

STRATEGIC FLEXIBILITY:  
Antecedents and performance implications in  
turbulent business environments

A thesis submitted in partial fulfilment for the Degree of  
Doctor of Business Administration

by  
Mats Lindgren

Henley Management College/Brunel University

December 2000

**PLEASE RETURN TO:**  
Doctoral Programmes  
Henley Management College  
Greenlands, Henley-on-Thames  
Oxon RG9 3AU, UK

This document is copyright material and  
must not be published, copied or quoted from  
without the written permission of the holder  
of the copyright whose name will be provided  
by the Henley Doctoral Office on request.

## **ABSTRACT**

### **STRATEGIC FLEXIBILITY: ANTECEDENTS AND PERFORMANCE IMPLICATIONS IN TURBULENT BUSINESS ENVIRONMENTS**

By

Mats Lindgren

During the 1990s many practitioners and scholars identified the organisation's strategic flexibility as critical to success in today's more turbulent business environments. Strategic flexibility could be defined as the organisation's ability to make a quick and adequate response to threats and opportunities in the business environment.

This research investigates the strategic flexibility concept and its antecedents and performance implications in turbulent environments. Based on a literature review and with support from a reference-group of top managers, a model was developed with strategic flexibility defined as the combination of strategic robustness and responsiveness. The model was tested on a sample of 105 northern European companies, mainly in banking and insurance, media and the IT industry.

The findings support the general proposition that strategic flexibility is critical to performance in turbulent environments. Specifically, the results show that robustness tends to be relatively more important as the turbulence increases, indicating a greater need for well-crafted strategies and business concepts.

It was also found that a strategic planning emphasis, proactive experimental strategic posture and task-oriented non-political top management

team enhance strategic flexibility. External orientation and social integration in the top management team, an adaptive organisational structure, cultural control, and comprehensiveness and participation in the planning process also enhance strategic flexibility.

The research leads to recommendations for managers to pay attention to balancing between robust strategies and business concepts and the responsiveness to threats and opportunities caused by changes in the business environment. It also gives provisional guidance on how the strategic flexibility of the organisation can be increased.

The research proposed and carried out in this thesis contributes to the understanding of strategy-related performance antecedents in turbulent business environments, and specifically to the role of strategic flexibility and strategic robustness.

## Table of contents

<b>1</b>	<b>Introduction .....</b>	<b>13</b>
<b>2</b>	<b>Take-off, scope and purpose of the study .....</b>	<b>16</b>
2.1	A tentative research strategy.....	16
2.2	Search for strategic flexibility: A strategic dynamic take-off .....	17
2.3	Organisational factors affecting strategic response capability: Developing a tentative research model .....	24
2.4	Putting perspectives together into a tentative research model .....	35
2.5	Purpose and research themes .....	37
2.6	The following chapters .....	38
2.7	Summary of chapter 2 .....	39
<b>3</b>	<b>Literature review.....</b>	<b>40</b>
3.1	Introduction .....	40
3.2	Strategy, performance and environment – some perspectives .....	42
3.3	Organisation and change.....	50
3.4	Management.....	55
3.5	Organisational structure.....	60
3.6	Strategic planning process.....	64
3.7	Strategy.....	72
3.8	Environment .....	80
3.9	Discussion and summary in the light of raplexity .....	86
3.10	Summary of chapter 3 .....	92
<b>4</b>	<b>Development of research hypotheses .....</b>	<b>94</b>
4.1	Basic logic and assumptions .....	94
4.2	Research model.....	95



4.3	Summary of Chapter 4.....	107
<b>5</b>	<b>Research methodology .....</b>	<b>108</b>
5.1	Overall philosophy and approach.....	108
5.2	Research design .....	109
5.3	Questionnaire design.....	111
5.4	Sampling frame and data collection .....	136
5.5	Data treatment and hypothesis testing.....	138
5.6	Validation of results – focus-group 2 .....	139
5.7	Validation of results – reference survey .....	139
5.8	Summary of Chapter 5.....	140
<b>6</b>	<b>Analysis and findings .....</b>	<b>141</b>
6.1	Response rate, non-response bias and final sample statistics .....	141
6.2	Data quality and reliability of constructs.....	144
6.3	Hypotheses testing .....	157
6.4	Excursus 1: A simplified model .....	183
6.5	Excursus 2: Analysis of differences between industries.....	189
6.6	Summary of Chapter 6.....	191
<b>7</b>	<b>Discussion and conclusions .....</b>	<b>192</b>
7.1	Discussion of results.....	192
7.2	Contributions and limitations of the research .....	201
7.3	Potential future research .....	205
7.4	Practical implications for managers in raplex environments.....	207
7.5	The learning process .....	210
<b>8</b>	<b>References .....</b>	<b>213</b>
<b>9</b>	<b>Appendix 1: Overview of instruments.....</b>	<b>243</b>

9.1	Management.....	244
9.2	Organisation – structure .....	245
9.3	Process .....	247
9.4	Strategy.....	250
9.5	Performance.....	252
9.6	Control/contingency variables .....	254
<b>10</b>	<b>Appendix 2: Operationalisation of predictors .....</b>	<b>257</b>
10.1	Procedure of operationalisation.....	257
10.2	Hypothesis in summary .....	257
	<b>Appendix 3: Research focus group .....</b>	<b>282</b>
10.3	Round-table discussion April 12, 1999.....	282
<b>11</b>	<b>Appendix 4: Data collection procedure.....</b>	<b>284</b>
<b>12</b>	<b>Appendix 5: Validation focus group.....</b>	<b>286</b>
12.1	Agenda.....	286
12.2	Reflections and practical conclusions .....	286
<b>13</b>	<b>Appendix 6: Data purification .....</b>	<b>288</b>
13.1	Missing-value analysis.....	288
	<b>Appendix 7: Non-normality assessment .....</b>	<b>289</b>
<b>14</b>	<b>Appendix 8: Analysis of reference data.....</b>	<b>292</b>
14.1	Instrumentation .....	292
14.2	Comments.....	293
14.3	Results.....	293
<b>15</b>	<b>Appendix 9: Confirmatory factor analysis of constructs .....</b>	<b>295</b>
15.1	Independent variables.....	295
15.2	Link- dependent and environment variables.....	296

16	Appendix 10: Questionnaire .....	298
----	----------------------------------	-----

## List of Tables and Figures

Table 1. Overview of some concepts of “strategic flexibility” .....	19
Table 2. Some concepts and theories related to performance and strategic response capability and change .....	25
Table 3. Themes related to strategy and the strategic management process .....	27
Table 4. Research studies on strategy, strategic change, and performance.....	28
Table 5. Overview of some conflicting paradigms in strategy research (Hamel and Heene 1994) .....	44
Table 6: Organisational characteristics directly or indirectly antecedents to performance in raplex environments, with emphasis on the four constructs identified in Chapter 2 .....	87
Table 7. Clustered suggested performance predictors (antecedents) .....	95
Table 8. Definition of variables.....	99
Table 9. Summary of hypotheses .....	100
Table 10. Critical predictors identified by the reference group.....	114
Table 11. Performance predictors according to reference group ranking of 58 identified indicators .....	117
Table 12. The reference group’s support for the variables .....	118
Table 13: A selection of existing instruments .....	120
Table 14: Summary of scales used in the research .....	121
Table 15. Assessment of response rate on the phone-based follow-up.....	142
Table 16. Assessment of non-response bias. British and Swedish samples ...	143
Table 17. Characteristics of the original sample (n=90) .....	144
Table 18. Sample characteristics of final sample (n=105).....	144
Table 19. TMT characteristics reliabilities.....	148
Table 20. Organisational structure reliabilities .....	150

Table 21. Strategy process reliabilities.....	151
Table 22. Strategy reliabilities .....	152
Table 23. Strategic response capability reliabilities.....	153
Table 24. Environment reliabilities.....	154
Table 25. Performance reliabilities .....	154
Table 26. Correlation analysis (n=105).....	159
Table 27. Correlation coefficients between independent variables and SRC and performance (n=105) .....	160
Table 28. Regression – Antecedents of Total Performance (PERFORM) (n=105) .....	161
Table 29. Regression – Antecedents of Financial Performance (FINPERF) (n=105).....	162
Table 30. Regression – Antecedents of Total Performance (PERFORM) with SRC (n=105) .....	162
Table 31. Regression – Antecedents of Financial Performance (FINPERF) with SRC (n=105) .....	163
Table 32. Regression – Antecedents of SRC (n=105).....	163
Table 33. Summary of hypothesis testing.....	166
Table 34. Comparison of Total performance between different sub-samples..	168
Table 35. Comparison of Financial performance between different sub-samples .....	168
Table 36. Meta-factors of the independent variables (factor loadings >0.4) ...	169
Table 37. Independent meta-variables .....	170
Table 38. Correlations between independent and dependent variables in low and high raplexity environments.....	171
Table 39. Regression – Antecedents of Total performance (PERFORM).....	172

Table 40. Regression – Antecedents of Financial performance (FINPERF)...	172
Table 41. Regression – Antecedents of Total performance (PERFORM) .....	172
Table 42. Regression – Antecedents of Financial performance (FINPERF)...	173
Table 43. Regression – Antecedents of SRC .....	173
Table 44. Regression coefficients of Total performance and SRC (N=105)...	177
Table 45. Standardised $\beta$ -coefficients for regression-models on Total performance and SRC (N=105) .....	177
Table 46. Regression coefficients of Financial performance and SRC (N=105) .....	177
Table 47. Standardised $\beta$ -coefficients for regression-models on Financial performance and SRC (N=105) .....	178
Table 48. Summary of hypothesis testing.....	183
Table 49. Comparison of industry sub-samples.....	189
Table 50. Regression on Total Performance in different industries .....	190
Table 51. Summary of testing of all the hypotheses .....	197
Table 52. Correlation coefficients of reference data (n=69).....	294
Table 53. Regression analysis of reference data (n=69).....	294
Table 54. Analysis of common factors in NONPOL and SOCIAL .....	295
Table 55: Factor analysis of Robustness construct.....	296
Table 56: Factor analysis of Strategic Response Capability and Performance .	297
 Figure 1. Illustration of the iterative literature search for a research model.....	 17
Figure 2. Illustration of the OODA Loop.....	20
Figure 3: Illustration of the Strategic Response Capability. Adapted from Bettis and Hitt (1995). .....	23

Figure 4. A proposed tentative research model .....	37
Figure 5. Overview of some themes in the field of strategy and performance in turbulent environments .....	42
Figure 6. Different types of environments with respect to complexity and change. Adapted from Chakravarthy (1997).....	49
Figure 7. Final research model .....	100
Figure 8: An overview of the research process. ....	111
Figure 9. Original contingency model .....	173
Figure 10. Overall model to be tested.....	174
Figure 11. Illustration of possible relationship between IntelBus on SRC over the raplexity spectrum.....	176
Figure 12. Simplified model with $\beta$ -values for total sample (N=105).....	185
Figure 13. Simplified model with $\beta$ -values for sub-samples (N=52/53).....	185
Figure 14. Simplified model II with significant $\beta$ -values (N=105) .....	187
Figure 15. Simplified model II with significant $\beta$ -values for sub-samples (N=52/53).....	187
Figure 16. Final model with significant $\beta$ -values (N=105) .....	188
Figure 17. Final model with significant $\beta$ -values for sub-samples (N=52/53) .....	189
Figure 18. Strategies to improve Strategic response capability.....	208

## Acknowledgement

Writing a thesis is a journey in the real world, in the world of research, but also an inner journey. During that exciting, often demanding, and sometimes even painful, journey you need companions and support. People to share joy and pain with, people who help you to keep on track and on the move, who help you find the broad alleys, but also the exciting paths, who can endure your absence, but also criticise your shortcomings.

First of all, I should like to thank my supervisors, Professor Patrick Joynt for your words of wisdom, your encouragement and support, but firstly for your ruthless critique of every dangerous detour, and Professor Stephen Drew for your fruitful comments and good advice. Without you, I would still have been stuck in the literature marshland.

Thanks are also due to all other professors, fellow researchers and staff at Henley Management. Thank you all for a good time, fruitful discussions, valuable comments and advice, and practical support.

To all real world practitioners, who with enthusiasm and energy participated in my focus groups and patiently completed my questionnaires: Thank you, you've been infinitely helpful.

Thirdly, I send my thanks to colleagues and co-workers at Kairos Future AB, without whom, I'd neither have started the journey nor reached its end. Thanks for support, encouragement, fruitful discussions and valuable comments, and most of all, your patience when I locked myself up for weeks.

Finally, heartfelt thanks to my family – my wife Christina and my sons Jacob and Andreas – without whose support and patience I would never have reached this stage. Thanks are also due to my parents who gave me the fruit of curiosity and the willingness to explore the world.



# 1 Introduction

The point of departure for this thesis is my own experience from almost two decades of consulting in the field of scenario analysis and strategy. Numerous clients and participants in seminars and workshops raised the question that caught my attention “How do you compete successfully in this endlessly restless world?”

Not surprisingly, the same question has been one of the major themes in more popular management books, journals such as *The Harvard Business Review* and *Sloan Management Review*, and more popular business magazines. Titles like *Competing for the Future*, *Hypercompetition*, and *Competing on the Edge* were amongst the best-sellers of the 90s. New business magazines like *Fast Company* and *Wired*, dedicated to the exploration of the business logic of the so-called new economy, have challenged old players in the business magazine market.

The general answer to the above question has been given in concepts such as ‘strategic flexibility’ (Ansoff, 1984; Hamel, Prahalad et al. 1998; Hitt, Keats et al. 1998), ‘strategic response capability’ (Bettis and Hitt 1995), ‘dynamic capabilities’ (Teece, Pisano et al. 1997), ‘dynamic core competencies’ (Lei, Hitt et al. 1996), ‘strategic manoeuvring’ (D’Aveni 1994), ‘competing on the edge’ (Brown and Eisenhardt 1998), ‘robust adaptiveness’ (Beinhocker 1999) and ‘funky business’ (Nordström and Ridderstråle 1999).

In the field of more academically-oriented strategy research a number of articles were published over the decade, addressing the question from different points of view. There are studies of the relation between strategy and

performance (Miller 1987; Mosalowski 1993; McDougall, Covin et al. 1994; Dess, Lumpkin et al. 1997), decision-process and performance (Fredrickson and Mitchell 1984; Eisenhardt 1989; Judge and Miller 1991), top management team characteristics and performance (Eisenhardt and Bourgeois III 1988; Smith, Smith et al. 1994; Gelatkanycz and Hambrick 1997), strategy and structure (Miles and Snow 1978; Miller 1987; Lyles and Schwenk 1992; Jennings and Seaman 1994) etc. However, much of the academic work is either theoretical, dealing solely with specific fast-moving industries such as the IT-industry or the biotech-industry, or is not specifically oriented towards the new fast-moving business environments. Since more and more industries are facing the challenges of fast-moving environments due to technologic development and dissolution of traditional industry boundaries, the restricted scope of most of the research dealing with fast-moving environments is a limitation.

So, the purpose of this explorative journey could be described as threefold, and related to my three fundamental research questions. First, does the concept of ‘strategic flexibility’ emerging in the popular literature and theoretically conceptualised by scholars hold under closer examination – does it actually predict ‘success’? Second, how much does the ability to adopt to changing circumstances mean to performance? Third, what are the antecedents of ‘strategic flexibility’?

Finally, what constitutes a good piece of management research? Besides the scientific basics of validity and reliability a third criteria could be added, namely applicability. Management research is an applied science, meaning that its ultimate purpose is to provide knowledge and guidelines that managers can use in their daily work. But to be useful, the concepts and guidelines

provided by the researcher must be possible to grasp and internalise by the individual manager.

As human beings, we consciously can handle only small amounts of information simultaneously, although we subconsciously can handle very large amounts of information. To be able to deal with the outside world we need to generalise, find patterns and reduce the perceived variety to a manageable number of alternatives (Ashby 1956). From that point of view, the purpose of this piece of research is to provide some guidelines on strategic management in an “endlessly restless world”.

## **2 Take-off, scope and purpose of the study**

This chapter introduces the research. First, the scope of the study is introduced. Second, a tentative research methodology is presented. Third, a tentative research model is developed, and the purpose of the research stated.

### **2.1 A tentative research strategy**

Research is by nature an iterative process. Questions are stated, answers are sought, old questions are restated and new ones formulated. To develop researchable hypotheses, a five-step approach was applied (see Figure 1). First, a more precise definition of strategic flexibility was sought in the literature. Second, major organisational factors or constructs related to performance and strategic flexibility in turbulent environments were identified in the literature. Third, these factors were used as ‘focus areas’ in a more in-depth literature search for performance and strategic flexibility antecedents. Fourth, performance predictors within each construct were identified in the literature. Fifth, a final research model was developed. This chapter covers the first three steps of this process.

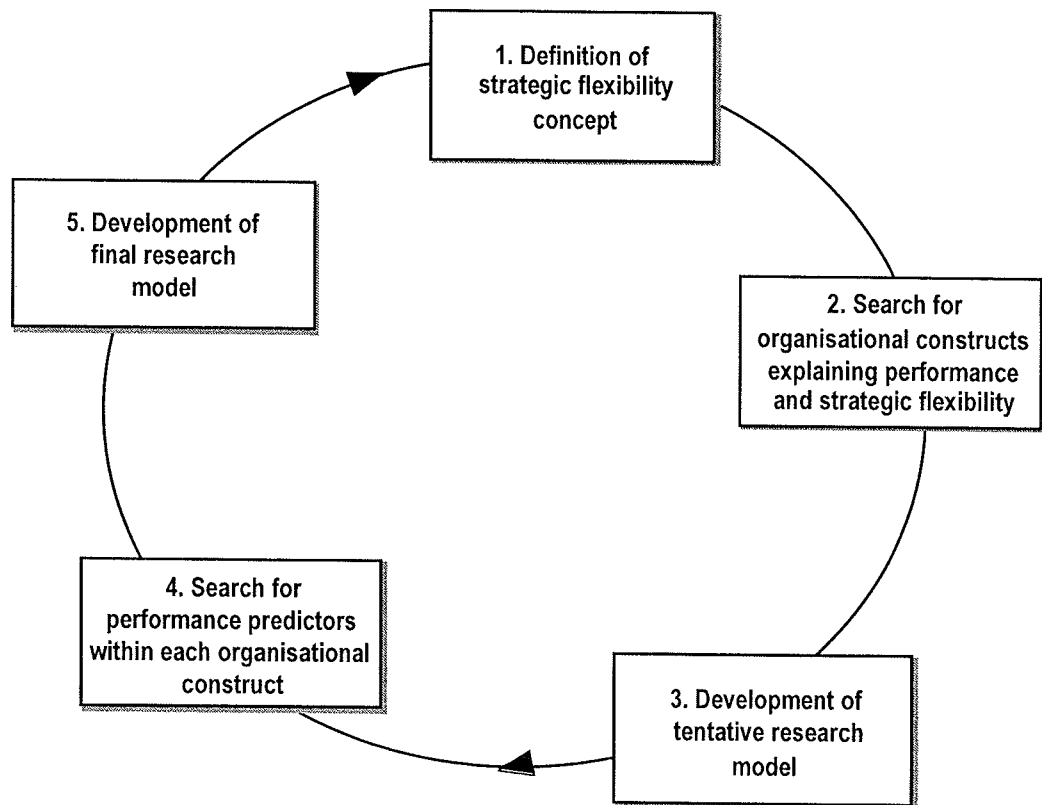


Figure 1. Illustration of the iterative literature search for a research model

## 2.2 Search for strategic flexibility: A strategic dynamic take-off

Critical to success in fast-moving and complex business environments is adaptation and speed. Lewis Carroll's story of Alice and the Queen in *Through the Looking Glass* illustrates the nature of fast-moving worlds. Alice notices that she doesn't move, although she is running fast, and when she notices that, the queen says that she must be from a slow world. In a fast-moving world you have to run for your life just to stay where you are, and run twice as fast in order to get anywhere.

Speed is one aspect of adaptation, often emphasised as critical to success in turbulent (that is complex and fast-moving) environments. The other aspect of adaptation is the ability to handle complexity, illustrated by Ashby's law

of requisite variety (Ashby 1956). It states that the only way to destroy variety (complexity) is through variety (flexibility, adaptation).

Speed and variety are also two major themes in the literature focusing on successful behaviour in turbulent business environments.

Several scholars, especially in what Lengick-Hall and Wolf (1999) call the 'guerrilla logic school', have noted that the strategic flexibility, that is the combination of speed and adaptiveness, is critical. Teece, Pisano and Shuen (1997:509) introduced the concept of 'dynamic capabilities' as an answer to the "Schumpeterian world of innovation-based competition, price/performance rivalry, increasing returns, and the creative destruction of existing competencies". The "reinvention capability" described above could fit into that category of dynamic capabilities, and Microsoft's ability to adapt to a changing competitive landscape is an illustration of such competence (Beinhocker 1999). Chakravarty (1997:69) argues in a similar way when he notices that market leaders must "repeat innovations, establish customer networks, sense the flow of new products, and share responsibility for new strategy throughout the firm". Hamel (1998:7) has a similar point of view when he argues for strategy innovation. "I believe that only those companies that are capable of reinventing themselves and their industry in a profound way will be around a decade hence."

What all those researchers and scholars are capturing is different aspects of speed, not in the notion of operational efficiency but speed in recognition, innovation, decision-making and implementation. Table 1 provides an overview of strategic-flexibility concepts.

**Table 1. Overview of some concepts of “strategic flexibility”**

CONCEPT	SOURCE
Strategic manoeuvring	D’Aveni (1994)
Strategic response capability	Bettis and Hitt (1995)
Dynamic core competencies	Lei, Hitt et al. (1996)
Dynamic capabilities	Teece, Pisano and Shuen (1997)
Repeated innovation	Chakravarty (1997)
Strategic flexibility	Ansoff (1984); Hitt, Keats et al. (1998); Hamel (2000)
OODA-cycle	Haeckel and Nolan (1993); Blaxill & Hout (1998)
Strategy innovation	Hamel (1998)
Competing on the edge	Brown and Eisenhardt (1998)
Robust adaptiveness	Beinhocker (1999)
Funky business	Nordström and Ridderstråle (1999)

### 2.2.1 Dogfights, speed-learning...

The benefits of speed could be illustrated by the fighter-pilot metaphor (Haeckel and Nolan 1993; Blaxill & Hout 1998).

The United States Air Force assesses a pilot’s ability to learn with the OODA Loop, a model for the mental processes of a fighter pilot. The OODA Loop is the cycle of observation (sensing environmental signals), orientation (interpreting), decision (selection from a repertoire of responses), and then action (executing a response). Fighter pilots with faster OODA Loops tend to win dogfights, while those with slower ones get more parachute practice. Applying the metaphor to organisations, you could say that high-performers are faster to observe changes in the competitive landscape, faster to orient themselves in the new landscape, faster to decide what to do, and to do it. They are quick responders.

Transformed into business activities, the OODA Loop is closely linked to the planning cycle. The observation is the result of the environmental

scanning or search for threats and opportunities, and the orientation is the outcome of the interpretation or analysis of the information. The decision is the result of a decision-planning process, and the carried out action is the result of implementation. The OODA Loop with its business parallels is presented in Figure 2.

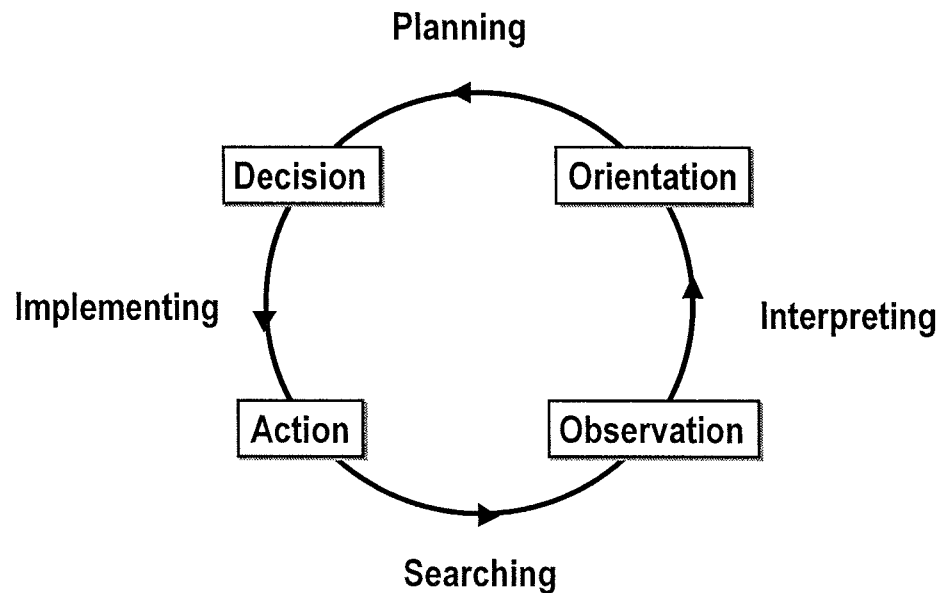


Figure 2. Illustration of the OODA Loop

### 2.2.2 ...and strategic response capability

But flexibility is not enough in order to respond quickly and cost-efficiently to challenges and opportunities in the business environment. The ‘grand challenge’ to strategic management is to manage the balance between stability and flexibility. As Hitt et al noticed (Hitt, Keats et al. 1998:24):

“Managers now face the task of creating a balance between the stability necessary to allow development of strategic planning and decision processes and instability that allows continuous change and adaptation to a dynamic environment.”



In a theory paper, Richard Bettis and Michael Hitt (1995) develop the concept of what they call 'strategic response capability', a capability that besides responsiveness also includes strategic robustness.

The foundation for their concept was the analysis of the changing competitive landscape with more intense and unpredictable competition, dissolution of traditional industry boundaries etc, and the cry for redefinition of the organisation and organisational learning. "Because of the dynamism in the new competitive landscape, firms cannot remain static even if they operate in mature industries ... Thus, firms in the new competitive landscape must achieve dynamic efficiency often regardless of their industry's life cycle. As such, managers must have an entrepreneurial mindset, emphasising innovation in most industry settings" (Bettis and Hitt 1995:14).

According to Bettis and Hitt, the strategic response capability can be compared to the stimulus-response paradigm of biology where the capability of an organism to respond to stimuli in the environment is the key determinant of its fitness for survival. Thus, it consists of two components – the capability to respond to threats and the ability to actively search for better positions in the fitness landscape and exploit new business opportunities.

Figure 3 illustrates three organisations with different response capability are illustrated. An environmental challenge is introduced at time 0. The likelihood of the organisation not needing to accomplish any change to meet the challenge is called its robustness of the organisation (or strategy). Organisations A and B in the example are equally robust, while company C is more robust. As time passes the probability that the organisation will be able to respond satisfactory to the challenge rises, until a certain point where it rapidly fall due to financial weakness, competence loss, time disadvantage etc. A challenge for

managers is to increase the strategic response capability of the organisation, both its robustness and its response speed and accuracy (responsiveness). In Figure 3, A is more responsive (or a quick learner), while C is the most robust and least responsive. Scenarios may be used in the strategic planning process to test for robustness.

Bettis and Hitt (1995:16) further propose that the SRC must incorporate the abilities “to rapidly 1) sense change in environment; 2) conceptualise a response to that change; and 3) reconfigure resources to execute the response”. The parallel to the OODA Loop is obvious. ‘Sense’ is parallel to ‘Observe’, ‘Conceptualise’ is similar to ‘Orient and Decide’, and ‘Reconfigure and execute’ equal ‘Action’.

Bettis and Hitt finally conclude, “further work is needed to develop an overall package of specific mechanisms for shifting the strategic response curve upwards” (Bettis and Hitt 1995:16). An open question is whether there also is a need for a package to increase robustness.

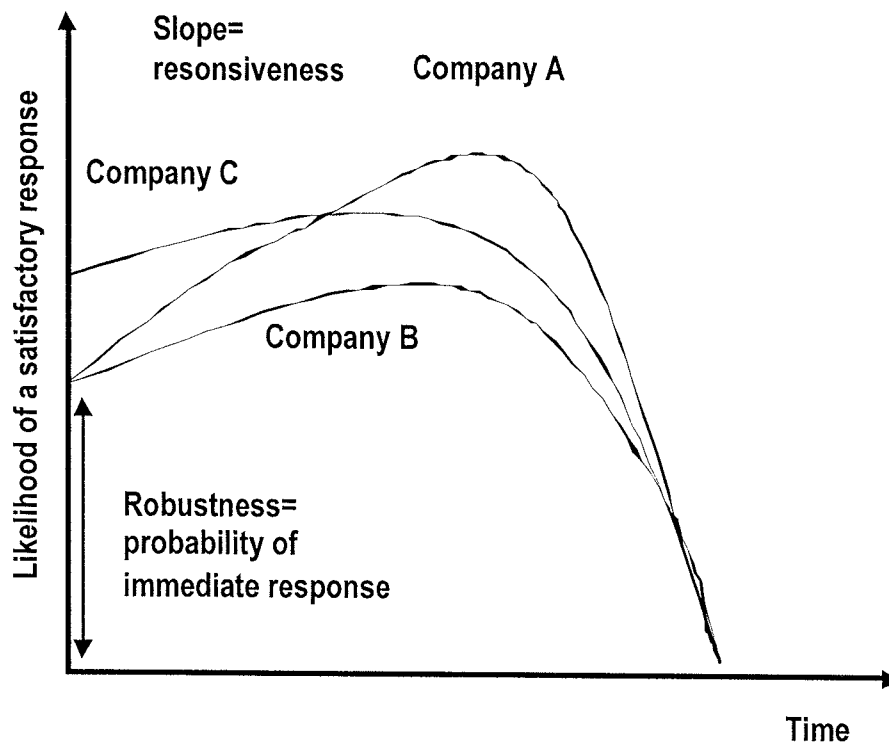


Figure 3: Illustration of the Strategic Response Capability. Adapted from Bettis and Hitt (1995).

### 2.2.3 Putting the strategic response theory into perspective

With the addition of the robustness concept, Bettis and Hitt (1995) have captured the essence of life. From a biological or ecological point of view, the general theme in organisational life is the struggle between life and death, or exploration and exploitation (Normann 1975; March 1996). There seems to be a constant flow and need to balance between those two states, and a constant struggle between the organisational sub-cultures that have dedicated their lives to either of them.

Consequently strategic flexibility without robustness risks leading to lack of focus and inability to build competence, whereas robustness without flexibility and adaptation risk leading to inertia and death.

Scholars and practitioners rooted in the complexity theory have explained that robust strategy in a complex and turbulent business environments must be flexible and adaptive. Just as living species build ‘portfolios’ of options for the future through mutation and ‘DNA-experimenting’, corporations must build portfolios of options for the future through an active search for new peaks in the fitness landscape (Brown and Eisenhardt 1997; Beinhocker 1999).

In a similar, but different way, James Brian Quinn has stated the need for robustness: “Consequently, the essence of strategy – whether military, diplomatic, business, sports, (or) political ... – is to build a posture that is so strong (and potentially flexible) in selective ways that the organization can achieve its goals despite the unforeseeable ways external forces may actually interact when the time comes” (Mintzberg, Quinn et al. 1995:12).

## **2.3 Organisational factors affecting strategic response capability:**

### **Developing a tentative research model**

#### **2.3.1 Literature search for organisational factors**

After identifying the strategic flexibility concept, the next step was to identify organisational factors or constructs relevant to performance and strategic flexibility in turbulent environments. A preliminary search for articles and books using keywords such as turbulence, strategy, performance and strategic change, identified a number of theories, themes and key persons. The purpose was to identify a conceptual tentative model that could guide the following search for more specific predictors of performance in turbulent environments.

The work started by scanning the Strategic Management Journal and Administrative Science Quarterly 1992–1998 and with a search on relevant keywords in databases covering academic journals. Relevant references found in those articles were followed.

In this first search some 50 relevant articles or papers were found, covering a number of theories and areas. Some of the major concepts and theories found are presented in Table 2, and a full overview of the articles is given in Table 4.

**Table 2. Some concepts and theories related to performance and strategic response capability and change**

CONCEPT	SOURCES, EXAMPLES
Strategic adaptation	(Child 1972)
Evolutionary ecology, inertia	(Hannan and Freeman 1984; Hannan and Freeman 1989)
Organisational learning	(Argyris and Schön 1978; Senge 1990)
Organisational culture	(Schein 1992)
Punctuated equilibrium	(Tushman and Romanelli 1985)
Complexity theory	(Brown and Eisenhardt 1997)
Top management team characteristics	(Hambrick and Mason 1984; Hambrick, Geletkanycz et al. 1993)
Decision-making	(Fredrickson and Mitchell 1984; Eisenhardt, Kahwajy et al. 1997)
Environmental scanning/information	(Jain 1984; Elenkov 1997)
Strategic planning	(Andrews 1971; Boyd and Reuning-Elliot 1998)
Vision, reference points	(Hamel and Prahalad 1989; Feigenbaum, Hart et al. 1996; Collins and Porras 1997)
Strategic posture, entrepreneurship	(Miles and Snow 1978; Covin and Slevin 1989)
Resource-based theory, core competence	(Hamel and Prahalad 1990; Barney 1991)
Environment-strategy-structure match	(Miller 1988)
Strategic position	(Porter 1985; Porter 1996)

The themes identified were arranged in four major organisational constructs or characteristics representing different aspects of the organisation: the top management characteristics, focus, and intra-team relations; organisational

structure, systems and control; strategic planning process; the strategy or strategic posture or orientation. The articles were also labelled 'environment' and 'performance', if they dealt specifically with those topics. A seventh theme was added, namely strategic change, for articles specifically dealing with aspects of strategic change.

The four major constructs or factors were adapted from *The Strategy Process*, by MintzbergQuinn et al (1995). The book is an introductory textbook to strategic management and strategy formation. Table 3 provides an overview of those themes and the labels used in this research. The third column presents aspects of the construct found in the literature reviewed.

The result of the literature search is presented in Table 4. Three characteristics were chosen to identify each study. 'Construct' refers to the constructs or themes discussed above. 'Research problem' lists the main purpose of the study, which is often not specifically related to strategy in turbulent environments. Column four 'Research findings' is the most interesting since it summarises important direct and indirect strategy-related determinants of success and failure in turbulent environments. The emerging performance antecedents in that column are well functioning management team, extensive communication, rich external information, innovation, experimentation, speed and adaptive structure. In the same way, some failure factors emerge: political behaviour, lack of external information and scanning, mental rigidity through long tenure, mental and structural inertia.

