, research, manufacturing, sales, and finance, and take responsibility for all aspects of the business he or she wishes to start."

Thus, the intrapreneur should have very detailed knowledge about the exact linkages of the venture to the various parts of the organization; these linkages are one of the central variables in this study. It is doubtful whether other organizational members who work with the venture on an occasional basis and typically from a specialized angle, such as either from marketing or from manufacturing, etc. have a nearly as detailed and accurate an understanding of the venture, and thus whether they could be considered to be competent and involved informants. Even the principal mentor of the project -- assuming such a mentor exists, can be identified and is willing to participate in the study -- is unlikely to have the detailed understanding of the venture required to reliably answer all the 128 questions in the survey. Indeed, a major component of the theory developed in this thesis is that there are considerable information asymmetries between the intrapreneur and other organizational members. Thus, even if several informants had been employed, one could almost expect, on the basis of these information asymmetries, that the inter-rater reliability between the various evaluations would be low. Also, owing to the sensitivity of the required information, asking for more informants might have had a negative effect on the willingness to co-operate. Moreover, key informants were very reluctant to identify to the researcher the relevant "selectors" of the venture, out of fear that contacting these persons might have uncontrollable and negative effects on the success of their project in the corporation.

For these reasons, only a single key informant was used for each venture. The decision was made to focus on the project managers, who typically were also the major innovators, as key informants. Doubtlessly, the potential for informant bias and common-method bias exists, even though several of the ex-ante precautions recom-

mended in the literature were taken to reduce these biases. Nevertheless, the results of this study need to be interpreted with the potential for these biases in mind. It would have also clearly been desirable to interview and receive the survey from people in other parts of the organizations, especially from the market organization and from sourcing and manufacturing in order to get a characterization of the various selection logics and the relationship between the venture and these logics from other people in the organization than from people working in R&D. However, this would have required another substantial number of interviews and it would have required to identify exactly those people in these other parts of the organization which are especially informed about the venture. As explicated above, finding these people is related to considerable difficulty and furthermore might have jeopardized the willingness of the most important key informants, the intrapreneurs, to participate.

4.5 A critical evaluation of the data set

The data set used in this study has a number of weaknesses but also a number of fairly unique strengths. Let me quickly summarize the strengths and weaknesses arising from the specific design chosen for this study.

One problem is clearly that with the sampling approach used one cannot be totally sure about the degree to which the sample is representative. Also, while the sample exhibits some temporal dispersion, it is strongly weighted towards ventures which existed during the last 10 years. Thus, organizations in the sample may handle new ventures in ways which are idiosyncratic to this period. However, because the sample also contains much older ventures, the probability that this might be the case is judged to be quite low. Furthermore, this problem is common to all studies which do not take an explicit historic perspective, and thus not unique to this study.

Moreover, because of this sampling approach, the study could not investigate how the selection of new ventures has changed and developed over a longer period such as thirty or forty years. While this investigation, especially from an evolutionary and learning perspective, would clearly have been interesting, it would have required a sample containing all ventures that existed within one or preferably several different companies over a thirty- or forty-year period. Given restrictions of data availability and accessibility, however, this ambition was not within the scope of the study. This restriction leads to a further limitation of the sample: namely, that it does not allow testing of the internal ecological effects of internal venture competition, such as the density of ventures at certain periods of time. While it would have been fascinating to investigate the kind of internal density effects explored by scholars like Hansen and Haas (2001), in the context of corporate venturing, too, that option is ruled out given the data set and restrictions in terms of data availability and accessibility.

A further limitation of the data set is that the assessments of the characteristics of the ventures are conducted by the intrapreneurs and not by the managers, the "selec-

tors" who actually make the spin-in/spin-off/termination decision. Theoretically, the perceived characteristics of the venture could differ significantly between the innovators and the selectors of the ideas. Thus, it might be possible that the intrapreneur sees the venture somewhat differently than those who make the relevant decision. However, at issue here is a trade-off between receiving as accurate an assessment of the venture as possible -- I have already argued above that clearly the intrapreneur can provide the most accurate assessment -- and obtaining an assessment by a person who *might* have made the decision but is probably not nearly as knowledgeable about the venture as the intrapreneur. This *might* is extremely important because we know from the extensive research on decision-making in organizations (see March, 1994 for a summary) that decision-making in organizations is a process which many different actors enter and leave, influencing each other. Thus, it is very unlikely that the decision about the fate of the venture was taken by a clearly identifiable person and based only on her/his personal perception of the venture. Even if this were the case, it is not clear whether this person could have been identified and would be willing to talk about the details underlying the decision, especially since many of these decisions might also have been wrong. Attempting to solve this problem would have led to a much lower response rate with all the difficulties arising from this shortcoming. Thus, weighing the advantages and disadvantages of each aspect of this trade-off, it was decided to focus on the intrapreneurs.

Despite these weaknesses, the data set has a number of unique strengths. First, it is probably one of the largest collections of data on internally generated projects based on generally rather radical and significant innovations and autonomous initiatives in large corporations. The set a) contains a large number of projects which are not accessible through publicly available archival data such as annual reports or industry publications; b) represents a unique combination of qualitative, quantitative and archival data; c) perhaps most importantly, it represents a balanced sample of both successful and unsuccessful ventures, the criterion for success or failure being whether the venture was retained or not inside the boundaries of the mother corporation.

Thus, the data set is not prone to two potentially problematic biases of the (relatively few) studies making use of such publicly available data. First, it contains a number of failed projects, that is, unsuccessful attempts at innovation and at diversification or market entry. Thus, this data set is not subject to the survival-bias so common in most research on diversification and on innovation in general. Second, the sample is not biased towards projects that the corporations want researchers or the larger public to know about, i.e. projects on which corporations issue press releases about or mention in their annual reports.

Another major strength of the data set is that it contains actual evaluations of the venture by the people who should know the most about the ventures, the innovators themselves. Thus, it allows evaluation of the actual characteristics of the venture as perceived by one of the most relevant players in the process, and it does not have to rely on subjective evaluations and classifications by the researcher or, even worse, on

classifications based on SIC codes, as is normally the case in most diversification research. The data thereby avoid a major weakness of research on diversification and on organizational search, as already discussed in an earlier chapter. Indeed, it is very doubtful whether SIC codes would be of any value in studying new entrepreneurial ventures. From this perspective, a major strength of this study is that it is based on actual perceptions of the intrapreneurs.

Finally, while snowball sampling has a number of problems, it is also a major strength. Thanks to the extensive use of referrals and personal contacts, the response rate was exceptionally high, especially in the second part of the data-collection process. As a low response rate is a crucial problem in practically all studies based on surveys, the present study is fairly unique in this regard. Also, it is doubtful that the data set is systematically biased towards certain kinds of ventures, companies or industries. One major bias emerging from snowball sampling is that there is an over-sampling of cases represented in a specific referral network (Hair, et.al. 2003). This bias is particularly likely when there is only a single entry point into the referral networks. However, in this study many different entry points were used, and personal referrals were complemented supplemented by systematic searches of the business press. This sample, moreover, has emerged from several different referral networks, which should further reduce bias. Thus, the sampling differed in many ways from a pure snowball sampling approach. As a result, the sample represents a fairly even distribution across a wide variety of firms and industries, making it fairly unlikely to exhibit systematic biases.

4.6 Data analysis

A proper analysis of the survival patterns of new entrepreneurial ventures in large organizations puts some special demands not only on the data-collection design but also on the data analysis techniques employed. Here a combination of cross-sectional and time-dependent data is used. Specifically, while the data from the survey is cross-sectional, I combine this data with time-dependent data on the longitudinal records of the performance history of the mother corporation during the lifetime of the ventures.

The specific data design was to construct life-histories of the various ventures and analyze these ventures with the help of event history or survival analysis,²⁹ which allows the inclusion of both cross-sectional and time-dependent data (Allison, 1984; Blossfeld and Rohwer, 1995). Survival analysis is a class of statistical methods for studying the occurrence and timing of events (Allison, 1995). In our case these events are the "death" or "non-retention" of the venture inside the boundaries of the mother corporation; either the venture is terminated, or it is spun or sold off.

²⁹ These two terms will be used interchangeably

Event history analysis has some critical advantages over traditional cross-sectional methods of data analysis, such as simple regression analysis. The most important advantage is that survival analysis allows for the handling of censoring (Allison, 1984). A further critical and special advantage of the use of the Cox proportional-hazard model is that it also permits the incorporation of time-dependent covariates (Allison, 1984). Both features are critical for this analysis.

To understand why this is the case, consider two alternative statistical approaches to our problem. One approach would be to analyze the data using a logistic regression model with a dichotomous dependent variable -- in our case "retention" vs. "non-retention." However, such operationalization ignores information on the timing of events. Clearly, a venture which is terminated after two years has a higher propensity not to be retained than a venture which survives for 10 years. This crucial difference would be lost if we used a logistic regression model. One potential solution to this problem would be to make the dependent variable the length of time from birth of the venture until the onset of an event, be it termination, sell-off or spin-off. This operationalization would clearly include information about the timing of events and it could be analyzed with the help of conventional linear regression analysis. However, how should one handle the cases in which no event has occurred? Cases in which no event has occurred during the observation period -- in other words, where ventures are retained for that time -- are called "censored" (Allison, 1984). There are left-censored and right-censored cases. Observations are said to be "left-censored" if an event happened *before* the observation window has opened, and "right-censored" when an event might happen after the observation window has closed (Allison, 1984). Left-censoring is not a serious problem in this study since there was no pre-determined starting point for observation window; rather, projects were sampled based on the possibility of accessing a project and on the projects that were remembered by key informants independent of the specific year of an event. Right-censoring, however, is certainly an issue in this sample since many ventures had still been retained internally at the end of the observation period.

One solution which would still allow the application of regression analysis would be to drop all censored cases, but as more than 40% of the case in the sample underlying this study were censored, this solution would force us to discard almost half of the sample. This is not really a viable option given the already fairly small sample size. Also, some of the censored cases may not be sold or terminated until, one day, the whole mother corporation is sold or becomes bankrupt. Not including such cases would thus lead to significant biases.

A further crucial problem with using either logistic regression or linear regression analysis for the data-collection design in this study, which includes both cross-sectional and time-dependent explanatory variables, is that these methods do not permit appropriate incorporation of time-dependent explanatory variables (Allison, 1995). Time-dependent covariates imply that the values of some or all of the explanatory variables change during the life history of a case. In this study, such time-

varying covariates are employed to analyze how shifts in the attainment discrepancy, i.e. shifts in the performance of the mother organization relative to a performance reference point, affect the hazard rate of ventures. Such time-dependent variables are very difficult to include in other, more conventional data-analysis methods.

The Cox proportional-hazard model also allows a reasonable handling of another problem -- unobserved heterogeneity. In general the hazard rate will be influenced by two families of factors, those covariates which are included in the model and all other variables which are not included in the model but which nevertheless have an effect on the hazard rate. No model can specify *all* relevant explanatory variables. However, the omission of such unobserved effects can cause serious biases. One such potential problem in survival analysis is referred to as "unobserved heterogeneity" (Allison, 1984; Blossfeld, Hamerle and Mayer, 1989). Unobserved heterogeneity makes it possible over time to observe a declining hazard rate even though the hazard rate for each individual case remains constant (Blossfeld, et.al., 1989)³⁰. It is extremely difficult to distinguish the effect resulting from variation in hazard rates across individual cases from a truly declining hazard rate over time. While methods for dealing with this problem have been developed (see Blossfeld, et.al., 1989), Allison (1984) points out that as long as one is primarily concerned with estimating the effects of the covariates and is not particularly interested in the effects of time, it is reasonable to deal with unobserved heterogeneity through the use of a more general model, such as the Cox proportional-hazard model. As this study is not primarily concerned with the effect of time on the hazard rate, the use of the Cox proportional-hazards model is a reasonable approach for dealing with this problem (see also Allison, 1995).

4.6.1 The Model

Survival analysis is a general designation for a vast number of different techniques and methods used to analyze event-history records. Approaches to analyzing event-history data distinguish themselves along a number of different dimensions, such as whether they are primarily designed for univariate analysis of the timing of events or whether they allow inclusion of explanatory variables, whether time is best treated as continuous or discrete and what specific assumptions are made about the underlying distribution of the hazard rate (Allison, 1995). Here the most frequently used approach for analyzing event-history data, namely the Cox proportional-hazards regression model, is applied (Cox, 1972; Steinberg, 1999, Allison, 1984; Blossfeld, et.al., 1989).

³⁰ Consider a population which consists of two segments, one segment with a constant high hazard rate and the other with a constant low hazard rate. Even though the hazard rate remains constant within each segment, the aggregate observed hazard rate will decrease. This effect occurs because those cases with a high hazard rate will, on average, experience an event earlier than those with a low hazard rate. Over time, only cases with a low hazard rate remain in the risk-set. As a result, the aggregate hazard rate will decrease as time elapses (Blossfeld, et.al., 1989).

The popularity of the Cox model is largely attributable to its high degree of flexibility and wide range of applicability. This is the case because it requires fewer assumptions about the underlying hazard-rate function than most other survival models. Whereas in other survival-analysis models specific assumptions need to be made about the distribution of the duration until an event happens, the Cox model is a semi-parametric approach with an unspecified baseline hazard rate (Blossfeld, et.al. 1989). In other words, the Cox proportional-hazards model does not require any assumptions about the time-dependence of the hazard rate. In comparison to other approaches, such as Kaplan Meier estimations, the Cox model also allows inclusion of time-dependent covariates (Allison, 1984). The model is based on the proportionality assumption. This assumption requires that for any two cases at any point in time the ratio of their hazards has to be constant (Allison, 1984).

The model for one time-independent and one time-dependent covariate is:

$$\text{Log } h_i(t) = \lambda(t) + \beta_1 x_{i1} + \beta_2 x_{i2}(t)$$

The model is estimated with the help of the partial-likelihood method. With this method, the β coefficients of the model can be estimated without having to specify the base-line hazard function $\lambda(t)$ (Allison, 1995). In particular, the model means that the logarithm of the hazard rate for case i at time t is the product of two factors. First, a baseline hazard function $\lambda(t)$ that because of the partial likelihood estimation can be left unspecified. Second, the logarithm of the hazard rate is a linear function of a set of covariates. These covariates can either be time-independent, as in case of x_{i1} , or time-dependent, as in the case of x_{i2} . The function $\lambda(t)$ can be regarded as the hazard function for a case whose covariates all have the values of 0. Thus, the effects of the covariates are measured by comparing the hazard function of only $\lambda(t)$ with the hazard function which includes the covariates as well.

4.7 Measurement and operationalization

Measurement can be defined as “rules for assigning numbers to empirical properties” (Ghuri and Gronhaug, 2002, p.64). Numbers are mapped onto objects or events. Thus, measurement represents the link between the conceptual and the empirical world. We typically cannot measure certain phenomena as such, but rather we measure specific properties of phenomena with the help of indicators. In the case of a questionnaire, indicators are represented by the specific scores obtained from the responses to the various questions or items in the survey.

Obviously measurement is only meaningful when there is an actual empirical correspondence to what is intended to be measured. Unfortunately, there is hardly ever a perfect match between what is intended to be measured and what is actually measured. Thus, data are prone to measurement error (Bagozzi, et.al., 1991). This implies

that observed scores, obtained for instance from questionnaires, are not only a function of the true score, but may also be a function of a) systematic bias in the data and of b) random error (Ghuri and Gronhaug, 2002).

4.7.1 Assessing reliability and validity of constructs

The two most important criteria for assessing the quality of measurement are *validity*, which refers to the accuracy of measurement and *reliability*, which refers to the consistency of measurement. The reliability of a measure refers in more detail to the extent to which the measure delivers consistent results across persons, time and context. Thus, reliability is concerned with estimates of the extent to which measurement is free of random or unstable error. It can be assessed by posing the following questions: Will the measures yield the same results on other occasions? Will similar observations be reached by other observers (Saunders, et.al., 2003)?³¹

Three ways can be used to assess reliability: test-retest reliability, alternative-forms reliability and internal consistency reliability (Hair, et.al., 2003). Test-retest reliability is obtained through repeated measurement of the same respondent(s) using the same measurement device under similar conditions. Whenever correlations between the different instances of measurement are high, test-retest reliability is high. Alternative-forms reliability is a second way to assess reliability. With this type of reliability, the researcher develops two equivalent forms of the same constructs and then assesses correlations between the scores obtained from the two constructs. A third way to assess reliability is to check for internal consistency. This approach is the one taken in this study and will be explored further below.

Except for the dependent variable, as well as the measurement of corporate performance and corporate sales, which are derived from archival data, all the major constructs underlying this study, such as different forms of relatedness, social anchoring, persuasive efforts and venture performance are measured with the use of multiple indicators from the survey. Measures based on multiple indicators are typically more robust; that is, they tend to contain less random error. Also, they typically cover the domain of the construct which they purport to measure in a better way than single-item constructs (Ghuri and Gronhaug, 2002). The reliability of a multi-indicator scale is typically tested with the help of the Cronbach Alpha statistic (Hair, et.al., 2003). The Cronbach Alpha can be conceived as a measure of the inter-correlations between the various indicators used to capture the underlying construct, such as venture performance or resource relatedness. The value of Cronbach's Alpha increases with the average inter-item correlation and the number of items in the scale

³¹ Reliability is a necessary but not sufficient condition for validity. As an illustration, consider the speedometer that *always* shows 15 km/h too much. This is clearly a reliable measurement tool as it consistently gives the same results no matter who is driving the car, when and where. Yet, measurement is not valid, since the observed score, i.e. speed shown by the speedometer does not correspond to the actual speed of the car. Thus, high reliability of measurement reduces random error, but it does not necessarily reduce systematic bias, the third component of observed measurement as explained above.

(Zander, 1991). There is no definite rule for what a satisfactory level of reliability should be. Yet, following the suggestion of Nunally (1978), it has become fairly widely accepted in business research that an Alpha of about 0.7 is acceptable (see also Green, et.al., 2003). The Cronbach Alpha is used in this study to assess reliability, and all scales have an Alpha of about 0.7 or higher.

The constructs are formed with the help of factor analysis. The scores for the various multi-indicator constructs or scales are the factor scores adopted from the factor analysis. Adopting the factor scores directly is a frequent practice in multivariate analysis (Hair, et.al., 2003). It has the major advantage that the various constructs which result from the factor analysis are not correlated with each other, thus removing potential problems of multicollinearity.

Validity is the extent to which a construct measures what it is supposed to measure (Hair, et.al., 2003). A construct with perfect validity contains no measurement error. Obviously, the best way to assess validity would be to compare the measured score with the true score. Unfortunately, we hardly ever know the true score. Even worse, there is no objective way to quantify validity in the same way as it is possible to quantify reliability with the help of Cronbach's Alpha. This makes the assessment of validity ultimately a highly subjective endeavour (Zander, 1991). There are three different ways to assess validity: content, or face validity, criterion validity and construct validity (Hair, et.al., 2003).

Face validity is a commonly used validation method in business research (Hair, et.al., 2003). It builds on consensus that a measure represents a particular concept and involves -obtaining the opinions of a small sample of experts. Criterion-related validity determines whether a construct performs as we would expect from established theory. If this is indeed the case, then we have established the criterion validity of the construct (Hair, et.al., 2003). For instance, the literature review in this study has rather firmly established that we would expect a positive relationship between relatedness and venture survival. Such a relationship, if found, can be taken to indicate the validity of the constructs used in this study. Finally, construct validity assesses what the construct is in fact measuring (Hair, et.al., 2003). With a detailed understanding of the theoretical rationale underlying the measurements obtained, two checks can be performed to assess construct validity -- convergent and divergent validity (Ghauri and Gronhaug, 2002). Convergent validity refers to the extent to which a measure correlates with existing measures of the same concept; divergent validity, to the extent to which a measure does not correlate with measures of a different concept. Factor analysis is frequently used to assess convergent and divergent validity (Hair, et.al., 2003).

4.7.2 Assessing the validity of the constructs underlying this study

As was pointed out in Chapter Two the diversification literature in the tradition of the resource-based view, for which relatedness is a central theoretical concept, relies on highly aggregate measures of relatedness such as SIC codes or patenting data.

This practice is largely a function of the macro perspective of these studies. This study, however, takes a more micro perspective in which such aggregate data are not very useful. Also, it is not feasible to use secondary data sources on corporate ventures to measure the constructs in this study; , secondary data sources do not contain the kind of detailed information which is required for assessing relatedness and efforts to gain social support for the concept and to convince others of its viability (Schrader and Simon, 1997). Thus, in comparison to established research practice in the diversification literature, it was necessary to take a fairly new and different approach to measuring the constructs underlying this study, especially the measurement of relatedness.

However, several points support the validity of the measurement approach taken. First, the items used to measure the various aspects of relatedness developed in Chapter Three, such as sourcing and manufacturing relatedness, sales and distribution relatedness and technological relatedness, were developed from a detailed understanding of the literature on the resource-based and knowledge-based theory of the firm and were guided by a traditional and generally accepted classification of the major activities of firms. This classification also corresponds to well-established conventions among managers. The detailed knowledge of the theoretical underpinnings of the construct is one of the primary reasons for confidence in the validity of the constructs. Second, there are some studies on corporate venturing studying the relationship between relatedness and venture performance which operationalized relatedness between corporate ventures and their mother organization in a manner comparable to the operationalization underlying this study (Miller and Camp, 1985; Sorrentino and Williams, 1995; Thornhill and Amit, 2001). They were all based on survey data and on subjective evaluations of the constructs, with reliance on a single key informant. For instance, taking a resource-based view of the firm, Sorrentino and Williams (1995) operationalized relatedness in three dimensions -- shared plant and equipment, shared marketing programs, and shared immediate customers -- a classification of relatedness dimensions which is very similar to the one used in this study (see also Miller and Camp, 1985). In operationalizing social anchoring, Thornhill and Amit (2001) used an approach somewhat similar to the one taken in this study with the help of direct survey questions about a number of relational linkages between the venture and management in the parent company. Thus, the general approach of this study to operationalizing the constructs and to classifying the activity system of the firm is fairly well established in the corporate venturing literature and tends to confirm the validity of the measurement in this study.

Third, several further steps were taken to check for validity. For instance, during the pilot stages of the survey, it was pre-tested with respondents to ensure that they would understand the exact meaning of each question. Furthermore, the personal contact with respondents in the course of the study provided immediate feedback about the survey concerning the understandability and relevance of the questions. Such feedback, which was typically received in meeting with the respondent, per-

sonally confirmed that the questions were simple, clear and relevant -- a further indication for the validity of the items. Also, the scores obtained for the various constructs were compared with the findings in the interviews and can thus be considered as a further "validity check." Furthermore, to check for face validity, the constructs used in this study were presented in a number of research seminars and were thus exposed to the opinions of various experts. Finally, factor analysis was used to guide the composition of the constructs. Factor analysis is an important tool for establishing divergent and convergent validity of the constructs (Hair, et.al., 2003).

In sum, as it is impossible to compare the measured score of a construct with its true score, one can never be totally sure whether the empirical constructs used in a study really measure what they are supposed to measure. Yet, considering detailed understanding of the theoretical literature, the fact that other researchers have used similar operationalizations and the various other checks performed, one can dare to be fairly confident about the validity of the constructs.

4.8 Operationalization of the constructs

4.8.1 The dependent variable: Hazard rate of non-retention

The major research question of this study is why certain ventures survive, i.e. are *retained* within the boundaries of the firm, while others are *not retained*, i.e. are either terminated, sold, or spun off. In studying these differential survival patterns of new ventures, a single dependent variable is used, namely the "hazard rate," or risk that a venture will not be retained. The hazard rate is an estimate of the potential for an event to happen per unit of time at a particular instant, given that the case has survived until that instant. A high hazard rate indicates a high risk of "mortality" for a venture (Steinberg, 1999). I do not distinguish between the type of event -- that is whether the venture is terminated or spun-off or sold, but lump these different events together into one event, *non retention in whatever form*. When ventures are sold or spun off, the mother corporation sometimes keeps a stake in the venture. I defined a venture as spun-off or sold whenever the mother corporation has divested more than 50% of the interest in the venture.

Survival duration is measured in years. Information about survival duration was obtained from key informants through interviews or, in the rare case of no interview, by e-mail. While survival time in years is a crude measure, I discovered in the course of the study that key informants could not specify the starting date of ventures more exactly, partly because it was unclear *exactly* when a venture was started, and partly because some ventures had their origins more than 10 years before the interview. Thus, a more fine-grained measure of time was not feasible. While a more detailed measure would obviously be desirable, measuring time in years is not a serious problem, for the Cox proportional-hazards model is equally applicable for discrete and continuous time measures (Allison, 1995).

In calculating *survival duration*, I did not include the first year of existence, but I did include the last year. For example, if a project was started in 1997 and terminated in 2001, then survival time was assumed to be four years, not five. This procedure was used in order to address and average out any errors arising from the possibility that a venture could have been started or terminated at the very end or very beginning of a year. Not including the first year of existence in the calculation of survival duration should, on average, eliminate this problem.

Project start was defined as the year in which serious and regular effort was invested in the venture by at least one person, typically the inventor. Thus, venture start was defined as the year in which at least one person regarded the venture as a priority and allocated time to it on a regular basis. The exact wording in the background information sheet used to guide the collection of data about project start and survival duration was: "*What year did active development of the project start?*"

In many cases, the inventor had already conceived the fundamental idea underlying the venture several years before the one defined as the project-start year in this study. Yet during this period the inventor only occasionally tinkered with the technology, often at home or during her/his spare-time, and was trying to determine whether there might be a business opportunity related to the idea. However, this period, comparable to what Burgelman (1983) referred to as the opportunity-definition stage, was *not* included in the calculation of survival duration. Project start as defined in this study did however not automatically imply that the project had already received an *official venture status* within the company at the time, i.e. had received official support and consent from top management, had been given a formalized budget and had become officially known throughout the company. Rather, the main criterion for project start was that at least one person has allocated most of her/his working time to the development of the venture on a regular basis.