**Table 3. Themes related to strategy and the strategic management process**

CONSTRUCT	(Mintzberg, Quinn et al. 1995)	EXAMPLES FROM LITERATURE
MANAGEMENT: Top Management	Manager as strategist Power and politics	Top management characteristics (tenure etc) (Hambrick, Geletkanycz et al. 1993) Intra-team process (Smith, Smith et al. 1994) External orientation (Elenkov 1997)
ORGANISATION: Organisational Structure	Structure and systems Culture	Integration (Miller 1988) Organic structure (Covin and Slevin 1989) Cultural control (Picken and Dess 1997)
PROCESS: Strategic Planning Process	Strategy formation Strategy design and planning Strategy analysis	Strategic planning (Boyd and Reuning-Elliot 1998) Entrepreneurial strategy-making (Dess, Lumpkin et al. 1997) Participation (Norrgrén, Hart et al. 1996) Comprehensiveness (Fredrickson 1984)
STRATEGY	Strategy (in various organisational and external contexts)	Strategic posture (Covin and Slevin 1989) Generic strategies (Miller 1988) Resource-based strategy (Mosakowski 1993) Innovative posture (Ozsomer, Cantalone et al. 1997) Entrepreneurship (Zahra 1991)
CHANGE: Strategic Response Capability/ability to adapt	Managing change	Strategic search and change (Boeker 1997) Organisational transformation (Bacharach, Bamberger et al. 1996) Strategic adaptation (Jennings and Seaman 1994)

**Table 4. Research studies on strategy, strategic change, and performance**

CONSTRUCTS	STUDY	RESEARCH PROBLEM	RESEARCH FINDING
Management, Change	(Bacharach, Bamberger et al. 1996)	Organisational transformation	Alignment of logic across organisational groups crucial for transformation
Management, Strategy	(Bantel and Jackson 1989)	Innovation in banks	Positive relationship between TMT heterogeneity in functional background and innovation
Management, Change, Performance	(Boeker 1997)	Management and growth	Poor performance function as trigger for strategic search TMT tenure negatively and tenure diversity positively associated with corporate strategic change in semiconductor industry
Process, Performance	(Boyd 1991)	Planning-performance. Meta-analytical study	Weak support for the effect of planning on performance. Measurement problems underestimate the effect of planning
Management	(Boyd and Fulk 1996)	Top management scanning and perceived uncertainty	Increased complexity decreases scanning activity
Process, Performance	(Boyd and Reuning-Elliott 1998)	Strategic planning and performance	Planning emphasis is positively related to performance
Organisation, Strategy, Performance, Environment	(Brown and Eisenhardt 1997)	The art of continuous change	Experimentation, time-pacing and proactive approach associated with success Limited structure, intense communication, experimentation
Strategy, Planning, Environment	(Chakravarthy 1997)	Strategy framework for coping with change. Theory	Repeated first mover activities, network and flow to cope with turbulence
Strategy, Organisation, Performance, Environment	(Covin and Slevin 1989)	Strategic management of small firms in hostile and benign environments	Organic structure, entrepreneurial strategy is related to performance in hostile environments
Process	(Daft, Sormunen et al. 1988)	Environmental scanning	Scanning driven by strategic uncertainty
Process, Environment	(Dean and Sharfman 1993)	Relationship between decision making and environment	Formal planning matters less and decreases with increased uncertainty/instability
Management, Process, Environment	(Dean and Sharfman 1996)	Effectiveness of procedural rationality and political behaviour	Political behaviour is associated with ineffective decision making Procedural rationality positively related to effectiveness Process matters more in stable environments
Strategy, Process, Performance, Environment	(Dess, Lumpkin et al. 1997)	Entrepreneurial approach to strategy making	Entrepreneurial strategy making related to performance when appropriate strategy and environment
Process, Management, Performance	(Eisenhardt 1989)	Fast decision-making in high-velocity environment	Fast decision-makers use more information, develop alternatives and solve conflicts. Speed leads to performance Comprehensiveness positively related to performance in unstable environments



CONSTRUCTS	STUDY	RESEARCH PROBLEM	RESEARCH FINDING
Management, Performance	(Eisenhardt and Bourgeois III 1988)	Relationship between power, politics and performance	Autocratic CEO generates political behaviour and thus poor performance
Management, Strategy, Environment, Performance	(Eisenhardt and Schoonhoven 1990)	Organisational growth	TMT important both for strategy and growth
Strategy, Performance	(Eisenhardt and Tabrizi 1995)	Accelerating adaptive processes	Experiential strategy based on multiple design iterations, extensive testing, frequent project milestones, powerful project leader and a multi-functional team accelerates product development
Management, Process	(Eisenhardt, Kahwajy et al. 1997)	TMT diversity and decision making	Intra-team interactions important for efficient decision making
Process, Performance	(Elenkov 1997)	Scanning and performance	Sophisticated scanning increase growth and profitability
Management, Process, Environment,	(Elenkov 1997)	Perceptions of uncertainty and scanning behaviour	Uncertainty shifts scanning from formal to informal sources
Management, Strategy, Performance, Environment	(Finkelstein and Hambrick 1990)	TMT tenure and organisational outcomes	Tenure associated with strategies conforming to industry means Conformist approach more favourable in unstable setting
Process, Performance, Environment	(Fredrickson 1984)	Planning and performance	Comprehensiveness favourable in stable environments
Process	(Fredrickson and Mitchell 1984)	Planning and performance	Comprehensiveness unfavourable in unstable environments
Management, Strategy, Change	(Gelatkanycz and Hambrick 1997)	TMT ties, strategy and performance	Intraindustry ties are related to strategic conformity, extraindustry ties to deviant strategies Conformist strategy favourable in computer industry
Management, Change, Strategy	(Geletkanycz 1997)	Cultural values and CSQ	Culture has a great impact on CEOs' CSQ
Management, Strategy	(Hagen and Amin 1995)	Environmental scanning and strategy	Company strategy influences CEOs' scanning behaviour Differentiation strategies lead to opportunity scanning and low cost strategies to scanning for threats
Management, Strategy, Performance	(Hambrick, Geletkanycz et al. 1993)	Executives' tenure and CSQ	Tenure and present performance relate to CSQ Industry tenure more strongly associated with CSQ than company tenure is
Process, Performance	(Hart and Banbury 1994)	Strategy-making process and performance	Firms with high strategy-making process capability outperform those with less
Change	(Haveman 1992)	Change and punctuated equilibrium	Change might be favourable in some situations
Management, Strategy	(Jennings and Lumpkin 1992)	Scanning and strategy	Differentiation associated with opportunities scanning
Strategy, Structure, Performance, Change	(Jennings and Seaman 1994)	Adaptation and strategy-structure match	Organisations with optimal strategy-structure match perform better than others
Process, Management, Performance, Environment	(Judge and Miller 1991)	Decision-speed in different contexts	Decision-speed related to simultaneous consideration of many alternatives, and associated with performance in high-velocity environments

CONSTRUCTS	STUDY	RESEARCH PROBLEM	RESEARCH FINDING
Management, Performance, Environment	(Keck 1997)	TMT and performance in different contexts	Shorter-tenured and heterogeneous teams are favourable in turbulent environments
Strategy, Performance, Environment	(Lumpkin and Dess 1995)	Simplicity and performance	Simplicity positively related to performance only at early stages, and negatively related to performance in dynamic environments
Strategy, Environment	(Løwendahl and Revang 1998)	Post-industrial challenges to strategy. Theory	Traditional management thinking is not applicable to complex-complex environments
Strategy	(Makadok 1998)	Early entrants and sustainable advantage	Early entrants gain sustainable advantage through resource accumulation
Process, Strategy, Environment	(Middelton Stone and Greer Brusch 1996)	Planning in ambiguous contexts	In ambiguous contexts organisations use planning as a strategy for acquiring resources
Strategy, Structure, Environment	(Miller 1988)	Relation between strategy, environment and structure	Strong relation between innovative differentiation, uncertainty, use of technocrats and integrating devices
Management, Strategy, Structure, Process, Environment	(Miller, Dröge et al. 1988)	Strategic process and content as mediators between context and structure	CEOs' need for achievement affects rationality Uncertainty affects product innovation and centralisation and formalisation
Management, Strategy, Structure, Performance, Environment	(Miller 1991)	CEO tenure and match between organisation and environment	CEO tenure is related inversely to match between organisation and environment, especially in uncertain environments Match between strategy and environment positively related to performance
Management, Process	(Miller, Burke et al. 1998)	TMT diversity and decision process	TMT cognitive diversity inhibits efficient decision making Extensiveness and comprehensiveness essential
Process, Performance, Environment	(Miller and Cardinal 1994)	Strategic planning and performance. Meta-analytical study	Planning associated with performance when broadly defined and in turbulent environments
Strategy, Performance	(Miller, Lant et al. 1996)	Simplicity and performance	Strategic simplicity through search favourable in software industry
Process	(Mohan-Neill 1995)	Scanning, age and size	Older firms scan more intensively and systematically than younger firms
Strategy, Performance	(Mosakowski 1993)	Strategy and performance. Dynamic modelling, longitudinal study	Both differentiation and focus strategies associated with performance
Process, Change	(Norrgrén, Hart et al. 1996)	Change strategy and efficiency	Participative learning strategies are associated with successful change processes
Organisation, Strategy, Performance	(Nahapiet and Ghoshal 1998)	Social capital, intellectual capital and the organisational advantage. Theory	Social capital might be the fundament of organisational advantage
Strategy, Structure, Environment	(Ozsomer, Cantalone et al. 1997)	Innovation and environmental factors	Innovativeness is influenced by strategic posture Innovative strategic posture positively related to uncertainty but negatively to hostility

CONSTRUCTS	STUDY	RESEARCH PROBLEM	RESEARCH FINDING
Management, Process, Performance, Environment	(Papadakis, Lioukas et al. 1998)	Decision-making process, management and context	Decision-specific factors are most important in shaping the decision-process
Organisation, Strategy	(Picken and Dess 1997)	The role of strategic control. Theory	Strategic control through informational and behavioural control important
Process, Performance	(Powell 1992)	Strategic planning as competitive advantage	Planning favourable in planning disequilibrium industries Strategic planning is not creating sustainable competitive advantage
Change	(Ruef 1997)	Organisational fitness on dynamic landscape	Provider density decreases ability to change
Change, Organisation, Performance, Environment	(Sastry 1997)	A model of punctuated equilibrium	Poor present performance trigger change. Need for rebuilding capacity after change Simplicity associated with performance
Organisation, Strategy	(Shortell and Zajac 1990)	Strategic orientation and structure	Prospector organisations are orientated towards innovation
Change, Strategy, Performance	(Sinha and Noble 1997)	Performance consequences of sub-field entry	High magnitude of change favourable for change. First-mover advantage
Process, Structure, Performance, Environment	(Slevin and Covin 1997)	Relation between strategy formation pattern and growth	Hostile environments decrease ability to change Planned strategies positively related to growth in hostile environments Process and structure must be matched
Management, Performance	(Smith, Smith et al. 1994)	TMT demography and process	TMT demography influence performance through intra-team process. Social integration directly linked to performance
Process, Performance	(Subramanian, Fernandes et al. 1993)	Scanning and performance	Advanced scanning systems is related to performance
Strategy, Environment	(Sutcliffe and Zaheer 1998)	Effects of uncertainty on vertical integration	General and competitor uncertainty decrease vertical integration Supplier uncertainty increase vertical integration
Strategy, Process, Performance	(Teece, Pisano et al. 1997)	Dynamic capabilities and strategic management. Theory	Identifying new opportunities and organising effectively more important than competitor focused strategy in changing markets
Management	(Vandenbosch and Huff 1997)	Executives search for information	Executive information systems are used to increase efficiency and effectiveness. Focused scanning to improve efficiency is most common
Strategy, Environment, Performance	(Venkatraman and Prescott 1990)	Strategy-environment co-alignment and performance	Co-alignment between strategy and environment affect performance
Organisation, Process, Strategy, Performance	(Zahra 1991)	Predictors and financial outcomes of corporate entrepreneurship	Entrepreneurship is driven by growth strategy, dynamism and values, and improves performance
Strategy, Performance, Environment	(Zahra 1993)	Environment, entrepreneurship and performance	Different environments lead to different entrepreneurial styles Entrepreneurship related to performance

### 2.3.2 Organisational factors and strategic response capability...

The next step on the road to a tentative research model was to summarise the relations between the independent constructs presented above, and strategic response capability and performance.

#### ***2.3.2.1 The top management***

The top management team (TMT) plays an important role in setting the organisation's focus and culture (Schein 1992), and thus the ability to change. The internal relations are also important for decision-making ability (Bourgeois and Eisenhardt 1988; Eisenhardt 1989; Eisenhardt, Kahwajy et al. 1997). Consequently, Finkelstein and Hambrick for instance, found that in high-discretion industries – such as the computer industry – consequently that managers seem to “matter greatly” (1990: 500). The theoretical fundament of the stream of TMT research of the 80s and 90s is Hambrick and Mason's (1984) upper-echelons theory. According to the theory, upper-level managers have an important impact on organisational outcomes because of the decisions they are empowered to make for the organisation. Since those decisions are based on the values and experiences, their personal experiences and values can be linked to organisational outcomes. During the late 80s and 90s scholars have linked management teams to organisational innovation, strategy, strategic change and performance (Smith, Smith et al. 1994).

To summarise, several aspects of the top management team affect the organisation's strategic response capability.

### ***2.3.2.2 Organisational structure***

Since the early days of organisation research, the relationship between strategy, structure, and performance has been at the heart of organisational studies (Chandler 1962). Organic or adaptive organisations have been found important in more turbulent environments (Lawrence and Lorsch 1969). During the 80s and 90s organisational ecologists (Hannan and Freeman 1984; Hannan and Freeman 1989; Haveman 1992; Ruef 1997) emphasised that organisational inertia inhibits the adaptation process. More recently researchers rooted in the complexity theory have emphasised the need for patching and loosely coupled organisations in order to adapt quickly and find favourable positions in the fitness landscape (Brown and Eisenhardt 1997; Beinhocker 1999; Eisenhardt and Brown 1999; Pascal 1999).

Since the alertness of the organisation is critical to change, organisational structure is an important predictor of strategic response capability.

### ***2.3.2.3 The strategic planning process***

The strategy-making process is a multi-faceted construct. In a recent article Mintzberg and Lampel (1999) found ten pure and ten more 'blended' strategy process schools, based in different disciplines ranging from history and psychology via economy and political science to biology and chaos mathematics. In an overview, Stuart Hart (1992) found ground for 5 distinct strategy-making modes based on the roles the top managers and organisational members play in the process: command; symbolic; rational; transactive and generative.

The strategic planning process deals with the questions about how, that is by whom and with what emphasis and thoroughness, planning is carried

out in the organisation. We have previously discussed the role of the TMT in the decision-making, but participation in the planning-process has also been found important to successful change (Norrgren, Hart et al. 1996).

Consequently, the strategic planning process is an important antecedent of SRC.

#### **2.3.2.4 Strategy**

As Henry Mintzberg noted, strategy could be almost “everything a company does or consists of” (Mintzberg and Lampel 1999:26). Notably, the sum of what a company does could be called its strategic posture. Over the last two decades, triggered by the work of Miles and Snow (1978), a number of researchers have examined the relationship between different aspects of posture and change, innovation, environment, and performance. Innovative and entrepreneurial orientation have got special attention (Dess, Lumpkin et al. 1997).

However, the border between strategic posture and strategy process research is however thin. They are both aspects of the ‘strategy as pattern’ perspective (Mintzberg, Quinn et al. 1995).

Closely linked to strategic posture, representing overall behaviour, culture, or pattern, is strategy as position. The dominating typology during the 80s and 90s in the field of strategy research was based on Porter’s typology (Porter 1980; Porter 1985). During the late 90s systems ecology and complexity theory have added new perspectives to the positioning discussion by introducing concept such as multiple and parallel search for alternative positions, populations of strategies (Beinhocker 1999), and strategy as portfolios of options for the future (Williamson 1999).

### 2.3.3 And the performance antecedents...

We have now discussed four constructs and their relations to the strategic flexibility or response capability. A review of the literature, presented in Table 4, also shows that those four constructs have proved to impact performance as well, directly or indirectly. We will go through this in detail in Chapter 3.

As seen from the table, top management team characteristics and interaction has been found to influence performance in several studies (Eisenhardt and Bourgeois III 1988; Eisenhardt and Schoonhoven 1990; Smith, Smith et al. 1994; Gelatkanycz and Hambrick 1997; Keck 1997) and so has organisation (Jennings and Seaman 1994; Brown and Eisenhardt 1997), process (Powell 1992; Hart and Banbury 1994; Boyd and Reuning-Elliot 1998) and strategy (Miller, Lant et al. 1996; Dess, Lumpkin et al. 1997; Makadok 1998). The construct of strategic response capability was proposed by Bettis and Hitt (1995), but has not previously been empirically tested. Finally, both environment (Ozsomer, Cantalone et al. 1997; Slevin and Covin 1997) and firm characteristics have been found to function as moderators of those relationships.

## 2.4 Putting perspectives together into a tentative research model

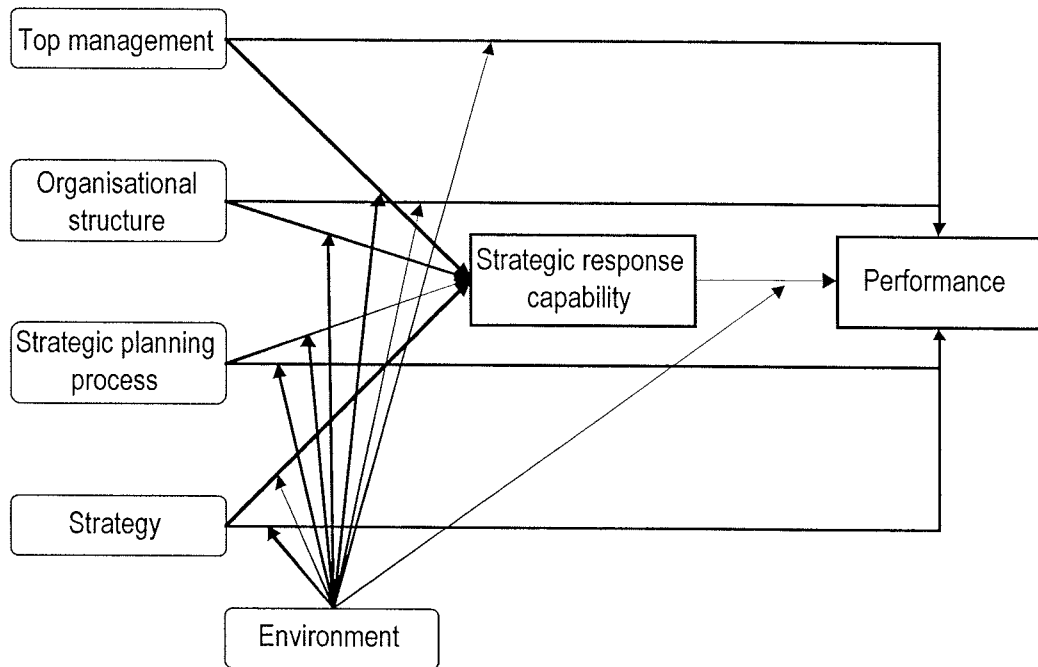
In the next chapter, the literature will be reviewed in the search for more precise predictors of strategic response capability and performance. In this chapter, to narrow the scope we have identified four broadly defined constructs with documented relevance to the study of strategic response capability and performance based on the first literature search. Implicit in this initial discussion is the importance of the external environment, since the scope of the study is the importance of strategic flexibility in fast-moving or turbulent environments.

Now it is time to put these propositions together in a tentative research model able to give guidance for the continuing discussion. In Chapter 4, the model will be developed further and several propositions regarding the relationships between the four independent constructs (management, organisation, process, and strategy), the contingency construct (environment), link-construct (SRC) and dependent construct (performance).

The genesis of the model to be developed and tested is represented in Figure 4. The figure reveals the key constructs and the expected relationships between them. The model proposes that the strategic response capability, that is the ability to handle challenges in the environment, influences performance. Furthermore, it proposes that management, organisational structure, and strategy process and strategy directly influence both the response capability and the performance itself. Finally, it proposes that the external and internal environment moderate all those relations (Hart and Banbury 1994).

In the literature, there are also arguments for relations between several of the independent structures such as between strategy and organisational structure (Miller, Dröge et al. 1988), and management and strategy (Hambrick and Mason 1984; Geletkanycz 1997). These relations are left out to keep the model as simple as possible.





**Figure 4. A proposed tentative research model**

## 2.5 Purpose and research themes

I initially stated that the purpose of this research was to find some answers to the critical question “How do you compete successfully in this endlessly restless world?” ‘Compete’ has to do with strategy, ‘success’ with performance and ‘endlessly restless’ with turbulent environments. Transformed into a researchable academic question the research problem thus could be formulated: *What are the strategy-related performance antecedents in turbulent environments?*

In this chapter we have found that strategic robustness and responsiveness, defined in slightly different ways by different scholars and consultants, is proposed as a good predictor of performance in turbulent environments. We also found that saw broadly defined constructs related to the internal organisation – management, organisation, process, and strategy – are

found in the literature to impact on both the strategic response capability and performance.

A sub-purpose of the research was to explore whether the results of studies, mainly in the IT-industry, are generalisable to less turbulent industries. Finally, I concluded that the ultimate purpose of the research was come up with some results with relevance for managers in the field.

Three tentative research questions can now be stated:

*RQ1. What characterises the strategy, strategic planning process, organisational structure and top management in high-performance companies in turbulent environments, that is, what are the performance antecedents in such environments?*

*RQ2. Is there empirical evidence for the concept of strategic response capability (Bettis and Hitt 1995), and if so, to what extent does it explain performance differences in turbulent environments?*

*RQ3. To what extent are the findings from turbulent environments generalisable to firms in more stable environments?*

## **2.6 The following chapters**

In the next chapter (chapter 3), I will discuss more in detail the literature on performance antecedents in turbulent environments. Based on the literature review, I will develop research hypotheses (chapter 4), and outline the methodology and operationalise variables (chapter 5). The last two chapters present the results from a European survey (chapter 6) and discuss these results in the context of the literature (chapter 7).

## 2.7 Summary of chapter 2

In this chapter, the research questions were introduced and a tentative research model developed. The general research question was stated as: *What are the strategy-related performance antecedents in turbulent environments?*

It was found that many practitioners and scholars have identified the organisation's strategic flexibility or strategic response capability as critical to success in such environments. The strategic response capability could be defined as the organisation's ability to make a quick and adequate response to threats and opportunities in the business environment (Bettis and Hitt 1995).

An initial literature review identified four major constructs explaining differences in performance and strategic response capability between organisations in turbulent environments: the top management; organisational structure; strategic planning process; strategy. A tentative research model was developed, based on the literature.

### 3 Literature review

This chapter reviews and summarises the literature in relation to strategy and performance in turbulent environments. First, the concepts of strategy, environment, and performance are discussed, and working definitions of ‘strategy’, ‘environment’, and ‘performance’ presented. Second, the literature is reviewed and discussed. Third, possible performance antecedents from the literature are summarised, with emphasis on performance antecedents in turbulent environments.

#### 3.1 Introduction

The selection of studies presented in Chapter 2 and extended in the following literature review was guided by two principles. Firstly, that of **strategic robustness and responsiveness** and performance. This principle means that only papers dealing with aspects of the relation between performance and the firm’s search for strategic robust alternatives and strategic change processes have been included. The lens, so to say, was the concept of strategic response capability. This means for instance that the vast area of operational effectiveness was left out.

Operational effectiveness could be defined as performing similar activities better (more efficiently, with higher quality etc) (Porter 1996). In this thesis the aim is to explore how much the ability to adapt to changing environmental settings means to performance, or even how much having such a robust concept means, that you can destroy external variety without adapting. And secondly, the aim is to explore the antecedents to that ability.

The purpose of the research is thus not to explore how much the strategic response capability (that is the ability to destroy or exploit variety in the external environment) means to performance, relative to the importance of operational effectiveness. However, one could expect that in more turbulent environments operational effectiveness could be considered less important to performance, since the most generic solutions diffuse the fastest (Porter 1996). Of course, the borderline between strategy and operational effectiveness is fuzzy – what is considered strategy for one organisation or researcher could be viewed as a matter of operational effectiveness by another.

The second guiding principle is that of **turbulence**. This principle means that the search has been focused on studies relevant for strategy making and strategic change in rapidly changing and complex environments.

An overview of some of the themes that emerge in a literature search on strategy and performance in turbulent environments is presented in Figure 5.



**Figure 5. Overview of some themes in the field of strategy and performance in turbulent environments**

### **3.2 Strategy, performance and environment – some perspectives**

In Chapter 2, the genesis of this thesis was stated as the manager's question: "How do you compete successfully in this endlessly restless world?" This questions consists of three primary themes: strategy (compete), performance (success) and environment (endlessly restless world). In this section, these themes will be introduced.

#### **3.2.1 Strategy**

Strategy has been defined in a number of ways. The root is the Greek word 'strategos', meaning 'a general'. The Greek word stratego means to "plan the destruction of one's enemies through effective use of resources" (Bracker 1980), or the art of a general.

James Brian Quinn (Mintzberg, Quinn et al. 1995:7) once defined strategy more precisely as “the pattern or plan that integrates an organization’s major goals, policies, and actions into a cohesive whole. A well-formulated strategy helps to marshal and allocate an organization’s resources into a unique and viable posture based on its relative internal competencies and shortcomings, anticipated changes in the environment, and contingent moves by intelligent opponents”.

But what does that mean in practice? Are good strategies really planned, or do they emerge? (Mintzberg 1994). Is it possible to identify a good strategy beforehand, or could we only do that in retrospect? Although strategy has been around for almost 40 years the field of strategic management is characterised, today more than ever, by contrasting and competing paradigms (Table 5) (Hamel and Heene 1994). There is still no consensus in the strategy field around basic questions such as “what is a theory of strategic management about?” or “what should a theory of strategic management be about?”

More recently Mintzberg and Lampel vividly described strategy as an elephant (Mintzberg and Lampel 1999:21): “Consultants have been like big game hunters embarking on their safaris for tusk and trophies, while academics have preferred photo safaris – keeping a safe distance from the animals they pretend to observe. Managers take one narrow perspective or another – the glories of planning or the wonders of learning, the demands of external competitive analyses or the imperatives of an internal ‘resource-based’ view. Much of this writing and advising has been decidedly dysfunctional, simply because managers have no choice to cope with the entire beast.”

**Table 5. Overview of some conflicting paradigms in strategy research (Hamel and Heene 1994)**

	EITHER	OR
Purpose of strategy	Reacting on changes	Anticipating changes
Strategy	Is Created	Emerges
Strategy formulation	Top-down	Bottom-up
Strategy is about	Thinking	Doing
In focus	Content	Process
Strategy should be	Prospective	Retrospective
Strategy is about	Positioning within an industry structure	Redrawing industry boundaries
Essence of strategic management	Creation of sustainable advantage	Continuous discovery of new sources of advantages
The dynamic of strategy derives from	Search for "fit" between the firm and its environment	A "deliberately created misfit" between resources and affirmations
Boundary conditions for firm profitability are set by	Industry attractiveness	Managerial capability
Strategic vitality is caused by	Decentralisation and devolvement	Clarity of strategic direction emanating from the top of the company
Corporate winners are the product of	Darwinian selection	Purposeful action

In this review, I will not take a standpoint on whether strategies are planned or emerge. I will simply conclude that strategy, strategic decision making and strategic change are not well defined. We tend to recognise a strategy when we see it, but we are not too sure how to get to it (Hamel 1998).

### ***3.2.1.1 Strategy in management research from 1960s to 1990s***

Strategy is by tradition a multidisciplinary field. The theoretical framework underpinning this study is consequently not based on a single theory, but rather on a number of inter-linked theories. In that way, it could be called pragmatic. The emphasis however, is often similar. Strategy research is concerned with the performance differences between organisations, either



directly, or through study of organisational and environmental differences that lead to performance differentials (Barnett and Burgelman 1996). There are a number of theoretical rationales for explaining performance difference, including market power from an industrial economics perspective (Porter 1980); the resource-perspective (Hamel and Prahalad 1990; Barney 1991); power perspective within organisational network (Olivers and Ebers 1998); transaction cost economics (Williamson 1994); game theory explanations (Camerer 1994); organisational ecology theory of initial conditions and selection (Hannan and Freeman 1984); evolutionary ecology (Hannan and Freeman 1989) and strategic control (Kaplan and Norton 1996). Over the years, the perspective on what strategy is, as well as the focus of the research, has shifted. And as we have seen above, there is still no consensus.

The field of strategy research in management dates back to the early works of scholars such as Chandler (1962), Ansoff (1965), Lawrence and Lorch (1967), Thompson (1967) and Andrews (1971). The concept of strategy was either to design an optimal strategy, or to formulate a strategic plan.

During the 1980s, a new wave swept strategic management research. Triggered by the work of Miles and Snow (1978) and Porter (1980; 1985), strategic content research flourished (Eisenhardt and Zbaracki 1992), emphasising the characteristics of successful strategies rather than how they are formed. During the 1990s, another revolution took place, shifting the focus from the content of strategy to the strategic decision-making process (Schwenk 1995), hyper-competition and high-velocity environments (D'Aveni 1994; Brown and Eisenhardt 1997; Brown and Eisenhardt 1998), organisational capabilities (Barney 1991) and evolutionary aspects of strategy (Brown and Eisenhardt 1997; Ruef 1997).

During the 1990s, more companies and industries were faced with rapid and continuous change. A number of studies have focused on firms operating in that kind of heavily unstable, uncertain and hostile environment, finding that such an environment requires innovative differentiation strategies combined with organic, specialised and integrated organisations (Brown and Eisenhardt 1997; Chakravarthy 1997; Ozsomer, Cantalone et al. 1997). Consequently, in the context of highly turbulent environments strategy tends to be defined more as a posture or a combination of activities in order to achieve competitive advantage (Porter 1996; Brown and Eisenhardt 1997; Williamson 1999) than a plan to destroy the enemy. Lengnick-Hall and Wolf (1999) identified three major schools of the 90s. The first school is based on the capability logic, emphasising the need for superior resources. The second school is based on guerrilla logic, emphasising the need for speed, and the third is based on complexity logic, emphasising the need for a deeper understanding of the underlying forces and attractors in the business environment.

In this thesis strategy is defined in conformity with Quinn (1995) **as the plans or pattern of activities that integrates an organisation's major goals, policies and actions into a cohesive whole, manifest into a unique and viable posture based on its relative internal competencies and anticipated changes in the environment.**

### 3.2.2 Performance

Defining and measuring performance in research settings is tricky, and has even been considered “one of the thorniest issues confronting the academic researcher today” (Venkatraman and Ramanujam 1987:801).

Most commonly, performance has been defined in management literature as financial performance, measured through collection of either primary or secondary data. But financial performance is only one aspect of performance. There are also non-financial aspects (such as employee satisfaction, new products, 'excellence', service and product quality – and even operational efficiency and capability to change) (Venkatraman and Ramanujam 1986; Caruana, Pitt et al. 1994; Bettis and Hitt 1995). Another issue in relation to performance is time-frame – over what period should performance be measured?

Having too narrow a perspective on performance might mean trouble in interpreting the result of the research. As Lumpkin and Dess (1996) noted:

”Entrepreneurial activity or processes may, at times, lead to favourable outcomes on one performance dimension and unfavourable outcomes on a different performance dimension. For example, heavy investment in R&D and product innovation may enable a firm to successfully enter new product-market domains and consequently enhance sales growth in the end. However, the requisite resource commitment may detract from short-run profitability. Thus, research that only considers a single dimension or a narrow range of performance constructs may result in misleading descriptive and normative theory building.”

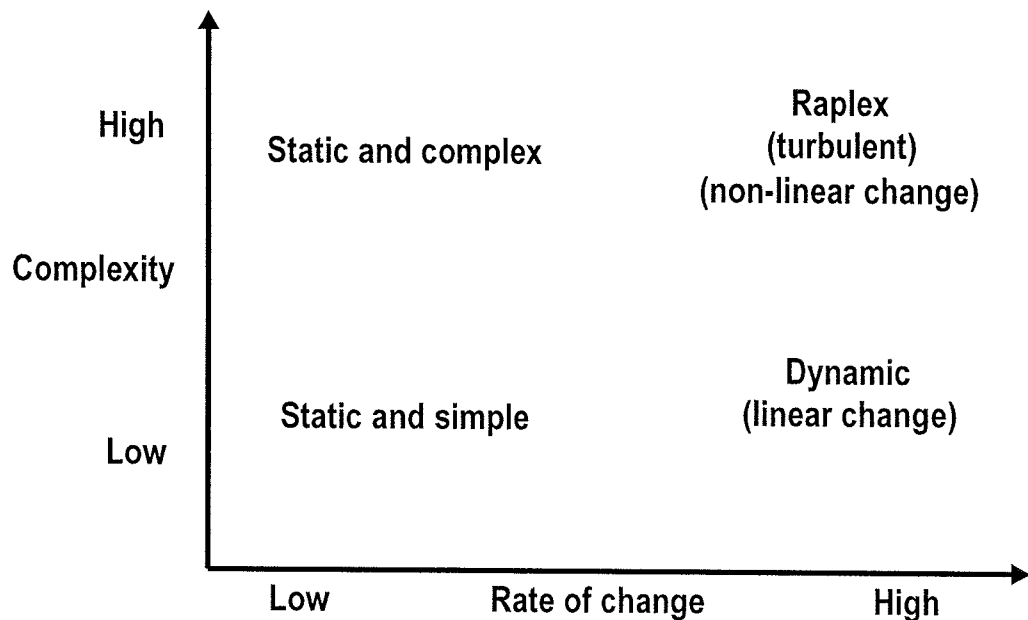
Venkatraman and Ramanujam (1986) define three domains of performance: financial performance; business performance (financial+operational performance); organisational effectiveness. In conformity with Venkatraman and Ramanujam (1986), performance in this thesis is broadly defined as overall output performance, or the **combination of financial performance, business, and organisational effectiveness, and the ability to successfully invest in future capabilities.**

### 3.2.3 Environment

The third theme, environment, has been in focus for management researchers for decades. In the 1960s, several researchers found that the business context was central to organisational performance (Lawrence and Lorsch 1967; Thompson 1967). It was even regarded as the “cutting edge” of organisational analysis, and, thus, coping with uncertainty was considered the essence of the administrative process (Thompson 1967).

Environmental uncertainty is characterised by the rate of change and innovation in the industry, as well as the uncertainty or unpredictability of the actions of competitors and customers (Ozsomer, Cantalone et al. 1997). Different researchers have defined the uncertainty in different ways and used different notions to describe similar phenomena. Miller and Friesen (1978) specified uncertainty as the “amount and unpredictability of change in customer tastes, production or service technologies, and the modes of competition in the firm’s principal industries”. Emery and Trist (1965) classified the organisational environment in terms of its complexity and dynamic. The larger the organisation, or the more complex its market and product portfolio, the greater the complexity it faces. Complexity is a measure of the number of competitive configurations that a firm must consider in shaping its own strategy. The dynamic of the environment is the rate at which these configurations change. An interpretation of the relationship between uncertainty (unpredictability) and complexity and dynamic is that the more complex and dynamic an environment becomes, the more unpredictable and thus uncertain it becomes too. When the environment is complex and changing rapidly the resulting turbulence makes orderly conduct among competitors more difficult (Ansoff 1984; Chakravarthy 1997).

The various definitions of dynamism, turbulence and velocity, make direct interpretation of the results of different studies difficult. What some researchers call turbulent, others call dynamic (Hart and Banbury 1994). To avoid confusion in this thesis the word raplex (rapid and complex) will be used for environments that are both rapidly changing and complex. An overview of the two environmental dimensions is presented in Figure 6.



**Figure 6. Different types of environments with respect to complexity and change. Adapted from Chakravarthy (1997).**

Hostility is another and slightly different aspect of the environment, related to the very survival and growth of the firm (Ozsomer, Cantalone et al. 1997). While uncertainty to a high degree has to do with opportunities (the number of competitive dimensions, expanding markets, product and technological innovations etc.) hostility has more to do with restrictions and lack of control. Munificence could be considered the opposite of hostility.

So far, not too many firms and industries are facing genuinely raplex environments. The infocom industry (or TIME-industry as it has been called since autumn 1999 – telecom, IT, media and entertainment) with content producers, broadcasting and telephone companies, and computer and telecom equipment producers is the most significant raplex industry. But since the advances in the infocom industry are changing the rules of the game in other parts of the business world as well, other industries are slowly becoming more and more raplex. Internet commerce is one of the forces changing the rules of the game in many places, helping local companies to go global, and giving local shops competition from global players. Consequently, there are reasons for a closer study of strategic decision-making in raplex environments.

In this thesis, the concept of raplexity is used. A raplex environment is a **rapidly changing, complex and unpredictable environment**.

The focus of the research is on environments that could be considered moderately to highly raplex. In such environments the uncertainty and unpredictability are high, but it is still meaningful to scan the environment and to make scenarios for the future (Schwartz 1991; Shoemaker 1994; Van der Heijden 1996; Courtney, Kirkland et al. 1997). In extremely raplex environments, the uncertainty becomes genuine, the unpredictability complete, and planning thus becomes more or less meaningless (Courtney, Kirkland et al. 1997).

### **3.3 Organisation and change**

The whole concept of strategic flexibility, adaptation and strategic response capability assumes the possibility of strategic change. But do organisations change, and to what degree are they able to change direction or

processes? Under what circumstances? For years, that has been one of the most central questions in strategy and organisational research (Greenwood and Hinings 1996; Sastry 1997; Macintosh and Maclean 1999). In short, there are two answers to those questions, based on two fundamentally different perspectives.

The first comes from the strategic adaptation school, which emphasises the managers' role in scanning the environmental changes and adopting a strategy to match the changing environment (Child 1972; Johnson and Scholes 1999). The viewpoint is that managers matter and can have an influence on the destiny of a firm, and consequently the model of strategic change based on that assumption has been labelled 'strategic choice'. From the discussion in the previous section, it is obvious that Bettis and Hitt (1995) fall mainly into this category.

The second perspective comes from the inertial school, which claims that organisations are basically unable to change and focuses on the general tendency to preserve rather than radically change existing strategies (Hannan and Freeman 1984; Hannan and Freeman 1989; Ruef 1997). The inertial school thus tends to apply an external control perspective to strategic decision making, arguing that decisions are largely constrained by the external environment and that management can't make much of a difference.

In recent years a number of both theoretical and empirical models that argue for both strategic choice and external control in decision making, have surfaced in the literature (Hitt and Tyler 1991; Lovas and Ghoshal 2000). For instance, in a study examining strategic decision making models guiding acquisition decisions Hitt and Tyler (1991) found the rational strategic choice

perspective explains the variance in acquisition decisions best, but that the strategic decision models varied with the industry and executive characteristics.

In this thesis, I will lean towards a 'realistic' strategic choice perspective, where strategy and changes is perceived as a process of 'guided evolution' (Lovas and Ghoshal 2000).

#### ***3.3.1.1 The antecedents of strategic change***

Strategic change has to do with organisation's ability to adapt to changing circumstances by exploiting opportunities and coping with threats. Based on works by e. g. Hannan and Freeman, the population ecology metaphor has been used to explore this fit between organisations and their environments. Hannan and Freeman suggest that organisations in principal are rigid and resistant to change, thus falling into the camp of the inertial school. One reason might be that change increases the likelihood of failure, since any significant change demands resources and thus reduces the efficiency of the organisation. Evidence for that has also been found in the literature (Ruef 1997). So, if change increases the risk of failure, why would a firm ever attempt to change? When would it be worth the risk?

Haveman (1992) answers that question with reference to the theory of punctuated equilibrium and concludes that there might be situations, such as when environmental change threatens the organisation's existence, when benefits of organisational change exceed the risks. Haveman also found, contrary to stricter population-ecology theory, a positive relationship between change and performance in her study of the savings and loans industry.

Sinha and Noble (1997) extended Haveman's analysis and applied it to changes in the banking system due to the introduction of the automatic teller



machine. They proposed that it is not only change that matters, but also the magnitude of change and whether the change is voluntary or not, and that at high magnitude change the organisation will overcome inertia either by choice (voluntary change) or by necessity (involuntary change). Applied to the study of subfield entry (high magnitude voluntary change) they found support for their proposition and found evidence for a strong first-mover advantage in technical sub-fields.

Ruef (1997) analysed strategic movement in the competitive landscape of Californian hospitals during the 1980-90 period, using the Jaccard similarity coefficient. The results indicated that few hospitals were able to overcome the inertial forces in adapting their service portfolios. Furthermore, the ability to change decreased with increasing provider density. A reason for that might be the decreasing benefits of differentiation into areas where population density is high. Others (Slevin and Covin 1997) have found that hostile environments, defined as competitive and risky, have proved to reduce the ability to change.

Referring to Haveman's (1992) 'life and death' notion, one would expect present performance to negatively influence the ability to change. Support for that assumption has also been found in the literature. Hambrick, Geletkanycz, and Fredrickson (1993) found in a multi-industry study of top executives' 'commitment to status quo' (CSQ) that not only the executives' tenure in the industry, but also the present firm performance, were significant determinants of CSQ. And the latter finding was more significant in high-discretion industries (characterised by low capital intensity, product differentiability, low degree of regulation, and high market growth) than in low-discretion industries. Boeker (1997) found in a study of managerial characteristics and strategic change that

poor performance was related to greater levels of corporate strategic change, indicating that poor performance might function as a trigger for strategic search, while high performance functions as confirmation of the appropriateness of the present strategy (Johnson and Scholes 1999). This finding indicates the need for constantly moving reference points (to support change in a constantly changing environment) (Feigenbaum, Hart et al. 1996). Sastry (1997) found support for the same conclusions when he tested a theory of organisational change and performance developed by Tushman and Romanelli (1985) through dynamic modelling.

Based on his computer simulations, he also concluded that under turbulent conditions there is a need for internal pacing, which suspends performance evaluation for a period following a reorientation and allows the organisation to rebuild its capabilities. Constant and significant change will destroy competence and thus negatively affect performance.

### 3.3.2 Summary of organisation and change

To summarise, it seems that there are two competing forces within organisations. One force initiated by the misfit with the external environment forcing the organisation to act in order to achieve fit, and another force driven by historical performance and practices holding the organisation back. From the perspective of strategic response capability, to obtain long-term performance it is not only important to achieve fit to the present environment, but to visualise the future business environment and conceptualise and implement a response to the challenges that might arise. But the risk is that present performance, as well as an industry or internal too narrow focus, will inhibit the ability to see the need for a future change.

### **3.4 Management**

“Only executive leadership has the position and potential to initiate and implement strategic change,” Tushman and Romanelli say (1985:209). The top managers influence the organisation both through decisions and through being role models for the rest of the organisation (Schein 1992). The executive team attributes, as well as the characteristics of the CEO, have been proved significant not only of organisational strategy but also firm-level performance (Eisenhardt and Schoonhoven 1990). But how and to what extent does top management influence performance? And what are the management antecedents to performance and strategic response capability?

There are, in short, three perspectives on the top management team that have been found relevant to the research question: the CEO-focus and tenure, the composition, orientation and diversity of the TMT, and the interactions between the TMT members.

#### **3.4.1 CEO Characteristics**

Research has found that the CEO alone has a great impact on the organisational outcomes, although the top management team is still more predictive of failure and success (Finkelstein and Hambrick 1990; Smith, Smith et al. 1994). Consequently, there is a reason for the management magazine’s focus on the top executives such as Apple’s Steven Jobs and Microsoft’s Bill Gates, to mention but two. The return of Steven Jobs in the mid-90s took Apple from “close to death” to all-time high on the stock market within a few years.

The research on the CEO-performance relation has found that CEOs primarily affect performance indirectly through the decision-making process of the top management team. Thus, autocratic CEOs have been found to

generate political behaviour (Eisenhardt and Bourgeois III 1988), which in turn is associated with ineffective decision making (Dean and Sharfman 1996) and poor performance (Eisenhardt and Bourgeois III 1988).

The effects of the CEOs' values, tenure in the industry and organisation, and cognitive orientation have also been studied. Hambrick, Geletkanycz, and Fredrickson (1993) found on executive's tenure in a certain industry to be a better determinant of commitment to status quo (CSQ) than organisational tenure. As Hambrick, Geletkanycz and Fredrickson (1993:412) conclude: "Those individuals who have participated in this 'social construction of reality' for the longest time are most convinced of its correctness."

Consequently, they are not very interested in changing the rules. Others have found CEO organisational tenure to be negatively related to strategic change (Boeker 1997) and consequently positively related to strategy CSQ (Hambrick, Geletkanycz et al. 1993; Gelatkanycz and Hambrick 1997) and less productive in complex and turbulent environments (Keck 1997).

CEOs' cultural values have also been studied as antecedent to strategy. Geletkanycz (1997) showed in a cross-national study that commitment to existing strategy and leadership is related to values of individualism, uncertainty avoidance, power-distance and long-term orientation. Her findings indicate that culture has an important impact on executive mindsets, demonstrated by the fact that executives of differing cultural background are not equally open to change in organisational strategy and leadership profiles, although it would be equally favourable to their respective organisations.

To summarise, CEOs influence strategy and performance, but the performance impact is primarily indirect through the top management team (TMT), decision-making processes, strategy, and organisational structure.

### 3.4.2 TMT diversity and information collection

Research in recent years has found that the characteristics of the top management team are highly predictive of a wide array of organisational outcomes and are substantially more predictive than characteristics of the CEO alone (Finkelstein and Hambrick 1990; Smith, Smith et al. 1994).

Diversity in the top management team has long been assumed to have a positive effect on performance and ability for strategic change. However, results so far are contradictory. For instance, Boeker (1997) found in the analysis of a strategic change in the semiconductor industry that tenure heterogeneity in the top management team was positively related to corporate strategic change and Bantel and Jackson (1989) found a positive relationship between TMT heterogeneity in functional background and innovation in banks.

Smith et al. (1994), on the other hand, found less straightforward results when testing the relationships between different aspects of heterogeneity, team communication and performance. For instance, diversity in educational level was found positively correlated to ROI and sales growth, while diversity in functional background was not. Their conclusion was that the top management team's demography is directly related to performance, but primarily indirectly related to performance through process. Priem (1989, referred to in Schwenk (1995)) explored different aspects of heterogeneity of TMT performance in the stable paint and allied products industry, and argued for a negative relationship. Although most of the correlations were insignificant, they were positive, and the opposite to what was expected. Finally, Miller, Burke and Glick (1998) found that executive cognitive diversity, that is diversity in preferred goals and interpretation of cause-effect beliefs, in hospital top management teams inhibits

rather than promotes comprehensive examination of opportunities and threats, and inhibits long-range planning, and thus negatively affects performance.

Another aspect of diverse opinions is the opinions originating from the organisation's environment and entering the organisation through the executives' boundary-spanning activities. Such diversity could be called information diversity. Gelatkanycz and Hambrick (1997) found that the executive team's external ties, interindustry as well as intraindustry ties, are significant for shaping firm strategies. Executives' intraindustry ties are related to strategic conformity, while their extraindustry ties are associated with the adoption of deviant strategies. Extraindustry ties in alignment with the information requirements of the organisation enhances organisational performance.

But how do executives in general get information of the world outside their own organisation? In short, they do what they do at home. They look at their neighbours, in this case the competitors and others in the marketplace. "Aha, he mows the lawn like that. I could try that myself", they all seem to think. That is also the reason why intraindustry ties, 'listening-to-the-neighbour-behaviour' enhances strategic conformity.

Research focusing on TMT characteristics of intra-team relationship has found significant relations between team constitution and activities, and efficient decision-making. Thus, Finkelstein and Hambrick (1990) found that long-tenured management teams follow more persistent strategies that conform to industry means and that tenure is more closely related to strategy and performance in high-discretion industries. Similarly, Boeker (1997) found TMT tenure to be negatively related to change.

### 3.4.3 Intra-team relations

The results above indicate that while diversity among top executives might lead to a willingness to change by being more open for alternatives, the diversity might also lead to destructive politics inhibiting both the decision-making process and the implementation of change, and therefore, negatively affecting firm performance. In her study of software firms, Eisenhardt (1989) found decision-speed crucial to performance and success in high-velocity environments. Since decision-speed is closely related to intra-team relationships, those relationships might be more important in high-velocity than in low-velocity environments.

Eisenhardt, Kahwajy, and Bourgeois (1997) found a significant relation between efficient decision-making and intra-team interactions in a study of IT-companies. Efficient decision-making was found to be related to teams whose members: worked with more, rather than less, information and debated on the basis of facts; developed multiple alternatives to enrich the level of debate; shared commonly agreed goals; injected humour into the decision process; maintained a balanced power structure; resolved issues without forcing consensus. Smith et al (1994) found similarly that social integration of the TMT was positively correlated to both profit and growth. An open and fact-oriented climate seems to be crucial to efficient decision-making. And conflicts should not be left out, but handled constructively. In a meta- analysis of past research, Schwenk (1990) even found support for the value of techniques introducing conflict into strategic decision-making, such as the devil's advocate.

Consensus is often regarded as a critical issue in strategic decision-making, and consensus on a chosen strategy has also been found to be more important for organisations following a differentiation strategy than for those

choosing a low cost strategy (Homburg, Krohmer et al. 1999). However, that relation seems to be weaker in raplex business environments, indicating that in times of rapid market change the benefits of consensus are lower, since the market may have changed by the time consensus is reached (Homburg, Krohmer et al. 1999).

Bourgeois and Eisenhardt (1988) have consequently noted that there is pressure for both rapid and high-quality decision-process, and that that pressure is especially high in high-velocity environments. Will that force decision-makers to be more task-orientated and thus inhibit political behaviour, and consequently making diversity to primarily an asset? Whereas in less decision-speed demanding environments where the need for task-orientation is less pronounced, political behaviour is enhanced by diversity among the top management?

#### 3.4.4 Summary of management and performance

To summarise, the TMT characteristics seem to be more important to strategic decision-making and performance than the CEO alone. The richness of external information (through diversity in background, networks, tenure etc) is important for the TMT to quickly observe threats and opportunities, and good intra-team relations (non-politics, social integration etc) are important to quick decision-making.

### 3.5 Organisational structure

In the resource-based view, organisational structure can be regarded as an organisational asset (Barney 1991). Several studies have shown over the years that in order to achieve high performance organisational structure must match



chosen strategies (Miller 1988; Jennings and Seaman 1994)). Strong evidence has also been found for the classical perspective (Chandler 1962), that structure follows strategy rather than the opposite (Miller, Dröge et al. 1988). But structure has not only been found a consequence of chosen strategy. Researchers have demonstrated, for instance, that the CEO's need for achievement (nAch) might as well be a predictor for structure (Miller and Dröge 1986; Miller, Dröge et al. 1988). And scholars based in the tradition of organisation ecology or complexity theory have claimed the importance of initial conditions and organisational inertia (Hannan and Freeman 1984, 1989).

A number of studies have focused on firms operating in heavily turbulent environments, finding that such environments require innovative differentiation strategies combined with organic, specialised and integrated organisations (Miller 1988; Covin and Slevin 1989; Brown and Eisenhardt 1997; Ozsomer, Cantalone et al. 1997). But the findings have not been completely consistent. I will here briefly discuss three aspects of organisational structure that emerge in the literature dealing with organisations in raplex environments, namely structure, integration, and control.

### 3.5.1 Adaptive structure

The need for adaptive structures to be able to cope with a changing environment is an old notion. Lawrence and Lorsch (1969:26) already noted that "life in an organizational unit must become more complex in order to deal adequately with an uncertain and rapidly changing sector of the environment. To have more points of contact with the environment, a flatter organization is employed. Formal rules cannot be formulated ... all-to-all communication ... longer time orientation."

Others have found similar results more recently. For instance, Brown and Eisenhardt (1997) found in a study of the computer industry, that successful firms combine limited structure with extensive communication and design freedom. They also found that those organisations tend to experiment themselves into the future using experimental products, futurists, and strategic alliances.

Brown and Eisenhardt (1997:3) based their research on what they themselves call “an emerging organisational paradigm, which combines field insights with complexity theory and time-paced evolution”. Their key notions are that successful organisations are semi-structured (balancing on the edge of chaos), sufficiently rigid so that change can be organised to happen, but not so rigid that it cannot happen. Secondly, these organisations use ‘links in time’, explicit organisational practices that address past, present and future time horizons and transitions between them. Thirdly, they have a proactive view of change. They see themselves as ‘aggressive’, ‘opportunistic’, ‘striking first’ and setting the pace of change themselves.

Consequently, Brown’s and Eisenhardt’s (1997) findings further emphasise the need for an alignment between environment, strategy and structure in order to achieve high performance, and that the alignment is more crucial and looks different in high-velocity environments than in more stable settings.

### 3.5.2 Internal integration

Integration is one of the least considered aspects of organisational structure (Fairbairn 1997). Integration has been defined as “lateral linkages that co-ordinate differentiated sub-units, reduce conflict and duplication, foster mutual adjustment, and coalesce sub-units toward meeting overall organisational

objectives” (Miller and Dröge 1986:542). Miller (1987) defined it as liaison devices, including task forces and co-ordinative committees. Such integrative devices seek to “encourage rationality in decision-making by precipitating contacts among decision-makers that may motivate systematic attempts to develop, scrutinise, and reconcile divergent perspectives” (Miller 1987:11).

In the context of raplex environments it could be argued that to adapt quickly to shifting environments there is a need for an adaptive flexible structure where each part of the organisation is free to search for an optimum in its own competitive landscape. But to see the same long-term picture and co-ordinate joint activities there is a need for co-ordination of perceptions of opportunities and threats, responses to those threats and short term actions. Integration in this respect focuses on integration of plans and activities, not of culture and norms. Several researchers have found such integration important in combination with innovative differentiation (Miller 1988; Brown and Eisenhardt 1997).

### 3.5.3 Cultural control and culture

During the 1990s, several scholars have argued for the need for new types of control systems based on visions and culture rather than formal instructions (Senge 1990; Kaplan and Norton 1996; Kotter 1996; Collins and Porras 1997; Brown and Eisenhardt 1998).

The traditional approaches to strategic control emphasise boundaries and constraints. But as the competitive environment becomes more raplex, the demand for both flexibility and quick response increases. As firms simultaneously downsize and face the need for increased co-ordination across organisational boundaries, a control system based primarily on boundaries and

constraints becomes dysfunctional according to Picken and Dess (1997). The use of rewards and culture to align individual and organisational goals becomes increasingly important.

Løwendahl and Revang (1998) have introduced another argument for cultural control, what they call the new complex-complex environment. Not only does the external environment becomes complex and rapidly changing, they argue, but also the internal environment becomes more complicated to control when employees (and young managers) see themselves as free agents and view their career as a series of opportunistic changes. The implicit long-term contract between the organisation and its key employees has thereby been eroded. Thus, organisational culture becomes increasingly important as a loyalty builder (Collins and Porras 1996; Collins and Porras 1997).

#### 3.5.4 Summary of organisational structure and performance

Emerging themes in the field of organisational structure in relation to strategic change in the context of raplex environment, are adaptive structures, integration and cultural control.

### 3.6 Strategic planning process

Over the last 20 years a great number of studies of the relationship between planning and performance have been carried out, starting with Andrews' and Ansoff's work in the 1960s and 1970s. Despite that, there has been no convincing evidence for the positive effect of planning on performance until recent days when several meta-analytical analyses of previous studies have shown a strong and positive relationship between planning activities and

performance (Pearce II, Freeman et al. 1987; Boyd 1991; Miller and Cardinal 1994).

In the context of raplex environments, five aspects of the strategic planning process will be discussed: the content of the planning (what); its extensiveness or comprehensiveness (how); participation (who); decision-speed (how quickly) and strategic planning as a competence.

### 3.6.1 Planning emphasis

One of the reasons for the previous debate on whether planning matters or not, is that there has been no general agreement on what strategic planning is. Thus, different researchers have chosen different constructs limiting the generalisability and comparability of individual studies.

Not until recently was a solution to that problem presented when Boyd and Reuning-Elliot (1998) developed and validated a multiple-item measure of strategic planning. Future research will show the relevance of that work.

Boyd and Reuning-Elliot's work relates to one of the two aspects of the 'strategic planning factor', namely content. The content aspect refers to what a strategic planning activity is. The other aspect is the 'process aspect', referring to how the planning is performed.

Defining planning as basically a normative process Boyd and Reuning-Elliot found, based on previous research, seven planning aspects to be relevant and used them as the fundament in their strategic planning scale. They also found several other aspects analysed in the literature, such as degree of sophistication, comprehensiveness, completeness, rationality, and formality, which they excluded from their planning scale.

### ***3.6.1.1 Environmental scanning***

One aspect of the planning emphasis is the focus of the first phase of the strategic planning cycle, namely information gathering through environmental scanning. Several studies focusing on the relationship between scanning activities and performance have proved a strong relationship between formal scanning procedures and organisational performance. Subramanian, Fernandes and Harper (1993) found that 60 percent of Fortune 500 companies have advanced scanning systems and that there is a significant relation between scanning activity and performance (ROI) and growth. Jain (1984) showed that scanning could be described as a series of phases increasing the sophistication of the process. In a study of Russian companies, Elenkov (1997a) found a positive relationship between the sophistication of the scanning system and growth and profitability in Russian companies.

### ***3.6.1.2 Strategic reference points***

A classic problem in the field of strategic management has been how to establish and maintain a match between environmental demand and internal capabilities. Since the environment is constantly changing, the capabilities have to be constantly adapting to the changing environment (Itami 1987). Itami captured that with the concept of 'dynamic fit', observing that the role of management in today's world is both to create and destroy alignment. In management literature as well as management research there has been several attempts over the years, from different theoretical perspectives, to identify targets (or reference groups) which expose gaps and thereby raise the individual's or organisation's aspiration levels (Railo 1988; Senge 1990; Hamel and Prahalad 1994). Feigenbaum, Hart and Schendel (1996) found seven theoretical

perspectives emphasising either external or internal conditions, or time as central reference points. In the article, they develop a concept of ‘strategic reference point’ with a three-dimensional matrix based on the dimensions internal–external, time, and functional area. On the basis of earlier research, where organisations have been found to behave as risk-takers when below the reference point, and risk-aversers when above, Feigenbaum, Hart and Schendel argue that successful organisations will possess internally consistent multidimensional strategic reference points that they continuously alter or revise.

The strategic reference-point focus could be considered an aspect of what above was called planning-focus, and more specifically the aspect of planning related to visions and long-term goals. In the context of strategic change, the reference-points could function as triggers for voluntary change (Boeker 1997; Sinha and Noble 1997).

### 3.6.2 Procedural rationality and comprehensiveness

Studies of strategic decision-making rationality focus on “the extent to which decision makers follow a systematic process in reaching carefully thought-out goals” (Schwenk 1995:475). They fall into the tradition of scholars like Andrews (1971), Ansoff (1965) and Steiner (1969) who emphasised a normative approach to strategy formation, that strategy formation is to plan, then act in a manner prescribed by the plan.

Numerous studies have operationalised decision rationality along a theoretically-derived continuum and adopted a contingency approach when examining strategic decision making rationality and the impact of contextual variables on the decision making process performance relationship.

Fredrickson (1984) operationalised the decision making rationality in the construct of 'comprehensiveness', which was defined as "the extent to which an organization attempts to be exhaustive or inclusive in making and integrating strategic decisions" (1984:447). Early findings indicated a positive relationship between comprehensiveness and performance in stable environments (Fredrickson 1984) and a negative relationship in unstable environments (Fredrickson and Mitchell 1984). Later, Eisenhardt (1989) found comprehensiveness (with a slightly different definition) to be positively related to performance in unstable (high-velocity) environments, while Powell (1992) found planned strategies to be economically favourable among firms in 'planning disequilibrium' industries, that is industries where planning is not commonplace.

Slevin and Covin (1997) operationalised the strategic decision making rationality along the emergent-to-planned strategy dimension. That was an attempt to bridge the incremental/adaptive models of strategic decision making, which can be seen as boundedly rational, with the synoptic/linear models, which can be categorised as rational. They also tried to match the strategy formation process with organisation structure and environmental hostility. Their findings indicate the necessity to match the strategy formation process with adequate organisation structure. Planned strategies were positively related to sales growth among firms with mechanistic structures operating in hostile environments. Emergent strategies were more positively related to sales growth among firms with organic structures and operating in benign environments.

Dean and Sharfman (1996) took a slightly different approach to the decision making rationality issue. Instead of focusing on economic outcomes of the strategic decision making process they studied the perceived effectiveness of the strategic decision process. Their conclusion was simply that process matters.



Procedural rationality was significantly positively related to effectiveness and political behaviour was significantly negatively related to effectiveness.

Finally, Papadakis, Lioukas, and Chambers (1998) examined the relationship between decision process and various contextual variables, and top management characteristics. They found that decision-specific characteristics had the most important influence on the process, i.e. comprehensiveness/rationality. Environment and management factors were found insignificant.

### 3.6.3 Participation

Researchers engaged in the area of organisational learning and strategy often focus on the need for organisation wide participation in planning (Senge 1990; Kotter 1996; Collins and Porras 1997). The same could be said about researchers studying environmental scanning activities (Hamrefors 1999).

Unfortunately, most of these claims are based on intuitive appeal and anecdotal evidence.

Norrgren, Hart et al. (1996) evaluated over 80 change projects in Swedish companies during the period 1990-95. The result of the study was that the only effective change model was the interactive or learning model, which was found to be significantly efficient with respect to both organisational and workplace issues. In that model, the employees were involved in the planning and implementation of strategic change.

While Norrgren et al. focused on organisation wide participation, Oswald, Mossholder et al. (1994) studied manager's involvement in the strategic planning process and found a positive correlation between strategic involvement and organisational commitment. However, the effects on performance were not

measured, although the more managers participate in strategy formulation, the more likely they will be to accept and act to implement the strategy (Quinn 1978).

The more turbulent the environment is the higher the demands on quick and integrated decisions. The sense of a salient vision and internalised strategies could thus be expected to become more important than in less turbulent environments.

#### 3.6.4 Decision-making and speed

Decision-speed is intuitively critical to performance in raplex environments. Several researchers have also studied the relations and found a positive impact of decision-speed on performance (Bourgeois and Eisenhardt 1988; Judge and Miller 1991). Politics within the organisation has also been found to slow down the decision-making process (Eisenhardt and Bourgeois III 1988; Dean and Sharfman 1996).

In several studies Eisenhardt and colleagues have analysed aspects of decision and implementation speed, finding that fast decision makers are more comprehensive since they use more information, develop more alternatives, and use a two-tiered advice process (Eisenhardt 1989). They also handle conflicts more creatively, use experimentation and low-cost probes into the future, communicate extensively etc (Brown and Eisenhardt 1997). Judge and Miller (1991) found that decision-speed was associated with simultaneous consideration of many alternatives regardless of context, possibly another aspect of comprehensiveness. Decision-speed was also highly linked to performance in the volatile biotech-industry.

But as J Freeman has noticed: “Speed of implementation matters, also because the world within which firms operate is constantly changing –

sometimes rapidly or erratically, sometimes more slowly or more predictably” (Freeman 1995:220).

### 3.6.5 Strategy process competence

The business environment of any organisation is never homogenous in terms of raplexity. In some aspects and at certain periods it is more raplex, and in other aspects or at other periods, it is less raplex. Thus, you could expect that organisations that are capable of adapting their strategic decision-process to the decision context, or with the ability to use several methods simultaneously, would be more successful than others. And therefore, that organisations with higher decision-making competence would out-perform less competent organisations.

That was also the result of a study of 285 top managers by Hart and Banbury (1994). Hart and Banbury tested a multi-dimensional strategy-making model consisting of five strategy-making modes, developed by Hart (1992). They found that organisations with high process capability – the simultaneous use of multiple strategy-making process modes – outperform single-mode or less process-capable organisations. The result indicates that strategy-making flexibility is important, especially in larger organisations and in environments that are more turbulent. These results are also in line with Kukalis (1991) findings that firms adopt more flexible planning systems as the level of complexity increase.

A counter-intuitive finding in their study was that among the large firms operating in raplex environments both high and low capacity firms were high performing. An explanation might be that such firms have to make a choice – either to develop fast-cycle competence in multiple modes or to ‘throw the

process to the wind' and concentrate on the business (Hart and Banbury 1994:266).

Hart and Banbury's findings are consistent with a theory developed by Jane McKenzie (1994), based on chaos theory. In short, her theory is that success in chaotic environments depends on the ability to manage paradoxes, such as balancing top-down with bottom-up, thorough planning with entrepreneurial search etc. Ability to manage paradoxes could be considered an aspect of sense-making capability, which becomes increasingly important in turbulent environments (Raimond 1998). Applying the theory in re-engineering projects, she found some evidence for it.

### 3.6.6 Summary of strategic planning process and performance

Planning emphasis, including emphasis on scanning and strategic reference-points, comprehensive and simultaneous evaluation of alternatives, participation in the strategic planning process and strategy-making competence are some of the emerging themes on strategic planning process in relation to strategic change and performance.

## 3.7 Strategy

In the context of the planning school (Mintzberg, Quinn et al. 1995), the strategy, in the sense of a combination of activities a firm choose in order to out-compete its rivals, is the result of the strategic planning activity. In reality, the specific chosen strategy is often a result of combinations of environmental conditions, top management personality, general strategic orientation, and ambitions, sudden opportunities etc. And consequently they emerge over time as much as they are the result of rational planning processes

(Mintzberg, Quinn et al. 1995). In raplex environments, two themes in combination seem to emerge: variety through experimental strategic posture and simplicity through time-pacing and focus on basic rules and competencies.

### 3.7.1 Strategic posture

Strategic posture can be broadly defined as a firm's overall competitive orientation (Covin and Slevin 1989) – that is whether the firm is proactive or reactive, innovative or conservative, risk-taking or risk-averting etc. On the one hand, strategic posture could be considered a manifestation of organisational culture, on the other hand the choice of strategic posture could be considered the most important strategic decision, from which every other decision should follow. Examples of such decisions are the choice between differentiation vs. cost-leadership strategy and choice of organisational structure and remuneration systems.

Several studies during the 1980s and 1990s were based on Miles and Snow's topology of strategic postures. Miles and Snow (1978) suggested that an organisation's strategies have three domains: the entrepreneurial, relating to how the organisation orients itself in the marketplace; the administrative, embracing how the organisation attempts to co-ordinate and implement strategies; and the technical, referring to the technology and processes used. Firms following a prospector strategy frequently change their products in an ambition to be first in the market. Analysers try to maintain a relatively stable base of products and more carefully move into new promising markets. Defenders are focused on doing the best job possible in their area of expertise. Reactors, finally, are lacking a consistent strategy.

Validating the topology, Shortell and Zajac (1990) found strong evidence for the strategic orientation variable. Prospector organisations are more orientated towards innovation, diversification etc than analysers and defenders. They also found that prospectors need more planning than analysers and defenders.

#### ***3.7.1.1 Innovation and proactivity***

Research in the field of strategy in raplex environments has emphasised the importance of innovation and proactivity as well as the antecedents and implications of innovativeness. For instance, Brown and Eisenhardt (1997) found that successful firms in the computer industry rely on a wide variety of low-cost probes into the future: experimental products, futurists, and strategic alliances. Similar conclusions have been delivered by Zahra (1991;1993), and by Chakravarthy (1997:69) who argue that in turbulent environments, “market leaders must repeat innovations, establish customer networks, sense the flow of new products, and share responsibility for new strategy throughout the firm”.

As seen above, such innovative orientation is closely related to prospector strategy.

Innovativeness in the sense of ‘being innovative’ could not be regarded as a strategy, but as an organisational competence as well and thus an outcome of a chosen strategy and culture. Empirical results also seem to support that notion. In a study of the relations between innovation, strategic posture and structure it was found that innovativeness is directly influenced by the strategic posture adopted by the firm to compete in a hostile or uncertain environment (Ozsomer, Cantalone et al. 1997). The choice of an aggressive, competitive, risk-

taking strategic posture apparently influences innovativeness. “This suggests that the firm chooses (or perhaps gravitates gradually to) a more organic, flexible structure to be able to support a proactive, aggressive, risk taking posture” (Ozsomer, Cantalone et al. 1997:408). It was also found that organisational structure affects innovativeness only through strategic posture.

Ozsomer, Cantalone, and Di Benedetto (1997) also found that innovative strategic posture was positively related to strategic uncertainty, but negatively related to environmental hostility. They interpreted that as results of rational behaviour. In too hostile and risky environments, firms may act safely, not risking their own life. Finkelstein & Hambrick (1990) similarly found a conformist approach to be more favourable in a hostile environment, as in the computer industry. Miller, Dröge and Toulouse (1988) found similar results testing the relations between uncertainty, innovation, strategy and structure. They also found that strategic process and content act as mediators between environment and structure and that strategy clearly influences structure, but not the opposite. As we have already seen, Miller (1988) came to the same conclusions, that there is a strong relationship between innovative differentiation strategy, uncertain environments and use of technocrats (specialisation) and liaison (integrating) devices. Cost leadership on the other hand was found to correlate to stable predictable environments and the use of control.

In a multi-industry study, Dess, Lumpkin and Covin (1997) explored the nature of entrepreneurial strategy making (ESM), characterised by innovativeness, risk taking, experimentation and proactive assertiveness, and found that ESM is a mode that is chosen by organisations when appropriate. They also found that ESM was most closely related to performance when it was combined with both the appropriate strategy and environmental conditions. An

interesting finding was that firms combining cost-leadership strategy with ESM, although they are not naturally consistent, excelled in the current sample. That could be explained through Hamel and Prahalad's (1990) observation that successful firms build layers of advantage.

In a study of strategy under causal ambiguity, Elaine Mosalowski (1997) found that differentiation through calculated experimentation might be a natural response to causal ambiguity. That means that firms actively search for opportunities to assign resources to uses.

#### ***3.7.1.2 Scanning follows environment and strategy***

The chosen strategy also correlates to the environmental scanning behaviour. Jennings and Lumpkin (1992) found in a study of 56 companies in the Savings and Loans-industry that differentiation strategies lead to a focus on opportunities and customer attitudes, whereas a cost-leadership strategy tends to lead to competitor scanning. The finding is in line with a more general conclusion, namely that scanning intensity in general is related to the perceived uncertainty and importance of the scanned area.

#### ***3.7.1.3 Time as strategy***

Innovation has to do with time. By being innovative, by striking first, a company can set the agenda for its competitors. By choosing a development speed, for instance product-introduction pace, they could set the pace in an industry. Nokia's aggressive pace in the mobile phone market is one example, and Intel's time-paced product launches another. Brown and Eisenhardt (1997; 1998) consider this type of time-pacing (including performance measures based on time, handling of transitions, rhythms etc) to be one of the most



important instruments when competing in what they call high-velocity environments.

But time could also be regarded as an aspect of simplicity as strategy.

### 3.7.2 Simplicity as strategy

The essence of the resource-based perspective is the emphasis on the creation or acquisition of unique, rare, specialised or hard-to-copy resources (Mosalsowski 1993). Innovativeness is discussed above as one such competence. Consequently, in the resource-based view the essence of a firm's strategic decisions is how to use, leverage and protect its existing resources and how to acquire or internally develop additional unique resources (Wernerfelt 1984; Lengnick-Hall and Wolf 1999).

In a longitudinal study of the strategy-performance dynamics in the software industry, Mosalsowski (1993) examined the relationship between focus and differentiation strategies and performance. The theory was that choosing either a focus or a differentiation strategy would mean that the firm has to develop certain skills to accomplish the chosen strategy. The findings of the study were in line with the hypotheses. When the focus and differentiation period is over, performance is higher for firms utilising a special resource or competence, than for other firms (Mosalsowski 1993).

Mosalsowski's findings are in line with those of Miller (1990; 1993) and illustrate the relationship between simplicity and competence building. Successes are often attributed to programs and activities that are favoured by the powerful, and before long the dominant strategic theme becomes codified via specialised routines, programmes, information and education systems, which

reinforce the narrowness of orientation. This march towards simplicity could be regarded as a process of competence building (Sastry 1997) or building of competitive advantage along certain dimensions (Porter 1980; Porter 1985) and will be especially prevalent in stable environments where firms are free from new challenges (Miller 1990; Miller 1993; Sastry 1997). Simplicity of strategic repertoires has also been demonstrated to have profound impact on organisational performance (Pascal 1989; Miller, Lant et al. 1996).

Testing the theories of simplicity on the furniture and software industries, Miller et al. (1996) found that simplicity increased ROA in both. In the furniture industry managers choose a 'passive' model for adaptation with firms simplifying their strategic actions through a fine-tuning process, unless they perceive a threat and there are slack resources. Simplicity was therefore inversely related to managerial discomfort and administrative slack, and positively related to financial liquidity. In the software industry, managers chose a learning 'opportunistic' model characterised by the search for, and exploration of, a wide variety of alternative goals, activities and modes of operation, and expanded their repertoires as the management team was seeded with outsiders.

But there may be another side of simplicity, namely that simplistic strategies may lack the scope needed to cope with changes in dynamic environments, a well-known phenomenon in the field of dynamic modelling (Ashby 1956). Evidence for that proposition was found in a study where simplicity was defined as a clear blueprint for the organisation's strategy (which has changed very little), a clear and consistent set of values, and a characteristic management style and management practices (Lumpkin and Dess 1995).

The traditional perspective on strategy, which we might call the 'sustainability perspective', argues that it is possible for competitive advantage to

be sustainable (Porter 1985; Porter 1996). Organisational and strategy robustness (Bettis and Hitt 1995) is also central to achieving high strategic response capability, since it leads to the ability to respond without redesign of strategies or reconfiguration of resources. Therefore building strategies in a sustainable way is the task for every strategist. In the context of the strategic response capability theory, you could say Porter argues that the most important thing is to find a robust (or sustainable) business concept.

Testing that hypothesis on sustainability of first-mover and early-mover advantages in the low-barrier money market fund industry, Makadok (1998) found a strong first and early-mover advantage that was sustainable over time. The reason for that counterintuitive result might be that early entrants are able to build a considerable resource advantage in the access to customers, an argument closely related to ‘strategy as time’.

Finally, intellectual capital was a dominating theme in strategy during the 1990s (Hamel and Prahalad 1990; Drew 1996; Kaplan and Norton 1996; Edvinsson and Malone 1997). But what are the antecedents to intellectual capital? In a theory paper, Nahapiet and Ghoshal (1998) argue for social capital as a fundament of organisational advantage. Based on a social capital model they argue that social capital facilitates the creation of new intellectual capital, and that it is because of their more dense social capital that firms have an advantage over markets in creating and sharing intellectual capital. Building intellectual capital through focusing on the social capital could also be regarded a “simplistic strategy” in order to manage a complex-complex business environment (Løwendahl and Revang 1998).

### 3.7.3 Summary of strategy and performance

In the context of raplex environments, two themes emerge in relation to strategy. Firstly, the theme of simplicity in terms of finding the firms beat, pulse or general strategic orientation, something that could function as the backbone of the organisation. Secondly, there seems to be a need for improvisation, experimentation, and innovation. Successful organisations in raplex environments seem to experiment themselves into the future. In Ashby's (1956) language they create variety in order to 'destroy variety' in the environment.

## 3.8 Environment

As already discussed, the business environment of a company includes several aspects among which environmental turbulence, complexity, uncertainty, resource density and control, hostility, and heterogeneity have been demonstrated to impact strategy processes (Lawrence and Lorsch 1967; Fredrickson and Mitchell 1984; Ansoff, 1984; Miller et al. 1988).

In this section a few more aspects of the business environment will be discussed, namely the role of the industry, the impact of different types of uncertainties on strategy and scanning behaviour, and internal uncertainty.

### 3.8.1 The industry factor

By tradition, choosing the right industry at the right moment has been a general strategy advice, coming from the traditional economic school viewing industry structure as the primary cause of firm strategy and performance. But in recent years, the resource-based school has challenged the perspective

claiming that firm-specific capabilities are better determinants of firm performance and strategy.

McGahan and Porter (1997) discuss these themes in a recent paper. Their results are in line with Rumelt's (1991:168), that "business units differ from one another more than industries differ from one another", and confirm that both industry and firm effects are important in shaping profitability. Furthermore, McGahan and Porter show that this partitioning differs dramatically across sectors of the economy. In service sectors such as wholesale/retail, lodging/entertainment, and general service, industry effects are much more important in explaining variance in profitability. In the manufacturing sector, business segment effects are much more important than industry effects. A reason for that might be that manufacturing firms rely more heavily on complex capabilities that include both individual competencies and organisational assets and thus are able to develop unique competencies. While service sector firms rely more heavily on individual competencies and that the key-members of the organisation can easily move on to a competitor, leading to an industry convergence.

McGahan and Porter's findings indicate that industry means less in industries with high levels of strategic variety. Miles et al (1993) also found such industries the most profitable. Dooley et al. (1996) took that finding one step further by concluding that not only very heterogeneous but also very homogeneous industries are more likely to be associated with industry profitability than those displaying moderate levels of strategic variety.

One aspect of temporarily differentiating strategy or competence is strategic planning. Powell (1992) consequently found that planned strategies are more favourable in industries where formal planning is uncommon. But, that

strategy does not satisfy the criteria for sustainable competitive advantage since it could be easily copied by competitors. But in the short term, strategic planning could be used to achieve competitive advantage through exploitation of market imperfections.

Powell's findings illustrate a more general aspect of the relation between competitive landscape and competence or capabilities, namely that firms develop capabilities, either by choice or selection, that then shape the environment which, in turn, further shapes capabilities (Henderson and Mitchell 1997).