Project end was defined as the time when an "event" actually occurred, i.e. the point at which the venture was in fact spun-off or terminated, not when the *decision* was taken to do so. The reason for this choice of definition was that intrapreneurs, who are the key informants, often would not know exactly when and by whom the decision not to retain the venture was taken.

4.8.1.1 *Why use a single-event and not a competing-events model?*

The combination of several potentially different events, such as termination, spin-off and sell-off into a single class of event, "non-retention", is based on the assumption that corporations *first* decide whether or not to retain the venture. Only in a *second step* to they decide how to dispose of it, given that it is not considered to be a valuable part of the corporation. The possible factors determining the decision outcome of this second step, such as the value of the venture on the outside market, especially the venture-capital market (Hellmann, 2003), or the motivation of the venture team to continue operations in a separate entity, are beyond the scope of this study.

Thus, I do not assume that the decision to terminate a venture is driven by an entirely different logic than the decision to spin it off or sell it. If it had been assumed that spin-offs, sell-offs and terminations were driven by entirely different logics, the correct model to use would have been a competing-events model (Allison, 1995), not the single-event model applied in this study, and different variables would have been required to explain each kind of event. The employment of a competing-events model would have been based on the assumption that large firms separate their venture portfolio *from the beginning* into three entirely different categories: a) ventures which will be terminated, b) ventures which will be if spun-off, and c) ventures which will be sold. Decisions whether to retain the venture or apply any of these three alternatives would then be triggered by entirely different factors.

There are two principal differences between termination, on the one hand, and spin-off or sale, on the other. These differences could be reasons for why the factors relevant to the specific fate of ventures might also be different. First, spin-offs and sell-offs have potential cost and/or profit implications for the parent, be it possible financial gains from the sale of the venture or possible future profits or costs resulting from keeping a minority stake in a spin-off company, while obviously no such future profit or cost implications will result from termination. In view of this difference the time required to identify an appropriate buyer for the venture, or the time spent waiting until a good price can be obtained, for instance, might theoretically have an influence on the timing of a spin-off or sale, but not on termination. Both considerations might also be related to the existence and the developmental state of a venture- capital market (Hellmann, 2003).

Another possible alternative explanation arises from these differences in financial value between spin-offs and sell-offs, on the one hand, and terminations, on the other. It is that corporate performance, one of the major explanatory variables for the timing of events in this thesis, might only matter for spin-offs, not for terminations, and perhaps for theoretical reasons different from those advanced in this thesis. More specifically, a decline in corporate performance might have an impact on the timing of spin or sell-offs but not on terminations. This might be the case, for instance, because a parent company might consider to sell or spin-off ventures when corporate performance is declining in order to generate cash and improve performance; in this case the divestment is not due to a change in attitudes toward risk or in the perceived value of the ventures but only due to the desire of the parent to receive cash from the sale of the venture. Thus, from this angle, a decline in corporate performance should only have an impact on spin-offs and sell-offs, not on terminations. However, it is doubtful whether this reasoning is valid for the current sample since virtually all of the spun-off or sold ventures were fairly small and their sale unlikely to have generated significant amounts of cash for the generally very large companies in the sample. Nor did they, in case the parent company kept a minority stake, generate any significant profits or costs. Thus, it is very unlikely that the financial value of the venture on the outside market or the future cost or profit implications of spin-

ning the venture off versus terminating it was a major variable affecting the decision to not retain ventures.

Second, spin-offs or sell-offs have potential competitive consequences for the mother corporation as a new company is formed or another industry incumbent is acquiring the venture. A spin-off or sell-off also reveals to the outside world and especially to competitors the existence of a particular venture and thus gives clues about the developmental and competitive intentions of the corporation. Some interviewees also indicated that a spin-off signals to the outside world that the parent company has failed in the development of a specific project. Terminating a project, on the other hand, does not have any immediate competitive consequences and does not send any signals to the outside world since the existence of the venture is not revealed. In summary, termination on the one hand, and spin-off and sell-off on the other, differ in terms of their competitive as well as financial implications.

However, it is very unlikely that firms are able and/or willing to evaluate ventures from the very beginning according to these potentially different consequences, since ventures initially are poorly defined. More likely, these considerations matter only after the general decision has been made that the ventures are no longer a valuable part of the company. Indeed, it can be doubted whether these considerations have played any significant role at all for the ventures in the sample underlying this study. While financial and competitive considerations certainly play a key role in the decision to spin-off or sell entire large business units or divisions, they are unlikely to have made a substantial difference in the decision to spin-off or sell the generally very small ventures in this sample. These ventures typically had little financial value on the outside market and little profit and cost implications for the parent company, at least at the time of their spin-off or sale. Thus, the decision to spin these ventures off was probably not motivated by a desire to maximize financial gains from their sale, and consequently the timing of the venture was unlikely to have been influenced by external economic or competitive considerations. Furthermore, making an explicit distinction between the three different kinds of events in the analysis – termination, spin-off and sale – would further complicate the analysis and go beyond the scope of this study. Let me illustrate this point.

The interviews gave the impression that different firms have different attitudes and policies concerning spin-offs and that these attitudes might change over time. While some firms have started, especially quite recently, to consider the spin-off as a very useful tool for dealing with entrepreneurial ventures, other firms still seem to totally reject this tool and automatically terminate a venture rather than considering a spin-off and thus the formation of a new company. Furthermore, attitudes towards spin-offs appear to have changed over time. In particular, firms which might have terminated a non-core venture 20 years ago today seem to consider avoiding termination and trying to reap some financial gains through a spin-off or, at the very least, giving venture management the chance to develop the venture further. This change

in attitude might, for instance, be the result of the development of the venture-capital market in Sweden.

The important point for this study, however, is that while the strategy for dealing with ventures considered as valuable might differ from firm to firm and change over time, there has been no change in the actual decision not to retain ventures which are regarded as having no value inside the firm. In other words, while firm A might have terminated a venture, and firm B might have spun-off an identical venture, or while firm A might have terminated a venture at $t-20$ but spun off an identical venture at time t , the relevant outcome in this study, namely non-retention, *would have remained unchanged* across firms and across time. Thus, distinguishing only between retention and non-retention makes it possible to avoid these kinds of problems. The most parsimonious approach is to simplify and to focus on the retention/non-retention decision instead of investigating what exactly happens to the ventures once they are no longer considered to be valuable.

In summary, in the context of this study, it seems most reasonable to assume that the decision to terminate, to sell or to spin off a venture is preceded by a general decision to not retain it, both for theoretical reasons and to avoid unnecessary complexity. The exact nature of the differences between ventures that are terminated and those that are spun-off or sold might be an interesting research topic, but is beyond the scope of this study.

4.8.2 The independent variables

4.8.2.1 Relatedness

The review of the literature has shown that "relatedness" between businesses and search areas in general is a central concept for understanding the growth trajectories of firms. We have shown in the previous chapter that the concept of relatedness is also essential for understanding the differential survival of ideas in large corporations. In the extensive literature review in Chapter Two, various ways in which "relatedness" was operationalized in prior studies were discussed. There it was noted that there are two major shortcomings to the approaches in the literature on diversification. First, in these approaches, ex-post, derived measures of relatedness are used instead of direct measures of how the degree of relatedness was actually perceived inside the corporation. Second, measures of relatedness typically focus only on one specific aspect of relatedness, be it technological relatedness (represented by patenting data), market relatedness or manufacturing relatedness. To the knowledge of the author, however, in very few studies has attempt been made to test for whether and when certain dimensions of relatedness are more important than others. This statement applies to the literature on diversification as well as on corporate venturing. To remedy these shortcomings, relatedness in this study is measured by the perceptions of key informants inside the mother corporations.

To measure relatedness, I have used a total of 14 items across the three major dimensions of relatedness identified in the previous chapter -- sourcing and manufac-

turing, technological know-how, and sales and distribution relatedness. The survey questions also allow a distinction between resource linkages, on the one hand, and process or routine linkages, on the other. This distinction is important because as we have seen in the review of the literature, relatedness is assumed to matter for different reasons in different theoretical perspectives. The resource-based view emphasizes the importance of linkages between "hard" resources as an important source of economies of scope and thus of competitive advantage. The evolutionary perspectives, by contrast, place more stress on the importance of relatedness for understanding the growth trajectories of firms, the reason being the limitations imposed by bounded rationality and the heritage of the firm embodied in its routines and organizing principles. The data design of this study makes it possible to test which of these two aspects of relatedness is more important for explaining the differential survival of ideas.

Average degree of overall relatedness: This construct is calculated by summing up and averaging the values of the 14 items in Table 7. The construct of overall average relatedness measures the average degree of relatedness for the three relatedness dimensions as well as for the two kinds of relatedness, i.e. resource and process relatedness. While 14 items at first glance appear quite numerous for a construct, the reason for calculating the construct in this way was to make full use of the fine-grained measurement of relatedness in the survey and to include all aspects of relatedness in one measure. Thus, the construct contains two items for each relatedness dimension, one measuring the resource relatedness and another measuring the process relatedness for each dimension. Such a broad assessment of relatedness integrating several different dimensions of relatedness into one measure was also conducted, for instance, by Sorrentino and Williams (1995) and by Thornhill and Amit (2001), however contrary to the present study, in order to assess the relationship between relatedness and venture performance.

This measure tests whether it is the overall fit, the "holistic image" of the venture evoked in the minds of selectors of the firm across the various departments in the firm, which best explains the differential survival of ideas. A venture scoring high on this measure represents a *compromise* between the various local demands and selection logics inside the firm. This measure allows us to test whether an idea needs to be related to both resources and processes as well as to each of the various local logics, satisfying their demands simultaneously.

This measure is designed to test Hypothesis 1a that the higher the venture's overall relatedness to existing resources and processes of the parent corporation, the lower the risk of non-retention. Table 5 summarizes the items used to calculate this construct. Items are grouped by relatedness dimension; this grouping does however not reflect the order of the questions in the questionnaire, where the various items were randomly distributed.

Likert scale from 1 (totally disagree) to 7 (fully agree)

Average degree of overall relatedness

The new concept:

1. used existing sales channels.
2. utilized the existing sales force.
3. required a sales process which was well known within the company.
4. required a distribution method which was well known within the company.
5. employed marketing knowledge which already existed within the company.
6. focused on existing customer groups.
7. based on manufacturing methods familiar to the company
8. utilized manufacturing knowledge which already existed within the company.
9. was based on purchasing routines which were well established within the company.
10. utilized the company's existing suppliers.
11. employed technical knowledge which already existed within the company.
12. obtained much of the required knowledge from inside the company.
13. used design systems which already existed within the company
14. utilized research and development resources already existing within the company.

Table 7 - Average degree of overall relatedness

Starting from this overall average, I then wanted to test whether new ventures instead can survive the various local selection logics in other ways. One alternative view is that it is not the overall average, but one particular dimension of relatedness that matters most.

Relatedness dimensions -- technological know-how, sourcing and manufacturing and distribution and sales: As argued throughout Chapter Three, organizations can be considered as a system of many different local logics, each with partly contradictory demands on a venture. Ideas and ventures have the highest chances of passing the various selection barriers if they do not deviate too much from these different logics. In order to test whether relatedness to one of these various logics is consistently more important than relatedness to another -- rather than being related to all of the dimensions simultaneously -- I separated the overall measure of average relatedness into three dimensions: technological relatedness, sourcing and manufacturing relatedness and distribution and sales relatedness. Each measure features both process and resource aspects. The three dimensions emerge from a factor analysis of the 14 items in Table 7 used to measure the average degree of overall relatedness (see

Appendix 3 for the details of the factor analysis). The three-factor solution supports my arguments about the three different dimensions of relatedness: sourcing and manufacturing, sales and distribution and technological relatedness. The results of the factor analysis also established the convergent and divergent validity of the constructs. Finally, using the factor scores directly removes any problems of multicollinearity. Table 8 lists the items for each construct (factor loadings in parentheses)³².

Since prior studies have typically focused on only one measure of relatedness at a time, but without attempting to test which one is more important by including several relatedness measures in the same study, there is no systematic evidence which for forming expectations about which dimension is most important. In the interviews, however, the importance of fit with sales and distribution channels was strongly emphasised. Recent research by Zander and Zander (2003), for instance, also points to the crucial role of the market organization for understanding the search and growth trajectories of firms. Therefore, one might expect that fit with the market organization would be the most important dimension for predicting venture survival. Based on my argument that the R&D department is not only most tolerant towards novelty but even demands it in order to consider an idea worth supporting, I would expect technological relatedness alone not to have a significant effect on the risk, or hazard rate, of an event (termination, spin-off or sale).

³² The survey instrument contains more than these fourteen criteria for assessing the degree of relatedness. Therefore, several different factor analyses were conducted, but with no significant changes in the various components or in the results of the statistical analysis. The same holds true for the construct of "average overall relatedness."

Likert scale from 1 (totally disagree) to 7 (fully agree)

Sales and Distribution Relatedness

The new concept:

1. required a distribution method well known within the company (0.717).
2. required a sales process well known within the company (0.688).
3. focused on existing customer groups (0.780)
4. employed marketing knowledge already existing within the company (0.825)
5. used existing sales channels (0.831)
6. utilized the existing sales force (0.714)

Technical Relatedness

The new concept:

1. obtained much of the required knowledge from inside the company (0.838).
2. used design systems which already existed within the company (0.553)
3. employed technical knowledge already existing within the company (0.819)
4. utilized research and development resources which already existed within the company (0.788).

Sourcing and Manufacturing Relatedness

The new concept:

1. built on manufacturing methods familiar to the company (0.724).
2. was based on purchasing routines which were well established within the company (0.784).
3. utilized manufacturing knowledge which already existed within the company (0.564).
4. utilized existing suppliers to the company (0.747).

Table 8 - Dimensions of Relatedness

4.8.2.2 Social Support and Persuasive Efforts

According to the concept of a "multiple-layered" selection system which was introduced previously, organizations select new ideas and ventures partly on the basis of their relatedness to the established system of resources and routines. Theorizing about how independent ventures are selected based on relatedness was subject of hypothesis 1a and 1b. However, because of the ambiguity of ideas and innovations, because of the ambiguity of the very concept of core competencies and "corporate strategy," and because of internal information asymmetries, an "interpretive space" is opened up which makes the fate of ventures subject to negotiation, persuasion and influence by actors. Selecting these specific strategies of negotiation and attempts of

interpersonal influence by actors, specifically by the intrapreneurs, represent a second layer of the internal selection system of organizations. In line with the discussion in the prior chapter, I created two constructs in order to test whether these interpersonal strategies have at all an influence on the survival chances of ideas – obtaining support through “social anchoring” and through general, untargeted “persuasive efforts.” These two constructs were derived with the aid of factor analysis, thus indicating convergent and divergent validity (Hair, et.al. 2003).

Social anchoring: There are several different aspects to obtaining social support for the venture in the mother organization. In the interviews as well as in the literature on corporate entrepreneurship (e.g. Day, 1994, Thornhill and Amit, 2001), it was emphasised how important for ventures it is to have one or several “mentors” in the upper echelons of the company. Such “idea mentors” are important for at least two reasons. First, they can legitimize the value of the venture by signalling to the rest of the organization that the venture is important to the overall strategy of the organization. Second, mentors might be extremely important for overcoming resistance from the various local selection units in the organization. Thus, having internal networks of contacts and especially having established relationships to top management and constantly engaging in a dialogue with them about the venture is a central aspect of obtaining social support for the venture in the mother organization. Another important way for obtaining social support for the venture is through increasing the visibility of the venture inside the parent company (Thornhill and Amit, 2001). Ways of enhancing visibility include obtaining top-management attention or through publicity in internal journals and magazines. The legitimizing effect of trade -journals in particular is well-known in institutional theory (see Jonsson, 2002, for an overview of this argument).

Expectations about the effects of this variable on the hazard rate of ventures however, show opposing tendencies since obtaining social support for the venture through building relations to top management and getting attention for the venture is a two-edged sword. On the one hand, attention for the venture and relationships with top management certainly have highly beneficial effects, as mentioned above. However, it is less frequently observed that they also increase the transparency of the venture and encourage monitoring by senior management, consequences which might decrease the survival chances of the venture, especially if it faces problems during development.

Persuasive efforts: Another way by which intrapreneurs might try to enhance the survival chances of their ventures is through persuasive efforts. Persuasion might play a role for the same reasons as social support does. Persuasion has two aspects. The first is the actual attempt at persuading somebody; the second is the particular strategy the person applies for that purpose (In the former chapter I presented some results on the various framing strategies used by intrapreneurs). The construct of “persuasive efforts” tests only whether the actual attempt at persuasion per se influences the survival chances of new ventures. In contrast to social anchoring, which s

more geared towards the upper echelons of the corporation and towards gaining company-wide attention for the venture, persuasive efforts are envisioned to be focused especially on people working close to intrapreneurs and their immediate superiors in middle management.

Expectations about the effects of persuasive efforts on the hazard rate for non-retention again cut both ways. On the one hand, one might expect persuasive efforts to decrease the hazard rate by helping to convince others of the viability and value of the venture. It is equally likely, though, that persuasive efforts actually tend to increase the hazard rate; managers and colleagues might grow suspicious or be annoyed at intensive "lobbying" for the venture. It is also conceivable that intensive persuasive efforts are a result of poor venture performance or a lack of strategic fit, a possibility which needs to be checked in the next chapter, on results. Table 9 summarizes the items used for in the construct of social support and persuasive efforts.³³

Likert scale from 1 (totally disagree) to 7 (fully agree)

Social Support

1. Corporate managers have shown great interest in the development of the new concept (0.726).
2. The new concept was given a lot of attention in company reports or publications (0.689).
3. One or more dedicated people invested a lot of their time to obtain acceptance for the concept within the company (0.698).
4. The concept was promoted by people who already had good contacts at the company or corporate levels (0.755).

Persuasive Efforts

1. Much time was spent on persuading others to invest time and money in the new concept (0.844).
2. Getting financing for the concept required considerable persuasion (0.766).
3. There were many intensive debates with people who doubted the viability of the concept (0.774).
4. The introduction of the new concept was based on intensive discussions with middle managers (0.678).

Table 9 - Social support and persuasive efforts

³³ The factor analyses leading to the operationalization of the relatedness constructs as well as to the operationalization of social anchoring and persuasive efforts can be found in appendix 2.

4.8.2.3 Attainment discrepancy

Another implication of multiple-layered selection is that the value of ideas is highly context-dependent, varying not only from place to place (in our case different departments and people inside the firm) but also from one point in time to another. Ideas considered brilliant in some departments or at a certain time may be regarded as stupid in other departments or at other times (see, for instance, Czernich and Heath, 2002, for the example of the context-dependent value of the "eyeballs" business model). The context-dependent nature of choice is a major finding in behavioural research on decision-making under ambiguity (Kahneman, Slovic and Tversky, 1982; Hastie and Dawes, 2001). As was argued in the previous chapter, the current performance situation is a primary determinant of the manner in which organizations select ideas and which kind of ideas they select. Prior research on performance and risk-taking has suggested that organizations measure their performance by what is called their "attainment discrepancy," which is the positive or negative difference between their actual performance and their desired level of performance, or aspiration level (Kahneman and Tversky, 1979; March and Shapira, 1987, 1992; Greve, 1998, 2003a).

In accordance with several other studies on risk-taking and performance, and with accepted research practice (Bromiley, 1991; Bromiley, Miller and Rau, 2001), company performance is measured by return on equity (ROE). Data on the ROE of companies was obtained from two principal sources: first the Findata-base, which provides historic financial data on Swedish quoted firms; then, if data was not available from this data base, the annual reports of the various companies included in the sample were used directly. As companies calculate ROE in different ways, there is considerable inconsistency in the ROE reported in annual reports and in databases. Consequently, ROE was manually determined, with guidance from the approach taken by Runsten (1998)³⁴. ROE at time *t* for company *j* was calculated by dividing earnings after tax by the average of equity (*C*) at *t* and *t*-1³⁵:

$$ROE_{j,t} = \frac{E_{j,t}}{(C_{j,t} + C_{j,t-1})/2}$$

³⁴ There have been changes in Swedish reporting standards regarding the two principal components of an ROE calculation – earnings after tax and of shareholder's equity. Until 1990 an adjustment was required for untaxed reserves, allocation to untaxed reserves and deduction for taxes. Specifically, earnings were calculated starting with earnings after financial items and subtracting 50% of allocations to untaxed reserves and taxes payable, and, if applicable, adjusting for extraordinary items and minority share of earnings after tax. Equity was calculated by adding 50% of untaxed reserves to reported equity.

³⁵ Approaches to calculating ROE vary among annual reports. In some cases companies take only the equity at time *t* as the basis for calculation; in other cases they take only equity at *t*-1. Runsten (1998) also used *t*-1. I settled for a frequently used compromise by taking the average of equity at *t* and *t*-1.

To check for any major deviations between these results and the ROE shown in annual reports, the results of this calculation were then compared with a sample of the ROE in annual reports. No major deviations could be detected. Once the ROE had been determined, the next step was to calculate aspiration levels and attainment discrepancies.

The literature has suggested several different ways for calculating aspiration levels and the pace at which aspiration levels adapt to historic performance (Lant and Montgomery, 1987; Greve, 1998, 2002, 2003b). There is no general consensus on these issues in the literature. Here I have taken a fairly simple approach, measuring attainment discrepancy at time t for company j (AD_{tj}) by the difference between ROE in the focal year t and the average of ROE in $t-1$ and $t-2$. Thus:

$$AD_{j,t} = ROE_{j,t} - \frac{(ROE_{j,t-2} + ROE_{j,t-1})}{2}$$

Aspiration levels were also calculated on the basis of the difference between ROE at t and $t-1$; it was thus assumed that aspirations adapt immediately to changes in performance. This approach has been taken by Chen (2003), among others. The results did not change, and I accepted the solution set forth above because it allows for some inertia in the adaptation of aspirations to historic ROE, as argued by Greve (2002), for example.

For purposes of further clarification, let us construct an example. Let us assume that a venture was terminated during the year 2001. The relevant attainment discrepancy potentially influencing this event would then be calculated in the following way: The performance of the focal year is the performance shown in the annual report for the year 2000, presumably presented in February or March 2001 (let us assume that the performance level was 14%). The aspiration level would then be calculated as an average of the ROE of the year 1999 (for instance 16%) and of the year 1998 (for instance 20%); i.e. the aspiration level would be 18%. Thus, the attainment discrepancy would then be -4 (14-18%), indicating that the company performed below its level of aspiration in 2000 and is expected to change its behaviour appropriately during the year 2001.

Previous research on the formation of organizational aspiration levels (Cyert and March, 1963; Greve, 1998; 2003a,b) has argued that aspirations are not only formed based on historical aspiration levels of the focal organization, as assumed in this thesis, but also based on industry performance levels. It would have clearly been desirable to also include industry performance levels into the calculation of organizational aspiration levels. Yet, such a calculation would have posed in the Swedish, as opposed to for instance the US context some specific and considerable challenges. The major problem is that industries in Sweden contain too few, and indeed often times only one major incumbent which makes it difficult to calculate average industry performance levels on a national basis. For instance, the major player in the telecommu-

nications industry in Sweden, Ericsson, has no other company of comparable size or operation to refer to in Sweden. This, for instance, opens up a number of question concerning whether such large incumbents compare their performance to smaller Swedish companies or to equally big companies on an international basis. Equally, it opens up the question whether smaller companies compare their performance with other Swedish companies of the same size, with the typical only one major large incumbent or with small or large incumbents outside Sweden. Obviously these are fascinating research question certainly worth further scrutiny, but their investigation would have required a dissertation on its own focusing exclusively on the formation of aspiration levels. As one of the major ideas behind this thesis is to simultaneously test for multiple selection mechanisms it was chosen to stick to a fairly simple operationalization of aspiration levels.

The review in the preceding chapter has already demonstrated that predictions about the effects of attainment discrepancy on the hazard rate of an event can cut both ways. Yet, from the interviews, represented by the quotes in the previous chapters, I would expect a positive attainment discrepancy (i.e., performance above the desired level) to decrease the hazard rate. In other words, superior performance by the mother corporation would have a favourable effect on the survival chances of entrepreneurial ventures.

4.8.3 Control variables

When considering control variables, the researcher should try to imagine all alternative explanations for the phenomenon under investigation which are not included in the principal explanations put forth in the study. In this study, control variables are used for four main factors: venture performance, the potential of the venture to threaten other businesses within the corporation, size of the mother corporation and finally, whether the venture at some point during its life-time was part of a formal corporate venturing or business-development department.

Venture performance: One obvious control variable is the actual performance of the venture. Yet, measuring the performance of ventures confronts the researcher with a number of challenges. These make it nearly impossible to use "objective" financial performance data to measure venture performance. Thus, researchers trying to assess the performance of both internal ventures and independent entrepreneurial ventures outside established firms have typically relied on subjective measures of performance (Covin and Slewin, 1989; Venkataraman, 1990; Thornhill and Amit, 2001; Green, Welsh and Dehler, 2003). As Covin and Slewin (1989) point out, there are several reasons for using subjective performance data. First, firms are generally unable or unwilling to provide financial data. Objective measures of venture performance, such as sales, profit margins, market shares, return on equity etc., are typically not available for these ventures, especially when they still are in a relatively early stage of development. Also, the use of financial data is further complicated by industry effects and differing firm objectives. For instance, what is the relevant refer-

ence point for "high" performance of a venture? Determining the reference points for the performance of large organizations in the same industry is already an enormous challenge; doing so for often idiosyncratic ventures in different industries is even more complicated. In view of these problems and in line with prior research, I used performance evaluations by the key informants to assess venture performance in the survey. To solve the problem of the reference point, venture performance was measured by asking key informants about venture performance along a number of different dimensions *relative to expectations*. This request was made in the survey instrument.