#### ***3.8.1.1 The market size factor***

One aspect of the environment closely related to the industry is market size, and market size has been found to influence performance in specific ways. Market environments that favour firms with general capabilities (e. g. construction) will give rise to diversified firms, while market environments that favour specialised capabilities give rise to specialist firms (Arora and Gambardella 1997). The degree to which the leading firms in an industry will approach a fit with the environment will increase with market size, so that specialists will be more specialised and generalists will be more diversified in larger markets. Consequently, firms based in larger markets tend to outperform firms based in smaller markets when they compete in common locations.

#### ***3.8.1.2 The external resource factor***

A second aspect of the industry is the industry constraints. The stable predictability of environments assumed in early theory has been replaced

by ambiguity manifested in rapidly changing industry logic and fluctuating stakeholder demands (Schwartz, 1991), a lack of direct control over resources.

Typical organisations facing ambiguous contexts in the sense that they don't control the necessary resources and that they are in constant need of commitment and legitimacy, are inter-organisational systems like strategic alliances, partnerships, joint ventures, but also small entrepreneurial and non-profit organisations. In a literature review of stakeholder ambiguity in general, and specifically the pressure for commitment and legitimacy, Middleton Stone and Greer Brush (1996) found that planning in non-profit and entrepreneurial organisations can be described as strategy for acquiring resources rather than for resource allocation. The planners are trapped between the need for vagueness and informality to gain commitment from diverse interests and the need to demonstrate formalisation of managerial practices in order to acquire legitimacy from critical resource suppliers.

### 3.8.2 Environmental Dynamism

The perceived environmental dynamism (uncertainty and change) has a great impact on management's scanning behaviour and decision-making and there have been a great number of ways to describe that dynamism – uncertainty, predictability, volatility, hostility, variability etc. March and Simon (1958) already found uncertainty to be a key variable in explaining organisational behaviour.

#### ***3.8.2.1 Perceived dynamism, scanning and planning***

Early research often focused on the relations between perceived uncertainty and scanning behaviour, but there was only weak evidence for such a

relation (Boyd and Fulk 1996). Daft et al. (1988) found that scanning behaviour was not driven by mere uncertainty, but by strategic uncertainty, that is uncertainty in strategically important sectors. Later Boyd and Fulk (1996) found that the perceived variability (the degree of change within an environmental sector) plays a key role since it interacts with the perceived importance to positively influence executives' scanning. However, contrary to what intuitively would be expected, top executives' environmental scanning slows down as environment is perceived to be increasing in complexity (Boyd and Fulk 1996). At the same time, the interest in formal planning procedures tends to decrease (Dean and Sharfman 1993). The decision rationality was highest when threat and external control were limited and uncertainty low.

The decrease in interest in formal scanning and planning procedures might be a result of a shift from a formal to more informal mode, using richer personal information sources. The Danish science journalist Tor Nørretranders calls that richness exformation (Nørretranders 1991). What we search for is not information, but the context in which the information is embedded (exformation). Consequently, Elenkov (1997b) found that the more uncertain the environment is, the more top management rely on personal information and external resources.

But on the other hand, that might also be rational behaviour since some research has found formal planning to matter more in stable environments than more turbulent ones (Dean and Sharfman 1996; Slevin and Covin 1997).

### ***3.8.2.2 Perceived dynamism and strategy***

In the marketing field, a considerable body of work has examined uncertainty and its consequences related to the structural properties of



organisations (Sutcliffe and Zaheer 1998). Much of this work, based on transaction cost analysis, explores uncertainty and its influence on vertical integration in distribution channels (Heide and Stump 1995). One important aspect in studying strategic decision making is the perception of risk related to vertical integration. In their work, in which they used decision scenarios in an experimental design, Sutcliffe and Zaheer (1998) studied three types of uncertainties – primary (reflecting a lack of knowledge), competitive (reflecting lack of knowledge about competitor's moves) and supplier (similar to competitor uncertainty). Their results are straightforward, but interesting. Primary and competitive uncertainty is negatively correlated to vertical integration, whereas supplier uncertainty is positively related to vertical integration. They conclude that “our results may suggest that firms opt against risky investments in vertical integration capacity when the macro-environment is perceived as uncertain, but decide for vertical integration when the source of uncertainty is more proximate or controllable” (Sutcliffe and Zaheer 1998:14).

### 3.8.3 The internal uncertainty

Organisations are not only facing a more complex and less predictive external environment. The internal environment is becoming complex as well. In a recent theoretical framework, Løwendahl and Revang (1998) argue that the new post-industrial setting leads to the collapse of the dimensions of external and internal environments, and that more organisations will be facing complex-complex environments with varied customer demands, intense supplier relations and demanding independent knowledge workers. Typical complex-complex organisations are professional service firms and groups of specialists within more traditional industries. In this post-modern world where the

employees constitute a major uncertainty, no traditional management thinking is applicable. “Both strategy and structure are required to be fluid and flexible, and we are beginning to see a number of different local and temporary solutions” (Løwendahl and Revang 1998:763). The work within the field of knowledge management, balanced score card and intellectual capital (Kaplan and Norton 1992; Edvinsson and Malone 1997) could be considered strategies for uncertainty reduction.

#### 3.8.4 Summary of environment and performance

Alignment to the environment is critical to firm performance. And strategic variety is the central aspect of the environment. The more varied the environment is, the less does the choice of industry mean, and the more critical will the ability to exploit the strategic variety become. And consequently, a more proactive strategy, adaptive structures etc, will be important. Thus, variety in terms of raplexity, seems to be a critical factor for the relations between strategy, organisational structure, strategic planning process, and performance. The variety will not only function as an antecedent of strategy and structure, but also as a moderator of the MOPS (management, organisation, process, strategy) – performance link so that the ability to manage the variety will be more critical in higher variety (raplexity) environments than in less raplex environments.

### 3.9 Discussion and summary in the light of raplexity

The literature on the relationships between strategy-related issues and performance is large and growing. Since strategy is a multi-disciplinary research, field researchers from different background enrich the accumulation of knowledge.

I will here summarise the most central findings in the literature reviewed with emphasis on raplex environments. In Table 6, they are presented as organisational or behavioural characteristics found or proposed as influencing performance directly or indirectly. The table is structured according to the four major constructs identified in Chapter 2, namely top management, organisational structure, strategic planning process and strategy.

**Table 6: Organisational characteristics directly or indirectly antecedents to performance in raplex environments, with emphasis on the four constructs identified in Chapter 2**

CONSTRUCT	PERFORMANCE ANTECEDENT	REFERENCE	CATEGORY	PREL. EFFECT
Management	CEO's cultural values	Geletkanycz, 1997	Values	+/-
	TMT organisational tenure	Boeker, 1997; Finkelstein & Hambrick, 1990	Tenure	-
	TMT industry tenure	Hambrick, Geletkanycz & Fredrickson, 1993	Tenure	-
	TMT organisational tenure diversity	Boeker, 1997	Diversity	+
	TMT functional background diversity	Bantel & Jackson, 1989;	Diversity	+
	TMT cognitive diversity	Miller, Burke & Glick, 1997	Diversity	-
	Extraindustry ties and information	Gelatkanycz & Hambrick, 1997; Brown & Eisenhardt, 1997	Ties	+
	Intraindustry ties	Gelatkanycz & Hambrick, 1997	Ties	-
	Social integration	Smith et al., 1994; Eisenhardt & Bourgeois, 1988	Interaction	+
	Conflict resolution	Eisenhardt, 1989	Interaction	+
	Open climate and debate based on facts	Eisenhardt, Kahwajy & Bourgeois, 1997	Interaction	+
	Non-political climate	Eisenhardt & Bourgeois, 1988; Dean & Scharfman, 1996	Interaction	+
	Autocratic CEO	Eisenhardt & Bourgeois, 1988	Interaction	-
	Continuous scanning, external informational control	Vandenbosch & Huff, 1997; Picken & Dess, 1997; Sutcliffe, 1994	Information	+
	Contextual awareness	Picken & Dess, 1997	Information	+
Organisation	Organic, decentralised and flexible structure	Brown & Eisenhardt, 1997; Ozsomer, Calantone & Di Benedetto, 1997; Covin & Slevin, 1989; Miller, 1988; Sutcliffe, 1994	Structure	+
	Principles and guidelines for strategic (behavioural) control	Brown & Eisenhardt, 1997; Picken & Dess, 1997	Control	+

CONSTRUCT	PERFORMANCE ANTECEDENT	REFERENCE	CATEGORY	PREL. EFFECT
Organisation	Extensive communication throughout the organisation	Brown & Eisenhardt, 1997; Miller, 1988	Links	+
	Use of liaison devices (integration) among departments	Miller, 1988; Brown & Eisenhardt, 1997	Links	+
	Alignment of logic across organisational groups, cognitive consonance	Bacharach et al., 1996	Links	+
	Organise to enhance capabilities	Teece et al. 1997	Capability	+
	Learning capacity	Bettis & Hitt, 1997; Senge, 1990	Capability	+
	Robustness of strategy/organisation	Bettis & Hitt, 1997	Capability	+
	Strategic response capability	Bettis & Hitt, 1997	Capability	+
	Manage network and alliances	Chakravarty, 1997; Brown & Eisenhardt, 1997	Capability	+
Process	Sophisticated scanning and use of rich information	Elenkov 1997a, 1997b; Subramanian, Fernandes & Harper, 1993	Information	+
	Opportunities scanning	Jennings & Lumpkin, 1992	Information	+
	Extensive use of industry external information resources	Brown & Eisenhardt, 1997; Gelatkanycz & Hambrick, 1997	Information	+
	Extensive use of internal and external real-time information	Eisenhardt, 1989; Picken & Dess, 1997	Information	+
	Use of technocrats (specialists) or experienced counsellors	Miller, 1988; Eisenhardt, 1989	Information	+
	Use of internal or external futurists	Brown & Eisenhardt, 1997	Information	+
	Context awareness	Chakravarty, 1997; Picken & Dess, 1997	Information	+
	Comprehensiveness, thorough evaluation of solutions related to problem	Fredrickson & Mitchell, 1984; Eisenhardt, 1989; Miller, Burke & Glick, 1997	Evaluation	+/-
	Simultaneous consideration of alternatives	Eisenhardt, 1989; Judge & Miller, 1991	Evaluation	+
	Procedural rationality	Dean & Scharfman, 1996	Evaluation	+
	Scenario planning for evaluation of alternatives	Bettis & Hitt, 1995	Evaluation	+
	Decision-speed	Brown & Eisenhardt, 1997; Judge & Miller, 1991	Decision	+
	Planning emphasis	Boyd & Reuning-Elliot, 1998 Miller & Cardinal, 1994	Goals	+
	Consistent and continuously altered strategic reference points, goal flexibility	Feigenbaum, Hart & Schendel, 1996; Picken & Dess, 1997	Goals	+
	Extensiveness, , thorough evaluation of solutions related to long term goals	Miller, Burke & Glick, 1998	Goals	+
	Integration among strategic decisions and tactical plans	Eisenhardt, 1989	Consistency	+
	Multiple strategy-making modes	Hart & Banbury, 1994	Competence	+
	Ability to manage paradoxes	McKenzie, 1994	Competence	+
	Organisation-wide participation	Norrgren et al., 1996; Chakravarty, 1997	Participation	+
	Implementation speed	Freeman, 1995; Eisenhardt, 1989	Speed	+

CONSTRUCT	PERFORMANCE ANTECEDENT	REFERENCE	CATEGORY	PREL. EFFECT
Strategy	Innovativeness	Ozomer, Calantone & Di Benedetto, 1997, Covin & Slevin, 1989	Posture	+
	Risk-taking	Ozomer, Calantone & Di Benedetto, 1997, Covin & Slevin, 1989	Posture	+
	Proactiveness	Ozomer, Calantone & Di Benedetto, 1997, Covin & Slevin, 1989	Posture	+
	Entrepreneurial strategy making	Dess, Lumpkin & Covin, 1997	Posture	+
	Non-linear strategy, strategy innovation, reinvention	Hamel, 1998; Teece, Pisano and Shuen, 1997	Posture	+
	Prospector strategy	Shortell & Zajac, 1990	Posture	+
	First mover, early entrant ambition, repeated first mover	Sinha & Noble, 1997; Makadok, 1998; Chakravarty, 1997	Posture	+
	Go with the flow, fluid strategy	Chakravarty, 1997; Løwendahl & Revang, 1997	Posture	+
	Identifying new opportunities	Teece et al. 1997	Posture	+
	Calculated experimentation and use of low-cost probes into the future	Brown & Eisenhardt, 1997; Mosakowski, 1997	Posture	+
	Concern for predicting industry trends	Covin & Slevin, 1989	Perspective	+
	Long-term orientation	Covin & Slevin, 1989	Perspective	+
	Balancing past and future	Brown & Eisenhardt, 1998	Perspective	+
	Effective handling of time and transitions (time-pacing)	Brown & Eisenhardt, 1997	Transformation	+
	Using genetic algorithms	Brown & Eisenhardt, 1998	Transformation	+
	Innovative differentiation	Miller, 1988, Hamel & Prahalad, 1994	Content	+
	Differentiation strategies	Mosakowski, 1993	Content	+
	High product prices	Covin & Slevin, 1989	Content	+
	Conformist strategies	Finkelstein & Hambrick, 1990	Content	–
	Resource based strategy	Makadok, 1998; Mosakowski, 1993; Chakravarty, 1997	Capability	+
	Strategy for acquiring resources	Middelton Stone & Greer Bush, 1996	Capability	+
	Social capital accumulation	Nahapiet & Ghoshal, 1998	Capability	+
	Focused strategies	Mosakowski, 1993	Capability	+
	Strategic simplicity through search	Miller et al., 1996; Pascal, 1989	Capability	+

### 3.9.1 Raplexity and top management

The top management team plays a key role in strategy formation and change. In uncertain environments, the ability to change and adapt to a

continuously changing landscape is crucial to survival and growth. Tenure diversity among the TMT has been found to positively correlate to strategic change (Boeker 1997) and extraindustry ties to the adoption of deviant strategies (Gelatkanycz and Hambrick 1997).

The risk with cognitive diversity among TMTs is that conflicting opinions and destructive debate inhibits the decision process. Preference diversity (opinions on the firm's goals) seems to be most difficult to deal with (Miller, Burke et al. 1998). Therefore a good intra-team relationship is crucial to performance in uncertain environments (Bourgeois and Eisenhardt 1988), especially social integration (Smith, Smith et al. 1994). Tenure, finally, and especially industry tenure has been found to be related to commitment to the status quo and strategies conforming to industry means (Finkelstein and Hambrick 1990; Hambrick, Geletkanycz et al. 1993; Boeker 1997; Geletkanycz 1997). In combination with the finding that extra-industry ties favour deviant strategies, this could indicate the need for information diversity to be able to craft innovative strategies, to think 'outside the box'.

### 3.9.2 Raplexity and the strategic planning process

When it comes to planning under uncertainty, the results are somewhat contradictory. Fredrickson and Mitchell (1984) found comprehensiveness to be unfavourable in unstable environments (sawmill and planing industry) and concluded that gathering information, alternative generation and analysis might slow down the decision process and thus negatively impact on the performance. Dean and Sharfman (1993) found that planning matters less when uncertainty increases. Eisenhardt (1989), however, came to the opposite conclusions when studying the volatile computer industry, and Elenkov (1997a)

found sophisticated scanning with be positively related with performance in Russian companies. Miller, Burke, and Glick (1998) found that both comprehensiveness (related to solving today's problems) and extensiveness (related to the firm's long-term goals) affected performance positively. And Hart & Banbury (1994) found that both firms with high and low (but not medium) strategy-making capability performed well in turbulent environments.

Studies of the relation between formal scanning and uncertainty have found that formal scanning slows down (Boyd and Fulk 1996) or shifts to more informal modes (Elenkov 1997) as uncertainty increases. A reason for the discrepancy might be the way comprehensiveness has been measured. A unifying notion could be that with increased uncertainty, increased real-time information and decision alternatives might actually speed up the decision process and improve performance (as Eisenhardt argues) but if the decision process becomes too formalised, sophistication becomes counterproductive.

Another aspect of comprehensiveness is participation in the planning-process, which has been found positive to implementation (Norrgren, Hart et al. 1996) and organisational commitment (Oswald, Mossholder et al. 1994).

In hostile environments, planning has been found primarily favourable (Slevin and Covin 1997). That finding is also consistent with the indication that hostile environments favour mechanistic structure.

### 3.9.3 Raplexity, organisational structure and strategy

The literature is quite consistent when it comes to the relationship between strategy, structure, and performance in raplex environments. Performance under uncertainty has been found to correlate to organic, flexible

structures and proactive, aggressive, risk-taking strategies based on innovative differentiation, first-mover ambitions and time-pacing (Miller 1988; Brown and Eisenhardt 1997; Chakravarthy 1997; Dess, Lumpkin et al. 1997; Ozsomer, Cantalone et al. 1997). Strategic simplicity derived from a search process has also been found to have a positive impact on performance (Miller, Lant et al. 1996). Feigenbaum, Hart, and Schendel (1996) have proposed the need for internally consistent multidimensional strategic reference points that are continuously altered and revised. Moreover, when studying entrepreneurial firms in the software industry, Mosalowski (1993) found evidence for the research-based view of strategy.

Performance under hostile conditions is not clearly correlated to certain strategies. While Ozsomer, Calantone, Di Benedetto (1997) found a negative correlation with an aggressive strategic posture, Covin and Slevin (1989) using the same instrument found a reverse relation. This might indicate that there is a limit where increased hostility no longer favours a high (aggressive) strategic posture.

### **3.10 Summary of chapter 3**

This chapter reviewed and summarised the literature in the field of strategy and performance. The guiding principle in the review was the literature's relevance to strategic robustness or responsiveness and performance in raplex environments.

The literature was divided into four major areas covering each of the four constructs in the research – top management, organisational structure, strategic planning process, and strategy.



Finally, the literature was discussed and summarised specifically in the light of raplexity. In total, 59 performance indicators were identified, covering 21 different categories.

## **4 Development of research hypotheses**

In the preceding chapters the evidence and issues surrounding strategy and performance in raplex environments have been reviewed and discussed. In this chapter, a final research model and a set of hypotheses are developed, based on the previous literature review.

First, a manageable number of independent variables are selected based on the predictor list from the literature review, and operational definitions are developed. Second, the relations between the independent variables, strategic response capability, performance and environment are discussed, and a set of hypotheses stated.

### **4.1 Basic logic and assumptions**

As stated before, the assumption underpinning the research design is that performance derives from two primary sources. The first is the organisation's ability to find favourable positions in the competitive landscape and successfully cope with change and exploit given opportunities in the changing environment. That is the 'strategy-source', or the 'doing-right-things-source'. The second source is related to the operational effectiveness of the organisation. In more raplex environments, coping with change and exploiting new opportunities become more important. Thus, by identifying strategy-related success and failure factors in raplex environments we could find the most important success factors in such environments. But, as previously stated, to analyse the relative proportion of performance variance explained by strategy-related factors relative to operational effectiveness factors, goes beyond the scope of this study.

## 4.2 Research model

The literature reviewed was organised around a tentative research model. The review supported the proposed model and gave indications of further development through the identification of performance indicators or antecedents in raplex environments.

To reach a more precise, but still manageable model, the indicators identified had to be reduced in some way. There are principally two different ways to do that – clustering, and exclusion – and both methods were used. First, the predictors from Table 6 were re-clustered and re-named following a procedure in which predictors capturing similar aspects were grouped together under the same label. After that, some of the factors were excluded following a procedure described below. Table 7 below presents the result of clustering the indicators.

**Table 7. Clustered suggested performance predictors (antecedents)**

CONSTRUCT	PREDICTOR	REFERENCE	VARIABLE
Management	CEO's cultural values	Geletkanycz, 1997	CEO
	TMT organisational tenure	Boeker, 1997; Finkelstein & Hambrick, 1990	TMT tenure
	TMT industry tenure	Hambrick, Geletkanycz & Fredrickson, 1993	TMT tenure
	TMT organisational tenure diversity	Boeker, 1997	TMT diversity
	TMT functional background diversity	Bantel & Jackson, 1989;	TMT diversity
	TMT cognitive diversity	Miller, Burke & Glick, 1997	TMT diversity
	Extraindustry ties and information	Gelatkanycz & Hambrick, 1997; Brown & Eisenhardt, 1997	TMT external orientation
	Intraindustry ties	Gelatkanycz & Hambrick, 1997	TMT external orientation
	Social integration	Smith et al., 1994; Eisenhardt & Bourgeois, 1988	TMT social integration
	Conflict resolution	Eisenhardt, 1989	TMT social integration
	Open climate and debate based on facts	Eisenhardt, Kahwajy & Bourgeois, 1997	TMT politics
	Non-political climate	Eisenhardt & Bourgeois, 1988; Dean & Scharfman, 1996	TMT politics

CONSTRUCT	PREDICTOR	REFERENCE	VARIABLE
Management	Autocratic CEO	Eisenhardt & Bourgeois, 1988	CEO
	Continuous scanning, external informational control	Vandenbosch & Huff, 1997; Picken & Dess, 1997; Sutcliffe, 1994	TMT external orientation
	Contextual awareness	Picken & Dess, 1997	TMT external orientation
Organisation	Organic, decentralised and flexible structure	Brown & Eisenhardt, 1997; Ozsomer, Calantone & Di Benedetto, 1997; Covin & Slevin, 1989; Miller, 1988; Sutcliffe, 1994	Adaptive structure
	Principles and guidelines for cultural (behavioural) control	Brown & Eisenhardt, 1997; Picken & Dess, 1997	Cultural control
	Extensive communication throughout the organisation	Brown & Eisenhardt, 1997; Miller, 1988	Integration
	Use of liaison devices (integration) among departments	Miller, 1988; Brown & Eisenhardt, 1997	Integration
	Alignment of logic across organisational groups, cognitive consonance	Bacharach et al., 1996	Integration
	Organise to enhance capabilities	Teece et al. 1997	Strategic response capability
	Learning capacity	Bettis & Hitt, 1997; Senge, 1990	Strategic response capability
	Robustness of strategy/organisation	Bettis & Hitt, 1997	Strategic response capability
	Strategic response capability	Bettis & Hitt, 1997	Strategic response capability
	Manage network and alliances	Chakravarty, 1997; Brown & Eisenhardt, 1997	Strategic response capability
Process	Sophisticated scanning and use of rich information	Elenkov 1997a, 1997b; Subramanian, Fernandes & Harper, 1993)	Information
	Opportunities scanning	Jennings & Lumpkin, 1992	Information
	Extensive use of industry external information resources	Brown & Eisenhardt, 1997; Gelatkanycz & Hambrick, 1997	Information
	Extensive use of internal and external real-time information	Eisenhardt, 1989; Picken & Dess, 1997	Information
	Use of technocrats (specialists) or experienced counsellors	Miller, 1988; Eisenhardt, 1989	Information
	Use of internal or external futurists	Brown & Eisenhardt, 1997	Information
	Context awareness	Chakravarty, 1997; Picken & Dess, 1997	Information
	Comprehensiveness, thorough evaluation of solutions related to problem	Fredrickson & Mitchell, 1984; Eisenhardt, 1989; Miller, Burke & Glick, 1997	Comprehensiveness
	Simultaneous consideration of alternatives	Eisenhardt, 1989; Judge & Miller, 1991	Comprehensiveness
	Procedural rationality	Dean & Scharfman, 1996	Comprehensiveness
	Scenario planning for evaluation of alternatives	Bettis & Hitt, 1995	Comprehensiveness
	Decision-speed	Brown & Eisenhardt, 1997; Judge & Miller, 1991	Strategic response capability

CONSTRUCT	PREDICTOR	REFERENCE	VARIABLE
Process	Planning emphasis	Boyd & Reuning-Elliott, 1998 Miller & Cardinal, 1994	Planning emphasis
	Consistent and continuously altered strategic reference points, goal flexibility	Feigenbaum, Hart & Schendel, 1996; Picken & Dess, 1997	Planning emphasis
	Extensiveness, thorough evaluation of solutions related to long-term goals	Miller, Burke & Glick, 1998	Planning emphasis
	Integration among strategic decisions and tactical plans	Eisenhardt, 1989	Planning emphasis
	Multiple strategy-making modes	Hart & Banbury, 1994	Planning competence
	Ability to manage paradoxes	McKenzie, 1994	Planning competence
	Organisation-wide participation	Norrgren et al., 1996; Chakravarty, 1997	Participation
	Implementation speed	Freeman, 1995; Eisenhardt, 1989	Strategic response capability
Strategy	Innovativeness	Ozomer, Calantone & Di Benedetto, 1997, Covin & Slevin, 1989	Strategic posture
	Risk-taking	Ozomer, Calantone & Di Benedetto, 1997, Covin & Slevin, 1989	Strategic posture
	Proactiveness	Ozomer, Calantone & Di Benedetto, 1997, Covin & Slevin, 1989	Strategic posture
	Entrepreneurial strategy making	Dess, Lumpkin & Covin, 1997	Strategic posture
	Non-linear strategy, strategy innovation, reinvention	Hamel, 1998; Teece, Pisano and Shuen, 1997	Strategic posture
	Prospector strategy	Shortell & Zajac, 1990	Strategic posture
	First mover, early entrant ambition, repeated first mover	Sinha & Noble, 1997; Makadok, 1998; Chakravarty, 1997	Strategic posture
	Go with the flow, fluid strategy	Chakravarty, 1997; Løwendahl & Revang, 1997	Strategic posture
	Identifying new opportunities	Teece et al. 1997	Strategic response capability
	Calculated experimentation and use of low-cost probes into the future	Brown & Eisenhardt, 1997; Mosakowski, 1997	Strategic posture
	Concern for predicting industry trends	Covin & Slevin, 1989	Planning emphasis
	Long-term orientation	Covin & Slevin, 1989	Strategic posture
	Balancing past and future	Brown & Eisenhardt, 1998	Strategic posture
	Effective handling of time and transitions (time-pacing)	Brown & Eisenhardt, 1997	Strategic posture
	Using genetic algorithms	Brown & Eisenhardt, 1998	Strategic posture
	Innovative differentiation	Miller, 1988, Hamel & Prahalad, 1994	Strategic posture
	Differentiation strategies	Mosakowski, 1993	Strategic posture
	High product prices	Covin & Slevin, 1989	Strategic posture
	Conformist strategies	Finkelstein & Hambrick, 1990	Strategic posture

CONSTRUCT	PREDICTOR	REFERENCE	VARIABLE
Strategy	Resource based strategy	Makadok, 1998; Mosakowski, 1993; Chakravarty, 1997	Resource-based strategy
	Strategy for acquiring resources	Middelton Stone & Greer Bush, 1996	Resource-based strategy
	Social capital accumulation	Nahapiet & Ghoshal, 1998	Resource-based strategy
	Focused strategies	Mosalowski, 1993	Resource based strategy
	Strategic simplicity through search	Miller et al., 1996; Pascal, 1989	Resource based strategy

The number of variables has now been reduced from 21 to 17, since some of the indicators are primarily related to the strategic response capability construct. But 17 independent variables are still too many and further reduction is needed. First, CEO characteristics are excluded since the TMT has been shown to have a substantially higher impact on the organisation than the CEO alone (Finkelstein and Hambrick 1990; Smith, Smith et al. 1994). TMT tenure could be considered an aspect of TMT information sources, TMT integration and TMT diversity and is thus excluded. The access to, and use of, information in the planning process (Information) is an aspect of planning emphasis and reflection. Planning competence is an organisational capability rather than ‘ambition’ or ‘behaviour’ and is closely related to the strategic response capability. Therefore, it is left out as an independent variable in the model. It has been shown that focus or differentiation strategies (Strategy content) could be considered resource-based strategies since all focused strategies help the organisation to develop certain skills (Mosakowski 1993). The final variable list with definitions is presented in Table 8.

**Table 8. Definition of variables**

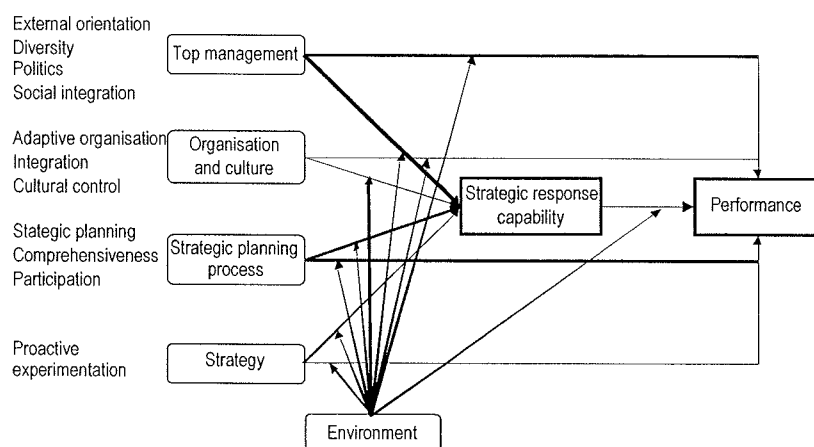
CONSTRUCT	VARIABLE	DEFINITION	REFERENCE
Management	TMT external orientation	The degrees to which the top management team access and evaluate information from the business environment.	Adapted from (Jennings and Lumpkin 1992)
	TMT perspectives diversity	The heterogeneity of the TMT with respect to the team members' information sources and perspectives.	Adapted from (Hamrefors 1999)
	TMT politics	The extent to which the TMT focus on 'inside the organisation', towards the mixture of interests, power bases and positions, rather than on what is feasible given current environmental forces.	Adapted from (Dean and Sharfman 1996)
	TMT social integration	The extent to which the members of the TMT stick together and co-operate in order to achieve common goals.	Adapted from (Smith, Smith et al. 1994)
Organisation	Adaptive structure	The extent to which the company has a flexible, informal and task-oriented structure and culture.	Ideas from e. g. (Miller and Friesen 1978)
	Integration	The extent to which decision-making at top level in the firm is characterised by participative, cross-functional committees in which different departments get together to decide specific classes of decisions.	Adapted from (Miller 1987)
	Cultural control	The extent to which organisational behaviour is controlled by rewards, culture and boundaries.	Adapted from (Picken and Dess 1997)
Process	Planning emphasis	The emphasis the organisation puts on each stage of the planning process from environmental scanning to evaluation.	Adapted from (Boyd and Reuning-Elliot 1998)
	Comprehensiveness	The extent to which an organisation when confronted with an important non-routine problem or opportunity tends to extensively examines alternative explanations and solutions.	Adapted from (Miller, Burke et al. 1998)
	Participation	The extent to which co-workers on all levels in the organisation participate in various planning activities.	Adapted from (Oswald, Mossholder et al. 1994) and (Norrgrén, Hart et al. 1996)
Strategy	Proactive experimentation	The degree to which the organisation applies an innovative, aggressive and risk-taking strategic posture.	Adapted from (Covin and Slevin 1989) (entrepreneurial posture)
Response capability	Strategic response capability	The capability to deliver a quick and adequate response to threats and opportunities in the environment.	Adapted from (Bettis and Hitt 1995)
Environment	Raplexity	The degree of complexity, uncertainty and change in the business environment.	Adapted from (Hart and Banbury 1994)
Performance	Overall performance	The combination of financial, business and organisational effectiveness, and the ability to successfully invest in future capabilities.	Adapted from (Venkatraman and Ramanujam 1986)

### 4.2.1 Hypotheses

The following section presents the research hypotheses based on the literature reviewed. The arguments for the hypotheses will be short, since most arguments have already been reviewed above. The hypotheses are summarised in Table 9 and Figure 7 below.

**Table 9. Summary of hypotheses**

HYPOTHESIS	SRC H1a-H11a	Performance H1b-H11b	Raplexity– performance dependence H1c-H11c
1. External orientation in TMT	+	+	+
2. Perspective diversity	+	+	+
3. Non-politics in TMT	+	+	+
4. Social integration in TMT	+	+	+
5. Adaptive structure	+	+	+
6. Organisational integration	+	+	+
7. Cultural control	+	+	+
8. Planning emphasis	+	+	+
9. Comprehensiveness	+	+	+
10. Participation in planning	+	+	+
11. Proactive experimentation	+	+	+
12. SRC (H12b, H12c)		+	+



**Figure 7. Final research model**



#### ***4.2.1.1 The impact of the Top Management Team on Strategic Response***

##### ***Capability and Performance***

Critical to success in raplex environments is the ability to respond quickly (Bettis and Hitt 1995). And quick response from a managerial point of view consists of several components, such as the ability to observe changes in the competitive landscape and the organisation, to make decisions and to implement those decisions. In order to ‘observe’, the TMT needs access to rich and diverse information (Brown and Eisenhardt 1997; Chakravarthy 1997; Gelatkanycz and Hambrick 1997). First, the ambition of the TMT to understand the external environment, that is the degree of ‘active’ external orientation of the TMT, could be considered important to SRC and performance, and could also be expected to be more important with increased raplexity (Sutcliffe 1994; Picken and Dess 1997; Vandenbosch and Huff 1997). Second, diversity in “information” or “perspectives” could be expected to directly increase SRC and both directly and indirectly (through SRC) increase performance. Perspectives diversity could be expected to give the TMT access to more varied information sources. Such diversity could be reached through diversity in the TMT’s functional background and education, extra-industry ties, gender, age, ethnic background, private and professional network. There is a risk, however, that perspectives diversity would also cause diversity in preferences (goals) and causality, which would not be expected to increase performance since such diversity could slow down the decision-making process. However, this risk could be expected to be less important (Miller, Burke et al. 1998).

To make quick decisions, a socially well-integrated TMT and minimal influence of politics in the decision-making process could be expected to

increase SRC and performance (Eisenhardt and Bourgeois III 1988; Smith, Smith et al. 1994). Open climate and debate based on facts, ability to solve conflicts creatively, and commitment to the team and company are components that could be expected to increase performance through increased quality and speed in decision-making (Eisenhardt and Bourgeois III 1988; Eisenhardt 1989; Dean and Sharfman 1996; Eisenhardt, Kahwajy et al. 1997). Apart from that, the role-model function of the TMT should not be underestimated (Schein 1992).

Hypothesis 1: External orientation of the TMT will be positively related to SRC and performance, and more positively related to performance in more raplex environments

Hypothesis 2: Perspectives diversity of the TMT will be positively related to SRC and performance, and more positively related to performance in more raplex environments

Hypothesis 3: Politics within the TMT will be negatively related to SRC and performance, and more negatively related to performance in more raplex environments

Hypothesis 4: Social integration of the TMT will be positively related to SRC and performance, and more positively related to performance in more raplex environments

#### ***4.2.1.2 The impact of the Organisational Structure on Strategic Response***

##### ***Capability and Performance***

Quick response to threats and opportunities is assumed a critical performance factor in more or less raplex environments. But to respond quickly there is a need for organisational robustness and adaptability. Three

organisational aspects then become important: an adaptive and flexible structure, with delegated responsibilities (Miller 1988; Covin and Slevin 1989; Sutcliffe 1994; Brown and Eisenhardt 1997; Ozsomer, Cantalone et al. 1997); integration and co-ordination between different sub-units and between short and long term plans in order to increase the impact of joint action (Miller 1988; Brown and Eisenhardt 1997); a developed and unifying tailored culture where the continuous strategic dialogue is part of the culture (Miller 1988; Brown and Eisenhardt 1997; Picken and Dess 1997).

The more raplex the environment becomes, the more important an 'action-ready' organisation is. For these reasons, both strategic response capability and performance are expected to accompany adaptive structure, integration, and cultural control in partly and heavily raplex environments. It is also expected that adaptive structure, integration and cultural control will be more positively related to performance in more raplex environments. There might however be a raplexity-limit, over which integration and cultural control become counter-productive.

Hypothesis 5: Adaptive structure will be positively related to SRC and performance, and more positively related to performance in more raplex environments.

Hypothesis 6: Integration will be positively related to SRC and performance, and will be more positively related to performance in more raplex environments.

Hypothesis 7: Cultural control will be positively related to SRC and performance, and more positively related to performance in more raplex environments.

#### ***4.2.1.3 The impact of the Strategic Planning Process on Strategic Response Capability and Performance***

In raplex environments the ability to understand the outside world, to predict possible outcomes and prepare for those outcomes could be expected to be important to success.

First, ambitions to understand the environment, to set out direction, and make plans for implementation could be expected to be important (Eisenhardt 1989; Jennings and Lumpkin 1992; Subramanian, Fernandes et al. 1993; Feigenbaum, Hart et al. 1996; Brown and Eisenhardt 1997; Elenkov 1997; Elenkov 1997; Gelatkanycz and Hambrick 1997; Picken and Dess 1997; Boyd and Reuning-Elliot 1998). Although detailed plans in raplex environments quickly tend to get outdated, the planning process or the emphasis on planning creates a “preparedness” for change that could be expected to increase the strategic response capability and performance. Since such preparedness could be expected to be more important in raplex environments, this planning emphasis-performance link could be expected to be stronger in more raplex environments.

Second, the comprehensiveness with which decision-alternatives are evaluated could be expected to increase performance in complex environments (Miller, Burke et al. 1998). Extensiveness or comprehensiveness could be expected to lead to more adequate (or effective) decisions and thus increase the “precision dimension” of the SRC. But comprehensiveness reached through a sequential examination of decision-alternatives risks slowing down the decision-process. Therefore, comprehensiveness in terms of ambition to make thorough and parallel evaluation of decision-alternatives could be expected to increase

performance and SRC, and could be considered more important in more raplex environments.