As with operationalization of relatedness, the composition of the constructs was guided by the use of factor analysis (see Appendix 3 for details). In order to determine which of the many different possible performance dimensions for evaluating ventures (consider the many different measures of performance in the literature on corporate venturing) is most important for influencing venture survival, I settled on three different measures of venture performance: market performance, technical performance and competitive pressure³⁶. Both technical performance and competitive pressure are single-item constructs.

There is one complication with using the measure of market performance -- not all ventures had been launched on the market at the time the survey was completed by respondents. In this case, informants were instructed to evaluate performance, according to sales or time-to-market, relative to planned performance at the current stage of venture development. For instance, if a venture has existed for only two years at the time of the survey and the plan is to launch the product after three years, then sales will be "according to expectations" since no one has expected the venture to have any sales after two years. However, if the venture has existed for more than ten years and has still not introduced the product, which was originally expected to be launched after three years, sales performance will be drastically below expectations. A similar complication arises with regard to customer satisfaction. However, since all products underlying the ventures had passed the prototype stage, they all had been tested with customers in one way or another. In this case, informants were instructed to use the feed-back that they had received from potential -- not actual -- customers to whom they had presented the prototype.

Clearly the solution to these two problems is not perfect, but it is reasonable, especially in the light of alternative solutions. One alternative solution would have been to include in the sample only ventures, whose products had actually been launched on the market. Yet, as we will see, venture performance measured by sales and customer satisfaction, as defined in this study, has a significant impact on the hazard rate for non-retention (indicating criterion validity of the construct as it would have been very surprising if venture performance had not influenced the hazard rate).

³⁶ This solution does not include all of the different performance aspects of ventures which were assessed in the survey. Yet, including other items did not significantly change the factor solutions or the results of the statistical analysis.

Thus, if the sample consisted only of ventures which actually had been launched on the market, it would have been strongly biased towards successful cases.

I also used two other performance measures which can be evaluated independently of whether the venture was launched on the market or not: technological performance of the product, and competition from other firms. The expected effects of competitive pressure on the hazard rate of non-retention can go in both directions, depending on the specific perspective adopted. From a Schumpeterian view on competition, strong competitive pressure should increase the hazard rate of non retention as firms should be less interested in the venture once they realize that they are neither the first nor the only corporation developing the specific invention underlying the venture. However, from another perspective one could also expect that competitive pressure has actually a negative effect on the hazard rate of non-retention since competition from others build legitimacy for the venture (Carroll and Hannan, 2000).

Internal threat: Another obvious control variable is the extent to which the innovation threatens established businesses or important people within the mother corporation. Radical innovations often undermine existing competence (Tushman and Anderson, 1986) and thus are a potential threat to established products and services inside the firm. The danger of internal threats and "self-cannibalization" of some ventures also came up a couple of times in the interviews. The survey contains two questions for assessing the potential for internal threat. For the sake of simplicity, I decided on a single-item construct, although taking the other item-- the degree of resistance to the venture from heads of other product areas -- or the sum or average of both items together, did not alter the results in any way. Table 10 summarizes the operationalization of the principal control variables.

Likert scale from 1 (fully disagree) to 7 (fully agree)

Venture Performance

Market performance

- 1) The market introduction of the new concept has gone faster than expected (0.878).
- 2) Sales of the new concept have grown faster than expected (0.923).
- 3) The new concept created much weaker demand among the intended customers than expected (inverse) (0.715).
- 4) Customers have been more satisfied with the new concept than expected (0.682).

Technical performance

- 1) The new concept is more successful in technical terms than expected (0.814).

Competitive pressure

- 1) Competition from other companies with similar ideas has been severe (0.942).

Internal threat

- 1) The new concept threatened persons with important positions at the company.

Table 10 - Control variables

Size of the mother corporation: Many studies have investigated how R&D expenditures, patent output and other research activities vary with firm size (e.g. Scherer, 1984). The general conclusion from the research on the relationship between firm size and innovation output is that R&D inputs tend to increase more than proportionately with firm size, but R&D outputs measured by patents tends to increase less than proportionately with firm size (Acts and

Audretsch, 1990). Thus, large firms tend to have disproportionately high expenses on R&D, yet they seem at the same time to be fairly unproductive when it comes to R&D output. How these effects of firm size translate into effects on the survival time of new ventures is not a straightforward issue. On the one hand, one might expect that the larger the firm the easier it is for ventures to "hide" within the organization; we would thus expect size to have a negative effect on the hazard rate for non-retention (this effect would also be consistent with the finding that large firms are relatively less productive in R&D output). On the other hand, large firms are more likely to have formalized processes for evaluating and dealing with entrepreneurial ventures. Size, in turn, should tend to increase the hazard rate. Whichever the direc-

tion of the effect, prior studies have firmly established that there is some relationship between firm size and innovative activity. For this reason, firm size should be used as control variable. I measure firm size as that of the mother corporation by using the logarithm of the average sales of the mother corporation during the life-time of the venture.

Corporate venture department: 29 of the ventures in the sample, or 33%, at some time during their existence were part of a formal corporate venturing or business-development unit specializing in the commercialization of innovations emerging within large corporations. Passing through a corporate venture department might potentially have a powerful impact on the survival chances of new ventures. This factor should therefore be used as a control variable. On the one hand, one might expect that a formal corporate venture department would tend to reduce the hazard rate for non-retention since the very purpose of such departments is to give ventures a relatively secure shelter and isolate them from the selection pressures of the main organization. On the other hand, formal corporate venture units are likely to have a very professional approach towards the management of ventures, with milestones and unambiguous criteria for measuring venture success. They also are likely to increase the transparency of the venture and thus constitute a stronger and more rigorous, though in some respects different selection environment than the mainstream of the organization. Whichever the direction of the effect, one can expect inclusion in a formal venture department to have a strong effect. Consequently, a control, or "dummy," variable was used for this factor.

Other potential control variables: As was noted earlier, 26 of the ventures, or 29.5%, come from one single company. Thus, the findings of this study might be biased towards company-specific idiosyncrasies. There is a possibility that the outcomes of these 26 observations are not independent of each other, but are a function of some unobserved variable affecting these observations, such as a particular firm-specific effect. Several measures were taken to exclude this possibility. First, 20 of the 29 ventures passing through a corporate venture (CV) department did so at this company. Thus, much of the firm-specific effect should be captured in the dummy variable for corporate venture department. This dummy variable was used in all models. It might be argued that what distinguishes at least 20 of the 26 observations from the same company is that they all passed through a CV unit, and that this effect should be captured by the CV dummy variable. However, as a further precaution the analyses were also conducted excluding the 26 ventures from the same company, or by introducing a dummy for firm. However, the results remained largely unchanged and will be discussed in a separate section in Chapter Five.

Another possibility is that there are industry-specific factors that influence the hazard rate for non-retention. However, there is generally no reason to believe that there are any systematic differences in the survival duration of ventures in the various industries represented in this sample. Furthermore, the sample has a fairly even distribution across many different industries. One exception again is the company

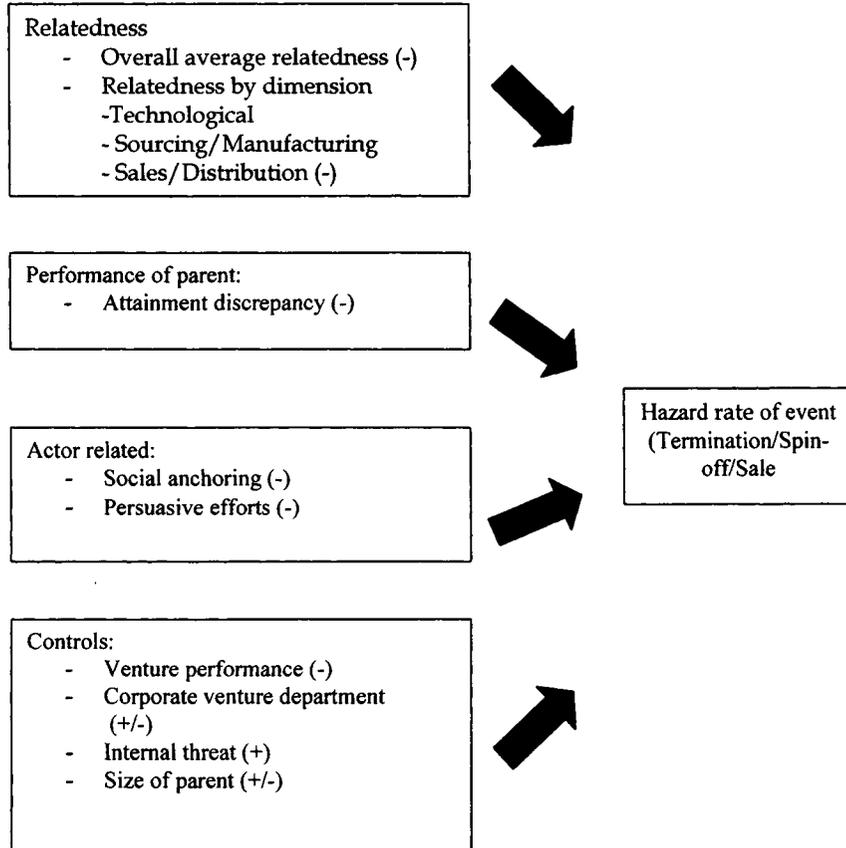
accounting for 26 ventures in the IT/telecom industry, but this effect will be treated in the various analyses explicated above. Another possible exception might be the pharmaceutical industry. Because of the rigorous requirements of product testing, clinical trials, etc., the development of new products might take systematically longer in the pharmaceutical industry than in other industries, such as the telecom industry, and hence ventures might systematically survive longer in the pharmaceutical industry. In order to check for this possibility, analyses were conducted without the ventures from the pharmaceutical industry or with a dummy variable for industry; however, there was no effect on the results.

Finally, as the histogram of the distribution of survival duration of ventures demonstrates, several ventures were started in the 1970's and 1980's and have hence survived for more than 20 years within their parent company. One cannot exclude the possibility that the selection logic inside firms was significantly different in the 1970's and 1980's from the logic prevailing today. Thus, ideally one would like to analyze for such possible cohort effects. Unfortunately, the composition of the sample does not permit distinguishing between these cohort effects and age effects; to do so would have required a sample which contained equally many short-term and long-term surviving ventures from the 1970's and the 1980's as from the 1990's. Unfortunately, this was not possible and therefore all the old ventures in the sample are also long-term survivors. Thus, introducing a dummy variable for these long-term survivors or excluding them from the sample is a way of accounting for long-term survivors, i.e. for age effects, not for cohort effects. In addition, using a control variable to account for long-term survivors potentially could distort highly valuable information, namely the fact that certain ventures actually survived for more than 20 years. Excluding them would bias the sample. Thus, in many ways these old ventures represent very important and informative cases and should therefore not be excluded from the sample³⁷.

Figure 5 provides a summary of the different variables included in the study and of the hypothesized relationships between the variables and the hazard rate for an event (termination, spin-off or sale).

³⁷ Nevertheless, I also conducted the analyses a) excluding all ventures which had survived for 12 years or longer and b) introducing a dummy variable for all ventures started before 1990. Neither of these analyses altered the effects of the main variables discussed in Chapter Five.

Figure 5 - Summary of variables and their hypothesized effect on the hazard rate



Hypothesis 1a: There will be a negative effect of the average overall degree of relatedness of a venture on its hazard rate of non-retention.

Hypothesis 1b: There will only be a negative effect of sales and distribution relatedness of a venture on its hazard rate of non-retention. Neither the sourcing and manufacturing relatedness nor the technical relatedness of the venture will alone have any effect on the hazard rate of non-retention.

Hypothesis 2a: Whenever the parent company is performing above its level of aspiration, the hazard rate of non-retention will decrease.

Hypothesis 2b: Whenever the parent company is performing below its level of aspiration, the hazard rate of non-retention will increase.

Hypothesis 3a: Persuasive efforts by the intrapreneur will have a negative effect on the hazard rate of non-retention.

Hypothesis 3b: Social anchoring by the intrapreneur will have a negative effect on the hazard rate of non-retention.

4.9 A summary of the limitations of the study

There are two concerns about the findings in this study presented in the next chapter. One relates to the generalizability of the findings, and the other, to concerns about the quality of measurement in the theoretical constructs.

In the current chapter I discussed at some length the important trade-offs which any researcher faces when designing a study. By using a triangulation method in which qualitative data was combined with quantitative data, I tried to extenuate this trade-off as much as possible. Furthermore, the sample is composed of ventures in a large number of different industries ranging from mechanical engineering to pharmaceuticals to telecom equipment. This diversity increases one's confidence that the findings of this study are *not* idiosyncratic to a certain industry. One potential problem, however, might be the specific period during which most of the ventures in the sample existed. As we know, the 1990's were a time of sustained economic growth and fairly high corporate profits, followed by a drastic downturn in the second half of 2000 and in 2001. Consequently, one might argue that the findings of this study are a product of this rather particular time. However, while many of the ventures existed during this period, the sample nevertheless represents a fairly balanced selection of ventures in regard to time, with 31 of the ventures starting before 1990 and 46, or more than half of the sample, starting before 1995. Also, both the economic boom and the subsequent economic downturn were most powerful in the IT industry, with the strongest effects on one specific dominant firm. A dummy variable was used to isolate these effects. While the time aspect warrants some concern about the generalizability of the results, several precautions were taken to reduce this problem.

Other concerns about generalizability relate to the composition of the sample. As discussed in considerable detail in the section on method, there is no way to be sure that the sample is a fair representation of the total population of corporate ventures, either in Sweden or internationally. In view of the combination of convenience and snowball sampling, it is possible that the sample is biased in some respects. Here, too, however, a number of precautions were taken, and I am fairly confident that these biases are not so serious that the findings are totally idiosyncratic. Still, the dangers of a snowball- and convenience-sampling approach need to be kept in mind when interpreting the results.

A further concern is the fairly special kind of ventures and intrapreneurship on which this study has focused. All the ventures were based on some kind of technological innovation with a tangible product as the outcome. Thus, the findings of this study can be applied only with considerable caution, if at all, to other types of corporate entrepreneurship. This warning is especially appropriate in the case of entrepreneurship, which involves the creation of new management concepts, of new ways of organizing, or the introduction of new strategic issues. Here, other local logics inside the firm probably play a larger role in selecting these concepts, and the concept of "relatedness" is likely to have a rather different meaning. Quite possibly the argu-

ments about framing and persuasion are also applicable to entrepreneurship in these areas as has been demonstrated in the literature on issue-selling.

Finally, all the ventures were undertaken within Swedish corporations and were located in Sweden. Thus, the findings of this study may be unique to the Swedish context and cannot be generalized to other countries or cultural contexts. However, most of the theoretical arguments in this thesis have been taken from US research literature. Since the findings in this study support most of these concepts, it is very likely that they are not particular to the Swedish context, but are generalizable at least to very similar cultures, such as those in the Anglo-Saxon countries. However, extending these findings to very different cultural contexts, such as Third World countries, China or Japan, probably would require considerable caution and sensitivity to the cultural differences between these countries and Sweden, or more generally, the western world.

Another potential concern regarding the effects of changes in organizational attitudes toward risk is that it was not possible to analyze changes in the composition of the entire venture portfolio of any corporation. Studying changes in the composition of the whole portfolio would be necessary to be sure whether the performance effects found are a function of changes in organizational attitudes toward risk. Terminating a venture does not necessarily imply that organizational attitudes toward risk or novelty-seeking decreased, since the corporation could at the same time have added ten new ventures to its project portfolio or could have substituted a less risky venture for a riskier one. This possibility cannot be excluded given the design of the quantitative part of the study. However, my claims are not based on quantitative data only. They are also substantiated strongly by the interviews as illustrated in the quotes in Chapter Three. Several interviewees indicated that organizations behave in a way which is consistent with the interpretation of the findings put forward in this thesis. Also, the interpretations are consistent with a large body of literature which has shown that risk-attitudes indeed change as a function of changes in performance. Thus, there is cause for confidence that the theory developed in this thesis is valid and accurately describes what happens in established firms when performance is changing.

A second problem of measurement in the study is that it uses only relatedness ratings of one key informant. Using several raters would have made it possible to check for inter-rater reliability and would certainly have increased the validity of the results. Attempts to secure ratings of at least one more key informant met little success. It was very difficult and time-consuming to identify even one key informant and to persuade that individual to participate in the study. Often respondents were only willing to participate after the researcher had signed a secrecy contract. In view of these problems in the course of the study and the limited time frame for completing the dissertation, I faced a crucial trade-off. Either I could analyze far fewer cases and obtain multiple opinions and multiple evaluations of a particular venture, or more I could analyze more cases but obtain only one evaluation for each venture. Given the

need for a minimum number of observations to conduct an event-history analysis, I chose the second option. Also, as was noted earlier in this chapter, it probably would not have been possible, regardless of the time and effort invested, to identify for each venture a second -- or even less a third -- person who would be as informed and knowledgeable on all the questions in the survey as the intrapreneur, who had been working with the venture on a daily basis from its very early stages of development. I was well aware of these problems in the course of the study and took a number of further precautions to reduce potential problems of common-method bias and other problems related to the use of key informants, as discussed earlier. Nevertheless, these problems must be kept in mind when interpreting the results.

A third potential concern with regard to the quality of measurement is the constructs used to evaluate relatedness. As also noted earlier, these constructs were derived from an in-depth analysis of the resource- and knowledge-based view of the firm, but not from direct measures of relatedness previously used in other studies. The primary reason is that no studies could be identified which operationalized relatedness in a satisfactory manner. Thus, the measurement of relatedness in this study is in many ways a novel approach, which warrants some caution concerning the validity of the measurement. There are, however, a number of reasons for confidence in the quality and validity of these constructs. First, some very direct and straightforward questions were asked about relatedness to the basic activities of a firm. These questions were easy to understand and difficult to misinterpret, to judge from the feedback received from key informants after completion of the survey. Second, as the relatedness results led to few surprises, it is more likely that these results meet criterion validity. Finally, the constructs were exposed to a number of experts in the course of seminars, which allowed a check of face validity.

Despite these limitations, I am convinced that the approach taken is fairly innovative and in many ways more rigorous than the one followed in other comparable studies. The approach in this study featured a combination of subjective evaluations of ventures which capture the critical factor underlying the decisions --namely, perceptions about the venture -- a striving for a balanced sample of retained and not retained cases, analyzing the data on the basis of survival instead of the more commonly used simple regression analysis, and finally, substantiating the arguments with interview data. Consequently, I am quite confident of the overall validity and generalizability of the results of this study.

Let us in the following chapter have a close look at the results of the quantitative analysis and the tests of hypotheses 1a to 3b.

Results

In the following chapter I will review the results of the various tests conducted in order to investigate the hypotheses formulated in Chapter Three and summarized at the end of Chapter Four. The overall research question of this thesis is why some intrapreneurial projects survive within the boundaries of their parent organization while others are terminated or spun-off into separate companies. The explanation put forth in this thesis has three major components: relatedness, actor-specific effects such as social anchoring and persuasive efforts of the intrapreneur, and context-specific effects represented by the performance history of the parent company during the lifetime of a venture. A fourth significant filtering criterion, which should become more important over time since it becomes more transparent and measurable the older the venture becomes, is the actual performance of the venture. These components represent different aspects of the internal innovation-selection system of organizations. They represent different explicit and tacit filtering criteria, what I call "layers of selection", which ventures have to pass and against which they are evaluated throughout their lifetime. The analysis will proceed step by step through the effects of each component. All analyses have been conducted in the SPSS software package.

5.1 Means, standard deviations and correlation coefficients of the constructs

Table 11 presents the means, standard deviations and Pearson correlation coefficients of the constructs. In general it can be observed that correlations between the constructs which will be included in the same models are fairly low, suggesting that there are no problems of multicollinearity in the models. Furthermore, several interesting and more detailed observations can be derived from this table.

Concerning means and standard deviations, the low mean of the internal-threat variable indicates that most of the ventures in the sample did not pose an immediate threat to other people within the corporation, and thus that most of the ideas and innovations underlying the ventures were not of a "competence-destroying" nature (Tushman and Anderson, 1986), or at least that they were not so perceived within their parent organization. Another interesting aspect is that the technical performance of the ventures was much higher on average than market performance (t-test

significant 2-tailed at the 0.001 level)³⁸. I will discuss venture performance in greater detail in another section below. There were also significant differences in the means of the various dimensions of relatedness. Technological relatedness was much higher on average than either sales and distribution relatedness or sourcing and manufacturing relatedness. This suggests that ventures were drawing to a much more significant extent on the existing technological competence of the parent company than on either the sales and distribution system or the sourcing and manufacturing system. Finally, the mean of social anchoring was fairly high, indicating that on average most of the venture champions were trying to build social relationships and call attention to their ventures to enhance their internal legitimacy.

The correlation table suggests that there is a significant negative correlation between corporate venture department and market performance. This indicates either that ventures tend to perform poorly because they are part of a venture department or that poorly performing ventures tend to become part of a corporate venture department. Both suggestions cast doubt on the value of such a unit. There is also a highly significant negative relationship between corporate venture department and sales and distribution relatedness, indicating that corporate venture departments tend to consist of poorly related ventures. This finding is consistent with the image of such a department as a haven for those ventures which, at least initially, do not fit naturally into the core areas of the parent. Finally, there is a negative correlation between social anchoring and corporate venture department, suggesting that a formal venture department might function as a substitute for the informal relationship-building mechanisms reflected in the social-anchoring measure.

Concerning venture performance, there is a significant positive correlation between market performance and sales and distribution relatedness. Perhaps somewhat surprisingly, though, none of the other three relatedness constructs -- average total relatedness, technological relatedness and sourcing and manufacturing relatedness -- have any significant correlation with venture performance. This is a first element of evidence that what matters most for new intrapreneurial ventures is to have linkages to the existing sales and distribution system of the parent, an argument to which I will revert several times.

Average overall relatedness is strongly correlated with all three sub-dimensions of relatedness, suggesting that this measure captures a significant aspect of all three sub-dimensions. Since this overall measure will not be included in the same model as the three sub-dimensions, these correlations will not cause any problems. Please note also that the correlations between the three sub-dimensions of relatedness are zero, a

³⁸ The scores for the construct of market performance, like the scores for the constructs of sales and distribution relatedness, technological relatedness, sourcing and manufacturing relatedness, persuasive effort and social anchoring, were derived directly from the factor analysis. Such scores always produce constructs with a mean of zero and a standard deviation of one. Thus, the means and standard deviations reported in the table are based on an index which was calculated by summing up and averaging those items with the highest factor loadings.

result of the use of factor scores. This has the significant advantage that there are no multicollinearity problems associated with analyzing the impact of the various relatedness dimensions upon the hazard rate for non-retention.

Finally, there are no significant correlations between the actor-related measures of social anchoring and persuasive efforts, on the one hand, and venture performance or any of the relatedness measures, on the other. Possibly both of these actor-related approaches towards building legitimacy for the venture are related to venture performance or to the degree of relatedness of the venture. Yet the low correlations suggests that neither venture performance nor relatedness are confounding variables that might have concealed an effect of either of these two actor-related variables. From a theoretical angle, the lack of a high correlation between these constructs is somewhat surprising. One might have expected, for instance, a positive relationship between social anchoring and relatedness. One could expect that ventures closely related to key strategic areas of their parent would receive more internal attention, suggesting that intrapreneurs of closely related ventures have stronger relationships to top management. Yet the data indicates that this is not the case.

	Mean	Std. Dev.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1. Corp. vent. dept.	0.33		0.432**	0.091	-0.348**	0.014	0.13	-0.216*	-0.277**	-0.017	-0.02	0.146	-0.222*
2. Log Sales (N=83)				0.069	-0.244*	0.06	-0.054	-0.029	-0.102	0.051	0.043	0.279*	-0.213
3. Internal threat	2.091	1.706			0.035	0.099	-0.207	-0.064	-0.061	-0.048	-0.005	0.437**	-0.062
4. Market perf.	3.77	1.518				0,000	0,000	0.197	0.337**	-0.059	-0.031	-0.153	0.139
5. Technical perf.	4.585	1.423					0,000	0.237*	0.235*	0.047	0.096	0.081	-0.044
6. Competition	4.296	2.007						0.094	0.065	0.128	-0.016	-0.253*	-0.057
7. Overall av. rel.	4.034	1.254							0.709**	0.450**	0.542**	-0.115	0.198
8. Sales&distr. rel.	3.705	1.753								0,000	0,000	-0.137	0.145
9. Technical rel.	4.662	1.431									0,000	0.008	0.146
10. Sourc.&man. rel	3.901	1.637										-0.023	0.054
11. Persuasive eff.	4.07	1.528											0,000
12. Social anch.	5.108	1.299											

** Correlation significant at 0.01 level (2-tailed)

* Correlation significant at 0.05 level (2-tailed)

N=88; missing values excluded pairwise.

Table 11 - Means, Standards Deviations and Pearson Correlation Coefficients

5.2 A closer look at venture performance

Explaining venture performance is not the primary purpose of this thesis. As argued several times throughout the thesis, one of the main reasons for not trying to explain venture performance in terms of sales, time to market, or return on investment, for example, is, that the concept of intrapreneurial-venture performance is highly ambiguous per se. Furthermore, several measurement problems are associated with reliably capturing venture performance. Nevertheless, the findings show some interesting aspects with regard to venture performance. Particularly interesting is the distribution of performance outcomes of entrepreneurial activity within established firms.