Third, participation in the planning process by both managers and employees could be expected to be positive, first, for SRC, but also for performance (Norrgren, Hart et al. 1996; Chakravarthy 1997). Participation means that more people are involved in the active scanning of the external environment, and in the evaluation of challenges to the organisation. Participation also creates a sense of involvement in the organisation and strategic decisions, which could increase commitment to the organisation, decisions and goals. Finally, people who are involved in decisions are often both more capable and willing to implement them (Norrgren, Hart et al. 1996).

It could also be expected that all these performance links are stronger in more raplex environments than in less raplex, to a certain level where the environment becomes genuinely uncertain and planning becomes more or less counter-productive.

Hypothesis 8: Planning emphasis will be positively related to performance and more positively related to performance in more raplex environments.

Hypothesis 9: Comprehensiveness will be positively related to SRC and performance, and more positively related to performance in more raplex environments.

Hypothesis 10: Participation will be positively related to SRC and performance, and more positively related to performance in more raplex environments.

#### ***4.2.1.4 The impact of Strategy on Strategic Response Capability and Performance***

In raplex environments, the ability to exploit the variety of possible strategic configuration could be expected to be critical to long term performance (Beinhocker 1999). Since strategic uncertainty in the raplex environment is high, the only way to figure out what works and what doesn't, is experimentation (Brown and Eisenhardt 1997; Beinhocker 1999; Pascal 1999; Williamson 1999). Since raplex environments are also rapidly changing, the window of opportunity is often narrow and consequently speed is crucial (Judge and Miller 1991; Brown and Eisenhardt 1997).

A strategic posture characterised by proactive experimentation and the ambition to strike first, creates new markets, breaks down industry barriers and could be expected to increase both SRC and overall performance. It could also be expected to be more important in more raplex environments than in less raplex ones (Brown and Eisenhardt 1997).

Hypothesis 11: Proactive experimentation will be positively related to SRC and performance, and more positively related to performance in more raplex environments.

#### ***4.2.1.5 The impact of Strategic Response Capability on Performance***

Strategic response capability could be defined as the organisation's ability to deliver quick and adequate responses to threats and opportunities in the environment. The more raplex the environment becomes, the more important response capability is expected to be to performance (Bettis and Hitt 1995). Thus organisations with a high response capability could be expected to have higher performance, and organisations in more raplex environments could be expected

to have stronger SRC-performance links than organisations in less raplex environments.

Hypothesis 12a: Organisations with higher strategic response capability will perform better than those with lower SRC.

Hypothesis 12b: SRC will be more positively related to performance in raplex environments than in more stable environments.

### **4.3 Summary of Chapter 4**

In this chapter a research model was developed, based on the literature. The model consists of eleven independent variables, one contingency variable (raplexity), one link-variable (strategic response capability, SRC) and one dependent variable (performance). A set of hypotheses was also stated, predicting positive relationships between all independent variables and SRC and performance. It was also hypothesised that raplexity positively moderates the relations between the independent variables and SRC and performance, as well as the relation between SRC and performance.

## **5 Research methodology**

This chapter describes how the research was approached. First, the overall research philosophy is discussed. Second, the research design is outlined and discussed. Third, the questionnaire design process is reviewed and discussed. Fourth, the sampling procedure and data collection are reviewed. Fifth, the data treatment procedures are discussed, and finally, the validation of the results outlined.

### **5.1 Overall philosophy and approach**

The overall question, as well as the number and characteristics of the preliminary hypotheses formulated in the previous chapters, tends towards a positivistic research approach in terms of methodology and research design.

It would not be right to claim that is the only possible route, but as Easterby-Smith et al. (1991:41) point out: “The appropriateness of a research approach derives from the nature of the phenomena to be explored.”

Since the basic subject material is quantifiable and the tradition in the field quantitative, much speaks for a quantitative approach. In addition, being a part-time non-native English DBA student, quantitative methodology has the advantage of being practical and affordable within the time-frame available. Taking the standpoint of a quantitative positivist does not mean though that I would call myself a pure positivist.

To follow a positivist research methodology it is important to be aware of the underling implications of that paradigm and to take them into consideration when preparing a research design, as well as when interpreting the results. According to Easterby-Smith et al. (1991) these are:



1. the independence of the observer;
2. value free decisions: in that the choice of what to study and how it is studied is influenced only by objective criteria;
3. causality: the research sets out to identify and explore causal explanations and fundamental laws;
4. by its nature the research should be hypothetico-deductive; that is hypotheses should be formulated and used to determine the kind of observations which will demonstrate their truth or falsity;
5. constructs should be operationalised in order to measure facts quantitatively;
6. problems are effectively understood if they are reduced to the simplest possible element (reductionism);
7. samples of sufficient size are used to enable results to be generalised; and
8. relationships are most easily identified by cross-sectional analysis (i.e., comparing variations across samples).

Although the considerations above point to a positivist paradigm by application of a correlation approach, it is necessary to consider whether an extension to incorporate qualitative methods as well could be a way to overcome some of the limitations related to a pure quantitative approach.

One way to do that is to use focus groups. Focus groups have previously been used with success for validation of questionnaire responses (Easterby-Smith, Thorpe et al. 1991).

## **5.2 Research design**

Research design is defined as a plan for carrying out the empirical activities; it is a plan to answer some specific questions or hypotheses (Money 1998). The purpose of this study was to clarify the relationship between some

strategy related issues in raplex environments. And the methodology chosen was primarily a positivist approach.

The research design was based on a survey with complementary focus groups before and after it. The purpose of this triangulation design was to provide a 'real-world' reference point complementing the survey statistics. The first focus group dealt with the proposed research model, giving an opportunity to comment on and complement the model with new predictors. The reference group invited to the focus group meeting was also asked to rank the identified performance predictors. The second focus group meeting was used for interpretation and validation of the survey results.

Since the research was based on a correlational design model, several issues required consideration: selection of the sample; measure of the outcomes; the nature of and operationalisation of the SRC-construct. Thus, those aspects were taken under serious consideration. An overall view of the research process is presented in Figure 8 below.

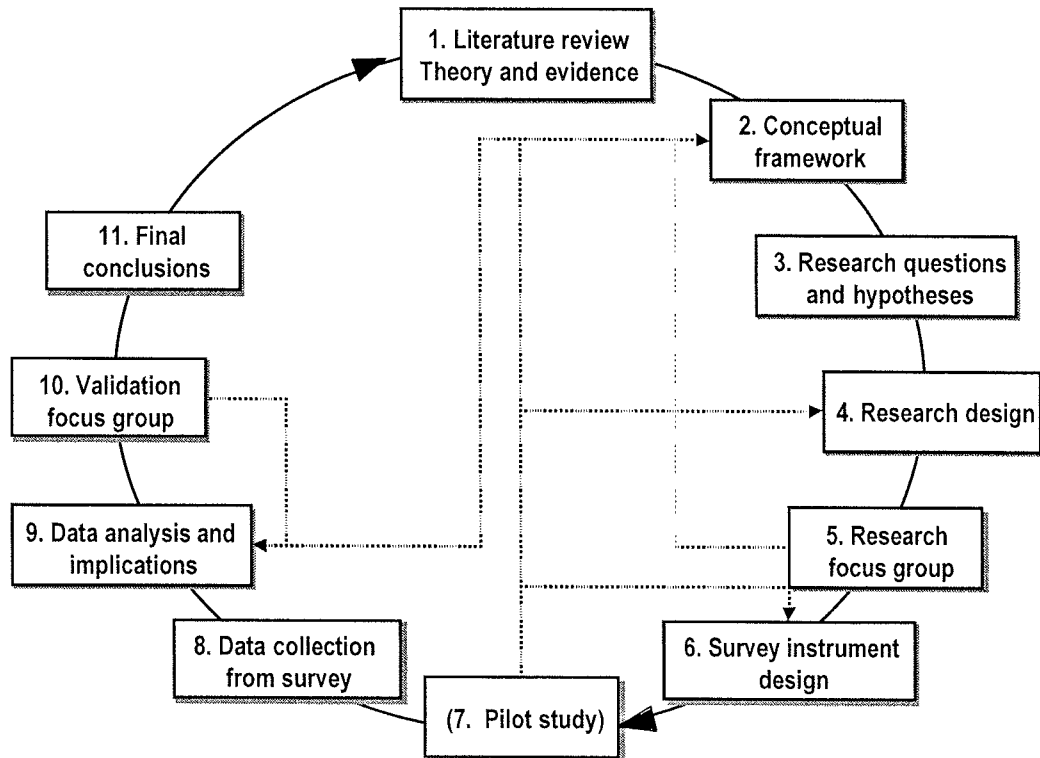


Figure 8: An overview of the research process.

### 5.3 Questionnaire design

The questionnaire was designed following a multi-step procedure. First, a large number of performance predictors (or antecedents) in the literature were identified. Second, the predictors were ranked based on the literature reviewed and support from a reference group of managers, strategists and consultants. Third, the predictors were categorised into variables. The variables were operationalised and possible instruments identified in the literature, and if necessary slightly modified to suit the purpose of the study. Where no relevant instruments could be found, new instruments were developed following the guidelines of Churchill (1979). Fourth, a questionnaire was designed. Fifth, the questionnaire was pre-tested on the reference group previously used. Sixth, the

questionnaire was slightly revised based on comments from the respondents and statistical reliability analysis of the scales.

In order to ensure response rate, reliability and validity, special care was taken with development and administration of the questionnaire. First, primarily previously developed and tested scales were used to ensure reliable measurement. Second, similar scales were used as much as possible throughout the questionnaire in order to avoid influences from shifting scales (Hair 1998).

The study was based only on self-reported data, and not on archival data. Thus, it was based on managerial perceptions of strategy and structure as well as on environmental and performance issues. There has been documented that the perception of the CEO on issues like strategy making, reflect an organisational construct and not only individual differences in perception, functional background etc (Dess, Lumpkin et al. 1997). Since there is a close relation between strategy-making posture and organisational structure and process, it could be assumed to hold for those constructs as well. Other studies have confirmed that the CEO's perception of the TMT reflects the other team members' perception (Dess and Robinson 1984; Miller and Cardinal 1994).

The use of managerial perceptions of the environment has also been supported by a number of studies based on the relevance of such perceptions to the formulation of strategy (Downey and Slocum 1975), as well as to their accuracy with respect to objective measures of the environment (Bourgeois 1985). Prior research has also indicated that subjective measures of performance can be consistent with objective measures, thus enhancing reliability and validity (Dess and Robinson 1984; Venkatraman and Ramanujam 1987), and that performance data provided by the informant may be more accurate than data available through archival sources (Miller and Cardinal 1994).

### 5.3.1 Review of performance predictors

The review of performance predictors was a second literature review, and the result of the search was reported (Table 4). In total, 58 performance predictors were identified. Two methods were used to obtain a manageable number of highly significant predictors, clustering, to reduce the number (as reported above, p. 95 ff.), and ranking of the 58 predictors by a reference group, as will be presented below.

### 5.3.2 Selection of performance predictors

To get an external evaluation of the research from the practitioner's point of view, a reference group was set up to assist the selection of predictors.

61 top managers and strategists in major Swedish companies were invited to participate in the study. Some scholars and management consultants were also invited. The members of the reference group were selected among Kairos Future's clients and network. Two selection criteria were used – a declared interest in the research topic and a strategic position in the company. Since I am the President and one of the founders of the consultancy firm, it was found a convenient way to handle the reference group.

#### ***5.3.2.1 Round-table discussion***

The reference group was invited to a focus group, labelled 'round-table discussion' on strategy and performance in turbulent environments (Easterby-Smith, Thorpe et al. 1991). A presentation of the research project and a questionnaire were appended the invitation. Those who weren't able to attend the round-table discussion were asked to score 58 performance predictors in raplex environments described above (Table 6). Of the 61 invited, 33 replied either to

accept the invitation or with a message that they weren't able to attend. Seven actually attended the round-table discussion and 18 answered the questionnaire. Three of them were round-table participants.

The research technique used during the round-table discussion was structured open questions. First, the participants were asked to comment on the overall research model, and then they were asked to identify the key factors within each of the four independent constructs (Management, Organisation, Process and Strategy) influencing the SRC and overall performance. For a more detailed description see Appendix 3: Research focus group.

The responses on the research model were positive. The reference group identified Management and Process as the most critical constructs. An overall conclusion was also that the co-ordination, or match, between environment, management, organisation, process, and strategy is critical to performance.

The critical performance indicators that were suggested by the reference group are presented in Table 10.

**Table 10. Critical predictors identified by the reference group**

CONSTRUCT	PREDICTORS	IDENTIFIED IN THE LITERATURE REVIEW	RELATED TOPIC
Management	Enabling management, supporting dialogue and personal growth etc	PARTLY	Adaptive structure Cultural control Participation
	Shared goals, non-political climate	YES	
	Diversity of experience	YES	
	Shared information throughout the organisation	PARTLY	Adaptive structure Cultural control Participation
	Trust from members of the organisation	PARTLY	Cultural control, Non-political climate
	Quick communication of goals and direction	PARTLY	Participation Cultural control
Organisation	Ability to change organisation, culture, regulations	YES	

CONSTRUCT	PREDICTORS	IDENTIFIED IN THE LITERATURE REVIEW	RELATED TOPIC
Organisation	Principles and values as non-changing guidelines	YES	
	Understanding throughout the organisation of the need for change	PARTLY	Participation Cultural control
	Ability to handle lay-offs constructively	NO	
	Arenas for strategic dialogue	PARTLY	Participation Cultural control Integration
	Transparent organisation, shared information	PARTLY	Adaptive structure Participation
	Ability to move on, be happy for what has been and leave the past behind	YES	
	Understanding among TMT for what is really core competence	YES	
	Virtual organisation, ability to expand and contract smoothly	PARTLY	Adaptive structure
	Measuring few but critical aspects	PARTLY	Cultural control
	Internal communication skills – communication in highly “packaged” form	PARTLY	Cultural control
Process	Decentralised operational decision-making	YES	
	Dialogue-based strategic decision-making when possible	YES	
	Decision-making flexibility	YES	
	Speed – no endless processing	YES	
	Clear and understandable visions that give long-term direction	YES	
Strategy	Clear strategy that is easy to communicate	YES	
	Innovative strategies, being No. 1	YES	
	Differentiation, being different	YES	
	Myth as strategy, spreading the myth of the company	PARTLY	Planning emphasis Cultural control
	Endurance, long-lasting strategies	PARTLY	Planning emphasis Robustness

What’s striking in the table above is the strong emphasis on a participatory approach to strategy, at least compared to the reviewed literature. One reason for that might be the Swedish context. The so-called Scandinavian management tradition has been more dialectic and participative than the American, and since the participants were all Swedes, their cultural tradition and values obviously influence their perspectives (Geletkanycz 1997). Another reason might

be that several of the participants came from organisations and traditions where participation is regarded as important, such as human resources and educational and vocational training companies, and their perspectives might have coloured the discussion (Easterby-Smith, Thorpe et al. 1991). That might also be one of the reasons why management and process were regarded as the two most important performance factors.

#### ***5.3.2.2 Questionnaire to rank performance predictors***

The questionnaire distributed to the reference group was answered by 18 of the members. The content of the questionnaire was 58 performance indicators or predictors, presented in Table 6 above. The respondents were asked to rate the importance of each indicator on a scale of 1–7 where 1 was ‘Without importance’ and 7 ‘Of critical importance’. The top-12 indicators are listed in Table 8. It is striking is that none of the top-12 indicators belongs to the strategy area. Instead there is an emphasis on rapid learning and adaptation (2, 3, 8, 9, 11), external information gathering (4, 5, 10), quick information processing (1, 12) and focus (6, 7). This finding is also in line with the SRC-theory, which says that the ability to quickly observe and respond to challenges and opportunities in the environment is critical to performance in raplex environments.

A group of seven strategy consultants that were asked to rank the same 58 performance predictors came up with similar results. That indicates a consistency among practitioners’ views of performance predictors in raplex environments.



**Table 11. Performance predictors according to reference group ranking of 58 identified indicators**

	PREDICTOR	CONSTRUCT	MEAN SCORE ON SCALE 1–7
1	Open climate in TMT and debate based on facts	Management	6.4
2	Learning capacity	Organisation	6.3
3	Implementation speed	Process	6.2
4	TMT “perspective” diversity	Management	6.2
5	Contextual awareness	Management	6.2
6	Consistent and continuously altered strategic reference points (goals)	Process	6.1
7	Strategic simplicity, understandable strategies	Process	5.9
8	Robustness of organisation, ability to adapt to shifting circumstances	Organisation	5.9
9	Decision-speed	Process	5.9
10	Extra industry ties and extensive external information gathering	Management	5.9
11	Ability to manage networks and alliances	Organisation	5.9
12	Extensive communication throughout the organisation	Organisation	5.9

### **5.3.2.3 Conclusions**

Based on the input from the reference group, I concluded that there was no need for minor adjustments of the predictors. There was an acceptance of the general model, and the suggested indicators were already covered by proposed variables in the model. Since the reference group so strongly advocated ‘external orientation in the TMT’, I decided that neither of the variables external orientation and perspective diversity should be excluded. I also concluded that the most important aspect of diversity in the TMT might very well be perspective diversity, so that diversity aspect was chosen in the operationalisation of the variables, despite lack of empirical research on it. The emphasis in the reference group on participatory management, led to the decision to keep the participation variable in the model.

Although the reference group did not strongly support planning emphasis and comprehensiveness, I decided to keep those variables in the model, based on strong support in the literature.

Support from the reference group for the different variables in the model is presented in Table 12.

**Table 12. The reference group's support for the variables**

HYPOTHESIS/VARIABLE	Support from reference group based on mean scores on scale 1-7
1. External orientation in TMT	VSS (>6)
2: Perspective diversity	VSS (>6)
3. Non-politics in TMT	SS-VSS (5.5- )
4. Social integration of TMT	SS (5.5-6.0)
5. Adaptive structure	SS (5.5-6.0)
6. Organisational integration	MS (4.5-5.5)
7. Cultural control	SS (5.5-6.0)
8. Planning emphasis	MS (4.5-5.5)
9. Comprehensiveness	WS (4.0-4.5)
10. Participation in planning	MS (4.5-5.5)
11. Proactive experimentation	MS-SS (4.5-6.0)
12. SRC	SS-VSS (5.5- )

### 5.3.3 Operationalisation of predictors

The variables were operationalised by a defined procedure. First, each variable was defined. Then a review of existing instruments was carried out and suitable instruments were selected and modified. Where no instruments could be found, new ones were designed based on the theory, pre-tested and revised.

An overview of existing instruments is presented in Table 13, and a more extensive overview in Appendix 1: Overview of instruments. The literature contains an extensive body of instruments for the independent constructs

(management, organisation, process, strategy), performance and raplexity. However, existing scales do not cover all the major indicators found in the literature. In some cases, there is also a heavy overlap between instruments measuring different constructs.

To minimise overlaps, instruments were carefully chosen. In some cases, extra items were added to existing scales in order to capture predictors identified as important, but not included in the existing scale.

For four of the variables (external orientation, perspective diversity, cultural control and strategic response capability) no existing scales that fully captured the variables were found. For those variables, instruments were developed based on existing literature. The process followed Churchill's guidelines (Churchill 1979), and the scales were pre-tested for alphas on the same reference-group of managers that was invited to the focus group.

**Table 13: A selection of existing instruments**

INSTRUMENT	ITEMS	RELIABILITY/ALPHA	REFERENCE
Politics	4 items, 7-point Likert	0.66	Developed by Dean & Sharfman, 1993a
Social integration	9 items, 5-point Likert	0.85	Developed by Smith et al, 1997
Comprehensiveness	5 items, 7-point Likert	Not reported	Developed by Ogilvy & Glick, 1990, reported in Miller, Burke & Glick, 1998
Organic structure	7 items, 7-point Likert	0.80	Developed by Khandwalla 1976/77, reported in Covin & Slevin, 1989; Ozsomer et al, 1997
Strategic planning (emphasis)	7 items, 5-point Likert	0.84	Developed by Boyd & Reuning-Elliott, 1998
Strategic posture	9 items, 7-point Likert to measure innovation, proactiveness, risk-taking	0.87	Developed by Covin & Slevin, 1989
Entrepreneurial strategy making	5 items (of 25 describing 4 strategy modes), 5-point Likert	0.64	Dess, Lumpkin & Covin, 1997
Innovative differentiation	6 items, 7-point Likert	0.64	Miller 1988
Financial performance	ROA, Sales Growth	0.84	Dess & Robinson, 1984
Performance	13-items, 7-point Likert to measure profit; growth; future position; quality; social responsibility	0.64-0.75 for sub-scales	Hart & Banbury, 1994
Excellence	16 items	0.89	Sharma, Netermeyer & Mahajan, 1990, reported in Caruana, Pitt et al. 1994
Environmental uncertainty	12 items, 7-point Likert to measure complexity (2 items); munificence (2); dynamism (8)	0.63-0.67 for sub-scales	Hart & Banbury, 1994

### 5.3.4 Questionnaire design

A questionnaire based on the literature review, the review of existing scales, and the results of the focus group, was designed. It contained several major sections of variables, consistent with the proposed model constructs. The instruments used to measure each variable are presented below.

A full description of the operationalisation of the predictors (variables) and selection of instruments is given in Appendix 2: Operationalisation of predictors together with the complete questionnaire in Appendix 10: Questionnaire.

In some cases alternative instruments, presented in Appendix 1: Overview of instruments, were considered. A summary of the instruments used is provided in Table 14.

**Table 14: Summary of scales used in the research**

SCALE	ORIGINAL ITEMS	REPORTED ALPHA	REFERENCE	MODIFICATION
External orientation	5 items	>0.80 in (Hagen and Amin 1995)	Jennings & Lumpkin, 1992. Used by Hagen & Amin, 1995	1 item added
Perspective diversity	10 items			New
Politics	4 items	0.66	Dean & Sharfman, 1993a	2 items added
Social integration	9 items	0.85	Smith et al, 1997	
Adaptive structure	7 items	0.80	Covin & Slevin, 1989; Ozsomer et al, 1997	
Integration	6 items	0.84	Miller, 1987	
Cultural control	8 items			New
Planning emphasis	7 item	0.84	Developed by Boyd & Reuning-Elliott, 1998	3 items added
Participation	5 items			New
Comprehensiveness	5 items	Not reported	Miller, Burke & Glick, 1998	1 item added
Strategic posture	9 items	0.87	Developed by Covin & Slevin, 1989	1 item added
Strategic response capability	17 items		Based on Bettis & Hitt, 1995	New
Performance	13 items	0.64-0.75	Hart & Banbury, 1994	
Environmental uncertainty	12 items	0.63-0.67	Hart & Banbury, 1994	

#### ***5.3.4.1 Top Management Team***

The top management team characteristics were measured in four ways: External orientation, Politics in TMT, Social integration of the TMT and Perspective diversity.

#### 5.3.4.1.1 *External orientation*

TMT external orientation was defined as “ the degree to which the top management team access and evaluate information from the business environment”.

The external orientation instrument was adopted from Jennings and Lumpkin (1992) and has previously been used by others (Hagen and Amin 1995). Hagen & Amin reported alpha above 0.8. Their instrument was developed to capture opportunities scanning (items 1 and 3) versus threat scanning (items 2 and 4). A fifth item was added to tap scanning for ‘organisational opportunities’.

To what extent does the Top Management Team of your company scan the external environment for threats and opportunities through:

	Not at all <span style="float: right;">To a great extent</span>						
Formalised evaluation of customer attitudes?	1	2	3	4	5	6	7
Explicitly tracking policies and tactics of competitors?	1	2	3	4	5	6	7
Formalised evaluation of opportunities for new acquisitions, investments, and markets?	1	2	3	4	5	6	7
Formalised evaluation of threats from competitors and regulatory changes?	1	2	3	4	5	6	7
Formalised evaluation of new opportunities for production and distribution?	1	2	3	4	5	6	7

#### 5.3.4.1.2 *Perspective diversity*

Perspective diversity was defined as “the heterogeneity of the TMT with respect to the team members’ information sources and perspectives”. Thus, private network and life situations, as well as educational and professional background and network, could be relevant for the perspective diversity. The instrument was developed following Churchill’s (1979) guidelines.

How would you consider the diversity of the top management team (TMT) with respect to different aspects such as:

	A very homogeneous TMT				A very heterogeneous TMT			
Gender (men/women)	1	2	3	4	5	6	7	
Age	1	2	3	4	5	6	7	
Ethnic background	1	2	3	4	5	6	7	
Educational background	1	2	3	4	5	6	7	
Educational level	1	2	3	4	5	6	7	
Family situation	1	2	3	4	5	6	7	
Private social network (friends)	1	2	3	4	5	6	7	
Private interests and hobbies	1	2	3	4	5	6	7	
Professional or business network	1	2	3	4	5	6	7	
Company network (contacts within the company)	1	2	3	4	5	6	7	

#### 5.3.4.1.3 Politics in the TMT

Politics was defined as “the extent to which the TMT focus on inside the organisation, towards the mixture of interests, power bases and positions, rather than on what is feasible given current environmental forces” (Dean and Sharfman 1996).

The instrument was adapted from Dean and Sharfman (1993). Two new items were added (4 and 6) capturing debate and conflict resolution (Eisenhardt 1989; Eisenhardt, Kahwajy et al. 1997).

Here follows some questions about the decision-making process within the Top Management Team.

	Not at all						To a great extent
To what extent are members of the TMT (top management team) primarily with their own goals, rather than with the goals of the organisation?	1	2	3	4	5	6	7
To what extent are the people in the TMT open with each other about their interests and preferences to decisions?	1	2	3	4	5	6	7

To what extent are decisions in general affected by the use of power and influence among the TMT members?	1	2	3	4	5	6	7
To what extent is there in the TMT an active debate based on facts, when major decisions are being made?	1	2	3	4	5	6	7
To what extent are the decisions affected by negotiation among group members?	1	2	3	4	5	6	7
To what extent is the TMT capable of solving conflicts in a creative way, rather than by the use of power and politics?	1	2	3	4	5	6	7

#### 5.3.4.1.4 Social integration

Social integration was defined as “the extent to which the members of the TMT stick together and co-operate in order to achieve common goals” (Smith, Smith et al. 1994).

Smith et al. (1994) developed the instrument and the reported alpha was 0.85. The original 5-point scale was changed to a 7-point Likert scale.

How would you describe the interaction within the Top Management Team?

	Disagree						Agree
The members of the TMT (top management team) are quick to defend each other from criticism by outsiders.	1	2	3	4	5	6	7
The success of other members of the TMT helps me to achieve my own objectives.	1	2	3	4	5	6	7
Everyone's input is incorporated into most important company decisions.	1	2	3	4	5	6	7
The members of the TMT get along together very well.	1	2	3	4	5	6	7
Relationships between members of the TMT are best described as “win-lose”, if he/she wins, I lose.	1	2	3	4	5	6	7
The members of the TMT are always ready to co-operate and help each other.	1	2	3	4	5	6	7
When final decisions are reached, it is common for at least one member of the TMT to be unhappy with the decision.	1	2	3	4	5	6	7
There is a great deal of competition between the members of the TMT.	1	2	3	4	5	6	7
The members of the TMT really stick together.	1	2	3	4	5	6	7



### 5.3.4.2 Organisational Structure

#### 5.3.4.2.1 Adaptive structure

Adaptive structure was defined as “the extent to which the company has a flexible, informal and task-oriented structure and culture”.

The chosen instrument was reported by Covin and Slevin (1989) (Alpha 0.80) and more recently used by Ozsomer, Cantalone et al (1997). Minor changes in formulations were made.

In general, the operating management philosophy in my firm favours:

Highly structured channels of communication and highly restricted access to important financial and operating information	1	2	3	4	5	6	7	Open channels of communication with important financial and operating information flowing quite freely throughout the organisation
A strong insistence on a uniform managerial style throughout the firm	1	2	3	4	5	6	7	Managers' operating styles allowed to range freely from the very formal to the very informal
A strong emphasis on giving the most to say in decision-making to formal line managers	1	2	3	4	5	6	7	A strong tendency to let the expert in a given situation have the most say in decisions-making, even if this means temporarily bypassing formal line authority
A strong emphasis on holding fast to tried and true management principles despite any changes in business conditions	1	2	3	4	5	6	7	A strong emphasis on adapting to changing circumstances without too much of concern for the past practice
A strong emphasis on always getting personnel to follow the formally laid down procedures	1	2	3	4	5	6	7	A strong emphasis on getting things done even if this means disregarding formal procedures
Tight formal control of most operations by means of sophisticated control and information systems	1	2	3	4	5	6	7	Loose, informal control; heavy dependence on informal relationships and cooperation for getting work done

A strong emphasis on getting line and staff personnel to adhere closely to formal job descriptions	1	2	3	4	5	6	7	A strong tendency to let requirements of the situation and the individual's personality define proper on-job behaviour
--	---	---	---	---	---	---	---	--

#### 5.3.4.2.2 Integration

Integration was defined as “the extent to which decision-making at top level in the firm is characterised by participative, cross-functional committees in which different departments get together to decide specific classes of decisions”.

The instrument was originally developed by Miller (1987) (alpha 0.84) and more recently used by Fairbairn (1997) in a slightly modified form.

To what extent does your company use the following integrative mechanisms to assure compatibility among decisions in one area (e.g. marketing) with those in other areas (e.g. production)?

	Used rarely <span style="float: right;">Used very frequently</span>						
Interdepartmental committees set up to allow departments to engage in joint decision making	1	2	3	4	5	6	7
	Used rarely <span style="float: right;">Used very frequently</span>						
Task forces, temporary bodies set up to facilitate interdepartmental collaboration on specific projects	1	2	3	4	5	6	7
Networking personnel whose specific job is to co-ordinate the efforts of several departments for purposes of a specific project	1	2	3	4	5	6	7

Q7. To what extent is decision-making at top levels in your firm characterised by participative, cross-functional committees in which different departments, functions or divisions get together to decide the following classes of decisions?

	Use rarely <span style="float: right;">Use very frequently</span>						
Product and service decisions concerning production, marketing and R&D strategies	1	2	3	4	5	6	7
Capital budget decisions – selection and financing of long-term investments	1	2	3	4	5	6	7

Long-term strategies (growth, diversification etc) and decisions related to changes in a firm's operating philosophy	1	2	3	4	5	6	7
--	---	---	---	---	---	---	---

#### 5.3.4.2.3 Cultural control

Cultural control was defined as “the extent to which organisational behaviour is controlled by rewards, culture and boundaries”.

Based on the theory an instrument was developed to capture strategic support systems (items 1,2, 6, 7, 8) and incentive systems (3, 4, 5, 9) in order to support desired behaviour and practices.

How would you describe the systems used to implement a desired culture and strategy?

	Very definitely false				Very definitely true		
We carefully hire people that already identify with, and have attributes that are consistent with, the organisation's desired values	1	2	3	4	5	6	7
Rituals (coffee breaks, information meetings, arenas for dialogue etc) are carefully tailored to support desired behaviour, culture and strategy	1	2	3	4	5	6	7
The compensation "system" is designed to support desired culture and strategy and consists of both financial and non-financial incentives	1	2	3	4	5	6	7
The compensation 'system' is perceived as fair and equitable	1	2	3	4	5	6	7
Performance feedback to individuals and groups is prompt, clear and unambiguous	1	2	3	4	5	6	7
Managers are implementing the goals and culture by being role models	1	2	3	4	5	6	7
There is a constant dialogue in the organisation on individual and organisational goals	1	2	3	4	5	6	7
We monitor not only pure performance indicators (such as sales and costs), but all kinds of indicators that are critical to long term performance and the desired culture and strategy (i.e. customer satisfaction, personnel satisfaction, educational expenditure, innovation etc)	1	2	3	4	5	6	7

### 5.3.4.3 Planning

#### 5.3.4.3.1 Planning emphasis

Planning emphasis was defined as “the emphasis the organisation puts on each stage of the planning process from environmental scanning to evaluation”.

The chosen instrument was developed by Boyd and Reuning-Elliot (1998) and tested on the 300 US firms with alpha 0.84. To increase the emphasis on environmental scanning and vision, three items were added (2, 3, 6). The 5-point Likert scale was also adapted to a 7-point scale.

This section examines several common planning activities. Please indicate the **emphasis placed on** each activity within your organisation:

	No emphasis			Moderate emphasis		Very strong emphasis	
	1	2	3	4	5	6	7
Mission statement	1	2	3	4	5	6	7
Continuous scanning of the business environment	1	2	3	4	5	6	7
Market and consumer behaviour analysis	1	2	3	4	5	6	7
Trend analysis	1	2	3	4	5	6	7
Competitor analysis	1	2	3	4	5	6	7
Vision statement	1	2	3	4	5	6	7
Long-term goals	1	2	3	4	5	6	7
Annual goals	1	2	3	4	5	6	7
Short-term action plans	1	2	3	4	5	6	7
Ongoing evaluation	1	2	3	4	5	6	7

#### 5.3.4.3.2 Participation

Participation was defined as “the extent to which co-workers at all levels in the organisation participate in various planning activities”.

No instrument was found that really suited the purpose. Therefore, a new instrument was developed in alignment with the planning emphasis instrument above. But since many organisations do not put too much emphasis on some of the planning activities, the list was considered too detailed. Therefore, a condensed version was developed to measure the degree of participation in each of the five planning phases – from environmental scanning to ongoing evaluation.

To what extent do co-workers on all levels in the organisation participate in the ongoing planning process? Please indicate the **emphasis placed on organisation wide participation** within your organisation regarding:

	No emphasis			Moderate emphasis		Very strong emphasis	
Scanning the business environment for threats and opportunities	1	2	3	4	5	6	7
Developing long term strategies (including mission and vision)	1	2	3	4	5	6	7
Setting annual goals	1	2	3	4	5	6	7
Short-term action planning	1	2	3	4	5	6	7
Ongoing evaluation	1	2	3	4	5	6	7

#### 5.3.4.3.3 *Comprehensiveness*

Comprehensiveness was defined as “the extent to which an organisation when confronted with an important non-routine problem or opportunity tends to extensively examine alternative explanations and solutions”.

Several available instruments were found and the one chosen was reported by Glick, Huber et al. (1990) and recently used by Miller, Burke et al. (1998) (Alpha 0.87). The last item was added to capture parallel decision-making capability (Eisenhardt 1989).

When confronted with an important, non-routine problem or opportunity, to what extent does your firm ...

	Not at all				To a great extent		
Develop many alternative responses?	1	2	3	4	5	6	7
Consider many diverse criteria for eliminating possible courses of action?	1	2	3	4	5	6	7
Thoroughly examine multiple explanations for the problem or opportunity?	1	2	3	4	5	6	7
Conduct multiple examinations of any suggested course of action?	1	2	3	4	5	6	7
Search extensively for possible responses?	1	2	3	4	5	6	7
Simultaneously evaluate different alternative explanations or courses of action, rather than evaluating them sequentially?	1	2	3	4	5	6	7

#### 5.3.4.4 Proactive Experimentation

Proactive experimentation (strategy) was defined as “the degree to which the organisation applies an innovative, aggressive and risk-taking strategic posture”.

The selected instrument was developed by Covin and Slevin (1989) based on items from Miller and Friesen (1982) and Khandwalla (1977). The scale was developed to measure innovation (items 1-3), proactiveness (4-6) and risk-taking (7-9). Two more items were added to capture futures-orientation suggested by Brown and Eisenhardt (1997).

How would you describe your company's strategic posture?

<i>In general, the top managers of my firm favour...</i>								
A strong emphasis on the marketing of tried products and services	1	2	3	4	5	6	7	A strong emphasis on R&D, technological leadership, and innovations
<i>How many new lines of products or services have your firm marketed in the past 5 years?</i>								
No new lines of products or services	1	2	3	4	5	6	7	Very many new lines of products or services
Changes in most products or services have been mostly of a minor nature	1	2	3	4	5	6	7	Changes in product or service lines have usually been quite dramatic

<i>In dealing with its competitors, my firm...</i>								
Typically responds to actions which competitors initiate	1	2	3	4	5	6	7	Typically initiates actions which competitors then respond to
Is very seldom the first business to introduce new products/services, administrative techniques, operating technologies, etc	1	2	3	4	5	6	7	Is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc
Typically seeks to avoid competitive clashes, preferring a "live-and-let-live" posture	1	2	3	4	5	6	7	Typically adopts a very competitive, "undo-the-competitors" posture
<i>In general, the top managers of my firm...</i>								
Prefer low-risk projects (with normal and certain rates of return)	1	2	3	4	5	6	7	Prefer high-risk projects (with chances of very high returns)
<i>In general, the top managers of my firm believe that...</i>								
Owing to the nature of the environment, it is best to explore it gradually via timid, incremental behaviour	1	2	3	4	5	6	7	Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives
<i>When confronted with decision-making situations involving uncertainty, my firm...</i>								
Typically adopts a cautious, "wait-and-see" posture in order to minimise the probability of making costly decisions	1	2	3	4	5	6	7	Typically adopts a bold, aggressive posture in order to maximise the probability of exploiting potential opportunities
<i>In dealing with the balance between present and future, my firm...</i>								
Focuses on existing products, services and markets in order to maximise short-term profit	1	2	3	4	5	6	7	Adopts a long-term orientation, encourages visionary thinking and involves futurists in projects in order to view present activities in a wider perspective
<i>In dealing with the balance between present and future, my firm...</i>								
Extensively develops and thoroughly tests new products and services before they are released in order to ensure acceptance from the market	1	2	3	4	5	6	7	Adopts an experimental approach to the future, frequently testing new experimental products and services in order to both influence the market and to get quick feedback from the market

#### 5.3.4.5 Strategic Response Capability

Strategic response capability was defined in line with Bettis and Hitt's (1995) definition as "the capability to deliver a quick and adequate

response to threats and opportunities in the environment”. According to their theory, the response capability derives from robustness and responsiveness.

Two instruments were developed to measure robustness and responsiveness. The robustness instrument was developed to capture several aspects, from business concept to R&D strategy and competence base. The first 5 items of the robustness variable were chosen to represent the external dimension in terms of behaviour in the market. The last six items were chosen to represent internal robustness in terms of organisational capabilities and strengths.

The responsiveness instrument consisted of 6 questions covering the three dimensions proposed by Bettis and Hitt: ability to sense changes (threats and opportunities) in the environment (items 1, 4); ability to conceptualise responses to those changes (2, 5); and ability to reconfigure resources to execute the response (3, 6).

Robustness can be defined as a company’s ability to adapt to new challenges in the business environment (threats and opportunities) without being forced to change strategy or structure. Assess your company’s **robustness to changes in the competitive landscape** compared to other companies in the same market and at a similar stage of development. Compared to those other companies, how robust are your:

	Highly vulnerable					Highly robust	
Business concept	1	2	3	4	5	6	7
Long term goals	1	2	3	4	5	6	7
Financial strategy	1	2	3	4	5	6	7
Market strategy	1	2	3	4	5	6	7
Supplier strategy	1	2	3	4	5	6	7
R & D strategy	1	2	3	4	5	6	7
Human resource strategy	1	2	3	4	5	6	7
Organisational structure	1	2	3	4	5	6	7
Financial platform	1	2	3	4	5	6	7
Product/service portfolio	1	2	3	4	5	6	7
Competence/knowledge base	1	2	3	4	5	6	7



Assess in a similar way your **company's ability to give quick and adequate responses to changes in the environment** (legislative, technological, competitive, customer demands etc). Compared to other companies in the same market and at a similar stage of development, how would you consider your own company's performance regarding the ability to:

	Low performer				High performer		
Sense potential threats (legislative, technological, competitive, customer demands etc)	1	2	3	4	5	6	7
Conceptualise a response and make decisions and plans to meet threats	1	2	3	4	5	6	7
Reconfigure resources and implement necessary changes to meet threats	1	2	3	4	5	6	7

	Low performer				High performer		
Sense new business or technological opportunities	1	2	3	4	5	6	7
Conceptualise a response and make decisions and plans to exploit opportunities	1	2	3	4	5	6	7
Reconfigure resources and implement necessary changes to exploit opportunities	1	2	3	4	5	6	7

#### **5.3.4.6 Performance**

Performance was defined as “the combination of financial, business and organisational effectiveness, and the ability to successfully invest in future capabilities”.

The chosen instrument was adopted from Hart and Banbury (1994), who developed an instrument to cover several performance dimensions. Compared to other ‘broad’ performance instruments such as the Excel-scale (Caruana, Pitt et al. 1994) the overlap with the independent variables in the model was considered relatively low.

Assess your company's performance on each of the following performance aspects **over the last 3 years**, compared to that of other companies in the same market and at a similar stage of development:

	Low performer				High performer			
Profitability/ROA	1	2	3	4	5	6	7	
Cash flow	1	2	3	4	5	6	7	
Sales growth	1	2	3	4	5	6	7	
Market share	1	2	3	4	5	6	7	
Market diversification	1	2	3	4	5	6	7	
Product/service change	1	2	3	4	5	6	7	
New products next year	1	2	3	4	5	6	7	
Product/service development	1	2	3	4	5	6	7	
Overall company quality	1	2	3	4	5	6	7	
Employee satisfaction	1	2	3	4	5	6	7	
Product/service quality	1	2	3	4	5	6	7	
Environmental responsibility	1	2	3	4	5	6	7	
Social responsibility	1	2	3	4	5	6	7	

#### **5.3.4.7 Raplexity**

Business environment raplexity was defined as “the environment’s variance in terms of complexity and change rate”. Several instruments measuring dynamism, munificence and complexity were found. Hart and Banbury (1994), based on the work of Dess and Beard (1984), developed the selected instrument. The first two items were developed to measure complexity, the following two munificence, and the last eight items to measure turbulence (the combination of unpredictability and change). Banbury and Hart combined complexity and turbulence into a single measure of turbulence. Since munificence leads to increased opportunities, it is also an aspect of raplexity. Therefore, the raplexity was measured as the sum of all twelve items in the question.

What would you say characterises your company's business environment? Please describe your company's business environment by responding to the statements below.

	Completely disagree						Completely agree
Actions taken by my firm will heavily affect our competitors	1	2	3	4	5	6	7
Our business environment is very complex with many unclear factors and relations influencing our firm	1	2	3	4	5	6	7
The market will grow for several years	1	2	3	4	5	6	7
The business opportunities for the next 12 months look good	1	2	3	4	5	6	7
Our customers' preferences are continuously changing	1	2	3	4	5	6	7
The social values in society are continuously changing	1	2	3	4	5	6	7
The business environment is continuously changing	1	2	3	4	5	6	7
It is very difficult to foresee change	1	2	3	4	5	6	7
New and unpredictable competition is constantly occurring	1	2	3	4	5	6	7
There are many unforeseen threats that we have to cope with	1	2	3	4	5	6	7
The innovation rate in the market is high	1	2	3	4	5	6	7
The performance of our firm is highly influenced by unpredictable public policies	1	2	3	4	5	6	7

### 5.3.5 Pre-testing and finalising the questionnaire

The questionnaire was pre-tested to finalise the instrument. The reference group previously used were mailed the questionnaire and asked to fill it out and evaluate its length, the time needed for completion and the content of individual items. 25 out of 61 questionnaires were completed and returned after one reminder. Only a few minor corrections were suggested, caused by language problems, and those were made.

A reliability test of the scales was also conducted, based on the first 12 pre-test responses. The alphas were well above 0.600 for all scales, both borrowed and developed.

Based on the comments from the respondents, some items were slightly changed in order to eliminate ambiguity and the questionnaire was finalised.

#### **5.4 Sampling frame and data collection**

For the survey, a multi-industry sample was chosen to ensure a variety in environmental raplexity. Data from 3 industries in 4 different North-European countries were collected. The selected industries were Finance (Banking and Insurance), Media (excluding advertising) and IT (software and hardware industry) and the sample was chosen randomly among companies with more than 50 employees. The ambition was to select companies from what could be assumed to be medium to high raplexity industries. The IT-industry is commonly used as a highly raplex industry (Brown and Eisenhardt 1997). Finance and Media were selected since internationalisation, deregulation and the emergence of the Internet affected them during the 90s. The chosen countries were Sweden, Germany, Holland, and Great Britain. Since the selection of addresses was handled by a Swedish address company (PAR) in collaboration with colleagues in the other countries, and since the survey was carried out in English, these four countries met the two important criteria of high-quality addresses and necessary language skills.

The questionnaires were mailed to the presidents/CEOs of the companies. First, a postcard was sent informing about the coming survey and stating the importance of participation. Two weeks later the questionnaire was

posted together with a cover letter explaining the purpose and importance of the study and repeating the importance of the participation. To increase response rate, participating companies were promised a copy of the preliminary results of the study together with a 'futures book'. They were also promised an invitation to a seminar where the strategic implications of the results would be discussed. After yet another week, a postcard 'reminding' the participants on the importance of taking part was mailed.

Due to delays caused by the address company and the company handling the mailing, the response rate was not at all satisfying. A second follow-up by phone was therefore initiated six weeks after the mailing of the questionnaire. 700 companies were contacted several times. In 462 of them, a relevant person was reached, most often not the actual respondent. Of the 462 companies reached, 134 were unwilling to participate. They referred to company policy, a parent company, or gave other reasons. Those companies that agreed to participate (328) were sent a new questionnaire and their responses were followed-up by e-mail and phone. After receiving the questionnaire, or at the second, third or fourth follow-up, another 48 companies refused to answer, leaving us with 281 potential responders.

The second follow-up continued over a period of 5 months. However, still only 90 completed questionnaires were received, although a huge amount of effort, energy and money had been put into the project. For practical reasons the time-consuming data collection was abandoned and I decided to include some of the cases from the pre-test in order to reach the desired sample size of 100. 15 cases from the pre-testing that met the criterion of minimum company size of 50 employees were therefore included in the final sample.

## **5.5 Data treatment and hypothesis testing**

A multi-step approach to data analysis was adopted in this research. First, potential non-response biases were assessed by comparing responders with non-responders, based on industry and number of employees. Second, the descriptive statistics for all scale items were calculated and potential non-normality problems assessed. Third, the reliability of the constructs pertaining to the environment, performance, response capability, management, organisation, process and strategy were evaluated and the measurement were purified. Fourth, the research hypotheses were tested by correlation analysis and multiple-regression analysis.

To increase the validity of the results, the intention had been to apply a sequence of test methods, namely correlation analysis, multiple regression analysis and structural equation modelling. A hypothesis supported by all three methods could be considered strongly supported (Fairbairn 1997). However, since the number of responses was low, structural equation modelling was dropped.

A final comment could be made on the hypothesis testing. Karl Popper (1959) once argued that, however much data one obtains in support of a scientific theory or law, it is not possible to reach conclusive proof of its truth. Therefore, one could argue that research within a positivist view should try to falsify hypotheses rather than verify them (Easterby-Smith, Thorpe et al. 1991). However, since the general stream in positivist management research leads towards a search for verification of hypotheses, the same approach has been followed in here.

## **5.6 Validation of results – focus-group 2**

Reference groups of practitioners have been found useful in validating questionnaire responses (Easterby-Smith, Thorpe et al. 1991). Therefore, the external reference group was invited to a second round-table discussion in June 2000. Before the meeting, a preliminary report was sent to.

At that meeting the results were presented and discussed and the participants asked for direct responses on the conclusions.

The participants confirmed the results, and found them relevant and the final models very useful.

The results were also presented and discussed in a similar way with a group of 10 strategy consultants, working mainly with companies in raplex environments.

A description of the focus group is given in Appendix 5: Validation focus group.

Finally, the results were presented and discussed at three breakfast seminars with 70 top managers and strategists. The general response, not reported here, was that the results were highly relevant.

## **5.7 Validation of results – reference survey**

In combination with another survey of companies in various industries operating in Sweden, a simplified version of some of the key variables in the research was included. The variables were planning emphasis, raplexity, strategic response capability, and performance.

The purpose of this reference survey was to check the generalisability of the research results. The result of the reference survey was in

line with the results of the major survey. The results are presented in Appendix 8: Analysis of reference data.

## **5.8 Summary of Chapter 5**

This chapter discussed the research philosophy, methodology and design. Since the research problem was well-suited to a positivistic approach and, primarily, quantitative design, that methodology was chosen.

In order to improve the selection of instruments, a reference group of top managers and strategists was invited to rank the performance predictors and comment on the research model. There were some discrepancies between the results from the literature and the practitioners' view, but the reference group largely confirmed the results from the literature review.

A questionnaire based on both the literature review and the focus group was developed and pre-tested on the reference group.

The sample of companies was selected from three industries – IT, banking and insurance, media – in four northern European countries: Sweden, Germany, The Netherlands and Great Britain. The industries were selected since they are largely affected by developments in the IT-field and thus becoming more raplex.

Finally, data collection, data treatment and validation or results through a reference group and minor reference survey are discussed.



## **6 Analysis and findings**

In this chapter, the data-analysis procedure is presented and the major results outlined and discussed.

First, the analysis of the sample data is discussed. Second, the purification of the sample and the confirmatory analysis of the instruments are presented. Third, the multi-step hypothesis testing is presented and the results discussed.

The analysis was made on a Macintosh Powerbook G3 with SPSS 6.0 for Macintosh.

### **6.1 Response rate, non-response bias and final sample statistics**

Of the 1200 companies in the original sample, 35 were no longer in business, the address was incorrect, questionnaires sent out were returned by the local post-office for other reasons. When, in the second round, I started to call the companies, another 66 were deleted for similar reasons. Of the 1099 companies contacted, another 33 immediately declared unwillingness or were unable to participate for policy reasons. 90 questionnaires were completed and returned, and thus the overall response rate was 8.4 percent. The response rate on the phone-based follow-up was considerably higher, but still low, about 20 percent (67 responses out of 330 companies that initially agreed to participate). The response rate on the phone-based follow-up differed between the countries. A comparison in different sub-samples is presented in Table 15.

**Table 15. Assessment of response rate on the phone-based follow-up**

Country	No. contacted companies	No. reached companies	No. companies agreed to participate	No. of Responders	Percent of Responders of reached	Percent of Responders of participating
Sweden	220	142	127	32	22.5	25.2
Germany	99	69	38	2	2.9	5.3
The Netherlands	192	112	86	12	10.7	14.0
Great Britain	189	139	78	21	15.1	26.9
Total	700	462	329	67	14.5	20.4

As seen from the table, the results, specifically from the Germany were poor.

The German companies were the most formal and consequently those hardest to get direct contact with the relevant person. A large proportion was also deleted from the sample due to language problems. After trying to reach 100 companies in the second follow-up, I decided to concentrate on Great Britain and The Netherlands, apart from Sweden from where the response-rate was satisfactory.

After five month of follow-up, still only 90 completed questionnaires were received. To those 90 questionnaires, another 15 cases were added from the pre-test of the questionnaire.

As a preliminary step, non-response bias in the original sample (90 responses) was assessed by comparing responding with non-responding companies on the profile variables of industry and number of employees, when available. The Swedish companies were grouped into different size groups based on turnover and number of employees. Information was more detailed from the British and German companies, while no size data was available from the Dutch sample.

The characteristics of the original sample is presented in Table 17. As seen, there is a slight industry bias towards IT, whereas Media is underrepresented in the sample. There are also few responses from Germany and

The Netherlands in the sample, whereas Sweden is over-represented. The reason for that was the great problem of collecting data from Germany (in particular) and The Netherlands, which led to a focus on Great Britain as the major European country besides Sweden.

To check for non-response biases of employees, the British and Swedish samples were used. The reason for leaving the Germans out was the low response-rate. The British employee-data was grouped in a similar way to the Swedish to make comparison possible. Table 16 shows the results of the comparison. Based on number of employees', there are slightly more responders than non-responders. An analysis of responses between Sweden and Great Britain also reveals some differences. Almost half (5) of the Swedish companies with more than 500 employees (11) responded, but less than 10 percent of the British ones. The consequence of the non-response bias might be that the results of the research are more representative of companies with more than 100 employees.

Major characteristics of the final sample of 105 companies are summarised in Table 18.

**Table 16. Assessment of non-response bias. British and Swedish samples**

No. of employees	No. of Non-responders	No. of Responders	Percent of responders
50 - 99	241	26	9.7
100 - 199	113	24	17.5
200 - 499	81	13	13.8
500 -	75	10	11.8
Total	510	73	12.5

**Table 17. Characteristics of the original sample (n=90)**

Characteristics of the original sample		Cases	Percent
Industry	Banking/finance/insurance	29	32
	Media	21	23
	IT	40	44
Country	Sweden	46	51
	Germany	3	3
	The Netherlands	14	16
	Great Britain	27	30

**Table 18. Sample characteristics of final sample (n=105)**

Characteristics		Cases	Percent
Industry	Banking/finance/insurance	30	29
	Media	21	20
	IT	45	43
	Other	9	9
Country	Sweden	61	58
	Germany	3	3
	The Netherlands	14	13
	Great Britain	27	26
Title of respondent	MD, CEO, president	53	50
	VP, Director, CIO, CFO etc	34	32
	Strategist, Corporate planner	8	8
	Regional director	4	4
	Other	4	4
	N/A	2	2

## **6.2 Data quality and reliability of constructs**

To assess the data quality, to purify variables and data set and to certify the assumptions of multi-variate analysis, a multi-step approach was applied.

First, preliminary analysis and purification of the data set was made. Second, initial data analysis was carried out to assess the quality of the final data set. Third, confirmatory factor analysis was made, and the variables purified. Fourth, the data was checked for potential multi-collinearity.

### 6.2.1 Preliminary analysis and purification

During the period of data collection, a preliminary analysis was made to get a general understanding of the material. Descriptive analysis, correlation analysis and multiple regression were made to get a general view of the data quality, instrument reliability, correlations and patterns.

Analysis of missing values revealed that no item (question) had fewer than 100 observations, and most had all 105 observations valid. An analysis of the cases revealed that 71 had no missing values at all, 19 had 1 or 2 missing values, 11 had 3 to 5 missing values. 1 case had 8 missing values, 2 had 13 missing values, and 1 had 22 missing values (the last two pages of the questionnaire). Consequently, only three cases had whole variables missing.

Following a procedure that was proposed by Hair (2000), single missing values were replaced through manual imputation (see Appendix 6: Data purification).

### 6.2.2 Initial data analysis

To assess the data quality of the purified sample, the means, the standard deviations, kurtosis, and skewness of each item were computed (see Appendix 7: Non-normality assessment).

A procedure proposed by to Hair, Anderson et al. (1998:65) was followed. The variable names (items) are listed in the first column. In addition to

the standard deviation, two other important characteristics of the data distribution are reported in the table, kurtosis and skewness. Kurtosis is the measure of flatness of data distribution, and skewness is a measure of symmetry of the distribution. According to Hair, Anderson et al. (1998:65):

“The most fundamental assumption in multivariate analysis is the normality of the data, referring to the shape of the data distribution for an individual metric variable and its correspondence to the normal distribution, the benchmark for statistical methods.”

A close examination of the fourth column reveals that kurtosis for all items is far below 2.58, a level beyond which non-normality becomes a concern (Hair, Anderson et al. 1998:72). Similarly, the sixth column reveals that the skewness of all items is smaller than the lower bound of concern of 2.58, in fact lower than 1.35. Therefore, the kurtosis and skewness of the items provide no indication that the items (questions) used in this research are distributed non-normally.

### 6.2.3 Confirmatory factor analysis and purification of constructs

Since several variables in the model were measured with different possibly overlapping instruments, a factor analysis of variables was conducted. This factor analysis also revealed some conceptual overlap between different concepts. The procedure and results are described in Appendix 9: Confirmatory factor analysis of constructs.

The major results of the factor analysis were the following. The SRC concept was found to share dimensions with aspects of the non-financial performance variable, and financially related Robustness items were correlated to financial performance. The factors found were interpreted as consisting of two

groups, one describing 'output-performance' or deliveries, such as financial output, quality and social and environmental responsibility, the others were interpreted as 'process-performance' variables or capabilities such as concept robustness, organisational robustness, responsiveness and change capability.

Social integration and Non-politics were also found to have factors in common, primarily two, interpreted as task-orientation and companionship.

The factor analysis also revealed some other possible conceptual overlaps. However, despite the findings, I decided to go with the theory and not develop new variables based on the factor analysis. One reason for that was that the confirmatory factor analysis of each variable largely confirmed the theory. Only minor deviations from the theory were revealed. A second reason was that each of the variables showed satisfactory internal reliability with Cronbach alphas well above 0.6.

#### 6.2.4 Confirmation of multiple item instruments

Each variable in the model was measured by multiple items in the questionnaire. To measure the reliability of the variable, a coefficient alpha was computed for each construct. All alphas but one were found to be well above the minimum acceptable level of 0.600 (Nunnally 1967), and all but two reached the level of 0.7-0.9 without purification. Four items were dropped due to low inter-item correlations (below 0.25). After purification, the alpha reached an acceptable level. Table 19 to Table 25 show all the constructs, the alphas of each variable and the item-variable correlation for each item on the original instrument (before dropping some of the items).

**Table 19. TMT characteristics reliabilities**

VARIABLE and items	item-variable correlation	Cronbach's alpha
EXTERNAL ORIENTATION (ORIENT)		0.759
Formalised evaluation of customer attitudes?	0.500	
Explicitly tracking policies and tactics of competitors?	0.540	
Formalised evaluation of opportunities for new acquisitions, investments, and markets?	0.491	
Formalised evaluation of threats from competitors and regulatory changes?	0.650	
Formalised evaluation of new opportunities for production and distribution?	0.468	
PERSPECTIVE DIVERSITY (DIVERS)		0.697 (0.738 after purification)
(Gender (men/women)) item dropped due to low inter-item correlation	(0.126)	
Age	0.357	
(Ethnic background) item dropped due to low inter-item correlation	(0.248)	
Educational background	0.472	
Educational level	0.388	
Family situation	0.438	
Private social network (friends)	0.408	
Private interests and hobbies	0.276	
Professional or business network	0.559	
Company network (contacts within the company)	0.414	
NON-POLITICAL CLIMATE IN THE TMT (NONPOL)		0.633 (0.689 after purification)
To what extent are members of the TMT (top management team) primarily with their own goals, rather than with the goals of the organisation?	0.374	
To what extent are the people in the TMT open with each other about their interests and preferences to decisions?	0.480	
To what extent are decisions in general affected by the use of power and influence among the TMT members?	0.325	
To what extent is there in the TMT an active debate based on facts, when major decisions are being made?	0.478	
(To what extent are the decision affected by negotiation among group members?) Item dropped after reliability analysis	(0.077)	
To what extent is the TMT capable of solving conflicts in a creative way, rather than by the use of power and politics?	0.502	



TMT SOCIAL INTEGRATION (SOCIAL)		0.820
The members of the TMT (top management team) are quick to defend each other from criticism by outsiders.	0.280	
The success of other members of the TMT helps me to achieve my own objectives.	0.547	
Everyone's input is incorporated into most important company decisions.	0.594	
The members of the TMT get along together very well.	0.627	
Relationships between members of the TMT are best described as "win-lose", if he/she wins, I lose.	0.567	
The members of the TMT are always ready to co-operate and help each other.	0.671	
When final decisions are reached, it is common for at least one member of the TMT to be unhappy with the decision.	0.397	
There is a great deal of competition between the members of the TMT.	0.535	
The members of the TMT really stick together.	0.532	

**Table 20. Organisational structure reliabilities**

VARIABLE and items	item-variable correlation	Cronbach's alpha
<b>ADAPTIVE STRUCTURE (STRUCTUR)</b>		0.790
Open channels of communication with important financial and operating information flowing quite freely throughout the organisation	0.374	
Managers' operating styles allowed to range freely from the very formal to the very informal	0.553	
A strong tendency to let the expert in a given situation have the most say in decision-making, even if this means temporary bypassing of formal line authority	0.534	
A strong emphasis on adapting to changing circumstances without too much of concern for the past practice	0.512	
A strong emphasis on getting things done even if this means disregarding formal procedures	0.583	
Loose, informal control; heavy dependence on informal relationships and cooperation for getting work done	0.443	
A strong tendency to let requirements of the situation and the individual's personality define proper on-job behaviour	0.663	
<b>INTEGRATION (INTEGR)</b>		0.716
Interdepartmental committees set up to allow departments to engage in joint decision-making	0.494	
Task forces, temporary bodies set up to facilitate interdepartmental collaboration on specific projects	0.515	
Networking personnel whose specific job is to co-ordinate the efforts of several departments for purposes of a specific project	0.302	
Product and service decisions concerning production, marketing and R&D strategies	0.478	
Capital budget decisions – selection and financing of long-term investments	0.432	
Long-term strategies (growth, diversification etc) and decisions related to changes in a firm's operating philosophy	0.498	
<b>CULTURAL CONTROL (CULTURE)</b>		0.780
We carefully hire people that already identify with and have attributes that are consistent with the organisation's desired values	0.336	
Rituals (coffee breaks, information meetings, arenas for dialogue etc) are carefully tailored to support desired behaviour, culture and strategy	0.261	
The compensation "system" is designed to support desired culture and strategy and consists of both financial and non-financial incentives	0.622	
The compensation "system" is perceived as fair and equitable	0.526	
Performance feedback to individuals and groups is prompt, clear and unambiguous	0.542	
Managers are implementing the goals and culture by being role models	0.652	
There is a constant dialogue in the organisation on individual and organisational goals	0.516	
We monitor not only pure performance indicators (such as sales and costs), but all kinds of indicators that are critical to long-term performance and the desired culture and strategy (i.e. customer satisfaction, personnel satisfaction, educational expenditure, innovation etc)	0.490	

**Table 21. Strategy process reliabilities**

VARIABLE and items	item-variable correlation	Cronbach's alpha
PLANNING EMPHASIS (PLANEMP)		0.776
Mission statement	0.380	
Continuous scanning of the business environment	0.481	
Market and consumer behaviour analysis	0.515	
Trend analysis	0.476	
Competitor analysis	0.326	
Vision statement	0.534	
Long-term goals	0.554	
Annual goals	0.475	
Short-term action plans	0.303	
Ongoing evaluation	0.391	
COMPREHENSIVENESS (COMPRES)		0.825
Develop many alternative responses?	0.465	
Consider many diverse criteria for eliminating possible courses of action?	0.636	
Thoroughly examine multiple explanations for the problem or opportunity?	0.701	
Conduct multiple examinations of any suggested course of action?	0.642	
Search extensively for possible responses?	0.565	
Simultaneously evaluate different alternative explanations or courses of actions, rather than evaluating them sequentially?	0.571	
PARTICIPATION (PARTICIP)		0.802
Scanning the business environment for threats and opportunities	0.551	
Developing long term strategies (including mission and vision)	0.590	
Setting annual goals	0.683	
Short-term action planning	0.544	
Ongoing evaluation	0.570	

**Table 22. Strategy reliabilities**

VARIABLE and items	item-variable correlation	Cronbach's alpha
PROACTIVE EXPERIMENTATION (STRATEGY)		0.890
A strong emphasis on R&D, technological leadership and innovations	0.590	
Very many new lines of products or services	0.503	
Changes in product or service lines have usually been quite dramatic	0.540	
Typically initiate actions which competitors then respond to	0.666	
Is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc	0.679	
Typically adopts a very competitive, "undo-the-competitors" posture	0.593	
Prefers high-risk projects (with chances of very high returns)	0.666	
Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives	0.734	
Typically adopts a bold, aggressive posture in order to maximise the probability of exploiting potential opportunities	0.766	
Adopts a long-term orientation, encourages visionary thinking and involves futurists in projects in order to view present activities in a wider perspective	0.631	
Adopts an experimental approach to the future, frequently testing new experimental products and services in order to both influence the market and to get quick feedback from the market	0.390	

**Table 23. Strategic response capability reliabilities**

VARIABLE and items	item-variable correlation	Cronbach's alpha
<b>ROBUSTNESS (ROBUST)</b>		0.823
robustness to changes in the competitive landscape compared to other companies in the same market and at a similar stage of development		
Business concept	0.512	
Long-term goals	0.590	
Financial strategy	0.552	
Market strategy	0.599	
Supplier strategy	0.301	
R & D strategy	0.362	
Human resource strategy	0.372	
Organisational structure	0.441	
Financial platform	0.567	
Product/service portfolio	0.644	
Competence/knowledge base	0.519	
<b>RESPONSE CAPABILITY (RESPONS)</b>		0.894
Compared to other companies in the same market and at a similar stage of development, how would you consider your own company's performance regarding the ability to:		
Sense potential threats (legislative, technological, competitive, customer demands etc)	0.656	
Conceptualise a response and make decisions and plans to meet threats	0.763	
Reconfigure resources and implement necessary changes to meet threats	0.772	
Sense new business or technological opportunities	0.634	
Conceptualise a response and make decisions and plans to exploit opportunities	0.764	
Reconfigure resources and implement necessary changes to exploit opportunities	0.712	
<b>SRC (strategic response capability) = (ROBUST + RESPONS)/2</b>		

**Table 24. Environment reliabilities**

VARIABLE and items (factors found through confirmatory factor analysis)	item-variable correlation	Cronbach's alpha
RAPLEXITY		0.764 (0.770 after purification)
(Actions taken by my firm will heavily affect our competitors) item dropped due to low inter-variable correlation	(0.213)	
Our business environment is very complex with many unclear factors and relations influencing our firm	0.501	
The market will grow for several years	0.399	
The business opportunities for the next 12 months look good	0.346	
Our customers' preferences are continuously changing	0.571	
The social values in society are continuously changing	0.277	
The business environment is continuously changing	0.488	
It is very difficult to foresee change	0.412	
New and unpredictable competition is constantly occurring	0.546	
There are many unforeseen threats that we have to cope with	0.346	
The innovation rate in the market is high	0.517	
The performance of our firm is highly influenced by unpredictable public policies	0.265	

**Table 25. Performance reliabilities**

VARIABLE and items	item-variable correlation	Cronbach's alpha
PERFORMANCE (PERFORM)		0.838
Performance over the last 3 years, compared to that of other companies in the same market and at a similar stage of development		
Profitability/ROA	0.525	
Cash flow	0.578	
Sales growth	0.521	
Market share	0.467	
Market diversification	0.424	
Product/service change	0.608	
New products next year	0.422	
Product/service development	0.636	
Overall company quality	0.584	
Employee satisfaction	0.472	
Product/service quality	0.370	
Environmental responsibility	0.263	
Social responsibility	0.467	
FINANCIAL PERFORMANCE (FINPERF)		0.808
performance over the last 3 years, compared to that of other companies in the same market and at a similar stage of development		
Profitability/ROA	0.688	
Cash flow	0.688	

### 6.2.5 Multicollinearity

The next step in the data-quality analysis was to examine the collinearity. Collinearity is an expression of the relationship between two independent variables. The independent variables are said to exhibit complete collinearity if their correlation coefficient is 1, and complete lack of collinearity if their correlation coefficient is 0. Multicollinearity occurs in a similar way when a single independent variable is highly correlated to a set of other independent variables.

The effect of collinearity can be categorised in terms of explanation and estimation. As collinearity occurs (already at a level of 0.30), it becomes harder for the researcher to separate the effects of each variable. The ideal situation for a researcher is to have a number of independent variables highly correlated with the dependent variable, but with little correlation among themselves. The researchers task is however, to assess the degree of collinearity and to determine its impact on the result (Hair, Anderson et al. 1998:188).

According to Hair, Anderson et al., the first check of collinearity is the correlation matrix. Correlations above 0.90 indicate strong collinearity. But lack of high correlations does not exclude the lack of collinearity. A second measure is the VIF value (variance inflation factor), the its inverse  $t$  (tolerance). Acceptable levels of VIF are below 5.3 and for  $t$  above 0.19, which corresponds to a correlation of 0.90.

Checking for collinearity revealed that no correlation coefficient between independent variables was higher than 0.55, except for the correlation between NONPOL and SOCIAL which was 0.71, and most were in the interval between 0.1 and 0.35 (see Table 6). Checking for VIF values revealed that none was higher than 2.5 (Social integration and Non-politics) when SRC was left out

of the equation. When SRC was included in the equation the VIF values increased to 2.75 for SRC, and between 1.1 and 2.71 for the other variables. But still the VIF is far below the acceptable level of 5.3. A VIF value of 2.5 means that  $1/2.5$  or 40 % of the variance in the independent variable is not explained by the other independent variables.

The sample was also checked for outliers in the regression equations, that is observations that have a substantial difference between the dependent variable and the predicted value. No outliers that would significantly influence the results were found.

#### 6.2.6 Validation of performance measure

The performance was measured with self-reported data where the respondents compared their own company's performance with other companies in the industry and at the same level of development. There were two reasons for that. First, previous research has shown that it is often hard to get actual financial data from the respondents, which is necessary as soon you are not investigating public corporations. Only 30 percent of the respondents in Hart and Banbury's (1994) study of the strategy performance link delivered actual data. Second, previous research has shown a high degree of correspondence between self-reported performance estimations and actual performance (Dess and Robinson 1984; Venkatraman and Ramanujam 1987). When Hart and Banbury checked the correlations between reported performance perceptions and objective data they found performance correlations between 0.55 and 0.99 with higher correlations the more specified the industry or sub-industry was. Research has even indicated that self-reported data might be more accurate in regard to actual performance than archival performance data.



### **6.3 Hypotheses testing**

As previously mentioned, a multi-step approach will be applied to test the hypothesis in this thesis. First, the Hypotheses H1 to H12 were tested by the use of correlation analysis and multiple regression. Second, the hypothesis that the independent variables and SRC will be more important in raplex than less raplex environments was tested by moderated regression analysis.

Correlation analysis simply assesses the relationship between two variables without controlling for the effects of other variables. It is particularly useful in exploring relationships between variables that were not hypothesised. It is also useful when comparing and relating the results to previous research, where other sets of variables were used. Multiple regression analysis is a more sophisticated technique used to evaluate the impact of several independent variables on a given dependent variable. When examining the relations between one of the independent variables and the dependent variables, all other variables in the model are controlled for.

#### **6.3.1 Part I: Hypothesis testing: Strategic response capability (SRC): antecedents and consequences**

In Chapter 4, it was hypothesised that TMT characteristics, organisational structure, strategic planning and strategic posture have an impact on organisational performance. It was also hypothesised that the strategic response capability is dependent on these four organisational characteristics and at the same time one of the antecedents of performance.

This section presents the results of testing Hypotheses 1 to 12. First, the result of correlation analysis will be discussed. Second, multiple

regression analysis of the antecedents of performance and SRC will be presented and discussed in relation to the correlation analysis.

#### **6.3.1.1 *Correlation analysis***

The complete correlation matrix is presented in Table 26, and the correlations between the dependent and the independent variables are presented in Table 27. Significant correlation coefficients are found between many of the independent variables, as well as between most of the independent and dependent variables SRC is significantly correlated to all independent variables except Perception diversity (DIVERS). Total performance (PERFORM) is significantly correlated (on 0.05 level) to all variables except DIVERS and Integration (INTEGR). Financial performance (FINPERF) is significantly correlated to SRC and to seven of the eleven independent variables. Finally, Raplexity is significantly correlated to External Orientation, Integration, Participation and Proactive Experimentation (STRATEGY), indicating that raplexity might be a driver for those variables.

**Table 26. Correlation analysis (n=105)**

- - Correlation Coefficients - -						
	ORIENT	DIVERS	NONPOL	SOCIAL	STRUCTUR	INTEGR
ORIENT	1,0000	,0752	,1779	,0440	-,0289	,1019
DIVERS	,0752	1,0000	,0297	,1228	,0910	,1224
NONPOL	,1779	,0297	1,0000	,7078**	,2694**	,2124*
SOCIAL	,0440	,1228	,7078**	1,0000	,3419**	,1792
STRUCTUR	-,0289	,0910	,2694**	,3419**	1,0000	,2221*
INTEGR	,1019	,1224	,2124*	,1792	,2221*	1,0000
CULTURE	,2814**	,1067	,5091**	,4873**	,3716**	,4328**
PLANEMP	,5106**	,0253	,4476**	,4253**	,1481	,3394**
COMPRE	,3278**	,1086	,4159**	,3044**	,1602	,3941**
PARTICIP	,3817**	,2248*	,3286**	,3017**	,1589	,2657**
STRATEGY	,4091**	,0321	,3424**	,2379*	,4348**	,1926*
SRC	,4126**	,0585	,4911**	,4166**	,3503**	,2401*
ROBUST	,3565**	,0686	,4895**	,3664**	,2465*	,1755
RESPONS	,3693**	,0380	,3874**	,3677**	,3585**	,2405*
FINPERF	,2563**	,1555	,1469	,1377	,2678**	,0693
PERFORM	,3228**	,0050	,3562**	,3154**	,3386**	,1590
RAPLEX	,2198*	,0721	-,1564	-,0835	,0782	,2654**
	CULTURE	PLANEMP	COMPRE	PARTICIP	STRATEGY	SRC
ORIENT	,2814**	,5106**	,3278**	,3817**	,4091**	,4126**
DIVERS	,1067	,0253	,1086	,2248*	,0321	,0585
NONPOL	,5091**	,4476**	,4159**	,3286**	,3424**	,4911**
SOCIAL	,4873**	,4253**	,3044**	,3017**	,2379*	,4166**
STRUCTUR	,3716**	,1481	,1602	,1589	,4348**	,3503**
INTEGR	,4328**	,3394**	,3941**	,2657**	,1926*	,2401*
CULTURE	1,0000	,4441**	,4507**	,5355**	,4100**	,5181**
PLANEMP	,4441**	1,0000	,5208**	,5229**	,4112**	,6527**
COMPRE	,4507**	,5208**	1,0000	,4191**	,4565**	,4596**
PARTICIP	,5355**	,5229**	,4191**	1,0000	,3976**	,4563**
STRATEGY	,4100**	,4112**	,4565**	,3976**	1,0000	,6483**
SRC	,5181**	,6527**	,4596**	,4563**	,6483**	1,0000
ROBUST	,4007**	,5930**	,3578**	,3101**	,4037**	,8498**
RESPONS	,5013**	,5610**	,4429**	,4758**	,7057**	,9065**
FINPERF	,2275*	,2513**	,2091*	,2030*	,2558**	,5160**
PERFORM	,4368**	,4868**	,4051**	,2928**	,5554**	,7902**
RAPLEX	-,0936	,1439	-,0015	,2384*	,1977*	,0717
	ROBUST	RESPONS	FINPERF	PERFORM	RAPLEX	
ORIENT	,3565**	,3693**	,2563**	,3228**	,2198*	
DIVERS	,0686	,0380	,1555	,0050	,0721	
NONPOL	,4895**	,3874**	,1469	,3562**	-,1564	
SOCIAL	,3664**	,3677**	,1377	,3154**	-,0835	
STRUCTUR	,2465*	,3585**	,2678**	,3386**	,0782	
INTEGR	,1755	,2405*	,0693	,1590	,2654**	
CULTURE	,4007**	,5013**	,2275*	,4368**	-,0936	
PLANEMP	,5930**	,5610**	,2513**	,4868**	,1439	
COMPRE	,3578**	,4429**	,2091*	,4051**	-,0015	
PARTICIP	,3101**	,4758**	,2030*	,2928**	,2384*	
STRATEGY	,4037**	,7057**	,2558**	,5554**	,1977*	
SRC	,8498**	,9065**	,5160**	,7902**	,0717	
ROBUST	1,0000	,5478**	,5491**	,6606**	-,0529	
RESPONS	,5478**	1,0000	,3791**	,7251**	,1563	
FINPERF	,5491**	,3791**	1,0000	,7011**	,0288	
PERFORM	,6606**	,7251**	,7011**	1,0000	,0321	
RAPLEX	-,0529	,1563	,0288	,0321	1,0000	

\* - Signif. LE ,05      \*\* - Signif. LE ,01      (2-tailed)

" , " is printed if a coefficient cannot be computed

**Table 27. Correlation coefficients between independent variables and SRC and performance (n=105)**

		SRC Correlation	FINPERF Correlation	PERFORM Correlation
TMT	X1. External orientation	0.413**	0.256**	0.323**
	X2: Diversity	0.058	0.156	0.005
	X3. Non-politics	0.491**	0.147	0.356**
	X4. Social integration	0.417**	0.138	0.315**
Organisational structure	X5. Adaptive structure	0.305**	0.268**	0.339**
	X6. Integration	0.240*	0.069	0.159
	X7. Cultural control	0.518**	0.228*	0.437**
Planning	X8. Planning emphasis	0.653**	0.251**	0.487**
	X9. Comprehensiveness	0.460**	0.209*	0.405**
	X10. Participation	0.456**	0.203*	0.293**
Strategy	X11. Proactive experimentation	0.648**	0.256**	0.555**
SRC	X12. Strategic response capability		0.516**	0.790**

Significance level: \* <0.05

\*\*<0.01

#### **6.3.1.2 Multiple regression analysis**

Using multiple regression analysis, performance was regressed on all of the antecedent dimensions except SRC. Both total performance and financial performance were regressed. The reason for leaving the SRC out is that according to the model, it primarily functions as a link variable between the independent and the dependent variables (performance).