As March (1988) has pointed out, most new ideas are bad ideas. Yet, among the large number of ideas which are indeed weird and useless, there are some which at first appear crazy, but turn out to be a stroke of genius. This argument is well reflected in the highly instructive book by Ehrlich (2002) on evaluating "crazy" new ideas in science. More systematic research on the performance distribution of entrepreneurial activity by Scherer and Harhoff (2000) and Gompers (1994), among others, confirms more systematically these arguments about the skewed outcome distribution of innovative and entrepreneurial activity. Scherer and Harhoff (2000) found, for instance, that of a total of 772 patents there were only 5 with a net present value of 50 million Deutsche Mark or more, while there were 673 with a net present value of 5 million or less.

Figure 6 shows the performance distribution of the ventures in the sample of this study according to two criteria: the increase in sales and the technical performance of the venture. As can be seen, arguments about the skewed outcome distribution of entrepreneurial activity are equally applicable to intrapreneurial activity. In 55.7% of all cases, the increase in sales was substantially below expectations, and a total of 72.7%, or more than two thirds, of all ventures performed below expectations with regard to increase in sales. Only 12.4% were performing substantially above expectations. This finding reflects the "one-out-of-ten" rule often referred to by venture capitalists when asked about the performance distribution of their venture portfolios (Gompers, 1994; Czernich, 2003). According to this rule, only about one out of ten ventures is successful. Interestingly, the same pattern appeared in this sample. The applicability of this pattern to intrapreneurial activity as well has some important implications for learning theory, since from this theoretical angle it is quite surprising that firms, despite the poor performance record of intrafirm entrepreneurial activity, nevertheless engage in it. I will return to this point in the chapter on implications.

Figure 6 illustrates also that ventures have performed far better with regard to technology; indeed, the shape of the technological-performance distribution is almost the mirror image of the sales-performance distribution. A total of 69.2% of all the ventures were technologically performing above expectations, and only 8% of all the

ventures were performing strongly below expectations. This suggests that solving the technical problems underlying internal

corporate ventures is a much lesser problem than finding customers for the technical solutions. This finding is consistent with those from the interviews, in which technical problems almost never came up as a major issue during venture development. Combined with the high mean of technical relatedness, this indicates that the technological pools of expertise which exist within established corporations are a powerful tool for solving the technical problems related to venturing. Hence, one can speculate that the problem of internal venturing is not so much that there is no expertise for creating new ideas and solving technical problems, but much more that these ventures find it difficult to identify suitable customers. Thus, the problems arise not in the invention phase, but in the subsequent phase of commercializing these inventions. Furthermore, the correlation between sales performance and technical performance (0,319) may possibly be significant, but these two aspects of performance are far from identical. Solving all the technical problems related to venturing is no guarantee of market success. As we will see in the following analyses, the impact of these two different aspects of venture performance upon venture survival is also fairly different.

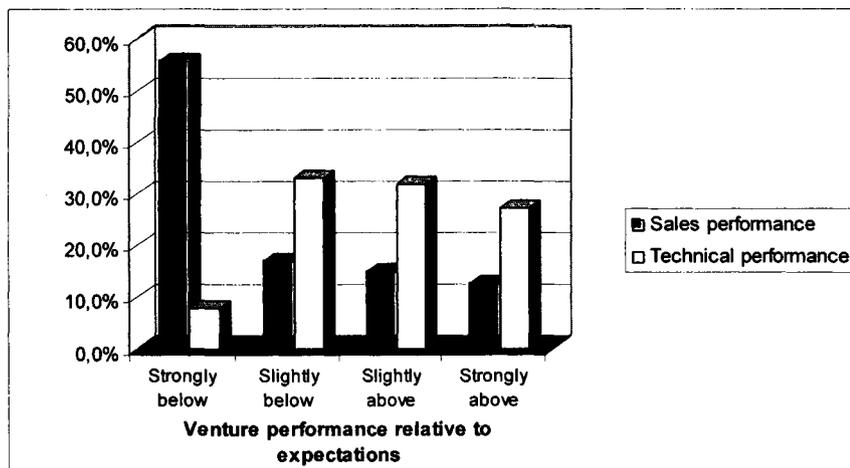


Figure 6 - Venture performance

5.3 Analyzing the differential survival patterns of intrapreneurial ventures

The strategy of analysis is to test step-by-step for the effects of the various explanatory components. I will depart from a "base-line" model, which contains only the control variables and will then, one-by-one, include the three families of explain-

ing variables into the models, relatedness, actor-related strategies and finally attainment discrepancy. This procedure of creating "nested models" will hopefully make it easier to follow the analysis. It is also appropriate because in multivariate analysis the contribution of any one variable is determined in the context of the contribution of all other variables in the model.

The Cox Regression function within SPSS provides different tools for finding a good model and adding and deleting variables from the model. Two such methods were used in the data analysis: 1) forced entry, which means that all variables are forced into the model in one step, and 2) stepwise forward selection. In stepwise forward selection the model begins as a baseline model without any variables. Variables are then considered one at a time. They are added to the model if they meet the selection criterion for the p-value of the score statistic. In the models the value for inclusion was chosen to be 0,1. Thus, this procedure makes sure that only variables with significant effects are entered into the model. As each new variable is added, the variables already present are evaluated for removal. The value for removal was chosen to be 0.15. Building the model stops when no more variables can be added or removed.

The drawback of this stepwise forward selection procedure is that it does not provide coefficients for the non-significant variables, which are not included in the model. Therefore, in order to be able to report the coefficient also for not significant variables I used the forced entry method for the first five models which test for the effect of each family of explaining variables in isolation. Stepwise forward selection was then used in models six and seven, which represent the last "full" models, where *all* significant variables are entered into the same model simultaneously.

In the lower part of each table, a chi-square statistic is reported to indicate how much the log likelihood function is reduced by introducing the variables into the model as compared to a base-line model which only contains the base-line hazard function without any explaining variables. A significant reduction in the log likelihood function indicates thus that at least one of the variables included in the model is significant. This chi-square statistic is highly significant for all the models in the analyses. Furthermore, as I enter the new explaining variables into Models II-V, I will report in the text whether the new variables entered into the models in comparison to Model I, which only contains the control variables, significantly reduce the log likelihood function. It can be mentioned already now that this was the case for each new family of variables added to the base-line Model I, which only contains control variables. In the analysis of the effects of attainment discrepancy, I used the Cox Regression with a time-dependent covariates feature.

Before examining the effects of the various variables, let us first consider the cumulative hazard function in Figure 7. As can be seen, there are no dramatic changes in the hazard function over a period of nearly 30 years. Ventures are almost equally as much at risk of being excluded in their early stages of development as they are after they have been retained for a considerable time. This finding is somewhat sur-

prising as one might have expected a fairly high hazard rate in the beginning and a lower rate once ventures have survived the early years and become institutionalized. The cumulative hazard function should thus have flattened out, but it does not. Indeed, the sample contains a number of ventures which were terminated or sold after they had been retained for 10, 15 or even more than 20 years. This suggests that no ventures are ever fully institutionalized in the parent company and that a venture (or in the case of ventures which have been retained for 20 years, it might be better to say business unit) *selection is an ongoing process*. This finding also supports the argument in this thesis that venture selection is context-dependent. Ventures which seemingly have become institutionalized after having been retained for long periods, suddenly are terminated or divested, possibly because of a change in the context and the specific situation in which the parent company finds itself. This change might be in the strategic context or the performance situation of the parent. The fairly low hazard rate in the early years suggests that ventures may be given the "benefit of the doubt". Parent companies seem to allow ventures a number of years to develop, and a notable increase in the hazard rate can only be observed after some 12 years and again after around 20 years³⁹.

³⁹ It can be speculated why the hazard rate shows a significant only increase after 12 years. Personally, I would have expected such an increase of the hazard rate already much earlier, maybe after 3 or 4 years. It is also interesting that the hazard rate showed again significant increases after more than 20 years, where one might have expected that ventures got institutionalized and the hazard rate flattens out. One explanation for the increase after 10 years is that organizations might, in contrast to the argument of myopic tendencies in organizations, actually have a fairly long-time perspective when investing into new ventures. Biggadike (1979) has reported that it takes on average about 12 years for new ventures to break even, so maybe organizations are willing to actually take such a long-time perspective and give ventures ten years or more to show positive financial results. Another explanation might be related to management tenure. If it is true that senior managers often act as a mentor for a project, who protects and supports it inside the organization, and these mentors are most often already in a senior management position when taking over mentorship, then about 10 years might reflect the time this person stays in such a position which allows her to personally support and sponsor the venture. All this is of course pure speculation and requires much more systematic research.

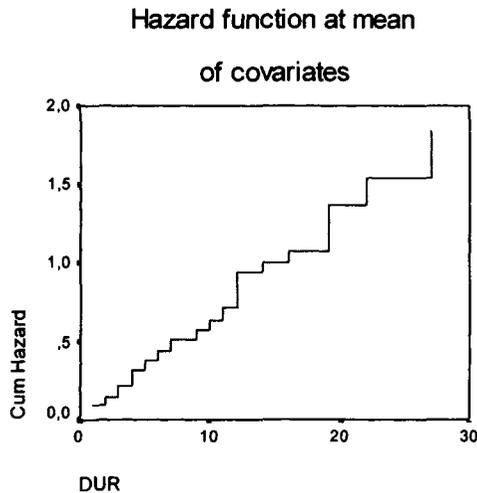


Figure 7 - Cumulative hazard function

5.3.1 The effects of control variables – corporate venture department, corporate size, and internal threat and venture performance

Model I in table 12 tests for the effects of the control variables. As can be seen in the lower part of the table, the chi-square statistic, which indicates how much the log likelihood function is reduced by introducing the variables into the model, is highly significant ($p < 0.001$), indicating that at least one of the variables included in Model I has a significant effect on the hazard rate.

One surprising result in Model I is the highly positive effect of the corporate venture department on the hazard rate for non-retention. Thus, ventures are much more likely to be excluded from the mother corporation if they are channelled into a corporate venture department. Figure 8 compares the cumulative survival function of those ventures which at some point in their lifetime were part of a formal corporate venture (CV) unit and those which were not. As can be seen, the cumulative survival function for ventures which went through a CV unit is considerably steeper, indicating that such ventures tend to be terminated or spun-off earlier. There are several interesting explanations for this somewhat counterintuitive finding. One would think that a corporate venture department is expected to create new businesses which should then be integrated into the core strategic areas of the mother corporation, not to terminate ventures at an early stage as my results suggest. One explanation for the counterintuitive character of these results is that given the negative correlation between venture performance and corporate venture department, ventures tend to be excluded from the mother corporation (as suggested by the correlation table above). Yet it remains open to discussion whether corporate venture departments attract bad ventures, or whether such a department has a negative impact on venture perform-

ance. Another explanation is that a formal venture unit increases transparency of ventures and makes them subject to in-depth monitoring, with explicit performance criteria and milestones. With more monitoring and transparency, information asymmetries are reduced, thus enabling the corporation to see earlier whether or not the venture fits into its overall strategy. A final explanation, supported by some of the interviews with senior executives, is that the function of the corporate venture department itself has changed. Formerly a vehicle for internal growth, the CV department would now be charged with packaging potentially valuable, yet very long-term investments and strategically uninteresting innovations and ventures and then spinning them off as fast as possible. This hypothesis is supported by the negative correlation between CV unit, on the one hand, and sales and distribution relatedness, on the other. This speculation suggests that large organizations are increasingly "outsourcing" the development of innovation costs to external investors, such as venture-capital firms. Such a trend would, in line with the arguments of Baumol (2002) reviewed in the introduction of this thesis, indicate growing "specialization" in the commercialization of innovations between large corporations on the one hand and start-up firms, possibly supported by venture capital investors, on the other.

There is one caveat to this finding: 20 of the 29 ventures in the sample which were part of a CV unit come from the same company. Once a dummy variable for this firm is included or the 20 ventures are excluded from the sample, the effect disappears. Thus, this finding may indicate a company-specific effect. The effect may also be industry- and time-specific. Since the company is in the IT/telecommunications industry and all the ventures existed in the late 1990's and the early months of 2000, they were probably influenced considerably by the "Internet mania" during this period⁴⁰. Nevertheless, similar patterns of very short survival times for ventures which went through a CV unit were also discovered in other companies, though on a much smaller scale, and the effect may have disappeared because of the limited number of ventures in CV units from other companies. Further research could be devoted to the question whether the higher hazard rate for non-retention is a company- or time-specific effect, on the one hand, or a general property of ventures going through a CV department, on the other. Based on the interviews with CV managers at other companies as well, my educated guess is that the higher hazard rate is a general property of such departments rather than a firm- or time-specific effect.

⁴⁰ Other changes in effects possibly attributable to this single company will be discussed in a separate analysis at the end of this chapter. However, whenever changes were significant and important, they are also mentioned as we review the various analyses.

Survival function for ventures inside
and outside a cv unit

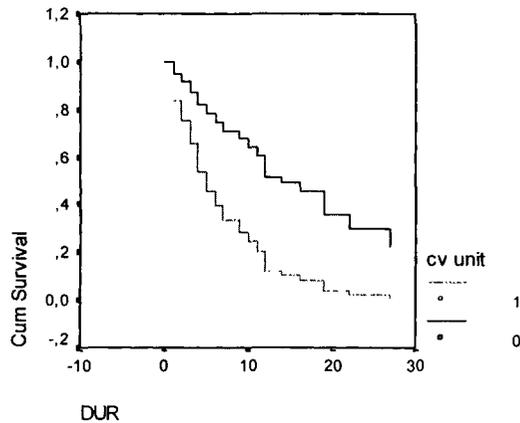


Figure 8- Cumulative survival of ventures inside and outside a CVunit

Model I also reveals that internal threat does not have any significant effect on the hazard rate⁴¹. An important aspect of Model I is the effect of venture performance. Given the general argument in this thesis that venture performance is multi-dimensional and therefore a somewhat ambiguous concept, it was measured along three different dimensions: first, market performance, which is an index composed of evaluation of time-to-market, increase of sales and customer satisfaction; second, technological performance; and third, competitive pressure from other companies with similar ideas. As can be seen in the table, neither technological performance nor competitive pressure has any effect on the hazard rate. It is somewhat surprising that technological performance did not have any effect. However, market performance has a highly significant ($p < 0,01$) negative effect on the hazard rate for non-retention. This finding indicates that ventures which perform favourably in terms of being fast to market, reaching an unexpectedly high sales volume and satisfying customer demands have a lower "mortality" rate. As we will see, this effect remains robust across virtually all models. This result suggests that market performance is an important selection criterion for organizations, a conclusion that is not self-evident. In some of the interviews, I was told of ventures which had existed for more than ten years without having sold any products or even having launched a product on the market.

⁴¹ Log Sales is not yet included into the model, because data on log sales was only available for 83 ventures. As the same is true for the data on attainment discrepancy, the reasons for these missing cases and its possible effect are discussed when discussing the effect of attainment discrepancy. Log Sales will thus be entered into later models in connection to the introduction of attainment discrepancy into the models. As will be seen log sales did not have a significant effect on the hazard rate.

Despite the ambiguity of innovations, venture performance matters, and the performance measure which is ultimately most important for the parent organization—namely actual market performance of the venture—matters the most. As will be seen in later models this highly significant negative effect of market performance on the hazard rate remains stable even if other variables, such as relatedness and attainment discrepancy are entered into the models. This finding indicates that internal selection might be more efficient than was initially expected. *Ceteris paribus*, highly performing ventures have better chances to survive. Although it cannot be shown with the present data set, one can expect the efficiency of selection to increase over time as venture performance becomes more and more transparent and unambiguous. However, as the following results will also demonstrate, venture performance is far from the only selection criterion, and it is not the one with the strongest effect. Thus, even when a control variable for venture performance is used, other selection criteria are also present and sometimes outweigh the importance of venture performance.

In the following three analysis steps I will test, one-by-one, first for the effect of relatedness, then for the effect of social anchoring and persuasive efforts and finally for the effect of attainment discrepancy. In the final two models all these variables are then entered simultaneously in order to summarize the results and in order to test for the effects of each variable in the context of all other variables investigated in this thesis.

5.3.2 The effects of relatedness

Model II in Table 12 tests for the effect of average overall relatedness. As can be seen in Table 12, the -2 log likelihood function is reduced from 355.381 to 346.904 when the variable average overall relatedness is entered into the model. This reduction is significant at $p < 0.0005$. The table also shows that overall relatedness has a highly significant and fairly strong negative effect on the hazard rate of non-retention. The result remains robust across several different models, even with slightly differing specifications of the variable with which I experimented. It also remains robust if a dummy variable is included for the company which provided 26 ventures in the sample, or if all 26 of these ventures are excluded from the sample. Indeed, together with attainment discrepancy, overall relatedness is the most important explanatory variable in the models. This finding strongly supports Hypothesis 1a. The effect of the control variables remains unchanged.

	Model I - Contr. variables	Model II - Avg. relatedness	Model III - Rel. dimension
1. Corp. vent. dept.	1.015** [0.328]	0.700** [0.344]	0.756** [0.343]
2. Internal threat	-0.002 [0.107]	-0.037 [0.104]	-0.057 [0.106]
3. Market perf.	-0.384** [0.17]	-0.386** [0.172]	-0.431** [0.187]
4. Technical perf.	-0.210 [0.148]	-0.049 [0.152]	-0.039 [0.155]
5. Competition	0.093 [0.158]	0.143 [0.156]	0.116 [0.156]
6. Overall av. rel.		-0.369*** [0.129]	
7. Sales & distr. rel.			-0.279* [0.155]
8. Technical rel.			-0.167 [0.149]
9. Sourc.& man. rel.			-0.359** [0.154]
-2 Log Likelihood	355.381	346.904	346.351
Chi-square	23.94***	31.886***	31.845***
Df	5	6	8

$p < 0.1^*$; $p < 0.05^{**}$; $p < 0.01^{***}$. Standard errors in parenthesis. N=88; and run in separate model

Table 12 - Analysis controls and relatedness

Model III in Table 12 is then used to test whether one specific relatedness dimension is more important than other dimensions for understanding the differential survival of ventures in organizations. Again, the reduction of the -2 log likelihood function in comparison to the base-line Model I is significant at $p < 0.005$. The results show that linkages to the existing sales and distribution system as well as those to the existing sourcing and manufacturing system have a significant negative effect on the hazard rate of non-retention. This finding supports Hypothesis 1b. In contrast to Hypothesis 1b, however, relatedness to sourcing and manufacturing resources and routines, somewhat surprisingly, had an even stronger negative effect on the hazard rate for non-retention. Technological relatedness does not have any effect on the hazard rate. The fact that technological relatedness had no impact on venture survival is interesting since it is a key variable in many theoretical approaches to explaining the growth and search trajectories of firms. The lack of an effect can be explained in two ways. The first, as suggested in Chapter Two, is that the place in the organization

where technological relatedness matters the most for being selected, namely the R&D organization, is highly tolerant towards ventures that are poorly related in a technological sense. The selection logic in the R&D department even actively encourages engineers to develop unusual ideas which transcend the current expertise of the mother corporation. Therefore, one might not expect technological relatedness to have a negative effect on the hazard rate. The argument against this explanation is that no significant positive effect of relatedness on the hazard rate was found, either. Hence, it is possible that requirements of novelty and deviation in a technological sense are offset by strategic requirements of relatedness in early stages of venture development.

Another plausible explanation lies with the sampling strategy underlying this study. As was pointed out in Chapter Four, all ventures in the sample had already reached a certain level of development when sampled, typically at least the prototype stage. Hence, all ventures in the sample might already have cleared the selection hurdle in the R&D organization. In effect, the sample had already been pre-selected for ventures that had passed the selection layer of technological relatedness. This suspicion is tentatively supported by the relatively high means for technological relatedness in the sample. In order to draw any valid conclusions about the effects of technological relatedness on the survival of ventures, one thus has to sample their underlying ideas at an even earlier stage of development than was done in the current study. This is an important methodological point which should be relevant for all studies investigating the significance of technology linkages for explaining the search and growth trajectory of firms. For instance, studies using patenting data to explain the search trajectories of firms exhibit a sampling bias similar to the one in this sample; these studies sample only those innovative efforts which have actually led to a patent and neglect all those which did not (it can be argued that reaching the prototype stage coincides approximately with a stage of development at which the parent company considers to patent the underlying technology). Hence, only because a firm has not been patenting in a certain technological areas does not mean that it has never allocated any attention and resources to this technological area. It only implies, that the firm has not (yet) been successful in patenting in this area and/or has chosen to not patent in this area. Thus, the use of patenting data is likely to lead to a systematic *under-estimation* of the reach of organizational search. The same is true for the present sample. If I also had included ideas which had not yet reached the prototype stage when sampled, it would have been likely that the average of technological relatedness would have been lower than in the present sample. Given my arguments concerning novelty seeking and a preference for experimentation with new and different solutions in the R&D department it would then be open more rigorous empirical testing whether technological relatedness indeed has a significant (positive) effect on venture survival.

The significant negative impact of sales and distribution linkages as well as sourcing and manufacturing linkages appropriately reflects prior theoretical arguments

about the importance of these linkages for explaining the growth trajectories of firms. The importance of sales and distribution relatedness was especially emphasized in the interviews and is now confirmed by the results of the statistical analysis. Linkages to the sourcing and manufacturing system had an equally strong and even more significant effect, a somewhat surprising finding since these linkages are not so strongly emphasized in the literature on directions of corporate growth. This result suggests that factor market linkages are at least equally important for understanding the direction of organizational growth and diversification in general and the differential survival of entrepreneurial ventures more in particular as are product market linkages.

In summary, the results in Model III confirm Hypotheses 1b; being strongly related to the sales and distribution system of the parent company alone reduces the hazard rate for non-retention. However, against initial expectations, relatedness to the sourcing and manufacturing system of the parent company had also a significant negative effect on the hazard rate of non-retention. Despite these significant effects of these two relatedness dimensions in isolation, average overall relatedness still has the strongest and most significant effect, suggesting that the ventures with the best survival chances are those related to all dimensions simultaneously⁴². Hence, it can be speculated that ventures which represent a *compromise* between all the various requirements of relatedness have the best odds for survival. A further implication of the strong effect of average overall relatedness is that strong conservative pressures in established firms force ventures either to adapt to the existing system of routines and resources or to leave it. The nature of the internal selection system for innovations, with its strong emphasis on resource and routine linkages, can thus be considered as the antecedent of the observed path dependency in macro patterns of organizational growth. It is doubtful, however, that from an evolutionary perspective on organizations this very conservative selection logic in firms is optimal for the overall well-being of the parent company, because it does lead to a strong reduction of variation in organizations. From a resource-based perspective, however, selecting related ventures clearly makes sense; as has been argued in Chapter Two according to this perspective, the linkages to firm specific resources and knowledge assets pro-

⁴² Strictly speaking this statement, made several times, about the advantage of being related to all dimensions "simultaneously" is not fully supported by the data, since overall average relatedness was calculated by taking the average of all the different relatedness dimensions. Thus, a relatively high average of this measure can be reached either by relatively high values on each relatedness dimension (be it market, sourcing and manufacturing, or technological relatedness) or it could be reached, against my argument, by very high relatedness values on one dimension and low values on other relatedness dimensions. This possibility cannot systematically be excluded with the data. However, detailed inspection of the data suggests, for instance, that those 20 ventures which did survive the longest within their parent in the sample, relatedness values along each dimension was fairly high and the *difference* between the values of the various relatedness dimensions was very low, suggesting that those ventures which did survive very long are indeed simultaneously related on all dimensions. However, obviously more detailed analysis is needed to substantiate this claim.

vide the sources of competitive advantage. Nevertheless, resource linkages are not valuable for their own sake, but only if they contribute to superior performance of ventures. The current data set suggests, in line with prior research on the relationship between relatedness and venture performance (e.g. Sorrentino and Williams, 1985; Thornhill and Amit, 2000) that it cannot be taken for granted that such a positive relationship between relatedness and venture performance exists. The correlation table showed that there was no significant correlation between average overall relatedness, the most powerful selection mechanism, and venture performance, and there was only a relatively weak (0.337), though significant, correlation between sales and distribution relatedness and market performance. Furthermore, according to our results, linkages that contribute to superior technological performance by ventures, possibly caused by strong technological relatedness, are not necessarily of value to the company since technological performance does not automatically translate into market performance. What ultimately matters from a normative perspective on selection is how the selection criterion employed, such as resource and routine linkages, contribute to increasing the likelihood that the selected venture will, sometime in the future, deliver high revenue and profit to the parent company. The results suggest, however, contrary to the normative arguments of the resource-based view that the relationship between venture performance and relatedness as a selection criterion of ventures is far from straightforward and empirically established.

5.3.3 The effect of attainment discrepancy

There is another important aspect of the argument in this thesis that the internal selection system in established organizations is not quite so "hard-wired" and deterministic as a selection system which only operated upon resource and routine linkages. Selection should also be sensitive to the specific context in which it takes place. Here the focus is specifically on the crucial question whether selection takes place in a context of corporate success or corporate failure.

Model IV in Table 13 tests for the effects of the impact of success and failure as measured by attainment discrepancy. The reduction of the log likelihood in comparison to Model I is significant at $p < 0.0005$ ⁴³. As can be seen, attainment discrepancy has a highly significant ($p < 0.01$) and strongly negative effect on the mortality rate of ventures. The effect remains equally strong and significant in many different specifications of the model, also if a dummy for the one firm accounting for disproportionately many ventures is included, or if all the ventures from this company are excluded from the sample. This finding strongly supports the arguments in Chapter Three that the performance context of the mother organization crucially shapes the selection of ventures. In particular, it suggests that if organizations are

⁴³ It is important to mention that the current model is based on 83 observations only. In order to facilitate comparison with Model I, the reduction of the log likelihood is reported in comparison to the not reported variant of Model I, which also contains log sales and which is only based on 83 observations.

performing above their aspirations, they are much less likely to terminate or spin-off ventures. This is clear evidence that success leads to a *weakening* of the organizational selection system and also indicates that success possibly leads to a "branching out" of the organizational search and diversification space. If organizations are performing below their aspirations, the mortality rate of ventures strongly increases, suggesting that if organizations run into performance problems there is a significant *tightening* of the internal selection system, and one immediate reaction is pressure within the organization to get rid of entrepreneurial ventures. This tendency suggests that failure leads to organizational myopia as organizations focus on short-term reduction of costs, potentially cutting away their future business areas. These arguments that success leads to relaxation and failure to tightening of the internal selection system are also strongly substantiated by the interviews as represented in the quotes in Chapter Three. Together, these results give strong support for hypothesis 2a and 2b.

This result is rather fascinating for a number of reasons. First, to the best of the author's knowledge, this study is one of a few, if not the only one, which can show this strong effect in the specific context of a systematic examination of the hazard rate for entrepreneurial ventures inside firms. Second, it suggests that intrapreneurial activity is a context-dependent phenomenon. In other words, the perceived value of such ventures changes according to the situation (remember that this effect is still present even in the context of a control variable for actual venture performance), and organizational selection more generally changes significantly depending on whether the context is one of success or one of failure. *Ceteris paribus*, the perceived values of ventures changes depending on whether the parent organization is performing above or below aspiration levels. In an even more general sense, this finding implies that the direction of organizational search, growth and diversification is strongly influenced by the context in which decisions on it are taken; this point is not observed frequently enough and not emphasized strongly enough in this vast area of the literature. Organizational selection is not totally "hard-wired" and deterministic, but changes from one situation to another; thus, it might easily become inconsistent and somewhat erratic. The implications of this finding will be discussed in greater detail in the last chapter. This finding is also important and interesting in light of the prior literature on the effect of attainment discrepancy on risky organizational activities, since these results in many respect at first sight suggest an opposite effect of performance above and below aspirations as suggested by for instance March and Shapira (1987; 1992). This, and a novel mechanism which might reconcile the findings of this study with the arguments in the tradition of the behavioural theory of the firm will be considered more in detail in the final chapter.

Two further points must be noted. To test for the possibility of a non-linear relationship between attainment discrepancy above and below aspiration levels, and venture mortality, I also conducted tests with the absolute values of attainment discrepancy. This testing, however, showed no significant effect. If the model based on absolute values had been significant, it would have suggested that the effect of a

negative attainment discrepancy is the same as the effect of a positive attainment discrepancy, leading to somewhat different conclusions about the effects of performance below aspirations. In particular, it would have suggested that performance below aspirations also leads to a decrease in the hazard rate and thus possibly to an increase in the tendency to take risks. This possibility, however, is excluded with this analysis⁴⁴.

A second point is that the analyses of the effect of attainment discrepancy are based on only 83 of the total of 88 ventures. These values were missing either for one or the other of two reasons. One was that performance data was unavailable because during the lifetime of the venture one of the companies became part of another non-public company with headquarters in Switzerland; consequently, no annual reports were available for this company. The other reason, applicable in other cases, was that corporations were not willing to help by providing financial information and the information could not be obtained from other data sources, such as databases or various libraries. One way to obtain information for these four companies would have been to contact the Swedish industry register ("Patent och Registreringsverket"), which keeps financial information on all companies located in Sweden. This was done, but I determined that costs relative to the benefits of obtaining this information would be prohibitive. The industry register was not willing to support this research and provide the information free of charge. Since these companies do not differ substantially from the other companies in the sample, and since they are so few and the effect of attainment discrepancy is so strong, it is extremely unlikely that these missing cases would significantly alter the results of this analysis if included in the sample.

Finally, as can be seen I also included log sales into this model, since data on log sales was available for the same 83 companies for which data on attainment discrepancy was available. As can be seen in the table, log sales did not have a significant effect on the hazard rate of non-retention.

⁴⁴ The analysis can, however, not exclude that risk-taking, here argued to be associated with the support of independent entrepreneurial ventures, again increases once performance is so low that the organization is close to bankruptcy.

	Model IV - Attainment Discrepancy
1. Corp. vent. dept.	0.933*** [0.352]
2. Internal threat	^-0.041 [0.112]
3. Market perf.	^-0.343** [0.171]
4. Technical perf.	^-0.141 [0.149]
5. Competition	0.081 [0.157]
6. Log Sales	0.008 [0.133]
7. Attainment Discrepancy	^-2.234*** [0.707]
-2 Log Likelihood	333.822***
Chi-square	32.355
Df	7

p<0.1*; p<0.05**; p<0.01***. Standard errors in parenthesis.
N=83.

Table 13 - Analysis of attainment discrepancy

5.3.4 The effect of social anchoring and persuasive efforts

Model V in Table 14 tests for the effects of social anchoring and persuasive efforts. The -2 log likelihood function decreases in comparison to Model I to 350,337, which is significant at $p<0.0005$ level. The model results show a highly significant ($p<0,05$) and negative effect of social anchoring and a non-significant positive effect of persuasive efforts on the hazard rate for non-retention. This result indicates that internal social linkages and the internal attention that intrapreneurs attract to their ventures contribute to reducing the mortality rate of ventures. However, efforts to convince others of the viability and value of the venture (persuasive efforts) do not have any effect; indeed, and against expectations, the sign of the coefficient is positive, which suggests that such efforts would tend to have a positive effect, if any at all, on the hazard rate for non-retention. Thus, the results suggest that the intrapreneur cannot influence the fate of ventures in any way just by trying to persuade others and that such efforts tend to be actually counterproductive for trying to increase the survival chances of ventures. However, a more fine-grained analysis which also combines the arguments in Chapter Three about possible framing strategies might reveal more subtle and possibly significant effects of persuasive efforts. Further research in this

direction investigating the effect of more advanced framing strategies as suggested in Chapter Three might well be worth pursuing, but is beyond the scope of this study. The significant impact of social anchoring, however, suggests that there is some room for agency and actors to influence the internal selection system of established organizations. Thus, the internal selection system consists not only of a selection layer which filters ventures according to their resource and routine linkages. It consists also of a second "social" layer which filters ventures on the basis of efforts to build social relationships and internal attention for ventures. In summary, these results do not support hypothesis 3a about the effect of persuasive efforts, but give at least initial support for hypothesis 3b about the significant effect of social anchoring. Again, though, there is an important caveat to this support for hypothesis 3b, namely that once social anchoring is analyzed in combination with total average relatedness, the effect of social anchoring disappears. This pattern will be shown and discussed in Model VI.

It is worth mentioning here that I also experimented with different measures in trying to capture the effect of the experience and competence of the intrapreneur on the mortality rate of ventures. The survey asks one question about industry experience of the intrapreneur and a second question about the extent to which the intrapreneur was previously involved in successful internal ventures. Yet neither in isolation nor in combination did these two measures have any significant effect. This finding was fairly surprising given that the literature on entrepreneurship strongly emphasizes the relationship between the experience and background of the entrepreneur and venture success outside established organizations. One speculation explaining the lack of effect of experience of the intrapreneur on venture survival, which is in line with evolutionary and behavioural perspectives on organizations, is that the "intelligence" of the organization is already built into the routines and resources of the organization, and thus possibly also into the internal selection mechanisms, making the personal experience of the intrapreneur less crucial than the personal experience of the entrepreneur outside established organizations, who cannot rely on existing resources, routines and selection mechanism. In other words, the external entrepreneur first needs by experience to "internalize" those filters which in established organizations are "in the air" or maybe better are embedded into the routines and selection mechanisms present *independent* of the personal experience of the intrapreneur.

In summary, actor-related variables play a role in influencing the fate of new ventures, although their effect is not so strong or straightforward as one might have expected from the strong emphasis in some of the literature on the importance of the actors involved in the venturing process. Perhaps individual actors in fact play a lesser role in the entrepreneurial process inside established organizations than outside. Routines and resources reduce to some extent the importance of actors in the internal selection system of ventures. It is also worth noting that there was no signifi-

cant correlation between any of the actor related measures and any measure of venture performance.

There is another effect, more subtle yet equally important, of social anchoring and also of persuasive efforts. If we take this construct as a proxy for the degree of the intrapreneur's commitment to the venture, this effect would be the way in which these actor-related variables influence the fate of a new venture *after* the parent organization has decided to terminate it or to spin it off. It should be recalled that "mortality" in this study can imply venture termination, but also spin-off. Thus, well connected intrapreneurs who are highly committed to their ventures might have a stronger impact on overall venture success by actively supporting a spin-off and helping the venture to grow *outside* the boundaries of the firm. This possibility is supported by some of the sample ventures in the pharmaceutical/biotechnology industry. A number of these ventures were initially championed by very senior employees of the mother corporation. These individuals were clearly well connected and highly committed inside the parent company. In view of the limited possibilities of developing their ventures fast enough inside the mother corporation, and of the lukewarm support from senior management they agreed with senior management to spin the company off, which management supported. Today some of these ventures are highly successful independent companies. By contrast, similar spin-off companies were championed by much less senior employees, who were probably not equally well connected or experienced. The interviews tentatively indicate that these spin-off companies subsequently were much less successful and did not grow nearly as fast. However, there are no systematic data in this study to confirm this possible actor-related effect *after* non-retention. To do so would require further research on the relationship between how well the intrapreneur was connected inside the company and venture success after spin-off.

	Model V - Soc.Anchoring. and Pers.Efforts.
1. Corp. vent. dept.	0.877*** [0.334]
2. Internal threat	-0.056 [0.119]
3. Market perf.	-0.384** [0.173]
4. Technical perf.	-0.214 [0.150]
5. Competition	0.129 [0.164]
6. Social anchoring	-0.280** [0.139]
7. Persuasive efforts	0.217 [0.206]
-2 Log Likelihood	350.337***
Chi-square	28.434
Df	7

p<0.1*; p<0.05**; p<0.01***. Standard errors in parenthesis.
N=88.

Table 14 - Analysis of social anchoring and persuasive efforts

5.3.5 Summary of the results and a closer look at the relationship between social anchoring and relatedness

Model VI and VII in Table 15 summarize the results. The method used here was to include all variables discussed in this chapter and enter them into the model by using the "stepwise forward selection" feature in SPSS explained in the beginning of this chapter. Thus, in this model, the only variables reported are those which remain significant in the context of all other variables discussed. The difference between Models VI and VII is that they use the two different operationalizations of relatedness, which had to be included in separate models since they are so highly correlated. As can be seen, the results of the prior analyses remain unchanged. The major prediction variables are the following: whether or not the venture went through a CV unit (positive effect); the market performance of the venture (negative effect); average total relatedness (negative effect); sales and distribution relatedness, and sourcing and manufacturing relatedness respectively (negative effect); attainment discrepancy (negative effect). As Table 15 also shows social anchoring is no longer significant if analyzed in the context of the relatedness variables. The coefficient for social anchor-

ing remains negative, and the significance level is reduced towards 0.109, thus being almost significant at the 0.1 level.

To explore further the obvious relationship between relatedness and social anchoring, the sample was split into two categories: "related" ventures and "unrelated" ventures. The sample was split in the following way: I decided to use the average-overall-relatedness measure calculated according to standardized values for this purpose. Standardized values were used because they indicate by how many standard deviations a value is above or below the sample mean. Thus, the overall-relatedness measure indicates the number of standard deviations by which a venture lies above or below the mean degree of relatedness across the various dimensions of relatedness. Thus, a natural point for splitting the sample is zero. All ventures with a score above zero are above the average degree of relatedness for all the ventures in the sample and can thus be classified as "related". All ventures with scores below zero are below the average degree of relatedness and can thus be classified as "unrelated." The resulting two sub-samples are equally large. Splitting the sample in this way shows that social anchoring has a strong and highly significant ($p < 0,01$) negative effect upon the "related" ventures, while it does not have any effect upon the "unrelated" ones. This result is interesting, because it shows that social anchoring matters more for related than for unrelated ventures. Thus, it can be speculated that social anchoring cannot compensate for a lack of resource relatedness (since there was no effect for the unrelated sub-sample). However, for ventures that have passed the selection layer of resource and routine relatedness, social anchoring significantly contributes to a reduction in the mortality rate. Thus, actors can influence the fate of ventures, but only if the ventures exhibit a relatively high degree of overall resource relatedness.

	Model VI - Complete Model A	Model VII Complete Model B
1. Corp. vent. dept.	0.622** [0.322]	0.717** [0.316]
2. Log sales		
3. Internal threat		
4. Market perf.	-0.384** [0.172]	-0.355** [0.182]
5. Technical perf.		
6. Competition		
7. Overall av. rel.	-0.373*** [0.123]	
8. Sales&distr. rel.		-0.308** [0.151]
9. Technical rel.		
10. Sourc.&man. rel.		-0.328** [0.143]
11. Persuasive eff.		
12. Social anch.		
13. Attainment discr.	-2.266*** [0.653]	-2.407*** [0.663]
-2 Log Likelihood	325.908	326.184
Residual chi-square	42.838***	43.212***
Df	10	12

p<0.1*; p<0.05**; p<0.01***. Standard errors in parenthesis;
N=83.

Table 15 - Summarizing models

Finally, let me shortly summarize the results of the analyses which either excluded all of the 26 ventures which came from the same company or which included a firm dummy (the results of models VIII to XI can be found in Appendix 3 at the end of this chapter). The results remain unchanged with regard to the major variables. With both methods for controlling for this possible firm-specific effect, attainment discrepancy, relatedness and market performance remain highly significant. Social anchor-

ing remains insignificant and as already mentioned earlier, the CVunit dummy also loses significance. The firm dummy has a highly significant ($p < 0.01$) and strongly positive effect on the hazard rate of non-retention which suggests that ventures from this company had a significantly higher mortality rate than ventures from other companies. It is however unclear whether this effect is firm specific or, which appears more likely, a function of the fact that most ventures from this company went through a CVunit, or a third explanation, because many of the ventures from this specific company existed in and around the period of the "Internet mania." In any way, the major results of the study remain unchanged. There are two further changes that result from controlling for the specific effect of these 26 ventures. Log sales measuring the average sales of the mother corporation during the life-time of ventures becomes highly significant ($p < 0.05$) and negative in all four model specifications. This indicates that controlling for this specific company size has a significant negative effect on the mortality of ventures. Thus, the bigger the company, the better the survival chances of new ventures. Another finding constrained to model VIII and IX, which include a dummy variable is that the coefficient of the variable internal threat becomes, once the specific company is controlled for, highly significant and, somewhat surprising, negative. This suggests that the more a ventures threatens internal interests the lower its mortality rate, This is a finding which is somewhat counter-intuitive goes against the generally accepted view, inspired by the view of dangers for "self-cannibalization", that internal threat should increase the hazard rate of ventures. However, that it actually decreased the hazard rate suggests that the selection logic is in effect the reverse. Indeed, some interviews indicated that internal threat is not necessarily a reason to kill a venture. As one senior R&D manager pointed out: *"If there is an idea which makes me lose my job, then it has to be a pretty darned good idea...I would become a hero for having been able to support it.* The same person also suggested that new technologies are not equally threatening to everybody in organizations. Especially, he suggested that those people who are most resistant against a new technology are those people in the lower management ranks, who have specialized on one particular technology and whose career is dependent on the importance of this specific technology within the company. However, the higher the management rank, the less are managers dependent on the importance of one particular technology and the more they are dependent on overall company performance. Thus, managers on higher management ranks might be absolutely willing to support technologies which cannibalize on existing technologies once they have understood that the new technology is really important and has strong upside potential. Furthermore, the fact that internal threat only became significant once controlled for one specific company suggests that attitudes towards internal threats arising from new venture might vary across companies. In particular, the result suggests that the one company controlled for is obviously strongly driven by the conflict between different competing technologies, an impression supported by many interviews in this com-

pany, while in other companies internal threat arising from a new venture is obviously not a reason to kill the venture.

	Model VIII - Firm spec. eff. Ia [^]	Model IX - Firms spec. eff. Ib	Model X - Firm spec. eff. IIa ^{^^}	Model XI - Firm spec. eff. IIb
Firm dummy	2.423*** [0.600]	2.514*** [0.603]		
1. Corp. vent. dept.	ns	ns	ns	ns
2. Log sales	^-0.334** [0.150]	^-0.337** [0.156]	^-0.347** [0.155]	^-0.367** [0.162]
3. Internal threat	^-0.362*** [0.118]	^-0.411*** [0.122]	ns	ns
4. Market perf.	^-0.408** [0.174]	^-0.349** [0.181]	^-0.641*** [0.220]	^-0.654*** [0.229]
5. Technical perf.	ns	ns	ns	ns
6. Competition	ns	ns	ns	ns
7. Overall av. rel.	^-0.386*** [0.122]		^-0.476*** [0.155]	
8. Sales & distr. rel.		^-0.365** [0.155]	ns	^-0.362** [0.179]
9. Technical rel.		ns	ns	ns
10. Sourc.& man. rel.		^-0.321** [0.149]	ns	^-0.608*** [0.209]
11. Persuasive eff.	ns	ns	ns	ns
12. Social anch.	ns	ns	ns	ns
13. Attainment discr.	^-2.112*** [0.705]	^-2.274*** [0.031]	^-2.663*** [0.860]	^-3.039*** [0.881]
-2 Log Likelihood	309.671	309.788	166.958	163.195
Residual chi-square	60.611***	60.552***	36.267***	38.287***
Df	11	13	10	12

p<0.1*; p<0.05**; p<0.01***. Standard errors in parenthesis; ^N=83; ^^N=57

Appendix 1 - Analysis of possible firm-specific effects

Implications and Conclusions

6.1 Summary of the findings

In this thesis I have developed and tested a number of hypotheses for when one can expect entrepreneurial ventures to survive in large organizations and what kind of ventures are likely to survive. It was argued that the answer to this overall research question of this thesis should be viewed as an outcome of the inner workings of the organizational selection system. Conceptually, this selection system can be understood as a multiple-layered system operating partly through resource and routine linkages to three parts of the firm: the R&D organization, the sales and distribution organization and the sourcing and manufacturing organization, and partly it operates upon the strategies of actors employed, such as building social relationships and attention for the venture, represented by the variable "social anchoring" and such as "persuasive efforts" and specific framing strategies of the intrapreneur. Furthermore, I argued that the nature of this selection system can be expected to change as a function of changes in corporate performance relative to a reference point.

The results were derived from a data set of 88 ventures and more than 100 interviews. Methodology-wise, the thesis builds on a fairly rare combination of qualitative and quantitative data. This combination of qualitative and quantitative data allowed for a fairly detailed micro analysis of the determinants of venture survival, while it at the same time also allowed for systematic statistical testing of hypothesized relationships illustrated and derived from the qualitative analysis. As was already pointed out in the introduction, this is a very rarely employed research design in the literature on corporate entrepreneurship as well as in the literature on learning and context dependent risk-preferences and the literature on growth and diversification. Furthermore, the study is also built on another rarely employed design approach as the sample represents a balanced collection of successful and failed cases. Thus, this thesis is not subject to the so frequent bias of over-sampling successful cases (Denrell, 2003). Furthermore, the data were analyzed with the help of a Cox proportional hazard model with time dependent covariates. This data analysis approach arguably represents a fairly new and innovative approach to the systematic study of internal selection processes, which might be worth applying even in future studies of these internal selection processes. This is especially the case, since most prior studies of internal selection (Burgelman, 1991; Baum and Singh, 1994; Miner,

Goshal, 2000) were either of a conceptual kind or were based on qualitative data only.

The results revealed highly significant effects of most of the variables tested. First, relatedness proved to be a crucial variable for understanding venture survival. Thanks to the fine-grained analysis of different hypotheses on how relatedness matters for predicting venture survival, we have now a better understanding of exactly how it matters for understanding the differential survival of entrepreneurial ventures. The results indicate that there is not one dominant "pipeline for growth", i.e. one dominant resource linkage that has the greatest influence on organizational growth, consistently overshadowing all other dimensions of relatedness. Rather, ventures have the best chances of survival if they are reasonably highly related "on average" -- that is, if they are somewhat linked to all resource dimensions simultaneously. The measure of "average overall relatedness" consistently had a very strong and highly significant negative effect on the hazard rate for non-retention; in other words, average overall relatedness showed a clear tendency to lessen the risk that a venture would be terminated, spun-off or sold. This finding suggests that ventures face considerable pressure to *compromise* when inside established organizations. The strong pressures for average overall relatedness are a powerful mechanism for reducing variation, for increasing reliability and for weeding out all ventures which do not "fit in." The strong effect of average overall relatedness represents the conservative forces inside organizations. These, if any forces, compel intrapreneurs, if they want to grow their ventures inside established firms, to adapt their ideas and ventures to existing ways of doing things, in other words, to conform to the prevailing organizational principles (Kogut and Zander, 1992; 1996) and to the existing system of routines and resources.

Furthermore, expectations that linkages to the sales and distribution channels alone significantly reduce the hazard rate for non-retention have also been confirmed. If a venture is linked with the existing sales and distribution system and is aimed at an already targeted customer group of the parent organization, then its chances of survival increase. Yet, contrary to expectations, the effect of these linkages did not dominate over all other resource linkages. In particular, and perhaps somewhat surprisingly, the analyses showed that linkages to the sourcing and manufacturing system of the mother corporation has an equally strong negative effect on the hazard rate for non-retention. This suggests that linkages to the sourcing and manufacturing system are at least as important for understanding venture survival and the direction of corporate growth more generally, as are linkages to the sales and distribution system. Thus, factor-market linkages matter just as much as product-market linkages for understanding organizational growth trajectories. This point may not always have been sufficiently emphasized in the literature on corporate growth.

Overall, the results of the relatedness analyses provide further support for the argument that organizational search and growth trajectories are guided and constrained to a considerable degree by the existing resource and knowledge base of

corporations and thus by their history and accumulated experience. -This statement also applies in the context of entrepreneurial ventures. Corporate growth is path-dependent (Nelson and Winter, 1982; Dosi, 1988; Teece, et.al, 1994). Hot-dog stands do not become biotechnology companies. Hence, the survival of ideas and ventures in established organizations is not arbitrary but follows to a considerable degree a *logic of relatedness*. This study is one of very few which could establish and further confirm this relationship between relatedness and venture survival and direction of diversification more generally on the level of the single diversification project and more particularly with regard to independent entrepreneurial ventures, a level of analysis still very rarely employed in the literature on corporate diversification (Ramanujam and Varadarajan, 1989; Pennings, et.al., 1994). This level of analysis combined with the qualitatively grounded arguments and analyses gave a more fine-grained analysis of the micro-foundations for path-dependency to be found in the workings of the internal selection system of firms.

The results show also a second and equally strong selection mechanism operating on entrepreneurial ventures -- timing. The corporate performance history during the lifetime of a venture, as measured by the attainment discrepancy between aspired and actual performance, is a crucial factor for understanding in what circumstances new entrepreneurial ventures are likely to survive in established organizations. The results show that success, defined as performance above aspirations, had a highly significant and very strong negative effect on the hazard rate for non-retention. Similarly, corporate performance below aspirations had a very strong positive effect on the hazard rate. It should be re-emphasized that these clear effects of corporate performance persist even when control variables are added for the degree of relatedness of the venture and for the actual performance of the venture. As we will discuss in more detail below, these findings are very interesting as they in many ways suggest opposite effects of success and failure on organizational risk-taking as suggested in the literature on context-dependent risk preferences within the tradition of the behavioural theory of the firm (Cyert and March, 1963; March and Shapira, 1987; 1992; Greve, 1998; 2003a,b). In particular, while this literature generally suggests that performance above aspiration leads to a decrease of risk-taking and performance below aspirations leads to an increase of risk-taking, the results of this thesis suggest that the hazard rate of non-retention strongly decreases if the organization performs above aspirations and strongly increases if performance lies below aspirations. If we interpret support of risky entrepreneurial ventures as evidence for a risk-seeking attitude of organizations and termination or spin-off of risky ventures as a decrease thereof, then the results of this thesis indeed show an opposite effect. Thus, the findings in this thesis add further evidence to the fact that the relationship between risk-taking and corporate performance is very intriguing and that it is no wonder that it is subject to such intense debate (Staw, et.al, 1981; Thaler and Johnsson, 1992; Ocasio, 1995). I will suggest below a novel mechanism which can reconcile the effect of changes of performance found in this thesis with established arguments in the theory

of context-dependent risk-preferences within the tradition of the behavioural theory of the firm. For the moment it suffices to argue that the findings in this thesis are indicative evidence that success leads to a weakening of the organizational selection system as new ventures have a systematically lower mortality rate during periods of success while failure leads to organizational myopia as organizations tend to get rid of them when performance falls below aspirations.

The results also indicate that the effect of the organization's performance history is at least as important as relatedness for guiding corporate growth and diversification. Indeed, success might considerably relax organizational requirements of relatedness and thus *compensate* for such requirements inside the organizational selection system.