According to Hair, Anderson et al. (Hair, Anderson et al. 1998), the general rule is that the ratio between the number of cases and the number of variables in a model should never fall below 5:1. Here the number of independent variables in each of the regression models is 11 and the number of cases is 105. The ratio is thus 9.5, which is above the lower limit, but still lower than the recommended 15 to 20 observations per independent observation in order to secure generalisability. Below the level of 5:1, the researcher encounters the risk

of ‘overfitting’ the variate to the sample, which makes the results too specific to the sample and thus less generalisable.

Total performance. The percentage of variance explained by the model ( $R^2$ ) was 44 percent and the model was highly significant. ( $p=.0000$ ). The regression beta weights and significance levels are reported below (Table 28).

Financial performance. The percentage of variance explained by the model is lower than for total performance, but not significant.  $R^2$  was 17 percent and the model was not significant at 5 percent level ( $p=.07$ ). The regression beta weights and significance levels are reported below (Table 29).

Strategic response capability. Finally, SRC was similarly regressed. Table 32 shows that SRC is positively and significantly influenced by first and all Planning emphasis ( $\beta=0.41$ ) and Proactive experimentation ( $\beta=0.38$ ).  $R^2$  was 63 percent and the model was highly significant. ( $p=.0000$ ).

**Table 28. Regression – Antecedents of Total Performance (PERFORM)**  
( $n=105$ )

		Regression Beta Weight
TMT	X1. External orientation	0.02
	X2: Diversity	-0.01
	X3. Non-politics	0.00
	X4. Social integration	0.10
Organisational structure	X5. Adaptive structure	0.11
	X6. Integration	-0.12
	X7. Cultural control	0.20*
Planning	X8. Planning emphasis	0.30**
	X9. Comprehensiveness	0.08
	X10. Participation	-0.13
Strategy	X11. Proactive experimentation	0.33**

Model  $R^2 = 0.44$

Adjusted  $R^2 = 0.37$

Model  $F = 6.62$

Model  $p = 0.0000$

Significance level: \*  $< 0.05$

\*\*  $< 0.01$

**Table 29. Regression – Antecedents of Financial Performance (FINPERF)**

**(n=105)**

		Regression Beta Weight
TMT	X1. External orientation	0.17
	X2: Diversity	0.12
	X3. Non-politics	-0.02
	X4. Social integration	-0.04
Organisational structure	X5. Adaptive structure	0.25*
	X6. Integration	-0.10
	X7. Cultural control	0.07
Planning	X8. Planning emphasis	0.13
	X9. Comprehensiveness	0.07
	X10. Participation	-0.02
Strategy	X11. Proactive experimentation	0.01

Model R<sup>2</sup>=0.17

Adjusted R<sup>2</sup>=0.08

Model F=1.77

Model p=0.07

Significance level: \* <0.05

\*\*<0.01

**Table 30. Regression – Antecedents of Total Performance (PERFORM) with SRC (n=105)**

		Regression Beta Weight
TMT	X1. External orientation	0.01
	X2: Diversity	-0.03
	X3. Non-politics	-0.09
	X4. Social integration	0.01
Organisational structure	X5. Adaptive structure	0.06
	X6. Integration	-0.07
	X7. Cultural control	0.10
Planning	X8. Planning emphasis	-0.02
	X9. Comprehensiveness	0.10
	X10. Participation	-0.12
Strategy	X11. Proactive experimentation	0.04
SRC	X12. Strategic response capability	0.77**

Model R<sup>2</sup>=0.65

Adjusted R<sup>2</sup>=0.61

Model F=14.3

Model p=0.0000

Significance level: \* <0.05

\*\*<0.01

**Table 31. Regression – Antecedents of Financial Performance (FINPERF) with SRC (n=105)**

		Regression Beta Weight
TMT	X1. External orientation	0.16
	X2: Diversity	0.11
	X3. Non-politics	-0.10
	X4. Social integration	-0.05
Organisational structure	X5. Adaptive structure	0.21 *
	X6. Integration	-0.06
	X7. Cultural control	-0.03
Planning	X8. Planning emphasis	-0.16
	X9. Comprehensiveness	0.09
	X10. Participation	-0.01
Strategy	X11. Proactive experimentation	-0.27*
SRC	X12. Strategic response capability	0.71**

Model  $R^2$  =0.36      Adjusted  $R^2$ =0.27      Model F=4.23      Model p=0.0000

Significance level: \* <0.05      \*\*<0.01

**Table 32. Regression – Antecedents of SRC (n=105)**

		Regression Beta Weight
TMT	X1. External orientation	-0.01
	X2: Diversity	0.02
	X3. Non-politics	0.11
	X4. Social integration	0.00
Organisational structure	X5. Adaptive structure	0.06
	X6. Integration	-0.06
	X7. Cultural control	0.14
Planning	X8. Planning emphasis	0.41**
	X9. Comprehensiveness	-0.02
	X10. Participation	-0.01
Strategy	X11. Proactive experimentation	0.38**

Model  $R^2$  =0.64      Adjusted  $R^2$  =0.59      Model F=14.8      Model p=0.000

Significance level: \* <0.05      \*\*<0.01

#### **6.3.1.3 Antecedents of SRC**

In Chapter 3, it was hypothesised that 11 independent variables would all influence the Strategic Response Capability (SRC) positively (H1a to H11a).

According to the table of correlation coefficients (Table 27), there are significant and positive correlations (at 5 % level) between SRC and all the independent variables except Diversity.

According to the regression analysis (Table 32), SRC is positively and significantly influenced by first and all Planning emphasis ( $\beta=0.41$ ) and Proactive experimentation ( $\beta=0.38$ ).

In summary, both techniques found Planning emphasis and Proactive experimentation to have a positive and significant impact on SRC, thus hypothesis 8a and 11a are strongly supported.

The analysis also supported hypotheses 1a, 3a, 4a, 5a, 6a, 9a, and 10a, although the support was weaker.

#### **6.3.1.4 Antecedents of performance**

In Chapter 3 it was hypothesised that 11 dependent variables would all influence performance positively (H1b to H11b).

Total performance. According to the table of correlation coefficients (Table 27) there are significant and positive correlations (at 5 % level) between Total performance and all variables except Diversity and Integration. For Diversity and Integration, the correlations were positive but non-significant.

According to the regression analysis (Table 28), two of the dependent variables were found to have a positive and significant influence on



Total performance: Planning emphasis ( $\beta=0.30$ ) and Proactive experimentation ( $\beta=0.33$ ).

Financial performance. According to the table of correlation coefficients (Table 27) there are significant and positive correlations (at 5 % level) between Financial performance and External orientation, Adaptive structure, Cultural control, Planning emphasis, Comprehensiveness, Participation and Proactive experimentation. With all other variables there were positive but non-significant correlations.

According to the regression analysis (Table 29) only one of the dependent variables was found to have a positive and significant influence on Financial performance, namely Adaptive structure ( $\beta=0.25$ ).

Total performance. In summary, both techniques found Planning emphasis and Proactive experimentation to have a positive and significant impact on Total Performance, thus hypotheses 8b and 11b are strongly supported.

The analysis also supported hypothesis 1b, 3b, 4b, 5b, 9b, and 10b, although the support was more moderate.

Financial performance. In summary, both techniques found Adaptive structure to have a positive and significant impact on Total performance, thus hypothesis 5b is strongly supported.

The analysis also supported hypotheses 1b, 7b, 8b, 9b, 10b and 11b, although the support was more moderate.

#### ***6.3.1.5 Antecedents to performance: Strategic response capability***

In Chapter 3, Strategic Response Capability was hypothesised to have a strong impact on performance (H12b).

The correlation analysis above supports that hypothesis. The correlation coefficient is 0.52 with Financial performance and 0.79 with Total performance.

The results of a multiple regression where SRC is treated as an independent variable together with all other independent variables gives support for the same conclusions (Table 30, Table 31).

### **6.3.1.6 Summary of antecedents**

The results of the hypotheses test are summarised in Table 33. A hypothesis is defined as ‘strongly supported’ if both techniques have supported it. If one the techniques has supported the thesis it is defined as ‘supported’.

According to the table, there is strong support for hypotheses 8a, 11a, 5b, 8b, 11b and 12b. All other hypotheses except 2a, 2b, and 6b are supported by correlation analysis.

**Table 33. Summary of hypothesis testing**

		SRC (1-12a) (SRC) antecedent	Performance (1-12b) (FINPERF) antecedent	Performance (1-12 b) (PERFORM) antecedent
TMT	X1. External orientation	Corr	Corr	Corr
	X2: Diversity			
	X3. Non-politics	Corr		Corr
	X4. Social integration	Corr		Corr
Organisational structure	X5. Adaptive structure	Corr	Corr, Reg	Corr
	X6. Integration	Corr		
	X7. Cultural control	Corr	Corr	Corr
Planning	X8. Planning emphasis	Corr, reg	Corr	Corr, reg
	X9. Comprehensiveness	Corr	Corr	Corr
	X10. Participation	Corr	Corr	Corr
Strategy	X11. Proactive experimentation	Corr, reg	Corr	Corr, reg
SRC	X12. Strategic response capability		Corr, reg	Corr, reg

### 6.3.2 Part II: Hypothesis testing: The impact of raplexity on the relationships

In Chapter 4, it was hypothesised that the relations between the dependent variables and performance would be stronger in highly raplex than in less raplex environments.

In this part of the hypothesis testing, the influence of the environment on the relation pattern will be analysed by dividing the sample in two sub-samples based on environmental raplexity.

#### **6.3.2.1 *Raplexity dependence***

To analyse the hypotheses of raplexity-dependence the sample was split in two sub-samples based on raplexity. The first group consisted of 53 companies in highly raplex environments and a second group of 52 companies in moderately raplex environments. The split-point was the median of the sample. There were only minor differences in terms of industry affiliation between the groups, indicating that sub-industry aspects might be more important than industry aspects (Rumelt 1991; McGahan and Porter 1997).

Similarly, the sample was divided in two groups based on strategic response capability (SRC) and financial performance (FINPERF).

A pre-test was made to get an overall impression of the importance of SRC in more raplex environments. Therefore, the percentage of high-performing companies was analysed in the different combinations of SRC and raplexity. The results in Table 34 below show that the percentage of high-performers is substantially higher among the companies with high SRC (more than 80 percent) than among companies with low SRC (less than 20 percent). It also indicates that SRC is more critical in high-raplexity environments. As

indicated in Table 34, 93 percent of the companies with high SRC in high raplexity environments are high performers, whereas only 71 percent of those companies are high performers in less raplex environments. Similarly, the proportion of high-performing companies is lower in high-raplexity environments than in less raplex environments.

**Table 34. Comparison of Total performance between different sub-samples**

RAPLEXITY SRC	LOW	HIGH
HIGH	71 percent high performers	93 percent
LOW	22 percent	13 percent
Difference High-Low SRC	49 percent	80 percent

**Table 35. Comparison of Financial performance between different sub-samples**

RAPLEXITY SRC	LOW	HIGH
HIGH	76 percent high performers	70 percent
LOW	42 percent	17 percent
Difference High-Low SRC	34 percent	53 percent

The testing was then performed in four major steps. First, the independent variables were factor analysed in order to explore potential opportunities to reduce the complexity. Through that procedure, two new meta-variables were constructed, Intelligent business and Team culture. Second, the sub-samples were analysed by correlation analysis. Third, the sub-samples were analysed by multiple regression using the new meta-variables. And finally, a contingency test was applied on the complete data set.

The number of cases in the two sub-samples was 52 and 53 respectively. With 3 independent variables in the model, the number of cases per variable was thus above 15.

### 6.3.2.2 *Meta-analysis of the variables*

To explore the interactions between the independent variables, the variables were factor analysed. Diversity and Integration were left out of the analysis since they were found to have low correlations with all other variables. Initial analysis also revealed that they loaded onto a common factor that only explained a low percentage of the total variance.

Two factors extracted were interpreted as Intelligent Business and Team Culture (Table 36). Two new variables were constructed as the sum of variables with the highest factor loadings on each variable. Crombach alphas for both variables were well above 0.6.

**Table 36. Meta-factors of the independent variables (factor loadings >0.4)**

Variable	Factor 1: Intelligent business	Factor 2: Team culture
X1. External orientation	0.82	
X8. Planning emphasis	0.76	
X10. Participation	0.70	
X9. Comprehensiveness	0.66	
X11. Proactive experimentation	0.60	
X4. Social integration		0.83
X3. Non-politics		0.74
X5. Adaptive structure		0.68
X7. Cultural control	(0.505)	0.59

**Table 37. Independent meta-variables**

VARIABLE and items	item-variable correlation	Cronbach's alpha
Intelligent Business (INTELBUS)		0.784
X1. External orientation	0.525	
X8. Planning emphasis	0.662	
X10. Participation	0.557	
X9. Comprehensiveness	0.557	
X11. Proactive experimentation	0.548	
Team Culture (TEAMCULT)		0.700
X4. Social integration	0.562	
X3. Non-politics	0.436	
X5. Adaptive structure	0.370	
X7. Cultural control	0.590	

### **6.3.2.3 Correlation analysis**

The results of the correlation analysis are presented in Table 38 below. As seen, the number of significant correlations between the independent variables and SRC and Performance is higher for the high-raplexity sample than for the sample consisting of companies from less raplex business environments. The number of significant correlations between independent variables and SRC are 11 and 9 respectively, and the significance level is higher. Similarly, the significant correlations between Financial performance and the independent variables are 4 and 1 respectively, and between the independent variables and Total performance 9 and 6 respectively.

**Table 38. Correlations between independent and dependent variables in low and high raplexity environments**

Performance antecedent	SRC		FINPERF		TOTALPER	
	LR	HR	LR	HR	LR	HR
X1. External orientation	0.30*	0.48**	0.23	0.27	0.30*	0.34*
X2. Diversity	-0.23	0.28*	0.17	0.14	-0.24	0.18
X3. Non-politics	0.46**	0.57**	0.01	0.28*	0.18	0.50**
X4. Social integration	0.44**	0.42**	0.09	0.19	0.22	0.39**
X5. Adaptive structure	0.32*	0.37**	0.25	0.28*	0.28*	0.37**
X6. Integration	0.15	0.31*	0.10	0.02	0.14	0.18
X7. Cultural control	0.51**	0.56**	0.35*	0.15	0.48**	0.42**
X8. Planning emphasis	0.55**	0.72**	0.07	0.39**	0.39**	0.55**
X9. Comprehensiveness	0.33*	0.55**	0.13	0.27	0.34	0.44**
X10. Participation	0.41**	0.48**	0.27	0.13	0.31*	0.29*
X11. Proactive experimentation	0.55*	0.71**	0.05	0.40**	0.47**	0.61**
X12. Strategic response capability			0.40**	0.60**	0.75**	0.82**
Intelligent Business	0.61**	0.76**	0.23	0.38**	0.51**	0.58**
Team Culture	0.58**	0.61**	0.22	0.29*	0.38**	0.53**

Significance level: \* <0.05

\*\*<0.01

#### **6.3.2.4 Multiple regression analysis**

The two new meta-variables were used to test the general hypothesis that the independent variables would have a greater positive impact on SRC and performance in more raplex environments. First multiple regression analysis was carried out on the two samples. Second, the contingency effect was tested following a procedure proposed by Schoonhoven (1981).

The results of the multiple regression analysis are shown below. Table 39 gives indications that Team Culture might be more important for Total performance in more raplex environments ( $\beta=0.33$ ), and Table 40 indicates that Intelligent Business might be more important to Financial performance in more

raplex environments. For all five models, the model-fit is also higher for the High raplexity sample than for the Low raplexity sample.

**Table 39. Regression – Antecedents of Total performance (PERFORM)**

	Low raplexity (N=52) Regression Beta Weight	High raplexity (N=53 ) Regression Beta Weight
Intelligent Business	0.45** (B=0.50)	0.41** (B=0.46)
Team Culture	0.10 (B=0.11)	0.33* (B=0.37)
Model R <sup>2</sup>	0.24	0.41
Model F/p	9.1/0.0004	17.6/0.0000

Significance level: \* <0.05      \*\*<0.01

**Table 40. Regression – Antecedents of Financial performance (FINPERF)**

	Low raplexity (N=52) Regression Beta Weight	High raplexity (N=53 ) Regression Beta Weight
Intelligent Business	0.15 (B=0.34)	0.31* (B=0.58)
Team Culture	0.13 (B=0.29)	0.13 (B=0.24)
Model R <sup>2</sup>	0.06	0.15
Model F/p	1.68/0.19	4.58/0.01

Significance level: \* <0.05      \*\*<0.01

**Table 41. Regression – Antecedents of Total performance (PERFORM)**

	Low raplexity (N=52) Regression Beta Weight	High raplexity (N=53 ) Regression Beta Weight
SRC	0.75** (B=0.69)	0.82** (B=0.86)
Model R <sup>2</sup>	0.55	0.67
Model F/p	64.1/0.0000	105.2/0.0000

Significance level: \* <0.05      \*\*<0.01



**Table 42. Regression – Antecedents of Financial performance (FINPERF)**

	Low raplexity (N=52) Regression Beta Weight	High raplexity (N=53 ) Regression Beta Weight
SRC	0.40** (B=0.77)	0.60** (B=1.05)
Model R <sup>2</sup>	0.15	0.35
Model F/p	9.77/0.0029	29.2/0.0000

Significance level: \* <0.05                      \*\*<0.01

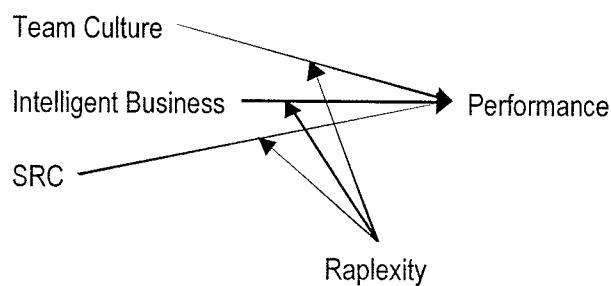
**Table 43. Regression – Antecedents of SRC**

	Low raplexity (N=52) Regression Beta Weight	High raplexity (N=53 ) Regression Beta Weight
Intelligent Business	0.41** (B=0.49)	0.60** (B=0.65)
Team Culture	0.33* (B=0.37)	0.30** (B=0.32)
Model R <sup>2</sup>	0.44	0.64
Model F/p	19.2/0.0000	45.1/0.0000

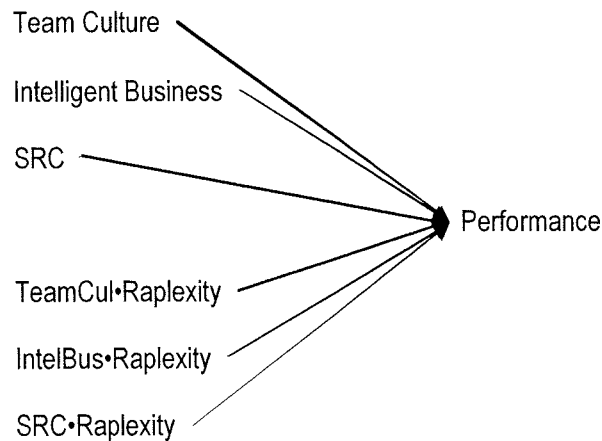
Significance level: \* <0.05                      \*\*<0.01

#### **6.3.2.5 Analysis of contingency effects**

To further analyse the contingency effect of raplexity, a multi-step approach suggested by Schoonhoven (1981) was applied. Four models were tested based on the overall model presented in Figure 9. A causal representation is presented in Figure 10. This model was split into three sub-models for further analysis.



**Figure 9. Original contingency model**



**Figure 10. Overall model to be tested**

#### ***6.3.2.6 Analysis of raplexity influence on Total performance relations***

The results of the regression analyses are presented in Table 44 to Table 47. As seen, all four models are highly significant and explain between 35 and 65 percent of the variance. However, the significance of the coefficients is partly low.

Starting with model 1 of the Total performance regression (Table 46), where SRC has been treated as an independent variable equal to Team Culture and Intelligent Business, we find four significant coefficients. All of them have the same signs as in Model 2. The coefficient for SRC is also similar in Model 1 and Model 3. It is also noteworthy that the  $R^2$ -values are almost as high for Model 3 as for Model 1.

A comparison between Model 1 and Model 4 indicates that the multi-collinearity between the two independent variables (Team Culture and Intelligent Business) and SRC makes the interpretation complicated. Model 4 indicates a positive influence of raplexity on the IntelBus-SRC relationship ( $B=0.185$ ), and a negative influence of raplexity on the TeamCult–SRC

relationship ( $B=-0.179$ ). In Model 1 where SRC is included, the signs are opposite.

Starting with Model 4, the regression coefficients indicate a positive impact of Team Culture on SRC, and that the impact decreases with increasing raplexity. According to the coefficients, the impact of Intelligent Business on SRC is expected to be negative but increasing with increasing raplexity. The question is whether the effect is monotonic over the raplexity spectrum or not. A monotonic impact would mean that the impact of the independent variable on SRC is either positive or negative over the whole spectrum (Schoonhoven 1981). A non-monotonic relationship would mean that the effect would switch sign somewhere on the raplexity continuum, and thus that the effect is negative in some parts of the raplexity spectrum, and positive in others.

By examining the regression coefficients of each part of the equation it is possible to estimate where the effect switches sign. The interaction between the dependent variable (SRC) and each independent variable could be expressed with the equation (Schoonhoven 1981:365):

$$Y=b_1X_1+b_3X_1X_2$$

This means that the effect of, for instance, Team Culture ( $X_1$ ) on SRC ( $Y$ ) is modified by raplexity ( $X_2$ ).

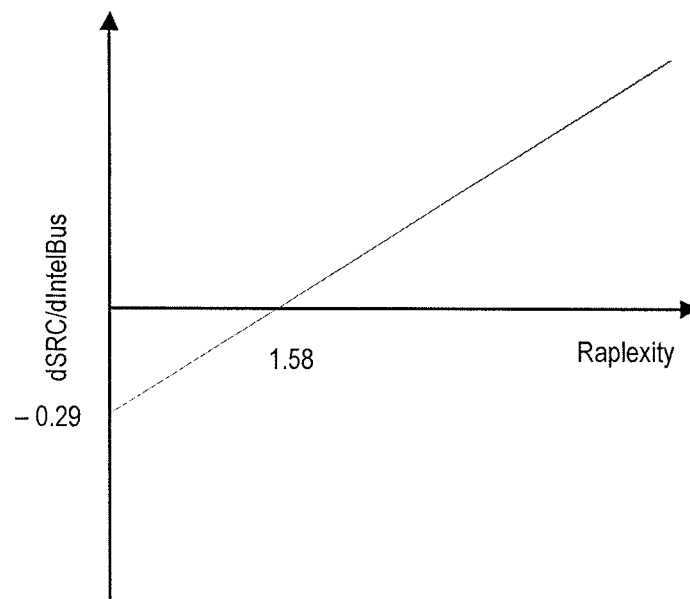
This equation may be rewritten as the partial derivative

$$dY/dX_1 = b_1+b_3X_2$$

At some part of the raplexity spectrum, the derivative is 0, which gives us the following intercept on the  $X_2$ -axis:

$$X_2= - b_1/b_3$$

For Model 4 in Table 44 below, the  $X_2$ -value for Team Culture is  $-1.19/(-0.179) = 6.65$ , and thus in the outer end of the spectrum considered (1 to 7). The interpretation is thus that Team Culture will have a positive but decreasing effect over the raplexity spectrum. For Intelligent Business, however, the sign will switch since  $-(-0.293)/0.185=1.58$ . The interpretation is that at very low raplexity levels (below 1.58) the increases in IntelBus will have a negative impact on SRC, while at higher levels of raplexity, raplexity will increase the impact of IntelBus on SRC (see Figure 11).



**Figure 11. Illustration of possible relationship between IntelBus on SRC over the raplexity spectrum**

**Table 44. Regression coefficients of Total performance and SRC (N=105)**

Model	RAPLEX* TEAMCULT	TEAMCULT	RAPLEX* INTELBUS	INTELBUS	RAPLEX* SRC	SRC	CONSTANT	F	R <sup>2</sup>
Model 1: Total performance	0.190* (0.112)	-0.924* (0.555)	-0.277** (0.121)	1.31** (0.576)	0.0687 (0.128)	0.499 (0.595)	0.980***	29.9	0.65
Model 2: Total performance	0.077 (0.123)	-0.113 (0.611)	-0.088 (0.130)	0.903 (0.654)			1.35***	13.7	0.35
Model 3: Total performance					-0.003 (0.012)	0.798*** (0.086)	0.989***	84.9	0.62
Model 4: SRC	-0.179* (0.102)	1.19** (0.504)	0.185* (0.108)	-0.293 (0.539)			0.483	33.2	0.57

Significance level: \* &lt;0.10      \*\*&lt;0.05      \*\*\*&lt;0.01

Unstandardised coefficients. Standard-error in parentheses.

**Table 45. Standardised  $\beta$ -coefficients for regression-models on Total performance and SRC (N=105)**

Model	RAPLEX* TEAMCULT	TEAMCULT	RAPLEX* INTELBUS	INTELBUS	RAPLEX* SRC	SRC	F	R <sup>2</sup>
Model 1: Total performance	1.20*	-0.855*	-1.98**	1.19**	0.500	0.503	29.9	0.65
Model 2: Total performance	0.491	-0.104	-0.628	0.821			13.7	0.35
Model 3: Total performance					-0.022	0.807***	84.9	0.62
Model 4: SRC	-1.12*	1.09**	1.31*	-0.263			33.2	0.57

Significance level: \* &lt;0.10      \*\*&lt;0.05      \*\*\*&lt;0.01

Standardised coefficients

**Table 46. Regression coefficients of Financial performance and SRC (N=105)**

Model	RAPLEX* TEAMCULT	TEAMCULT	RAPLEX* INTELBUS	INTELBUS	RAPLEX* SRC	SRC	CONSTANT	F	R <sup>2</sup>
Model 1: Financial performance	-0.146 (0.292)	0.597 (1.44)	-0.063 (0.315)	0.104 (1.50)	0.205 (0.331)	0.123 (1.55)	0.639	6.2	0.28
Model 2: Financial performance	-0.238 (0.262)	1.40 (1.30)	0.248 (0.277)	-0.699 (1.39)			1.08	3.39	0.12
Model 3: Financial performance					-0.0005 (0.030)	0.929*** (0.217)	0.098	18.5	0.27
Model 4: SRC	-0.179* (0.102)	1.19** (0.504)	0.185* (0.108)	-0.293 (0.539)			0.483	33.2	0.57

Significance level: \* &lt;0.10      \*\*&lt;0.05      \*\*\*&lt;0.01

Unstandardised coefficients. Standard-error in parentheses.

**Table 47. Standardised  $\beta$ -coefficients for regression-models on Financial performance and SRC (N=105)**

Model	RAPLEX* TEAMCULT	TEAMCULT	RAPLEX* INTELBUS	INTELBUS	RAPLEX* SRC	SRC	F	R <sup>2</sup>
Model 1: Financial performance	-0.513	0.304	-0.251	0.052	0.824	0.205	6.2	0.28
Model 2: Financial performance	-0.833	0.711	0.973	-0.350			3.39	0.12
Model 3: Financial performance					-0.002	0.518***	18.5	0.27
Model 4: SRC	-1.12*	1.09**	1.31*	-0.263			33.2	0.57

Significance level: \* <0.10

\*\*<0.05

\*\*\*<0.01

Standardised coefficients

An examination of Model 2 indicates that the impact of TeamCult on Total performance is negative but increasing with raplexity. However, through previous regression analysis we have found a positive impact of TeamCult on Performance. A closer examination reveals that the relationship is non-monotonic and that the sign switches at  $-(-0.113)/0.077 = 1.45$ . Since 1.45 is a very low raplexity level and outside the actual spectrum, it means that the Team Culture in practice is monotonic over the spectrum. However, Model 1 indicates a higher intercept (4.87) over which Team Culture has a positive impact on Performance. It is probable that the actual intercept lies somewhere between those points. The interpretation of that would be that a 'loose' team-oriented culture and organisation is counter-productive at low levels of raplexity, while it is important when the environment becomes more raplex. In stable environments a more mechanistic organisation and formal management style is favoured, or less counter-productive (Eisenhardt 1989; Brown and Eisenhardt 1997). The previous regression (Table 39) points in the same direction. In the high-raplexity sub-sample, Team Culture was found to have a significant positive beta

coefficient, but in the low raplexity sample, a positive but non-significant relation was found.

According to Model 2, the relationship between IntelBus and Total performance is positive and monotonic over the raplexity spectrum. The impact of the raplexity on the relationship is relatively low. In practice, it means that IntelBus is positively related to performance in both low and high raplexity environments, but that the importance is lower in more raplex environments. The previous regression analysis (Table 39) point in the same direction.

However, Model 1 gives another picture. According to that equation, the IntelBus impact on Total performance becomes negative at a medium raplex level (4.71), but there is no support for the conclusion that the coefficient will switch sign at medium raplexity levels in the previous regression analysis. A possible interpretation is that the multi-collinearity with SRC is influencing the regression coefficients in Model 1. But still, previous regression analysis supports the interpretation that too strong an emphasis on IntelBus in high raplexity environments becomes counter productive. Too much of formalised planning will draw the attention from action to preparations, and thus negatively affect performance. In Table 39 the  $\beta$ -coefficient for IntelBus is relatively lower in the high raplex sample than in the other sample, and so is the non-standardised coefficient. But on the other hand, raplexity still seems to positively affect the IntelBus–SRC relation and the IntelBus – Financial Performance relation (according to the previous regression analysis). So, this negative impact on the IntelBus – Performance relation might not hold for Financial Performance.

The SRC – Performance is also hard to interpret. Model 1 supports the hypothesis that the SRC – Performance is stronger in highly raplex

environments. However, Model 3 does not support that hypothesis. The multicollinearity between the TeamCult and IntelBus, and SRC causes a problem here.

#### ***6.3.2.7 Analysis of the Raplexity impact on Financial performance relations***

For Financial performance, the regression results are slightly different. A comparison between Models 1 and 2 in Table 46 reveals that the signs of coefficients for both Raplex•IntelBus and IntelBus are different in the two models. Obviously, that is a consequence of SRC's influence in Model 1. In Model 1, SRC's impact on Financial performance is highly impacted by raplexity, which also corresponds to the correlation analysis and the previous regression analysis (Table 42).

According to Model 2, the Raplexity has a positive impact on IntelBus – Performance relations, although we must keep in mind the lack of significance and the high standard errors. The equation reveals that the IntelBus would have a negative impact on Financial performance at low Raplexity levels (below 0.699/0.248), but that the impact will increase with increasing raplexity. This also corresponds to the previous regression analysis (Table 40).

In both models, Raplexity has a negative impact on the TeamCult – Financial performance relation. According to Model 2, the derivative even switches sign at 5.84 (1.40/0.238), and according to Model 1 already at 4.1. That would mean that TeamCult is less important, or even counter productive, to Financial performance in raplex environments. But, there is no support for such a strong negative impact of Raplexity on the relationship from either the correlation analysis or the previous regression model. However, there is no support for a positive impact of Raplexity on the relationship either.



### **6.3.2.8 Summary of raplexity analysis**

The results of the hypothesis test of the independent variables' impact on Performance and SRC in more and less raplex environment will now be summarised (H1c to H12c).

Correlation analysis. The correlation analysis gave some, but not strong, support for the hypotheses. There were more significant correlations between independent variables, and SRC, and Financial and Total performance, in total 24 in the high raplexity sample vs. 16 in the low raplexity sample. Furthermore, the correlation coefficients between IntelBus and TeamCult, and SRC, Total performance and Financial performance were higher in the high raplexity sub-sample, except for the correlation between TeamCult and SRC, which was equal in both sub-samples.

Multiple regression. The multiple regression analysis of IntelBus and TeamCult on SRC, Total performance, and Financial performance, and SRC on Total performance and Financial performance, confirmed the results of the correlation analysis. The model fit was generally better for the high raplexity sub-sample, and the regression coefficients were higher and more significant for IntelBus on Financial performance, TeamCult on Total performance, IntelBus on SRC, and SRC on both Total and Financial performance. Some regression coefficients were similar or slightly lower for the high raplexity sample. Those were IntelBus on Total performance and TeamCult on SRC.

Contingency analysis. In the final part of the contingency analysis, the raplexity was included in the regression analysis as a interactive variable. The results point in the same direction as the previous multiple regression analysis. Raplexity was found to have a negative effect on the TeamCult – SRC relation, but a positive effect on the IntelBus – SRC and TeamCult – Total performance

relations. The IntelBus – Total performance is less straight-forward to interpret, but there are strong indications of a negative impact of raplexity on the relationship. The IntelBus relation to Financial performance seems to be positively influenced by raplexity, although non-significantly. The TeamCult – Financial performance relationship on the contrary is non-significant, but seems to be negatively moderated by raplexity.

The hypothesis that raplexity would positively moderate the relation between SRC and the performance variables was thus not supported by the contingency analysis. That is somewhat counter-intuitive since SRC's predictive power is significantly higher in high-raplexity than in low raplexity. The B-values in the regression analysis (Table 41 and Table 42) are also higher in the high-raplexity sub-sample. One reason for that might be that the moderation effect was not strong enough to be significant. Positive effects were identified in Model 1 for both Total performance and Financial performance, but the effect was not significant.

The hypotheses are summarised in Table 48.

**Table 48. Summary of hypothesis testing**

		SRC (SRC) Raplexity impact	Performance (FINPERF) Raplexity impact	Performance (PERFORM) Raplexity impact
TMT	X1. External orientation	Corr		
	X2: Diversity			
	X3. Non-politics	Corr	Corr	Corr
	X4. Social integration			Corr
Organisational structure	X5. Adaptive structure			Corr
	X6. Integration	Corr		
	X7. Cultural control			
Planning	X8. Planning emphasis	Corr	Corr	Corr
	X9. Comprehensiveness	Corr		Corr
	X10. Participation	Corr		
Strategy	X11. Proactive experimentation	Corr	Corr	Corr
SRC	X12. Strategic response capability		<b>Corr, Reg</b>	Reg
Intelligent Business	X1, X8, X9, X10, X11	<b>Corr, Reg, Cont</b>	<b>Corr, Reg</b>	Neg. reg, Neg. cont
Team Culture	X3, X4, X5, X7	Neg. reg, Neg. cont	Corr	<b>Corr, Reg, Cont</b>

Corr = indications from correlation analysis, correlation coefficient significant on 0.1-level and >20 % higher in high raplexity sample.

Reg = significant indications from regression analysis (on 0.1-level). Neg. reg = negative indication

Cont = significant indications from final contingency analysis (on 0.1-level). Neg cont = negative indication

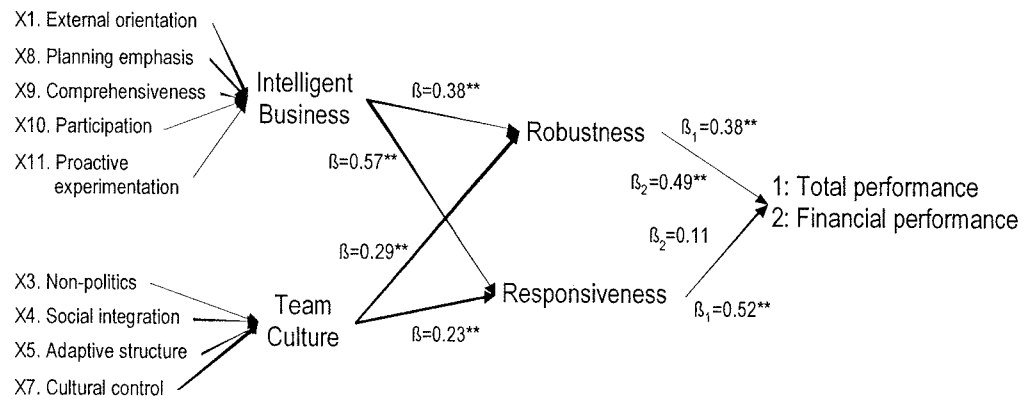
## 6.4 Excursus 1: A simplified model

A simplified model, based on the result of this research could be developed. A general principle in research as well as real life is to “make it as simple as possible, but not simpler than that”. So, the question is where is the limit of simplification.