The tendency to terminate or spin off companies during periods of success is very limited. One implication of this effect is that success leads to a "branching out" of the organizational search and diversification space. From this perspective, it can be speculated that success breeds failure, not only through strategic persistence in its core areas, as suggested by for instance Miller (1994) or Audia et.al. (2000), but also because the organizational selection system weakens. Organizations then over-invest in risky entrepreneurial ventures or at the very least fail to terminate or spin-off ventures which are not aligned with corporate strategy. Inasmuch as these ventures demand considerable financial resources, overinvestment in entrepreneurial ventures might potentially lead to deterioration of the overall performance of the mother corporation. These statements have gained consistent support from the findings derived from interviews. The findings provide indicative evidence that established organizations engage in radical innovation in periods when they are consistently performing above their aspirations; however, this tendency is also likely to increase the failure rate of such ventures. Below it will be argued that in the worst case over-investment in entrepreneurial ventures during periods of success might, somewhat paradoxically, be coupled to strategic persistence in the core areas, with an unwillingness actually to launch the new ventures on the market on a large scale.

If organizations are performing below their aspirations, the mortality rate of ventures strongly increases, suggesting that when organizations encounter performance problems one of their immediate reactions is to get rid of entrepreneurial ventures. This indicates that failure may lead to organizational myopia as organizations focus their attention on short-term cost-cutting, potentially cutting away their future business areas as well. Thus, I suggest that large corporations typically react to organizational crises in the wrong way. Instead of investing in the future by supporting new ventures, they nip them in the bud, potentially endangering the corporation's future. These statements are strongly substantiated by my interviews as presented in a prior section.

Overall, the results concerning the effects of corporate performance show *that the survival chances of entrepreneurial ventures are very context-dependent and that the organizational selection system exhibits a considerable degree of inconsistency.* With control vari-

ables for venture performance and relatedness and with the entrepreneurial idea kept constant, the results indicate that the same ideas and ventures are considered as strategically valuable to the corporation in certain situations, but not in others. Inasmuch as the perceived value of a venture in corporations is connected to the degree of the venture's relatedness, as is likely given the strong effects of relatedness in the analyses, *attitudes towards relatedness may vary as a function of corporate performance*. These arguments qualify the previous statements about path-dependency to some extent. They indicate that if organizations ever deviate from their growth path guided by resource and routine linkages, and if they allow the introduction of considerable novelty and variation, then these deviations are likely to be associated with fluctuations in their performance. The direction of corporate growth and diversification might thus be influenced by the performance of the corporation.

The results also indicate that experience need not at all lead to a decrease in variability and to convergence, but that this relationship might be moderated by changes in corporate performance. The changes would lead in turn to a *cyclical increase and decrease in variation* inside organizations depending on the performance history of the organization. Especially, the results suggests that corporate success leads to an increase of tolerated and/or retained variability, while corporate failure leads to a decrease thereof. Coupled with the fact the most of the entrepreneurial ventures in the current sample were retained within large, well-established companies, this observation lends further support to the argument that experience need not lead to convergence but can equally well result in divergence and variability (Miner, et.al., 2003). The findings in this thesis add to this argument that there might not be a linear relationship between experience and divergence or convergence but that there might be cyclical relationship, the direction of which crucially depends on the performance history of the organization. It might be worthwhile to conduct further research on the proposition that changes in corporate performance cause changes in organizational requirements of relatedness and lead to increases and decreases of variation inside organizations more generally. This proposition will re-emerge later in this final chapter.

The analyses on the effect of actor-specific variables were somewhat mixed. While persuasive efforts consistently in all models had no significant effect on the hazard rate for non-retention, the effect of social anchoring was closely associated with the effect of relatedness. Particularly when the effect of social anchoring was analyzed without including a relatedness variable, it had a highly significant and fairly strong negative effect on the hazard rate for non-retention. Yet as soon as a relatedness variable was introduced into the model, the effect disappeared. This indicates that the effect of social anchoring is subordinate to the effect of relatedness. To explore the relationship between relatedness and social anchoring further, I split the sample into related and unrelated ventures. This analysis showed that social anchoring has a strong negative effect on the hazard rate for non-retention, but only for the relatively more related ventures in the sample, while there was no effect for the ones that were

relatively less related. Thus, it seems that being well-connected to top-management and getting attention from top-management and from internal publications strongly increases the survival chances of new ventures, though *only if* a venture has met the overall "relatedness" criteria in the various parts of the organization. Social anchoring is *no* substitute for lack of relatedness, for the variable has no effect on unrelated ventures. Given this finding, it can be speculated that the most powerful combination appears to be a venture with strong resource and routine linkages which is also socially anchored. Thus, one can imagine various combinations of social anchoring and degrees of relatedness and speculate about the likely effects of such combinations on the survival chances of new ventures.

Overall, these results provide partial support for the proposition that actors and specifically intrapreneurs play a crucial role in shaping the fates of new ventures (Block and McMillan, 1993; Day, 1994). Why does social anchoring only matter in connection to relatedness? One explanation could be that ventures and intrapreneurs can only build social relationship with top-management and gain attention for the venture, if the venture is highly related. However, as shown by the weak correlation between relatedness and social anchoring in the correlation table presented in Chapter Five, relatedness and social anchoring is not a "natural" combination. A more likely explanation is that mentorship cannot overrule the local selection logics inside firms. In other words, even if the mentor of a venture is the CEO of the corporation, it is not very easy for the CEO to tell the market organization to build up a completely new distribution system and start selling a radically new product to an entirely new customer group. In other words, it can be speculated that even the decisions of the CEO are constrained by the local logics inside the firm. Even if the CEO, in theory, could overrule the local selection logics, he would be forced to use all his clout and put his personal reputation at stake when doing so. In case a CEO is informed about the low odds of success of new entrepreneurial ventures it can be doubted whether she would be willing to do so. All these statements naturally also apply, to even a larger extend, to all more frequent cases in which the mentor of a venture is not the CEO, but rather a senior manager on a lower hierarchical level. Contrary to expectations, persuasive efforts of the intrapreneur did not have any significant effect on the hazard rate of non retention of ventures.

Finally, the analyses have also shown that venture performance has a highly significant and positive effect on venture survival. According to the analyses, the critical performance dimension is the market performance of the venture -- that is, an index combining measures of how fast the product is launched on the market, how fast sales are growing and how satisfied customers are. Neither technological performance nor pressure from competitors had any effect. This finding indicates that there is a strong efficiency component in the internal selection system of organizations. Ventures with high performance have better chances of being retained. This result is especially interesting and valid since the sample consists of a balanced collection of successful and non-successful ventures. However, other variables, such as related-

ness and corporate performance had an even more significant effect. This indicates that there is constant tension between strategic and financial goals in the selection of intrapreneurial activity, as suggested at the beginning of this thesis and emphasized by Hellman (2002), for instance. Also, the relatively weak correlation between venture performance and relatedness, which is actually quite surprising from a resource-based point of view, shows that these goals are by no means always perfectly aligned. It is likely that an equally intense conflict between financial and strategic goals is also present in other decisions about the direction of corporate growth.

One effect of the more peripheral variables in the study is worth reiterating here, namely that those ventures which went through a formal corporate venturing (CV) unit had a very significantly higher risk of being terminated or spun off. While the effect in this sample was largely attributable to one single CV unit of one company in one specific industry, interviews with CV unit managers in other companies and industries indicate that this higher hazard rate might be a more general property of such ventures. If this is the case, then we have to re-evaluate the image of a CV unit as a "secure shelter" for entrepreneurial ideas in established organizations. Rather, such units are likely to increase selection pressures upon ventures considerably by exposing them to constant monitoring and to milestones, thus making them much more transparent. Thus, large corporations seem to a growing extent use corporate venture departments to spin-off potentially promising but unrelated ventures rather than as vehicles for spurring internal growth. Accepting this possibility would require us to revise our conception of a corporate venture department as a promotor of growth by protecting ventures from internal selection pressures. The CV department rather appears to be designed more to facilitate spin-offs, thus increasing selection pressures. This subject might be worth further research in the future.

As was argued in the introduction understanding the variables that affect the differential survival of ideas gives us a better understanding of when organizations are willing to support exploration and when they are willing to retain the results thereof. As such, knowing about these factors gives us also a better understanding of when the fundamental clash of logics that comes about when ideas meet organizations or more generally when variation meets selection can be reconciled. We are now in the position of giving an overall answer to the research question underlying this thesis: The survival chances of ventures increase when a) their market performance lies above expectations, b) if they demonstrate either a strong degree of overall average relatedness, or high relatedness to the sourcing and manufacturing and the market organization respectively in isolation, if c) they are championed by an intrapreneur who is committed, well connected and can generate some internal attention for the venture. However, such a socially anchored intrapreneur and venture is no substitute for a lack of resource relatedness. Further, and perhaps most importantly, d) if the parent organization is performing above aspiration levels. These effects of corporate performance and the timing of ventures are of crucial importance for understanding the differential survival of ventures and determinants of the direction of organiza-

tional growth and diversification more in general. These effects might even be able to compensate for an actual lack of relatedness. It is one of the unique contributions of this study to be able to test for each of these variables in the context of the others. Especially, being able to test for the effects of relatedness and of organizational performance at the same time has, to the best of the author's knowledge, not been done before. Thus, we are now in a position to say that selection of ventures is not only driven by a logic of relatedness. There are also other conceptual layers of selection, such as the impact of actors and of timing, that must be considered to fully understand what determines the differential survival of ventures and the direction of corporate growth. Thus, overall, the findings support my claim that the internal selection system needs to be understood as a multiple-layered system.

While the results of this thesis could establish the effect of each of these variables separately, the interconnections and interactions between these different layers of selection, or filtering criteria, might be worth investigating in a more detailed manner. The interaction between requirements of relatedness and corporate performance, corporate performance and social anchoring as well as social anchoring and relatedness could be especially interesting areas for future research. I have, for instance, suggested that corporate success might lead to a decrease in the demands of relatedness while failure leads to an increased demand for relatedness when making important strategic decisions about the direction of search and the direction of diversification. This effect might lead to the more general conclusion that there are cyclical changes in the scope of organizational search and diversification.

Another related question for further research is how the specific sequence or path followed by a venture through the internal selection system affects its chances of survival. It has recently been suggested that such sequences and paths are important for understanding large-scale radical change (Amis, Slack and Hinings, 2004) and innovations inside established organizations (Seshadri and Shapira, 2003). Due to the detailed characterization of the internal selection system, we can now specify along which dimensions such paths might vary and which specific hurdles ventures might face in different parts of the organization. Specifically, such paths might vary along a) the specific hierarchical position ventures are exposed to, b) along the specific local logic ventures are exposed to, and along c) the specific stage of development at which ventures are exposed to either of the former two alternatives and d) the specific timing at which ventures are exposed to these internal selection forces. As was argued in Chapter Three attitudes towards novelty and new ventures are likely to vary across hierarchical positions and across local selection logics and also across the specific context in which the organization finds itself in. These variations can lead to fairly different survival chances of different kinds of ventures very much dependent on the specific path they travel through the organization and dependent on the specific timing of their travel.

6.2 The broader implications for three areas of research

6.2.1 Implications for the literature on corporate entrepreneurship

I shall start with implications for the literature on corporate entrepreneurship. One straightforward implication of the findings is a need for appropriate expectations of the success ratio of independent entrepreneurial ventures in established organizations. The results of this study show that most entrepreneurial ideas are bad ideas, and most attempts to commercialize these ideas and inventions show very disappointing results. Only about 10% of the ventures were performing "above expectations," based on evaluations by the intrapreneurs. This fact, while recognized in prior studies on the outcome distribution of innovations (Scherer and Harhoff, 2000), has not been sufficiently emphasised in the literature on corporate entrepreneurship; it is due largely to the tendency in this literature to focus only on single, usually successful cases. This over-sampling of successful cases contributes to a misperception of the base-line probability of success. Researchers and practitioners alike are overoptimistic about the benefits and value of entrepreneurial activity in large firms. My findings show that, on average, entrepreneurial activity does not add value, but destroys it.

However, there are rationales which might justify entrepreneurial activity nevertheless. One rationale, which might apply in large organizations, is the same as in the venture capital industry, namely the hope that the benefit of one successful venture will compensate for the destruction of value from nine other ventures which failed. Owing to the asymmetric pay-off structure of entrepreneurial activity and of innovation more in general (Scherer and Harhoff, 2000), investments in entrepreneurial ventures resemble in many ways what March (1991) and Miner, et.al. (2003) have referred to as "competition on extreme values." In such a competitive environment the single highest score beats a good overall performance, consistent performance and high average performance. Probably, however, such a competitive logic is difficult to accept inside established organizations. This rationale requires large firms *to learn to live with failure* and also to be willing to learn from their failures when engaging in entrepreneurship; both requirements are extremely hard to accept in organizations. There is a second rationale which can justify entrepreneurial activity in established firms despite its high failure rate. It is to consider these ventures not only as investments that require an appropriate rate of return, but also as *insurance* against the potentially fatal consequences of drowning in the "gales of creative destruction," to use Schumpeter's famous metaphor, while missing out on major changes in the organization's environment. Ventures allow established firms *to probe into the future* as they make use of the ideas and insights of the people working closest to the market and to technological developments. They allow organizations to test with relatively small resources new technologies and new products which potentially can trigger significant changes in the competitive landscape surrounding the organization and thus with a potentially major impact on the well-being of the organization. Knowing that a certain path of development is in effect *not valuable*, but

Knowing that a certain path of development is in effect *not valuable*, but a blind alley with no future potential, can be just as useful as a big success. However, there are no financial returns directly attributable to the venture. A further rationale is related to human-resource policy. Corporations which allow entrepreneurship might be a more attractive work place for highly talented people and thus have better chances of retaining them in the competition for talent.

The findings have three further and more theoretical implications for the literature on corporate entrepreneurship. First, ventures resulting from independent entrepreneurship -- as opposed to routinized innovation -- emerge frequently in established organizations and they have systematically good chances of surviving inside established organizations. Such independent entrepreneurial projects could be identified in a cross-section of Swedish industry. *Yet it is constrained by referring to existing firm resources.* In other words, established organizations support entrepreneurial activity, but only the kind which allows the firm to leverage its resources and capabilities. This finding implies that even independent entrepreneurial activity inside the firm is subject to path dependencies. As I attempted to demonstrate in Chapter Three, the nature of the internal selection system of organizations results in differential support for the commercialization of inventions; this differential support, in turn, produces path dependency. For the ideas that receive support are primarily those which fit into the established innovation system.

However, path dependency in entrepreneurial activity at established firms probably starts in an earlier stage of idea-selection, namely with the kind of ideas that potential intrapreneurs are likely to suggest in the first place. For instance, it is very unlikely that an intrapreneur within a telecom company will come up with a new drug against cancer; he/she simply does not have the competence and knowledge for doing so. Thus, the kinds of ideas proposed by entrepreneurs are constrained by the specific competence of the entrepreneur and the competence available in her/his immediate environment (Aldrich, 1999; Aldrich and Kenworthy, 1999). However, where is the border? Might an intrapreneur within a chemical company come up with a new drug against cancer? Or maybe an intrapreneur in a medical equipment company? In other words, we know very little about determinants of the "search space" of intrapreneurs, but it is likely that their search space is equally constrained as the search space of whole organizations.

The table in Chapter Three on the sources of new ideas supports the view that the kinds of ideas likely to emerge in organizations are already limited by the competence base of the organization. The table shows that most ideas were inspired by contacts *inside* the organization and thus by its existing resource and knowledge base. Such arguments are also consistent with "intentions-based models" (Krueger and Brazeal, 1994; Krueger, 2000), according to which entrepreneurs form intentions to pursue a certain idea or opportunity if they perceive they have the requisite personal resources as well as the necessary support from their larger social network. In the

case of intrapreneurs the support would come from the network of people inside the corporation.

The arguments on the nature of the selection system inside the R&D organization suggest that the selection mechanism is likely to be weakest in this early stage of venture development. Thus, deviant ideas and inventions which emerge inside the R&D organization have a good chance of eventually becoming ventures as long as they are only exposed to the selection system in that sub-organization. However, selection pressure increases considerably once the venture is exposed to the selection logic in the market system and the sourcing and manufacturing system of the firm. The results of this thesis imply that entrepreneurial ventures have the best chances to survive if they can relate to all three of these selection logics in the firm simultaneously. One fallacy of this overall selection logic prevalent in the sample underlying this study is that new ventures can lose their potential for survival by getting "stuck in the middle". There is a danger that the core of the idea underlying the venture will be lost in the compromising between the various local demands inside the corporation. This tendency, referred to as "*interbreeding*," is another mechanism that destroys variation in organizations. Thus, those ventures which survive might not always be the most novel or necessarily the ventures with the highest potential.

The interaction between the three logics of internal selection is worth further research. I suggested in Chapter Three that one way in which established firms can overcome path dependencies, if they wish to do so, is by allowing strong linkages to one local selection logic, such as that of the existing technological, R&D resource base of the organization, to compensate for weak linkages in another local selection logic like that of the market organization. In this way, more variation could be introduced into the organization. Taking the sample of all ventures and organizations as a whole, I could not find any evidence that this was indeed happening. Yet, it might well be that single organizations have understood the dangers of interbreeding and permit compensation of weak resource linkages to certain parts of the organization by stronger ones to other parts. To find out about whether this is the case, future studies would have to investigate in much more depth whether there are *idiosyncratic* selection logics in certain organizations. Here, the selection logic of only two or three firms would be examined after collecting a much larger sample of ventures within each of these few organizations.

If internal selection logics of firms vary, then we would come to different predictions about the growth trajectories of individual firms. For instance, if the selection system in firm A was dominated by linkages to technological resources, then we would predict a growth path which shows relatively little variation in terms of the technological/R&D know-how of new ventures, but with high variation in terms of targeted customer segments, use of suppliers and of manufacturing technology. On the other hand, if firm B was dominated by the selection logic of the market organization, then we would predict a growth path based upon a highly variable base of technological know-how, but always focusing on the same type of customers. More

generally, one might predict relatively more variation in firms dominated by engineers than in those dominated by business graduates, where the logic of the latter prevails. The reason is the generally weaker selection regime of engineers and the R&D organization and their preference for novelty and variation, compared to the selection regime of business graduates and of the market organization, with their more prevalent aversion to novelty or their demands for "variants of the same."

These arguments also imply that the propensity of organizations to engage in and support independent entrepreneurship might be related to the demography of the organization and the background of the employees working therein. The study would, however, also have to investigate into an alternative explanation for differing attitudes towards novelty and intrapreneurship more in general inside organizations. Specifically, it would have to investigate not only into whether it is indeed the professional background of the people, i.e. whether they are trained in business or whether they are engineers, that is the foundation of variation of local logics, or whether it is rather the specific role and identity evoked by being part of a certain part of the organization, such as R&D, sales or manufacturing. If my arguments in Chapter Three about the differences in the local logics between manufacturing on the one side and R&D on the other are correct, then it might indeed be the identity evoked by a specific part of the organization and not necessarily the professional background (i.e. being an engineer) that causes this variation in local logics inside the firm since engineers work in both, manufacturing and R&D. In summary, investigating into the relationship between professional background, the identity evoked by being part of a certain organizational department and attitudes towards novelty and new venturing more in particular might be worth further investigation and might inform us about whether and when organizations are willing to support and retain exploratory activities.

In summary, the fact that relatedness matters for the survival of entrepreneurial activity supports the argument made in the introduction based on Hellman (2002) that entrepreneurship in established firms is not only driven by the quest for financial value, but it is also driven (or constrained by) a quest for strategic value represented by linkages to the resources of the firm. It also confirms arguments by Hellman (2002) and Bhide (2000) that one of the major differences between entrepreneurship and intrapreneurship is that the intrapreneur has to be concerned with an alignment of her/his personal visions and ideas with the visions and strategies of the parent organization. The findings regarding requirements of relatedness along all three local selection logics simultaneously indicates that even independent entrepreneurial activity is subject to path dependency as represented by the past experience and growth trajectory of the mother corporation. These path dependencies lead to systematic selection of inventions based on the existing knowledge base of the mother corporation. However profitable the commercialization of a new revolutionary drug against cancer might be, it is very unlikely that the organizational selection system of a telecommunications company would retain and commercialize such an

idea. Indeed, it is very unlikely that anybody within a telecom company would even make such a discovery at all. These mechanisms, which are supported by the findings of this thesis, are important for explaining the micro-foundations of path dependency in organizational growth. They also suggest that one should not be too optimistic about the likelihood that independent entrepreneurship can liberate the firm from its path dependencies. As will be argued below, however, there may be one crucial exception -- strong fluctuations in corporate performance.

Second, entrepreneurship in large organizations is to a considerable extent context-dependent, *ceteris paribus*. The results of this study show that entrepreneurial activity in large firms is very sensitive to the performance of the mother corporation and thus subject to considerable fluctuations. Success of the mother corporation weakens the organizational selection system and increases the survival chances of entrepreneurial ventures. Problems in corporate performance, on the other hand, drastically increase the mortality rate of new ventures. These findings suggest that *if any forces can set the organization on a radically different growth trajectory, they are likely to be associated with changes in corporate performance*. I will come back to this argument when I discuss the implications for the literature on context-dependent risk preferences and the effects of success and failure. For the literature on corporate entrepreneurship, this finding has one implication above all others: not only does corporate entrepreneurship influence corporate performance -- as noted in the introduction, this is a major focus of the literature on corporate entrepreneurship (McGrath, Venkataraman, and McMillan, 1994; Dess, Lumpkin and Covin, 1997; Covin and Miles, 1999; Zahra and Garvis, 2000) --but performance also influences the existence and support of corporate entrepreneurship, a point still rarely recognized in this literature. This finding casts considerable doubt on the validity of studies which investigate the impact of entrepreneurship on corporate performance with a cross-sectional data design; such a research design cannot properly account for the relationship of mutual causation between corporate entrepreneurship and corporate performance.

Third, the findings of this study have implications for our understanding of the role of the intrapreneur in influencing the fate of new ventures. The results show that intrapreneurs use numerous strategies in trying to positively influence the survival chances of new ventures, but that the effect of these attempts is not as strong as might be expected. In particular, it seems that the intrapreneur does not have as crucial a role in influencing the fate of internal ventures as the entrepreneur has in shaping the fate of independent start-up firms outside established organizations. Rather, the importance of resource relatedness seems to compensate for the importance of the intrapreneur as a person rather than the other way round. Only after ventures have passed the relatedness criteria in the internal selection system of organizations can they influence the fate of new ventures. To put it differently, no matter how brilliant, experienced or well-connected the intrapreneur as a person, he/she is unlikely

to be able to launch a venture for the commercialization of an anti-cancer drug at telecommunications company.

The data on the various framing techniques used by intrapreneurs suggest that intrapreneurs frequently try to frame their venture to increase its chances of survival, lending support to the findings and arguments of Burgelman (1983), Dean (1987), Howell and Higgins (1990) and Hargadon and Douglas (2001) as well as applying the arguments in the literature on issue-selling (Dutton and Ashford, 1993; Dutton, Ashford, O'Neill and Lawrence, 2001) to intrapreneurship. However, we cannot assume that all intrapreneurs have a good understanding of the "normatively" appropriate framing approach necessary—to follow the suggestions of this literature—. For instance, the results on the importance of relatedness indicate that related ventures have better survival chances, yet the results of the framing analysis suggest that most intrapreneurs tend to exaggerate the degree of novelty of the venture. Obviously, this is not the right strategy, given organizational demands for linkages to existing resources. Instead it would be better to downplay the degree of novelty, as Edison did when trying to gain legitimacy for the electric light bulb (Hargadon and Douglas, 2002). I suspect that this "wrong" framing approach is largely due to the fact that most of the intrapreneurs in the sample were engineers coming from the R&D department. As argued in Chapter Three, engineers, especially if coming from R&D, are driven by a quest for novelty and the selection logic in the R&D organization is also strongly influenced by this quest for novelty. These engineers carry this logic from the R&D organization with them to the market and manufacturing organizations, not recognizing that the selection logic in those departments is not driven by an R&D department-like preference for true novelty but rather by a preference for "variants of the same" in the case of the market organization and by a preference for scale and efficiency in the case of the sourcing and manufacturing organization. Unfortunately, the limited availability of data on these framing strategies did not permit reliable testing of the effects of these strategies on the survival chances of ventures. This is certainly a task worthy of further research.

The findings of this study also have important implications for a long and more fundamental discussion in organization theory and strategy, originally initiated by Schumpeter. The question in that discussion is whether large corporations are an appropriate vehicle for entrepreneurship in the first place (Schumpeter, 1934, 1942; Stevenson and Jarillo, 1990; Bhidé, 2000). The analysis in this thesis suggests not surprisingly, that there are powerful forces hampering entrepreneurship in large corporations, but also that (radical) entrepreneurship is nevertheless frequently supported; moreover, there might be systematic patterns that allow us to predict when entrepreneurship is more likely to be supported within large established organizations. According to the findings in this thesis, resource linkages, timing of ventures and the existence of intrapreneurs, well-connected and capable of navigating the internal selection system, are important variables that we need to include in any analysis of corporate entrepreneurship in large organizations. The specific sequence and

path of ventures through the internal selection system might be another important variable worth investigating further.

While the kind of independent and autonomously initiated ventures considered in this thesis are not the most dominant aspect of organizational life, they frequently exist and are frequently supported. In this study, it was possible to identify 88 such ventures in the rather limited population of large firms in Sweden, and numerous respondents indicated in the interviews that many more of them exist. Thus, there is no doubt that independent entrepreneurship occurs and is supported in large organizations. This implies that the argument of Baumol (2002) that large organizations have specialized in routinized innovations and that independent, non-routinized entrepreneurship takes place as independent start-ups is generally correct -- we would probably find many more independent ventures outside than inside established organizations. However, the existence of the ventures in the sample -- and the fairly long survival time of many of them -- suggest at the same time that independent entrepreneurship is not exclusively the realm of start-ups outside the boundaries of established firms. The ventures not only emerged inside established organizations; in many cases they also led to the introduction of a novel product into the mother organization. Thus, while more systematic data on a population or even national level would be required, the cases identified in this study indicate that large firms are an important source of entrepreneurship, not the least through spin-offs.

If we traced the origin of many of today's large and firmly established organizations, we would probably discover fairly often that they began as a venture inside an established organization (Ito, 1995; Hellman, 2003). By implication, the prediction by Schumpeter quoted at the beginning of this thesis is then correct as a general tendency - innovative activity in large firms is predominantly routinized. However, not all innovative activity in established firms has become routinized, and probably it never will be. Further future research might investigate how major changes in the institutional environment of large organizations affect the way in which production and support of inventions and innovations are organized on a population level.

For instance, Hellmann (2003) argues that the existence of a venture-capital market has a significant impact on the choice by entrepreneurs and by organizations whether and when to commercialize an invention in-house and when to commercialize it outside the firm, a variable which has not been included in the present study. Such potentially interesting linkages between intrapreneurial ventures, spin-offs and venture capitalists have also become apparent in following the ventures in the sample of this study. It could be observed that some of the ventures which were terminated, and even more of those which were spun-off, were later acquired by venture-capital firms. Thus, the institutionalization of a venture capital market might indeed contribute further to specialization in the production and commercialization of innovations, as suggested by Baumol (2002). In general, large organizations are an important source of entrepreneurship, though their role may have changed over time with changes in the institutional environment, such as the emergence and growth of the

venture capital industry. With more systematic longitudinal data on the frequency of entrepreneurial ventures inside vs. outside established organizations on a population level, it might be possible to assess rigorously just how important a source of entrepreneurship large organizations are and how this importance has shifted over time. This task would certainly be appropriate for further research.

In view of the existence of independent entrepreneurship in large organizations, there is some doubt whether concepts such as search routines, combinative capabilities and dynamic capabilities (Nelson and Winter, 1982; Kogut and Zander, 1992, Teece, et.al., 1997; Zollo and Winter, 2002) are sufficient to describe how firms innovate. At the very least, further refinement of these concepts requires more detailed analysis of the micro aspects of the internal innovation system and of search routines, as was attempted in this thesis. Search routines probably play an increasingly important role in later stages of venture development, yet in early-stage ventures venture development is probably largely driven by the initiative and ideas of single employees. Obviously, it is fruitless to discuss whether single individuals or organizational routines are the ultimate driving force of innovation in organizations. As noted above, linkages to the existing innovation system are extremely important. The contribution of this thesis to the literature on dynamic capabilities is that the ideas of single individuals play an important role even in established organizations -- a seemingly obvious point, but totally neglected in this literature. Without the intrapreneur who had the idea and the will to commercialize it, none of these ventures would ever have come into existence. The existence of intrapreneurs is a necessary but not sufficient condition for independent entrepreneurial ventures inside established firms. This point could be illustrated more clearly by making a systematic distinction between two processes; on the one hand, processes of variation, or the capability of coming up with new ideas; on the other hand, processes of selection and the capability of implementing the ideas. Actors are likely to be more important for processes of variation, while search routines are likely to be more important for the actual selection and implementation of ideas. Thus, the ability to attract and retain people who can create variation and come up with new ideas might be a source of competitive advantage to established organizations and, at the very least, it is probably a precondition for entrepreneurship in large organizations.

My findings suggest in addition that some of the independent entrepreneurial activity in established firms is concerned with radical innovation, that is, with the kind of innovations which have the potential to transform and redefine whole industries (Henderson and Clark, 1990; Ahuja and Lampert, 2001). The method used in this study did not allow systematic assessment whether the innovations underlying the various ventures were radical. Furthermore, their history so far is generally too brief for estimating their eventual impact. Nevertheless, with a fairly good personal understanding of the idea behind each venture in the sample, and the more formal evaluation of the novelty of each venture, I am confident that at least some ventures have been aimed at commercializing radical innovations with the potential to redefine a whole industry and make a significant impact. The existence

fine a whole industry and make a significant impact. The existence of these ventures in my sample also makes me fairly confident to conclude that *radical innovation does occur and is supported in large organizations*. In this light, my results should contribute to the debate on whether large, established firms are capable of engaging in radical innovation. Some scholars (Tushman and Anderson, 1986; Henderson and Clark, 1990; Christensen, 2001) have argued that most large, established firms fail to engage in radical innovation, but more recent research (Methe et.al, 1997; Ahuja and Lampert, 2001; Rosenkopf and Nerkar, 2001, Hargadon, 2003) has shown otherwise. They also relate to the debate on structural inertia (Hannan and Freeman, 1977; Carroll and Hannan, 2000).

Two points can be added to this discussion. First, it is no surprise that it is so difficult to identify large firms that engage in radical innovation, for such innovations are rare. For instance, Nordhaus (1989) has estimated that 99.99% of the tens of thousands of invention patents issued each year are worthless. Only about 0.01%, which corresponds to about three to eight inventions per year, have really high value. Thus, intuitively it is more likely that a start-up will discover such a radical innovation than one of the large industrial firms, since as argued above, there are many more independent start-up firms than independent entrepreneurial ventures inside large organizations. If each project or venture represents one "trial" at producing a breakthrough invention, and a large firm typically has only one venture working on a certain kind of invention, then there may be about 100 trials in start-ups against 10 trials at reaching a breakthrough in large organizations (if we assume that there are 10 incumbent firms in the industry, which is quite many). In celebrating one small start-up that made a breakthrough invention, it is easy to forget that there were 99 other start-ups working on a similar idea but unable to achieve a breakthrough, whereas there were only 10 incumbents that tried to do the same and also failed. Figuratively, the population of start-ups can toss the coin more often than the population of incumbents. This needs to be accounted for with a control variable when one investigates whether radical innovations tend to occur more in small start-ups or in established organizations (see also Methe et.al., 1996).

Thus, I would like to suggest that it is probably misleading to ask *whether or not* firms are able to engage in radical innovation and support entrepreneurship in general. There is nothing about large organizations which would render them a priori incompetent or inept at producing radical innovations (see also Ahuja and Lampert, 2001 for a similar argument), even if we might be led to think so by the literature on learning, with its strong emphasis on anti-exploration biases like competency traps, myopia and exploitation. These forces are doubtlessly present and powerful, yet the studies and cases discussed in this thesis and contained in the sample have shown that sometimes large firms also engage in radical innovation and in independent entrepreneurship more in general. Again, we must not forget the base-line probability that radical innovation will happen! Thus, a more fruitful avenue of research would be directed at *the conditions* under which radical innovation and entrepreneurship

more in general *are more likely* to occur within large firms. My results and arguments suggest that there are two principal determinants of these conditions. One is the recent performance history of the organization, and the consequent changes in risk preferences and in the requirements of resource relatedness; the other is the existence of intrapreneurs who are capable of navigating their ideas through the socio-political environment inside the corporation, for instance, by being well-connected to top management or -- even if I cannot show whether there is a statistical effect -- by framing the venture to appear less radical than it actually is.

6.2.2 Implications for evolutionary perspectives on growth and diversification

The findings of this thesis have also implications for the literature on diversification and growth in so far as intrapreneurship is the underlying process leading to organizational entry into new markets. First, the results on the analysis of relatedness provide overall support to the arguments in the diversification literature inspired by the resource-based view of the firm (Rumelt, 1982; Montgomery and Hariharan, 1991; Teece, et.al., 1994; Silverman, 1999). The direction of organizational diversification is guided by linkages to the existing resource and knowledge base. This study supports these arguments from a somewhat different angle. This study followed the call of Ramanujam and Varadarajan, (1989) and Pennings, et.al. (1994) to investigate the importance of relatedness for the direction of corporate growth and diversification on the level of the single diversification project. This study did just that in the context of corporate entrepreneurship. Thus, the results of this study enable us to conclude that the principal predictions of the resource-based view also apply to corporate entrepreneurship. However, given the weak correlations between relatedness and venture performance, we cannot take for granted that relatedness also leads always to higher venture performance, an argument consistent with findings in the literature on the relationship between relatedness and venture performance (Thornhill and Amit, 2000 for an overview). The weak correlation between relatedness and venture performance leads one to speculate that relatedness does not necessarily matter as the most efficient way of selecting ventures and thus because it maximizes firm profits, as suggested by the resource-based view. Rather, relatedness is important as a useful, though obviously not fully reliable, heuristic for judging the profit potential of ventures, especially because it satisfies the requirements of the various internal selection logics represented by the local preferences of the various parts of the organization.

The study also made use of a new and different way to assess relatedness by trying to measure the actual perception of relatedness by the key players involved in the process of venturing. The use of this approach towards measuring relatedness should pave the way for more studies on diversification through internally generated innovative projects. The reason is that SIC codes cannot fruitfully be applied to these kinds of projects since they typically do not fit into established SIC categories. The measurement of relatedness with the help of patenting data, as was done, for in-

stance, by Silverman (1999), has the major disadvantage of measuring relatedness on only one dimension, namely technological relatedness. Thus, one contribution of this study is that it measures relatedness on the level of the single diversification project, based not only on actual perceptions of relatedness, but also along three different dimensions simultaneously. This fairly innovative approach is worth pursuing further in other studies on the phenomenon of the differential survival of diversification projects in established firms.

Beside supporting the basic arguments of the resource-based perspective on diversification, the results of this study suggest not only that patterns of diversification affect performance -- the main focus of the literature on diversification (see e.g. Ramanujam and Varadarajan, 1989; Palich, et.al., 2000) -- but also that corporate performance has an important effect on patterns of diversification (see also Miles, 1982). This effect, however, is much less frequently observed in the literature on diversification. One way in which performance affects patterns of diversification is through its impact on organizational attitudes toward risk and on the internal allocation of attention. In so far as related diversification is less risky than unrelated diversification, a risk-seeking attitude should lead to more unrelated diversification. Another mechanism suggested below is that corporate performance might cause internal shifts of attention between core and non-core areas. These effects should make patterns of diversification context-dependent and sensitive to corporate performance. Thus, we would expect firms sometimes to enter more related markets and sometimes less-related ones, depending on current firm performance. This effect has been largely neglected in the literature on diversification and casts some doubt on the consistency of corporate diversification moves on the level of the single diversification project. The reason is that requirements of relatedness in regard to diversification might be sensitive to context and thus change from one situation to another.

This study also attempted to assess whether single actors, in our case intrapreneurs, are capable of shaping the diversification trajectory of firms. The treatment of this issue is an important contribution to the literature on corporate diversification and growth, for the role of individual actors is totally neglected within the resource-based literature on diversification. To some extent, the results of this study seem to justify this neglect. As already noted above, this study indicated that through social anchoring single actors can considerably influence the diversification path of organizations, but only if the venture meets current requirements of relatedness. It seems as if actors only can influence the survival chances of new ventures that exhibit a considerable degree of resource linkages. However, it can be speculated that actors might become increasingly important the more radical and more extreme the venture. On average, actors seem not to make much difference, with the conceivable exception, however, of the "outliers of the outliers," i.e. those very rare cases where entrepreneurial ventures can indeed transform the strategy of organizations, (see, for instance, the typical examples used in the popular management literature such as some of the examples used by Hamel (2000)). These cases are probably impossible to

explain without due recognition of the role of single actors. Thus, to investigate the role of actors in entrepreneurial activity inside established firms in more detail, and to investigate whether and how such single actors can shape the diversification space of organizations, one might need to take an even more extreme sampling approach than the one in this study.

Finally, in this study I have sought to describe in much more detail the micro processes determining the direction of corporate diversification, and thus to provide a more realistic, fine grained and more "living" picture of how firms actually select different paths of growth. I have argued that relatedness is in effect a multi-dimensional concept and have attempted to demonstrate that each of these dimensions is assessed along three partly contradictory logics inside the firm. I have further maintained that organizational growth can be seen as an outcome of the interaction of these different logics and of the manner in which they are reconciled. With this conceptual model, which distinguishes between different layers and logics of selection, it would be interesting to conduct further studies on the timing and the specific paths of introducing new ventures across organizational levels and locations, as well as their effects on venture survival and the direction of corporate growth more in general.

6.2.3 Implications for behavioural theories of learning and exploration

Finally, and maybe most importantly, the findings in this thesis have also implications for theories of context-dependent risk-preferences (March and Shapira, 1987, 1992; Greve, 1998; 2003a,b) and more generally for the literature on learning (Levitt and March, 1988; Huber, 1991; Argote, 1999; Denrell and March, 2001). In the discussion on the effects of corporate performance I will discuss the effects of success and failure on venture survival "ceteris paribus," that is, under the assumption that all other variables are held constant, especially the degree of relatedness of the venture.

Let me start off with the arguably important implications of the findings of this study for the literature on organizational learning and especially for the arguments in this literature that organizations exhibit powerful biases which divert them from exploration (Levitt and March, 1988; March, 1991, 1996; Levinthal and March, 1993; Denrell and March, 2001). The survival of some of the ventures in this study represent archetypical instances of organizational support of exploration. I have previously argued elsewhere (Czernich, 2003) that from the perspective of the literature on learning the very existence of such independent entrepreneurial ventures inside established organizations is difficult to explain other than by discarding them as "random mutations" or "mistakes". More generally, it was contended that theories of learning cannot readily explain processes of variation and the emergence of new ideas (Czernich and Heath, 2002). Despite recent attempts of integrating phenomena such as improvisation and bricolage as important processes of variation into the learning framework (Miner, et. al., 2001; Baker, et.al., 2003) the predominant assump-

tion is still that learning and the accumulation of experience leads to convergence and a reduction in variability (Miner, et.al., 2003).

Despite assumptions about biases towards uncertainty avoidance, myopia, and local search, this study has shown that highly uncertain entrepreneurial ventures which require a long time horizon receive organizational support and systematically survive in established organizations. As the results of this study demonstrate, not all these ventures only emerge and are then quickly terminated or spun-off; some ventures survive and are retained for considerable periods of time inside established firms. As Figure 4 in Chapter Four has shown, survival time ranged from 1 to 29 years and the median survival time of ventures in the sample is seven years. 29 of the ventures in the sample had survived for 10 years or more. It is very unlikely that this support was only a symbolic action from the organization. Rather, support of these ventures required substantial organizational resources and substantial attention by a large number of people. There were up to 250 people working on these ventures; on average 33 people worked on each venture.

Furthermore, organizational support of these ventures is surprising from a learning-theory perspective since most entrepreneurial ventures fail. The critical mechanism underlying learning is the reproduction of successful actions (Levitt and March, 1988; Simon, 1999). Thus, the central prediction is that those actions which have led to successful outcomes are repeated while those which did not lead to successful outcomes are not repeated. Yet, as the data and discussion on the distribution of venture performance has demonstrated, most of the entrepreneurial ventures in this study failed. Only about 10% of the ventures in the sample were performing strongly above expectations as measured by the perceptions of the intrapreneurs. Large organizations should have learned from experience about this poor performance record of entrepreneurial ventures, which is supported not only by the data in this study but also by the studies of Scherer and colleagues cited several times before. Despite these low odds for success, *established firms repeatedly support corporate ventures*. That they do so is surprising, especially in case we assume that the reproduction of success is the principal driver of corporate development. Given this fact, the third research question underlying this thesis was how we can account for the systematic survival of entrepreneurial ventures within evolutionary and especially behavioural perspectives on organizations. Let us explore this question further in the following last sections of the thesis.

What are mechanisms that might make it possible to explain the support of corporate entrepreneurship within the behavioural framework, and more generally, help to explain when learning and the accumulation of experience can lead to increased variability rather than to convergence and a reduction of variability? As already mentioned earlier in this chapter, competition based on extreme values (March, 1991; Miner, et. al., 2003) is certainly one important component for explaining why corporate entrepreneurship is supported and sponsored despite dismal average performance and also despite organizational tendencies towards uncertainty avoidance and

myopia. Organizations might know that in order to find "the next big thing" with the potential of creating extremely high benefits for the organization, they need to accept high degrees of uncertainty and need to take a long time perspective in development.

Two other explanations can be added. First, my results show that organizations are especially prone to retain entrepreneurial ventures if the parent company is successful. Thus, success might cause organizational learning to become imprecise. It might cause a temporary lapse of corporate memory, a mechanism previously suggested to increase variation in organizations (Denrell and March, 2001). Organizations might conclude that "this time it is different" and engage in corporate venturing despite a probable accumulation of, on average, negative experience. Success also attends to weaken the internal selection regime, an effect well documented in the literature on organizational slack briefly reviewed in Chapter Three. I am thus suggesting that *learning mechanisms work differently depending on whether the organization is currently successful or is facing a financial downturn*. The overall argument is that one way in which we can account for the phenomenon of independent entrepreneurial activity in established organizations from a learning-theory perspective is to understand it as an outgrowth of periods of relative economic abundance. One reason is that success leads to a "temporary lapse of corporate memory" and a resultant weakening of the internal selection regime.

I was "lucky" enough to have held a number of interviews with companies which had recently undergone rather severe financial problems, or were still in financial trouble. In these companies, which during periods of success had engaged in a number of corporate venture activities, there was a fairly negative attitude towards corporate venturing at the time when the interview was made. Attention was intensely focused on the negative aspects of corporate venturing, on its riskiness, on its frequent failure and on the costs of supporting such ventures. If the argument advanced above about the "temporal lapse of memory" during periods of success is correct, then one would predict that as soon as the company is entering a prolonged period of success again, the poor experience of prior attempts at corporate venturing will temporarily be forgotten. Attention would then focus once more on all the potentially positive aspects of corporate entrepreneurship, such as creating new business areas, increasing revenues, etc. From this perspective, the relationship between experience and the creation of variability and exploration is not linear in either direction, but rather *cyclical*, with increases and decreases of variation inside firms, very much depending on recent performance.

There is, however, a second much more fundamental mechanism which can be included to account for the existence of independent entrepreneurial activity in large organizations. This mechanism contrasts rather sharply with the mechanism of the reproduction of success and, once acknowledged, could complement learning theory very well. This mechanism is *novelty-seeking*. Czernich and Heath (2002) have argued that the enormous variation of new ideas created during the Dot Com boom cannot be explained by standard theories of selection and especially not by theories of learn-

ing alone. Taking as an example variations created around one central idea during the Dot Com boom, namely that websites need to attract eyeballs, they argued that, especially at first, the creation of new ideas in the Dot Com boom was strongly driven by an active search for novelty and variation by operators involved in the field. Contrary to the widespread assumption that novelty in general and new ideas in particular face a "liability of newness" (Stinchcombe, 1965), they contended that new ideas enjoy a "honeymoon period" in the early stages of their development (Strang, 1997) when novelty has the potential to attract attention and is traded at a premium.

This mechanism of "novelty-seeking" has ample support from two entirely different intellectual traditions. First, in decision research, and especially research on consumer behaviour, it is well-known that consumers easily become bored by too much sameness and therefore actively seek variety for its own sake (McAllister and Pessemier, 1982; Kahn, 1996; Ratner, Kahn and Kahneman, 1999). Furthermore, decision makers can also be expected to be driven by curiosity (Loewenstein, 1994). Second, in the biology-oriented literature on human nature and human behaviour, it has been assumed that one special characteristic of human beings is their natural tendency to explore and to seek novelty (Morris, 1983). From this perspective, the mechanism of the reproduction of success faces a constant countervailing force, namely novelty-seeking, which induces people to choose novel alternatives even though current actions have proved successful in the past and puts novelty at a premium just for the sake of exploring a new alternative.

Such mechanisms might also be at work in the entrepreneurial activities of large firms. I have argued throughout the thesis that engineers in particular in the R&D organization are driven by a quest for novel solutions, for exploration and for the development of new technologies. *It is part of the nature and identity of an engineer in the R&D department to explore.* Inasmuch as those people who select and support new entrepreneurial ventures inside established organizations are themselves novelty-seeking engineers, tendencies towards novelty-seeking might go far toward explaining why established firms engage in entrepreneurial activity. Such processes of novelty-seeking are also reinforced by the effects of success. Research on individual novelty-seeking has shown that individuals are much more likely to seek variety when they are in a positive mood (Kahn, 1996). Thus, it might be the case that tendencies towards novelty-seeking become especially salient when organizations are successful. Such a relationship between success and economic abundance more in general and a tendency towards novelty seeking might even be found on higher levels of analysis. One could speculate for instance that, if it is true that the DotCom boom was, at least initially powered by a very positive attitude towards variation and novelty, then the fact that such a novelty-seeking attitude was present in the economy at large could, at least partly and very tentatively, be explained by the fact that the years before the Internet boom was a period of prolonged economic growth, abundance and, especially in the US, a period of prolonged increase of wealth. For

instance, Shiller (2000) in his analysis of the Internet boom has noted that the advent of the Internet was preceded by a period of strong growth of corporate earnings. Such relationships are, of course, highly speculative but might nevertheless be worth further scrutiny and might, if they turn out to be fruitful, inform us for instance about some of the psychological processes going on during business cycles.

Taking the natural human tendency towards novelty-seeking and exploration seriously leads also to some interesting implications with regard to the whole discussion about the exploitation-exploration trade-off (March, 1991; Benner and Tushman, 2002). From this perspective we cannot take for granted that the natural tendency in organizations is *always* to over-exploit and under-explore. There might be also cases in which organizations have a natural tendency towards over-exploration and under-exploitation. The impression emerged in many interviews that some large Swedish firms were actually struggling, at least during certain periods of their development and in certain parts of the organization, with such tendencies towards over-exploration, though I cannot support this impression statistically or with the help of detailed quotes. This was especially true of companies that were strongly oriented toward science and engineering. If it may be true that novelty-seeking is an important driving force of some human beings, and if this tendencies are especially strong a) during periods of success and b) for people with certain professional backgrounds, such as engineering or scientists, alternatively with certain departmental roles and identities, then dealing with the exploitation-exploration trade-off is ultimately a question of managing a) resource-allocation decisions during fluctuations of corporate performance and especially b) of managing corporate demography and departmental identities. Demography should also be an important predictor of the frequency of independent entrepreneurship in established organizations. In my opinion, this point is worth further research. Somewhat provocatively, if the drive to explore is an inherent feature of human nature, what we actually might have to explain is why organizations exploit and not why they explore.

6.2.4. Implications for theories of context-dependent risk-preferences

At first sight, the findings in this study concerning the effects of corporate performance on venture survival seem to conflict with the standard argument in the literature on risk-taking, namely that performance above aspirations leads to risk aversion and persistence, while performance below aspirations leads to risk-seeking and change in organizations (Cyert and March, 1963; March and Shapira, 1987, 1992; Greve, 1998; 2003a,b). The findings in this study, however, indicate that if firms are performing above aspirations they have a lesser tendency to terminate or spin-off ventures. This difference can be interpreted as a more risk-seeking attitude since supporting such ventures is a risky matter. The argument that performance above aspirations actually leads to an increase and not to a decrease in risk-taking is also consistent with the "house money" effect suggested by Thaler and Johnson (1992),

which holds that after windfall profits gamblers are more likely to take risks due to their perception of "playing with the house money."

The results also showed that if performance is dropping below aspirations, the tendency not to retain ventures significantly increases. This change can be interpreted as a decrease in risk-taking since firms are less willing to take the risks involved with supporting these ventures. These findings persist when control variables for venture performance and resource relatedness are added, and they are supported by the interviews as illustrated by the quotes in Chapter Three. This reduction, rather than increase in risk-taking for performance below aspirations is consistent with a threat-rigidity bias suggested by Staw, et.al., (1981) and the "snake bit effect," (Nofsinger, 2001) which holds that gamblers decrease their risk taking after having lost considerable amounts of money. Indeed the literature has suggested that the relationship between performance and risk-taking can in effect go in both ways (see Ocasio, 1995 for an overview).

I want to suggest a new mechanism that might make it possible to reconcile these conflicting findings and arguments on the relationship between success and failure on the one side and attitudes towards risk and persistence on the other. In particular, I want to suggest that contexts of success and failure not only impact risk-preferences, but also *cause an internal shift of organizational attention*. In particular, I suggest that as performance rises above aspirations, organizational attention shifts from core to currently non-core but potential future core areas. To make clearer what I mean, consider the theory on the allocation of managerial effort developed by Radner (1975) and Radner and Rothschild (1975). They suggested that managers allocate their attention according to a simple rule which they called "putting out fires." According to this theory, managers set a certain target or aspiration level for each goal or task. According to the rule of putting out fires, managers will allocate their attention to those goals for which performance is below the target level. Once management has brought performance above aspirations, their attention turns to the next goal where performance is below aspirations. In accordance with Seshadri and Shapira (2002), who have argued that managers are aware of the need to pursue short-term *and* long term goals, I would contend that organizations in general and senior management in particular know that they need to fulfil not only short term goals, such as meeting quarterly profit targets and increasing the efficiency of existing operations, but also to pursue long-term matters, such as innovation, finding new markets, considering long-term growth strategies and opening up future core areas of business. The "default" top priority of any organization is first to meet the short-term goals. But whenever these short-term goals are being met, i.e. if the organization is delivering results in accordance with or above expectations (i.e. if there is no "fire" in the core areas of the organization), management attention is freed up for the pursuit of more long-term goals (Seshadri and Shapira, 2002).

In the context of corporate entrepreneurship and new ventures, this implies that when organizations are performing above their aspirations, more attention and priority might be allocated to new ventures since pressing short-term problems, if

ority might be allocated to new ventures since pressing short-term problems, if any, are currently being controlled. This implies that there might emerge an interest in ventures which formerly have been considered to be strategically unimportant, too long-term, too unrelated and therefore not worth supporting. Top management might rather suddenly become willing to support those ventures inside the firm now that more priority is being given to long-term growth strategies, innovation and entrepreneurship. Ventures might more easily find a mentor in the upper echelons of the organization, and thus increasing the survival chances of the venture. At the same time, the internal selection regime weakens. Members inside the organization become more tolerant towards novelty when the organization is successful, a well-known fact in the literature on slack as discussed in Chapter Three. And those organizational members who do not consider internal entrepreneurship as important at least do not actively try to stop it.

If, however, corporate performance is dropping below aspirations, the deterioration, which is most likely to be caused by problems in one or several core business areas, will draw attention back to the core areas and to putting out fires, i.e. to fighting acute short-term problems in these core areas. In this situation, corporate entrepreneurship is no longer a priority and might even be considered an unnecessary cost. To reduce this cost, ventures are terminated or spun-off.

This mechanism does not contradict, but rather complements the arguments in the behavioural literature on context-dependent risk-preferences that risk-preferences increase during periods of economic problems and decrease during periods of success. This pattern might describe very well what is going on in the *core areas* of the firm. In these areas, performance above aspirations might lead to less risk-taking and to strategic persistence, as argued by Lant, et.al. (1992) and Audia, et.al. (2000), for example. It will *also* lead to a shift of attention towards longer-term goals and a greater willingness to take risks in non-core areas. Reduced corporate performance, on the other hand, will lead to a changed perception about the importance of entrepreneurship, namely that it is no longer a priority for the firm, given the problems in the core areas. Yet it *also* leads to an increased willingness to take risks to solve the problems in the *core areas*. This theory suggests that both success and failure simultaneously result in increased as well as decreased risk-taking, but in different parts of the organization. If these two mechanisms are considered in combination, it is easier to understand why, as shown in the literature review in Chapter Three, there are apparently contradictory results in the literature on the effects of success and failure on individual and organizational action (Ocasio, 1995).

If this is indeed what happens in large organizations, what would be the appropriate timing for a venture to increase chances of eventually becoming a part of core corporate strategy, *ceteris paribus*? The optimal timing for a venture would probably be to get started and pass the early growth phase during a period when a corporation is currently successful. During a period of success, independent entrepreneurship is regarded as an important activity within the organization, or at least not as an un-

necessary cost driver which needs to be eliminated. As my results suggest, there is a much lower probability that a venture will be terminated during a period of corporate success. However, this success might also be counterproductive for the venture, when its entrepreneurial phase is over, that is, when the venture has proved its technological feasibility and market viability. Then what is needed is strong support by the core areas of the corporation, such as the existing distribution organization, large-scale manufacturing, sourcing -- all that is required to mass-produce the products of the venture. Yet, according to the arguments made above, core areas are likely to be averse to change and risk averse during periods of success, when there is no perceived need to change core strategy. Consequently, the venture is likely to face considerable resistance in these core areas. In the worst case, success will produce a lot of entrepreneurial activity with many new products and ventures, but those few which prove to be technological feasible and show market viability will never be launched on the market on a large scale. For no one will consider it necessary to change or add a new business to the core strategy. *If these arguments are correct, then success leads to the creation of a pipe full of new products which is sealed at one end.*

Thus, perfect timing for the venture would imply that at this stage of venture development corporate performance would deteriorate, enhancing the willingness in the core areas to change, take risks and launch new products with a fairly short time horizon to quickly increase sales. In other words, perfect timing for a venture would require that it grows up under a weak selection regime when the venture is the most fragile, i.e. during the early stages of venture development. Once the venture has successfully passed this early phase and has proven to have the potential to become a new core area, it would then be best for the venture if corporate performance deteriorated. The core areas would then be more willing to change and more willing to accept a new product.

Admittedly, many of these arguments cannot directly be supported with the empirical results of this study. However, this theory might be worth more rigorous testing than was possible in this thesis. In that case, the study would have to be designed from the very beginning to allow testing for these predictions. *Ceteris paribus*, these arguments imply that changes in corporate performance are a crucial predictor of the time when organizations are likely to change and explore (Greve, 1998; 2003b). What the theory developed above might contribute is to explain, somewhat paradoxically perhaps, that what internally driven organizational change requires is *fluctuations* in corporate performance. Periods of success are important for the generation of new ventures, or more generally for the generation of variation. Periods of success and economic abundance are important for accumulating ideas, ventures and new products. If organizations are always under economic pressure and constantly have little or no slack resources, they will never be able to create any variation in the form of independent entrepreneurship. However, if they were constantly successful, there would probably never be any willingness to integrate ventures and new products into established core areas and change the strategic focus of the company, for core

areas would likely maintain their current focus. Thus, a deterioration of performance is necessary to cast doubt on the value of current core areas and to induce the willingness to shift strategic focus or change core areas with new ideas and products developed during periods of relative economic abundance.

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Appendix 2

Industry classification of parent companies and ventures

Industries	No. of ventures per industry
Information Technology	30
Defense, Aviation and Space	8
Heavy Trucks/Buses/Aviation	8
Pulp, Paper and Packaging	7
Power and Automation Technology	5
Pharmaceuticals	5
Automotive Safety	5
Tooling, Mining and Construction	3
Steel	3
Medical Equipment/Biotechnology	2
Bearings and Seals	2
Process Machinery and Equipment	1
Construction and Mining Equipment/Power Tools	1
Automated Waste Collection	1
Insurance	1
Wholesale	1
Electronics	1
Mechanical Engineering, Marine Propulsion	1
Information Technology Consulting	1
National Post/Logistics	1
Nuclear Industry	1
	88

Appendix 3

Factor Analyses

Principal component analysis of survey items on relatedness

Component	Eigenvalues	Variance explained	
	Total	% of Variance	Cumulative %
1	5,117	36,547	36,547
2	2,405	17,179	53,726
3	1,431	10,220	63,946
4	1,093	7,808	71,755
5	0,703	5,020	76,775
6	0,601	4,293	81,068
7	0,519	3,709	84,777
8	0,487	3,479	88,256
9	0,374	2,671	90,927
10	0,356	2,541	93,468
11	0,336	2,398	95,866
12	0,282	2,012	97,878
13	0,201	1,433	99,312
14	0,096	0,688	100,000

Rotated Component Matrix

	Component 1	Component 2	Component 3
Manufmeth	0,090	0,123	0,724
Distribmeth	0,717	0,074	0,361
Salesproc	0,688	-0,111	0,270
Purchasrout	0,332	-0,087	0,784
Designsys	-0,131	0,553	0,462
Techknowl	0,072	0,819	0,128
Manufknowl	0,233	0,469	0,564
R&D resour	0,079	0,788	0,041
Saleschann	0,831	0,116	0,101
Salesforce	0,714	0,180	0,118
Suppliers	0,268	0,214	0,747
Customers	0,780	-0,006	0,119
Marketingkn	0,825	0,176	0,049
Internalknow	0,160	0,838	0,059

Varimax Rotation with Kaiser Normalization.

Rotation converged in 5 iterations.

Principal component analysis of survey items on actor related measures

Component	Eigenvalues	Variance Explained	
	Total	% of Variance	Cumulative %
1	2,877	35,959	35,959
2	1,823	22,791	58,750
3	0,719	8,988	67,739
4	0,668	8,345	76,084
5	0,576	7,200	83,284
6	0,548	6,846	90,129
7	0,468	5,851	95,981
8	0,322	4,019	100,000

Rotated Component Matrix

	Component 1	Component 2
GeneralPersuas	0,844	0,028
FinancePersuas	0,766	-0,129
ManagtInterest	-0,293	0,726
InternalAttention	-0,182	0,689
BuildAcceptance	0,314	0,698
ManagtContacts	-0,121	0,755
Debates	0,774	-0,153
Discussions	0,678	-0,095

Varimax Rotation with Kaiser Normalization.

Rotation converged in 3 iterations.

Principal component analysis of survey items on venture performance

Component	Eigenvalues	Variance Explained	
	Total	% of Variance	Cumulative %
1	2,950	42,139	42,139
2	1,159	16,557	58,696
3	1,044	14,910	73,606
4	0,684	9,767	83,373
5	0,520	7,427	90,800
6	0,483	6,895	97,695
7	0,161	2,305	100,000

Rotated Component Matrix

	Component 1	Component 2	Component 3
SpeedMarkIntro	0,878	-0,095	0,062
Salesgrowth	0,923	0,142	0,055
Competition	-0,029	-0,014	0,942
TechnicalPerf	0,178	0,814	0,253
Buyingdemand	0,715	0,248	-0,198
CustomerSatisf	0,682	0,343	-0,040
DevelopCost	-0,100	0,740	0,306

Varimax Rotation with Kaiser Normalization.

Rotation converged in 4 iterations.

Appendix 4 Background Information

The first part of the questionnaire is concerned with background information on the new concept **XXXX** in **XXXX**. Depending upon how the new concept has developed, some of the questions may not be relevant – in those cases, mark with n.a. or similar.

Name of the new concept: _____

Respondent: _____

Industry: _____

1. Your position in the company when the new concept was developed: _____

2. What year did active development of the new concept start:

(Note that the new concept at that time did not have to be known or given official status within the company)

3. In which company was development of the new concept started: _____

4. The new concept was developed by one or several of the company founders:

Yes (1) No (2)

5. How large, in terms of employees / turnover, was the company when development of the new concept started:

6. Which was the subsequent development:

___ The new concept is still being developed within the company.

___ The new concept was placed in a wholly-owned subsidiary, year _____.

___ The new concept was placed in a partly-owned company, year _____, company's ownership share _____ %.

___ The new concept was taken over/acquired by employees and continued in a new, independent company, year _____.

___ The assets were taken over by/sold to another company, year _____.

___ The new concept was discontinued/put on hold, year _____.

Comment: _____

7. Current status of the new concept:

Prototype (1) Full-scale investment (2)

If full-scale investment, what year did the new concept leave the prototype stage:

8. What year, if at all, was the market introduction:

9. How many people at most were employed to develop the new concept:

10. The new concept from the outset was based on one or several concept-specific patents:

Yes (1) No (2)

11. One or several new patents were granted during the development of the new concept:

Yes (1) No (2)

12. The new concept was / is sold under the parent company's name:

Yes (1) No (2)

13. When the new concept was introduced, did the company have a formal venture capital department or similar:

Yes (1) No (2)

14. Which other people have good knowledge about the development of the new concept:

15. We are continuously searching for new concepts that can be included in the research project. Do you have any suggestions on other new concepts that could be studied, also outside your company:

Appendix 5 - Questionnaire

Your help with filling out this questionnaire is a unique contribution to research on how companies grow. All answers are treated confidentially – the results are only presented in aggregate form by which no individual companies or individuals can be identified.

The questions that you will be answering concern the concept *XXX* during the time it was carried out within *XXX*. There are no right or wrong answers to the questions. Think back and try to give an as accurate picture of circumstances and events as possible.

Part A: The origin of the concept

1. The idea to the new concept primarily came from (*rank with numbers not more than two alternatives*):

- ▼ Work and contacts within the company (1)
- ▼ Customers (2)
- ▼ Suppliers (3)
- ▼ Observations, thoughts and reflections outside daily work (4)
- ▼ Technical magazines, scientific publications, or other published material (5)
- ▼ Previous employment (6)
- ▼ Competitors (7)
- ▼ Do not know (8)

The following seven questions concern the degree of novelty of the new concept *in relation to the solutions that previously dominated on the market*. Please indicate the extent to which you agree with the following statements by marking a figure from 1 (totally disagree) to 7 (totally agree). If you do not have an opinion or lack insight into the question, or if it is not applicable in your case, please mark the "do not know" category.

Part B: The concept's degree of novelty

	Totally disagree						Totally agree	Do not know	
The new concept:									
2. - introduced an entirely new product or service.	1	2	3	4	5	6	7	0	
3. - improved existing solutions on a number of points.	1	2	3	4	5	6	7	0	
4. - introduced an entirely new way of manufacturing.	1	2	3	4	5	6	7	0	
5. - Introduced an entirely new organizational form.	1	2	3	4	5	6	7	0	
6. - opened up an entirely new geographical market.	1	2	3	4	5	6	7	0	
7. - opened up an entirely new customer segment.	1	2	3	4	5	6	7	0	
8. - utilized entirely new components or inputs.	1	2	3	4	5	6	7	0	

The questions that follow examine the new concept from a number of angles. Please indicate the extent to which you agree with the following statements by marking a figure from 1 (totally disagree) to 7 (totally agree).

Part C: The concept

	Totally disagree						Totally agree	Do not know
9. It was easy making others at the company understand the new concept.	1	2	3	4	5	6	7	0
10. It was easy to convince others in the company to invest time and resources in the new concept.	1	2	3	4	5	6	7	0
11. It was easy to get initial capital for the development of the new concept.	1	2	3	4	5	6	7	0
12. It was easy to get capital for the continued development of the new concept.	1	2	3	4	5	6	7	0

Part C: The concept

	Totally disagree						Totally agree	Do not know
13. The new concept could easily be described in a business plan.	1	2	3	4	5	6	7	0
14. It was easy to formulate an action plan for the development of the first prototype.	1	2	3	4	5	6	7	0
15. A first, functioning prototype of the concept was rapidly developed.	1	2	3	4	5	6	7	0
16. A clear strategy for the new concept was formulated early on.	1	2	3	4	5	6	7	0
17. Other people in the company frequently met the new concept with comments like "I don't believe in this" or "this is nothing for us to be doing".	1	2	3	4	5	6	7	0
18. The development work demanded operational freedom which normally was not granted within the company.	1	2	3	4	5	6	7	0
19. The new concept required a way of working which was entirely new to the company.	1	2	3	4	5	6	7	0
The new concept:								
20. - meant a way of doing business which was similar to that which already existed in the company.	1	2	3	4	5	6	7	0
21. - was based on a development process which was well known within the company.	1	2	3	4	5	6	7	0
22. - built on manufacturing methods the company was well familiar with.	1	2	3	4	5	6	7	0
23. - demanded types of marketing which were well known within the company.	1	2	3	4	5	6	7	0
24. - demanded a distribution method which was well known within the company.	1	2	3	4	5	6	7	0
25. - demanded a sales process which was well known within the company.	1	2	3	4	5	6	7	0
26. - focused on already existing customer groups.	1	2	3	4	5	6	7	0
27. - was based on purchasing routines which were well established within the company.	1	2	3	4	5	6	7	0
28. The company had good knowledge about the purchasing behavior of customers to the new concept.	1	2	3	4	5	6	7	0
29. It was easy to show that the new concept strengthened existing products and services within the company.	1	2	3	4	5	6	7	0
30. Much time was spent on persuading others to invest time and money in the new concept.	1	2	3	4	5	6	7	0
31. Getting financing of the concept required much persuasion.	1	2	3	4	5	6	7	0
32. There were many discussions with the company's manufacturing units to have production adapted to the new concept.	1	2	3	4	5	6	7	0
33. Many negotiations were required to adapt existing market channels to the new concept.	1	2	3	4	5	6	7	0
34. Much time was spent on getting existing marketing adapted to the new concept.	1	2	3	4	5	6	7	0
35. Much time was spent on getting existing purchasing routines adapted to the new concept.	1	2	3	4	5	6	7	0
36. Much effort was spent on adapting existing routines among sales personnel to fit the new concept.	1	2	3	4	5	6	7	0

Part C: The concept

	Totally disagree						Totally agree	Do not know
37. The new concept was markedly different from the type of new products and services the company normally has invested in.	1	2	3	4	5	6	7	0
38. Compared to other new projects within the company the new concept required much larger investments.	1	2	3	4	5	6	7	0
39. Compared to other new projects within the company the new concept was expected to generate much larger income.	1	2	3	4	5	6	7	0
40. The people who were to decide about commercialization of the new concept were spread out in the organization.	1	2	3	4	5	6	7	0
41. There was big turnover of directors who were to decide about commercialization of the new concept.	1	2	3	4	5	6	7	0
42. Corporate managers have shown great interest in the development of the new concept.	1	2	3	4	5	6	7	0
43. The people promoting the new concept often discussed if it would not have a better future outside the company.	1	2	3	4	5	6	7	0
44. The people promoting the new concept were actively trying to achieve a sell-off or spin-off.	1	2	3	4	5	6	7	0

The following questions examine the new concept's relation to the company's ongoing operations. Please indicate the extent to which the new concept employed existing knowledge and resources by marking a figure from 1 (to a very small extent) to 7 (to a very large extent). If you do not have an opinion or lack insight into the question, or if it is not applicable in your case, please mark the "do not know" category.

Part D: The new concept's relation to ongoing operations

	To a very small extent						To a very large extent	Do not know
The new concept:								
45. - got much of the required knowledge from inside the company.	1	2	3	4	5	6	7	0
46. - employed the company's existing contacts with external expertise.	1	2	3	4	5	6	7	0
47. - used documented information which was available within the company.	1	2	3	4	5	6	7	0
48. - used databases which already existed within the company.	1	2	3	4	5	6	7	0
49. - used design systems which already existed within the company.	1	2	3	4	5	6	7	0
50. - employed technical knowledge which already existed within the company.	1	2	3	4	5	6	7	0
51. - utilized manufacturing knowledge which already existed within the company.	1	2	3	4	5	6	7	0
52. - employed marketing knowledge which already existed within the company.	1	2	3	4	5	6	7	0
The new concept:								
53. - utilized research and development resources which already existed within the company.	1	2	3	4	5	6	7	0
54. - utilized manufacturing resources which already existed within the company.	1	2	3	4	5	6	7	0
55. - was marketed together with other products within the company.	1	2	3	4	5	6	7	0
56. - used already existing sales channels.	1	2	3	4	5	6	7	0

Part D: The new concept's relation to ongoing operations

	To a very small extent					To a very large extent			Do not know
57. The new concept:									
- utilized the existing salesforce.	1	2	3	4	5	6	7	0	
58. - utilized already existing suppliers to the company.	1	2	3	4	5	6	7	0	
59. - utilized the company's existing contacts with external people and companies.	1	2	3	4	5	6	7	0	
60. - used components that were only available internally within the company.	1	2	3	4	5	6	7	0	
61. - used patents that were already owned by the company.	1	2	3	4	5	6	7	0	
62. Marketing of the new concept emphasized the connections to the parent company and its name.	1	2	3	4	5	6	7	0	
63. The development of the new concept was based on extensive cooperation with external companies with special competences.	1	2	3	4	5	6	7	0	
64. The development of the new concept was based on extensive cooperation with universities or external research institutes with special competences.	1	2	3	4	5	6	7	0	
65. The people promoting the new concept had good contacts with representatives of external venture capital.	1	2	3	4	5	6	7	0	

Below we ask you about your opinion about a number of different questions. Please indicate the extent to which you agree by marking a figure from 1 (totally disagree) to 7 (totally agree).

Part E: Your opinion about the following statements

	Totally disagree						Totally agree	Do not know
66. The total market for the new concept has grown very rapidly.	1	2	3	4	5	6	7	0
67. When the development of the new concept started there was great uncertainty concerning market demand.	1	2	3	4	5	6	7	0
68. When the development of the new concept started there was great uncertainty concerning the technical solutions.	1	2	3	4	5	6	7	0
69. When the development of the new concept started there were clearly stated criteria for which type of project the company should invest in.	1	2	3	4	5	6	7	0
70. When the development of the new concept started there were clear evaluation criteria concerning how well new projects evolved.	1	2	3	4	5	6	7	0
71. The new concept was met with strong resistance at the company or corporate level.	1	2	3	4	5	6	7	0
72. The new concept was met with strong resistance among representatives of other product areas.	1	2	3	4	5	6	7	0
73. The new concept meant a new strategic direction within the company.	1	2	3	4	5	6	7	0
74. The new concept created a lot of positive attention among company employees.	1	2	3	4	5	6	7	0
75. The new concept was given a lot of attention in company reports or publications.	1	2	3	4	5	6	7	0
76. It was easy to find employees who were willing to work full time on the new concept.	1	2	3	4	5	6	7	0

Part E: Your opinion about the following statements

	Totally disagree						Totally agree	Do not know
77. One or more dedicated people invested a lot of their time to get the concept accepted within the company.	1	2	3	4	5	6	7	0
78. The concept was promoted by people who had completed many successful projects within the company.	1	2	3	4	5	6	7	0
79. The concept was promoted by people with extensive industry experience.	1	2	3	4	5	6	7	0
80. The concept was promoted by people who since before had good contacts at the company or corporate levels.	1	2	3	4	5	6	7	0
81. There were many intensive debates with people who doubted the viability of the concept.	1	2	3	4	5	6	7	0
82. The introduction of the new concept was based on intensive discussions with middle managers.	1	2	3	4	5	6	7	0
83. The introduction of the new concept was based on intensive talks with managers at company or corporate levels.	1	2	3	4	5	6	7	0
84. The new concept was introduced in a period when the company as a whole was experiencing financial problems.	1	2	3	4	5	6	7	0
85. The new concept was introduced in a period when competition for resources within the company was hard.	1	2	3	4	5	6	7	0
86. The new concept was introduced in a period when company management supported a diversification of operations.	1	2	3	4	5	6	7	0
87. The new concept was launched in a period when company management supported a focusing of operations.	1	2	3	4	5	6	7	0
88. The development of the new concept took place under strong pressure from competing companies.	1	2	3	4	5	6	7	0
89. The relationship with middle managers was characterized by strong personal disagreements.	1	2	3	4	5	6	7	0
90. The relationship with managers at the company or corporate levels was characterized by strong personal disagreements.	1	2	3	4	5	6	7	0
91. The new concept threatened people holding important positions within the company.	1	2	3	4	5	6	7	0
92. During the development of the new concept the company experienced a radical shift in strategy.	1	2	3	4	5	6	7	0
93. Company managers had very homogenous opinions about which products and services the company should invest in.	1	2	3	4	5	6	7	0
94. Unexpected external events had a big positive impact on the development of the concept.	1	2	3	4	5	6	7	0
95. Unexpected external events had a big negative impact on the development of the concept.	1	2	3	4	5	6	7	0
96. In conversations with people inside the company (but outside the venture team) it was attempted to downplay the degree of novelty of the concept during early stages of development.	1	2	3	4	5	6	7	0

97.	In conversations with people inside the company (but outside the venture team) it was attempted to emphasize the degree of novelty of the concept during early stages of development.	1	2	3	4	5	6	7	0
98.	In conversations with people inside the company (but outside the venture team) the concept was portrayed as a response to a new market opportunity for the company.	1	2	3	4	5	6	7	0
99.	In conversations with people inside the company (but outside the venture team) it was emphasized how the concept could contribute to increasing profits for the company.	1	2	3	4	5	6	7	0
100.	In conversations with people inside the company (but outside the venture team) the concept was portrayed as a response to a threat against the company.	1	2	3	4	5	6	7	0
101.	In conversations with people inside the company (but outside the venture team) it was emphasized how the concept could counteract a decline in company profits.	1	2	3	4	5	6	7	0
102.	In conversations with people inside the company (but outside the venture team) similarities to earlier successful projects were emphasized.	1	2	3	4	5	6	7	0
103.	The new concept was perceived as a threat for other technical solutions which were already established within the company.	1	2	3	4	5	6	7	0
104.	The new concept was perceived as a support for other technical solutions which were already established within the company.	1	2	3	4	5	6	7	0
105.	During the first three years of concept development profitability of the parent company was better than during the three years before the introduction of the new concept.	1	2	3	4	5	6	7	0
106.	During the first three years of concept development profitability of the parent company was better than those of the most important competitors.	1	2	3	4	5	6	7	0

Below we ask you to comment upon how you think the new concept has developed over time. Please mark with a figure from 1 (to a decreasing extent) to 7 (to an increasing extent).

Part F: The concept's development over time

	To a decreasing extent							To an increasing extent	Do not know
107.	During the development of the new concept, to what extent has it come to utilize the company's:								
	- already existing knowledge.	1	2	3	4	5	6	7	0
108.	- already existing customer groups.	1	2	3	4	5	6	7	0
109.	- already existing research and development resources.	1	2	3	4	5	6	7	0
110.	- already existing manufacturing resources.	1	2	3	4	5	6	7	0

111. - already existing marketing.	1	2	3	4	5	6	7	0
112. - already existing market channels.	1	2	3	4	5	6	7	0
113. - already existing salesforce.	1	2	3	4	5	6	7	0
114. - already existing suppliers.	1	2	3	4	5	6	7	0
115. - already existing brands.	1	2	3	4	5	6	7	0
116. - already existing contacts with external expertise.	1	2	3	4	5	6	7	0

Finally, we ask you to comment upon how you perceive the overall development of the new concept. Please indicate the extent to which you agree by marking a figure from 1 (totally disagree) to 7 (totally agree).

Part G: The overall development of the concept	Totally disagree						Totally agree	Do not know
117. The market introduction of the new concept has gone faster than expected.	1	2	3	4	5	6	7	0
118. Sales of the new concept have grown faster than expected.	1	2	3	4	5	6	7	0
119. The new concept has grown faster than expected in terms of number of employees.	1	2	3	4	5	6	7	0
120. Competition from other companies with similar ideas has been hard.	1	2	3	4	5	6	7	0
The new concept:								
121. - has developed better than your expectations.	1	2	3	4	5	6	7	0
122. - is more successful in technical terms than expected.	1	2	3	4	5	6	7	0
123. - has changed considerably compared to the original plans.	1	2	3	4	5	6	7	0
124. - was significantly delayed compared to the original plans.	1	2	3	4	5	6	7	0
125. - became considerably more expensive than planned.	1	2	3	4	5	6	7	0
126. - created much weaker demand among the intended customers than expected.	1	2	3	4	5	6	7	0
127. - has created much higher margins than expected.	1	2	3	4	5	6	7	0
128. The customers have been more satisfied with the new concept than expected.	1	2	3	4	5	6	7	0

If you have any further comments or reflections, please write them down below or use the back of the questionnaire.

Thank you for your kind help. We are looking forward to putting together the results!

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