There are two major comments to be made on the modelling. First, for complexity reasons I have used the composite variable strategic response capability throughout this thesis instead of the two components Robustness and

Responsiveness. The major reason for that was complexity reduction. However, exploratory research reveals that the two components have a different impact on Total performance and Financial performance, and that their internal relationship is different in more stable business environments than in more raplex ones. The replacement of SRC by Robustness and Responsiveness does not make the model simpler, but it adds richness and understanding of the processes predicting performance in different environments. In Figure 12 and Figure 13 below, the models are presented with  $\beta$ -coefficients for the different parts of the model.

As seen from the model (Figure 12), Robustness is relatively more important to Financial performance than to Total performance. Robustness is also more closely related to Total performance in the high raplexity sub-sample. The relative importance of Robustness on Total performance is 42 % ( $0.38/(0.38+0.52)$ ), while the relative importance of Robustness on Financial performance is 82 % ( $0.49/(0.49+0.11)$ ). The relative importance of Intelligent Business is also higher in the high raplexity sub-sample, as is its impact on Robustness (Figure 13). The reason for that could be that developing, challenging and renewing business concepts, visions and long-term goals in a dynamic business environment is more intellectually demanding and requires great attention to business challenges, planning and experimental focus. It requires what Gary Hamel calls ‘meta-innovation’ (Hamel 2000).



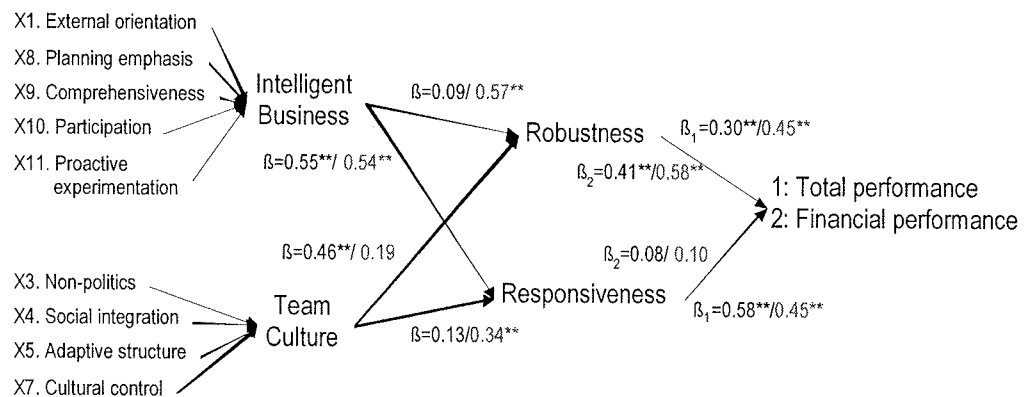
$\beta$ -values for regression coefficients.  $\beta_1$  = values for regression of Robustness and Responsiveness on Total performance and  $\beta_2$  values for the regression on Financial performance.

Significance level: \*  $<0.05$

\*\*  $<0.01$

$R^2$  for different parts: Respons + Robust on Perform: 0.62; Respons + Robust on Finperf: 0.31; IntelBus + TeamCult on Robust: 0.35; IntelBus + TeamCult on Respons: 0.51

**Figure 12. Simplified model with  $\beta$ -values for total sample (N=105)**



$\beta$ -values for regression coefficients.  $\beta_1$  = values for regression of Robustness and Responsiveness on Total performance and  $\beta_2$  values for the regression on Financial performance. First coefficient represents Low raplexity sample, second High raplexity sample.

Significance level: \*  $<0.05$

\*\*  $<0.01$

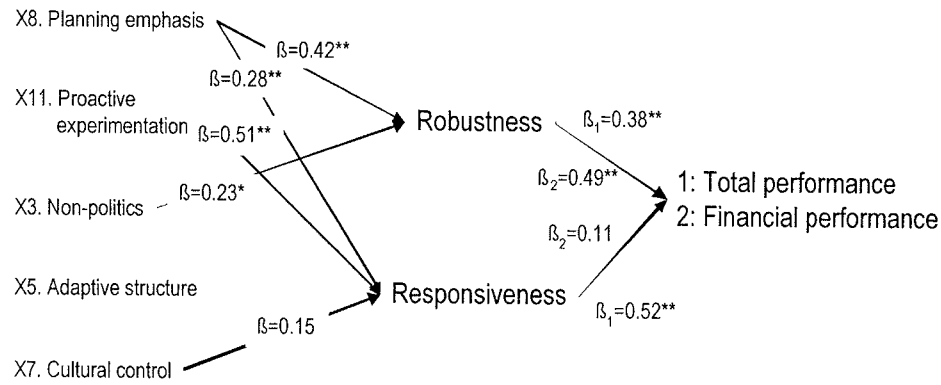
$R^2$  for different parts: Respons + Robust on Perform: (Lo/Hi-raplexity sample) 0.57/67; Respons + Robust on Finperf: 0.21/41; IntelBus + TeamCult on Robust: 0.27/47; IntelBus + TeamCult on Respons: 0.40/0.60

**Figure 13. Simplified model with  $\beta$ -values for sub-samples (N=52/53)**

The second comment to be made has to do with the meta-variables Team Culture and Intelligent Business. The main reason for developing them was

complexity reduction. They were selected through factor analysis of the independent variables. All variables loading on the two major factors selected through the factor analysis were incorporated in the new meta-variables, and no exclusion was made based on the variables' impact on SRC or performance.

The purpose of the new meta-variables was to simplify the contingency analysis, not to give the best possible representation of the data set. Naturally, the replacement of 11 independent variables by 2 meta-variables means that variety, and consequently explanatory power, is lost (Hair, Anderson et al. 1998). If the meta-variables in the models above are replaced by the 9 independent variables, so that Intelligent Business is replaced by its 4 composites and Team Culture by its 5 variables, some conclusions could be drawn. First, only Planning emphasis and Proactive experimentation have significant regression coefficients on Robustness and Responsiveness when regressed on the total sample and the two sub-samples. Second, among the Team Culture-variables, Social integration could be dropped due to non-significant regression coefficients. The new models with 5 independent variables and 2 dependent (Robustness and Responsiveness) represent the variance in the data set better, and make interpretation easier. The  $R^2$  for the regression on Robustness increases from 0.34 to 0.44 and the  $R^2$  for the regression on Responsiveness increases from 0.51 to 0.61, without over-fitting the model. The number of observations per independent variable is still more than 20 ( $105/5$ ) on the total sample and more than 10 on the sub-samples (Hair, Anderson et al. 1998). The models are presented in Figure 14 and Figure 15.

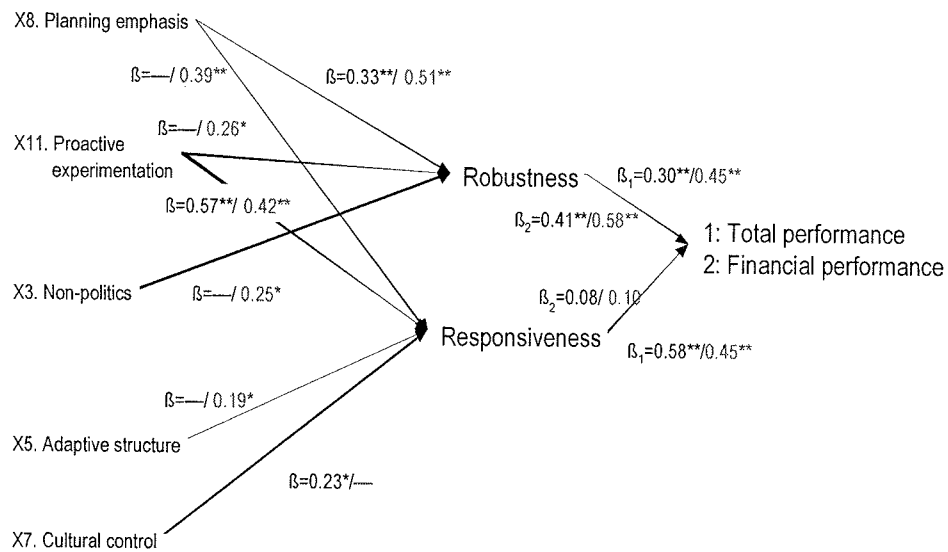


$\beta$ -values for regression coefficients.  $\beta_1$  = values for regression of Robustness and Responsiveness on Total performance and  $\beta_2$  values for the regression on Financial performance.

Significance level: \* <0.05 \*\*<0.01

$R^2$  for different parts: Respons + Robust on Perform: 0.62; Respons + Robust on Finperf: 0.31; Independent variables on Robust: 0.44; Independent variables on Respons: 0.61

**Figure 14. Simplified model II with significant  $\beta$ -values (N=105)**



$\beta$ -values for regression coefficients.  $\beta_1$  = values for regression of Robustness and Responsiveness on Total performance and  $\beta_2$  values for the regression on Financial performance. First coefficient represents Low raplexity sample, second High raplexity sample.

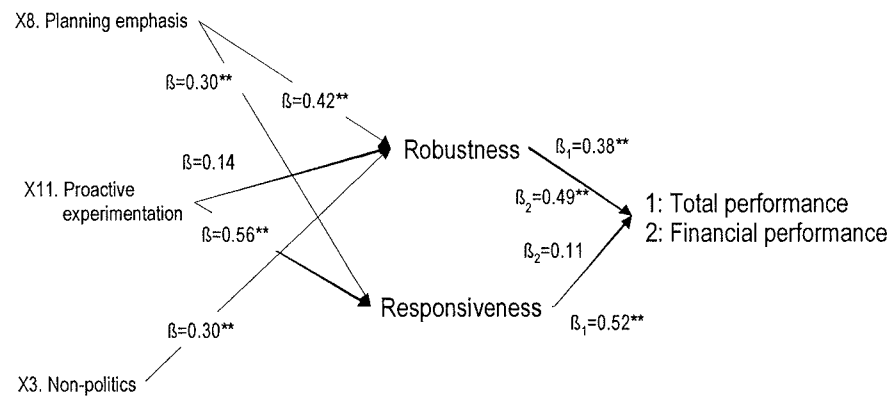
Significance level: \* <0.05 \*\*<0.01

$R^2$  for different parts: Respons + Robust on Perform: (Lo/Hi-raplexity sample) 0.57/67; Respons + Robust on Finperf: 0.21/41; Independent variables on Robust: 0.33/59; Independent variables on Respons: 0.57/0.68

**Figure 15. Simplified model II with significant  $\beta$ -values for sub-samples**

**(N=52/53)**

In fact, the model can be simplified one step further by dropping the two variables with low regression coefficients. The  $R^2$  drops a few percent in the regressions on the data from the low raplexity sample, but it is still considerably higher than for the previous models based on meta-variables. The models are presented in Figure 16 and Figure 17.



$\beta$ -values for regression coefficients.  $\beta_1$  = values for regression of Robustness and Responsiveness on Total performance and  $\beta_2$  values for the regression on Financial performance.

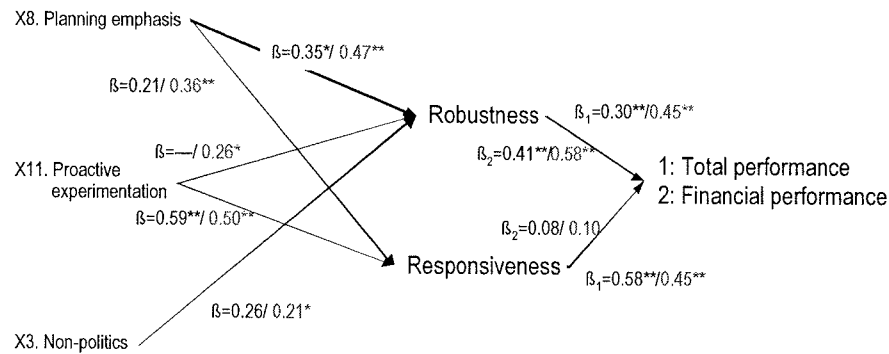
Significance level: \*  $<0.05$

\*\*  $<0.01$

$R^2$  for different parts: Respons + Robust on Perform: 0.62; Respons + Robust on Finperf: 0.31; Independent variables on Robust: 0.43; Independent variables on Respons: 0.59

**Figure 16. Final model with significant  $\beta$ -values (N=105)**





$\beta$ -values for regression coefficients.  $\beta_1$  = values for regression of Robustness and Responsiveness on Total performance and  $\beta_2$  values for the regression on Financial performance. First coefficient represents Low raplexity sample, second High raplexity sample.

Significance level: \* <0.05

\*\*<0.01

$R^2$  for different parts: Respons + Robust on Perform: (Lo/Hi-raplexity sample) 0.57/67; Respons + Robust on Finperf: 0.21/41; Independent variables on Robust: 0.29/58; Independent variables on Respons: 0.52/0.65

**Figure 17. Final model with significant  $\beta$ -values for sub-samples (N=52/53)**

## 6.5 Excursus 2: Analysis of differences between industries

The aim of this research was not to analyse differences between industries, but to investigate whether findings from raplex industries (mainly the computer industry) were applicable to less raplex industries as well.

First, there are no major differences between the industry sub-samples in terms of raplexity. The finance companies are slightly larger in terms of number of employees, and the IT-companies' environment is perceived as slightly more raplex (see Table 49).

**Table 49. Comparison of industry sub-samples**

	Finance (N=30)	Media (N=21)	IT (N=45)
Number of cases	30	21	45
Mean size (log of number of employees)	2.78	2.31	2.43
Mean raplexity	4.64	4.47	4.72

Regression analysis of Robustness and Responsiveness on Total performance reveal firstly (Table 50), that the SRC-concept seems to be relevant

in all the industries, and secondly, that the relative importance of the two SRC-components is industry specific. In the finance industry robustness accounts for the major part of the variance in the model, while in the IT-industry Responsiveness seems to be more critical to performance. Confirmatory analysis where the total sample was split into two equal parts based on size, reveals that size effects are negligible. Thus, the natural explanation for the industry differences is differences in industry structure, where the finance industry is more mature and more capital intensive, while parts of the IT-industry are much more labour intensive and rely heavily on human capital (Løwendahl and Revang 1998). But this is also an oversimplification, since business segment effect could be expected as important as general industry effects (McGahan and Porter 1997). The lack of raplexity difference between IT and Finance indicates that business segment effects are important, given that managers interpret the business environment in a similar way.

It was not considered meaningful to continue the analysis, but this very preliminary analysis, indicates that although the overall model is relevant in all three industries, the internal correlations between different variables may vary from industry to industry.

**Table 50. Regression on Total Performance in different industries**

	Finance (N=30) Regression Beta Weight	Media (N=21) Regression Beta Weight	IT (N=45) Regression Beta Weight
Robustness	0.61** (B=0.52)	0.42** (B=0.31)	0.19 (B=0.23)
Responsiveness	0.37* (B=0.29)	0.58** (B=0.38)	0.66** (B=0.59)
Model R <sup>2</sup>	0.66	0.72	0.63
Model F/p	26.0/0.0000	23.5/0.0000	45.1/0.0000

Significance level: \* <0.05

\*\*<0.01

## 6.6 Summary of Chapter 6

In this chapter the data analysis and results of the quantitative study were presented and discussed. A total of 105 questionnaires were collected and analysed, 90 from the original sample and 15 from the pre-test sample consisting of Swedish companies from various industries. A multi-step model was used in the data-analysis, consisting of correlation and multiple regression analyses, and contingency analysis, to test for raplexity dependence.

Support was found for most of the hypotheses, and strong support from both correlation and multiple regression analysis was found for some of the hypotheses tested. The Strategic response capability was found to have a profound impact on performance. It explains approximately 60 percent of the variance of Total performance and almost 30 percent of the variance of Financial performance.

The most important antecedents of SRC are Planning emphasis, Proactive experimentation and Nonpolitics. Together they explain a large proportion of the variance both in SRC and performance.

Extended analysis through decomposition of the SRC variable into Robustness and Responsiveness reveals that the relative importance of Robustness increases with raplexity. Analysis of industry effects also reveals that the relative importance of the different variables varies between industries.

## **7 Discussion and conclusions**

This final chapter discusses the results in the context of the literature. First, the results of the hypothesis testing are summarised and discussed. Second, conclusions regarding contributions and limitations of the results are outlined and discussed. Third, proposals for further research are presented. Fourth, some managerial implications of the research are presented and discussed. And fifth, some comments on the researcher's learning experiences during the research journey are made.

### **7.1 Discussion of results**

In Chapter 1, three tentative research questions were formulated. In short-form they were: What are the performance antecedents in raplex environments? Is there empirical evidence for the concept of strategic response capability, and if so, to what extent does it explain performance differences in raplex environments? To what extent are the findings from raplex environments generalisable to firms in more stable environments?

#### **7.1.1 The SRC-concept**

Let us leave the first question for the moment and briefly discuss the second and third. In short, the answer from this research would be yes to both those questions – there is empirical evidence for the SRC-concept, and the SRC explains a large proportion of the variance in performance. The results of this research also give some support for the generalisability of the theory and empirical research from raplex industries. The sample was drawn from different industries and SRC was found a strong predictor of performance in all three

industries. However, major preliminary differences between the industries were found when the SRC-variable was de-constructed in Robustness and Responsiveness. Robustness was found to be relatively more important in the finance industry and Responsiveness more important in the IT-industry. Further research with larger samples is necessary to clarify the relations between the variables in the model in detail.

Back to the second question. The research results indicate that there is a concept of 'strategic response capability' that could be operationalised and empirically explored. They also indicate that that concept counts for a majority of the variance in Total performance (57 to 67 percent), and a large proportion of the variance in Financial performance (between 21 and 41 percent) in the industries examined.

Responsiveness is found to be relatively more important to Total performance than to Financial performance. A reason for that could be that responsiveness is closely linked to entrepreneurial innovative and expansive behaviour improving quality, growth, motivation and other non-financial performance indicators, and thus Total performance. But on the other hand, such expansionist behaviour often negatively affects financial performance in the short run (Hopkins and Hopkins 1997).

However, results also indicate that Responsiveness (similar to the concept of strategic flexibility (Ansoff, 1984; Hitt, Keats et al. 1998)) is no more important than Robustness. In fact, in highly raplex environments, the relative importance of robustness increases for Total performance and becomes as important as Responsiveness. For Financial performance, Robustness is more important than Responsiveness in both sub-samples. That robustness is more important in a raplex environment might at first sound counter-intuitive. One

explanation could be that well-crafted business concepts, clear and robust goals and principles help the organisation to focus on the tasks and might even enhance innovation and improvisation in raplex environments. Brown and Eisenhardt's (1997) findings from computer industries support such a conclusion. In a multiple case study, they found considerable differences between firms, where the high-performers differed in terms of clear and robust organisation, communication patterns, and goals. Consequently, those organisations could concentrate on experimentation and projects, while the low-performers were stuck in a mess and confusion, caused by 'rule breaking' culture and lack of structure. In a recent article, Peter Doyle (2000) also supports the proposition that robust strategies based on long-term focus, corporate effectiveness and commitment and empowerment is critical to long-term performance in raplex environments.

Another reason for the increased importance of Robustness could be that the more raplex the business environment becomes the more important differentiation becomes (Nordström and Ridderstråle 1999). But at the same time differentiation becomes harder since it becomes less straightforward to match internal capabilities with external demands and opportunities, and since it is hard to find concepts that provide more than temporary competitive advantage in such environments. That might be the reason why many companies fail with their differentiation strategies (Gelatkanycz and Hambrick 1997). Thus, those who are capable of defining and redefining robust, hard-to-copy, core competence-based differentiation strategies will be able to gain a sustainable competitive advantage (Hamel 1998; Johnson and Scholes 1999; Hamel 2000). A real-world illustration of the consequence of lack of robustness is the dotcom-death of the year 2000.

Many of the dotcoms have not been able to find robust concepts and relied only on being first. But that has often proved to be not enough.

### 7.1.2 Performance and SRC-antecedents

Back to the first research question. The main finding in this study was that performance in a raplex environment is heavily driven by the strategic response capability. Decomposition of the SRC-construct into Robustness and Responsiveness and reduction of the number of independent variables, revealed that this ability is directly influenced by three major forces: the organisation's emphasis on strategic planning and strategy making (planning emphasis); a proactive and experimental strategic posture; a non-political and task-oriented top management team. Additionally, two minor forces affect the SRC – adaptive structure and cultural control. The initial hypothesis testing, when SRC was treated as a single variable, found strong support for the impact of Planning emphasis and Proactive experimentation on SRC.

The strong impact of Planning emphasis on SRC and performance is consistent with earlier findings. For instance, Miller and Cardinal found in a meta-analytical study (1994:1661) that “planning is very positively related to profitability when an informant source of performance data is used, planning is measured without reference to written documentation, the quality of an assessment strategy is high, and the environment faced by the firms in the sample is turbulent.” Hopkins and Hopkins (1997) found in a study of banks that strategic planning had a strong positive effect on performance, and furthermore, that performance positively influenced planning intensity. They also found that managerial expertise and belief in planning increased planning intensity. They conclude (Hopkins and Hopkins 1997:646): “Proponents of strategic planning

have argued that the value of strategic planning is that it generates information, promotes long-range thinking, forces the firm to evaluate its environment, provides a structured means for identifying and evaluating strategic alternatives, stimulate new ideas, increases motivation and commitment, and reduces focus on operational details, all of which improve firm performance.”

The importance of Proactive experimentation is also consistent with previous research. There is much empirical support for the relation between experimental or entrepreneurial strategic posture and performance in raplex environments (Zahra 1993; Brown and Eisenhardt 1997), and between experimental approach and strategic flexibility. For instance, Eisenhardt and Tabrizi (1995) found an experiential product development strategy to be successful in improving development speed.

The other independent factors in this research were found less important for the Strategic response capability. There are two possible explanations for that. First, the effect might be indirect, so that there are other cause-effects present than explained by the model. The literature review revealed many other possible relations between the independent variables, and that the relations are complex. A second explanation is that co-variance with other variables hides the effect of the variable in the model. External orientation, Participation and Comprehensiveness probably all fall into the second category, since they are closely related to the ‘generic’ variable Planning emphasis. Boyd and Reuning-Elliott (1998) concluded that there is a strong overlap between the Planning emphasis variable and the numerous other measures of planning intensity, completeness, and focus. And Miller and Cardinal (1994) found that planning is positive to performance when widely defined. This research confirms Boyd and Reuning-Elliott’s, and Miller and Cardinal’s findings that it is sufficient



to use a broad general planning concept to measure strategic planning, and that strategic planning is related to performance. But still, further research is needed in this area to clarify the complicated interactions between the different independent variables.

A summary of the results of the hypothesis testing is presented in Table 51. Corr means that there is support for the hypothesis from correlation analysis. Reg means that there is support from the multiple regression analysis, and Cont indicate that there is support for the hypothesis from contingency analysis. A blank field indicates that no significant relation has been found, and Neg.reg and Neg.cont mean that the significant relations found are opposite to those hypothesised.

**Table 51. Summary of testing of all the hypotheses**

		SRC (1-12a) (SRC) antecedent	Performance (1-12b) (FINPERF) antecedent	Performance (1-12 b) (PERFORM) antecedent	SRC (1-12c) (SRC) Raplexity impact	Performance (1-12c) (FINPERF) Raplexity impact	Performance (1-12 c) (PERFORM) Raplexity impact
TMT	X1. External orientation	Corr	Corr	Corr	Corr		
	X2: Diversity						
	X3. Non-politics	Corr		Corr	Corr	Corr	Corr
	X4. Social integration	Corr		Corr			Corr
Organisational structure	X5. Adaptive structure	Corr	Corr, Reg	Corr			Corr
	X6. Integration	Corr			Corr		
	X7. Cultural control	Corr	Corr	Corr			
Planning	X8. Planning emphasis	Corr, Reg	Corr	Corr, Reg	Corr	Corr	Corr
	X9. Comprehensiveness	Corr	Corr	Corr	Corr		Corr
	X10. Participation	Corr	Corr	Corr	Corr		
Strategy	X11. Proactive experimentation	Corr, Reg	Corr	Corr, Reg	Corr	Corr	Corr
SRC	X12. Strategic Response capability		Corr, Reg	Corr, reg		Corr, Reg	Reg
Intelligent Business	X1, X8, X9, X10, X11				Corr, Reg, Cont	Corr, Reg	Neg. reg, Neg. cont
Team Culture	X3, X4, X5, X7				Neg. reg, Neg. cont	Corr	Corr, Reg, Cont

### 7.1.3 Unverified hypotheses

Of the hypotheses 1a to 12c, only a few were not verified at all. Firstly, TMT perspective diversity did not at all correlate to either SRC or Performance, and the relation was unaffected by raplexity. There are two possible explanations for that: lack of relation and lack of construct validity (Churchill 1979). In this case, the reason might be a combination of the two. Factor analysis of the variable revealed that it is not a first-order factor but made up of several factors covering different aspects of perspective diversity. A major reason for the lack of result might be that those dimensions out-play each other by showing different effects on SRC. For instance, Smith et al. (1994) found that heterogeneity in years of education and heterogeneity in experience had a different impact on ROI and sales growth. While education diversity (one of the dimensions in the information diversity scale) had a positive impact, experience diversity had a negative impact. Smith et al. (1994) proposed that some forms of heterogeneity are desirable because they contribute to team creativity, but not all.

In a more recent study of work groups, informational diversity (diversity in education, functional area and position) was found to have a positive impact on group performance, while social diversity (age and sex) moderated that effect and had a positive impact on morale (Jehn, Northcraft et al. 1999). In another recent study, it was found that task conflict had a positive impact on cognitive task performance, while emotional conflicts had a negative impact (Pelled, Eisenhardt et al. 1999). However, functional background diversity drives task conflict, while multiple diversity drives emotional conflicts. Thus, the pattern of diversity, conflict and group performance is complex and there are reasons to believe that the instrument used in this research consists of several conflicting dimensions.

In this study, the aim was to explore whether informational diversity has an impact on performance and strategic response capability or not. The informational diversity could be expected relate to the bandwidth of the dominant logic (Bettis and Prahalad 1995), which is important to the ability to exploit opportunities in the business environment (von Krogh, Erat et al. 2000). Therefore, further research is necessary to clarify the relationships between perspective diversity, dominant logic, strategic response capability and performance.

The second ‘low-effect’ variable was integration. Integration had a positive correlation with SRC, but the correlations with the performance variables were low and insignificant. This finding is harder to explain. Miller (1988) found a positive correlation between integration and innovative differentiation strategy, a result similar to ours, where the correlation coefficient between Integration and Proactive experimentation was significant and positive. A reason for the lack of result might be that too much formalised integration creates bureaucracy and inhibits the decision-process and thus responsiveness and performance in raplex environments. Continuous patching could be an alternative to formalised integration as an organisational concept in raplex environments (Beinhocker 1999; Eisenhardt and Brown 1999).

#### 7.1.4 Lack of raplexity-effect

Two results were opposite to the hypothesised direction. They were the mediating effect of raplexity on the IntelBus relation with Total performance and the TeamCult relation with SRC. In the first case, the correlation coefficient was actually slightly higher in the high-raplexity sample than in the low-raplexity sample, and the significance in the regression model and

contingency model is low. Since IntelBus is a composite variable, the reason for the lack of effect might actually be due to different effects on the sub-variables Planning emphasis, Proactive experimentation, External orientation, Participation and Comprehensiveness. Further exploration of the raplexity effect – not reported here – indicates that Planning emphasis on Total performance is negatively moderated (non-significantly) by raplexity over the raplexity spectrum, but that the effect is non-linear. Further exploration of the raplexity impact on Planning emphasis and Proactive experimentation on the relation to Robustness and Responsiveness also indicates that Planning emphasis is positively related to Robustness, but that raplexity moderates the relation negatively. For Proactive experimentation the situation is the opposite, Proactive experimentation has a negative impact on Robustness, but is positively moderated by Raplexity, so that the effect becomes positive beyond moderate levels of Raplexity (about 4). The moderating effect of Raplexity on the Planning emphasis – Responsiveness relation is non-significant but positive, and the effect on Proactive experimentation – Responsiveness relation is non-significant and negative. These results are in line with the analysis presented in Figure 17 and reveals that the use of the composite variable IntelBus hides important interactions between the independent sub-variables, raplexity, and performance.

The situation is similar with the unexpected impact of raplexity on the TeamCult-SRC-relation. An examination of the correlation and regression coefficients for the two sub-samples reveals that the correlation coefficient is slightly higher in the high-raplexity sample, but when TeamCult is regressed on SRC together with IntelBus the regression coefficients are lower in the high-raplexity sample. A closer examination of each of the sub-variables in the TeamCult variable also reveals that only Non-politics' regression coefficient is

significantly higher in the high-raplexity sample. Consequently, the regression of a composite independent variable (TeamCult) on another composite variable (SRC) leads to a situation where several important interactions are hidden by the general 'noise'. Further research is needed to clarify these interactions.

## **7.2 Contributions and limitations of the research**

### **7.2.1 Contribution of the research**

It was initially concluded that many studies on strategy and performance in raplex environments have been conducted (e.g. Brown and Eisenhardt (1997)). However most of them had been focusing on the IT-industry, and many have been qualitative rather than quantitative. Furthermore, most studies have focused on one or a couple of aspects of strategy and performance, for instance strategy-performance relations, process-performance, management-strategy-performance and strategy-structure-performance.

Finally, several researchers and practitioners have proposed strategic flexibility (Ansoff, 1984; Hamel, Prahalad et al. 1998; Hitt, Keats et al. 1998) or strategic response capability (Bettis and Hitt 1995) to be of critical importance in turbulent environments. But so far, that construct has not been operationalised.

To summarise, the major strengths and contributions are:

#### **1. The importance of strategic flexibility in raplex environments.**

By operationalisation of the SRC this research has supported the proposition that raplex environments demand a combination of firm and robust concepts and principles, and rapid and continuous adaptation (Bettis and Hitt 1995; Collins and

Porras 1996). It has also given indications of the relative importance of Robustness and Responsiveness in different parts of the raplexity spectrum.

2. The importance of robustness in raplex environments. During the 1990s, there has been a call for 'speed' in business life. No longer are the big fishes eating the small, but the fast ones eating the slow. A major contribution of this research is that robustness in terms of 'business concept' has been demonstrated to be even more important in raplex environments than in less raplex ones, and that robustness is as important as responsiveness and adaptation speed (Beinhocker 1999; Hamel 2000; Porter 1996; Quinn 1995).

3. Understanding of the strategic flexibility antecedents. In their article on strategic response capability, Bettis and Hitt (1995:16) conclude, "further work is needed to develop an overall package of specific mechanisms for shifting the strategic response curve upwards". With the operationalisation of the construct and examination of the relationship between SRC and many other constructs, this research provide some guidelines on how to put together such a package (Beinhocker 1999; Brown and Eisenhardt 1998; D'Aveni 1994; Hamel, Prahalad et al. 1998; Bettis and Hitt 1995; Hitt, Keats et al. 1998; Lei, Hitt et al. 1996; Teece, Pisano et al. 1997).

4. The scope of the study. The broad scope of this study is one of its strengths. Earlier studies have been focusing on parts of the model in this research, such as the relationship between strategy and performance (Miller 1987; Mosalowski 1993; McDougall, Covin et al. 1994; Dess, Lumpkin et al. 1997), decision-process and performance (Fredrickson and Mitchell 1984; Eisenhardt 1989; Judge and Miller 1991), top management team characteristics and performance (Eisenhardt and Bourgeois III 1988; Smith, Smith et al. 1994; Gelatkanycz and Hambrick 1997), strategy and structure (Miles and Snow 1978;

Miller 1987; Lyles and Schwenk 1992; Jennings and Seaman 1994), strategy and process etc. in relation to different environmental contexts. This study is one of the few to put all these variables together in a single model. Thereby, I have been able to quantify the relative importance of different variables. By examining a large set of independent variables I have also been able to explain a large proportion of the variance in both SRC and performance, and thus been able to identify the most critical SRC and performance antecedents. Those were found to be Planning emphasis, Proactive experimentation, and Non-politics in the TMT.

Other strengths and contributions are:

5. The extension of findings from the computer and software industries to other industries. Previous research has dealt mostly with the computer industry itself (Eisenhardt 1989; Mosalowski 1993; Miller, Lant et al. 1996; Brown and Eisenhardt 1997). In this research, it has been demonstrated that the findings relevant to the IT-industry are relevant to many other industries as well. However, the relative importance of different variables varies from industry to industry.

6. Quantitative testing of some relationships that have been proposed qualitatively or based on theory. The aim of this study was to test some of the perceptions of success factors in rapidly changing business environments. Many of them are based on theory and sometimes underpinned by anecdotal evidence.

7. The use of an external reference group of practitioners. This research was based on an extensive literature review. But to get a real world perspective a reference group of top managers and strategists was used both in the selection of variables and validation of results (Easterby-Smith, Thorpe et al.

1991). This systematic use of ‘third party opinion’ was helpful in developing the model and increases both the validity and reliability of the results.

#### 8. The use of an external reference survey to validate the results.

To check the validity of the results of the SRC-performance link, a simplified version of some of the variables was tested on a sample of Swedish companies in a variety of industries. Since the results point in the same direction, the reference survey increases the validity of the results of this research.

### 7.2.2 Limitations

In various sections of this thesis, the limitations of sample size, sample composition, response rate, instrumentation and methodology have been highlighted. These may be summarised as follows:

1. Sample size, response rate, and selection. The ambition of this research was to reach the sample size of 150, fairly distributed over three industries in four European countries, to be able to use structural equation modelling (Hair, Anderson et al. 1998). That goal was never reached. Neither was the goal of size, nor the ambition of distribution. I had even to add cases from the pre-test collected with another sampling procedure, to reach 100 responses. The consequences of that are several. First, the limited sample size made it impossible to work with structural equation modelling as intended. It also made the regression models less stable. Furthermore, with a larger set of data it would have been possible to analyse differences between industries. Therefore, the sample size, low response rate and selection procedure limits the generalisability of the results as well as their reliability.

2. Single sample, no complete reference. A second aspect, limiting the generalisability of the results, is the fact that the research has primarily been



based on a single sample. Although the study has largely confirmed previous research, some constructs have never been tested before, and need to be confirmed on other samples before conclusions could be made. The use of an external reference sample to test some of the variables dealt with some of the limitations (Appendix 8: Analysis of reference data). But still, that was a limited survey, covering only a fraction of the variables in the major survey.

3. Collinearity between variables. Although the collinearity between the variables in the model was well within acceptable limits (Hair, Anderson et al. 1998), there was still strong collinearity between several of the independent variables, especially between SRC and some of the other variables. The collinearity makes interpretation of multiple regression results, for instance, more difficult.

4. Absence of objective SRC measures. A central concept in this research has been the SRC. But the SRC, which could partly be interpreted as an output or dependent variable, has been measured with self-reported data. Interpreted in that way, there is no doubt that an objective measure of robustness and response capability would have affected the result (Venkatraman and Ramanujam 1986).

5. Absence of objective performance measures. Whilst there is much debate around the validity of self-reported performance data, there is no doubt that the absence of objective measures has affected the results and the interpretation of them (Venkatraman and Ramanujam 1986).

### **7.3 Potential future research**

There are several ways to continue this piece of research. Some of the most important are:

1. Replication or extension to a larger set of data. A larger set of data would make it possible to further analyse both the internal relations between the different variables with structural equation modelling. That would be useful to validate the results in this research. A larger set of data would also make it possible to analyse predictor differences between different groups, such as firms in different industries or more or less raplex environments. In this research, it has only been possible to analyse differences between two 'raplexity'-groups. To split into three groups would have required a larger data set.

2. Further analysis of the SRC variable and its antecedents. That could be done through decomposition of the SRC and performance variables. Decomposition of other dependent variables to identify the correlation with robustness and responsiveness, for instance, would also be fruitful.

3. Generalisation of results. Replication of this study in other industry and national settings is a third natural extension. Are the results generalisable to other samples, other industries etc? The very preliminary analysis made of differences between industries indicates that there might be major differences in terms of the relative importance of robustness and responsiveness.

4. Objective measures of SRC (robustness and responsiveness). This study lacks objective measures of SRC. But if SRC were such a critical factor as indicated in this research, development of objective measures that could be used in research as well as by practitioners would be fruitful.

5. Qualitative analysis of SRC and its antecedents. This research was based on a quantitative study. But to gain richness and deep understanding of the mechanisms leading to SRC and thus developing the theory, qualitative research is needed (Eisenhardt 1989). What do managers and organisations really

do to achieve high strategic response capability and performance? Qualitative analysis is also a means to achieve objective measures of SRC.

5. Validation of results with objective performance measures. As noticed above, one of the major limitations of this research is the absence of objective performance measures (Venkatraman and Ramanujam 1986). But, as previously noticed, it was not possible to collect objective data for most companies.

6. Explanation of unexplained variance in performance and SRC. Finally, although the variables measured in this research explain a considerable proportion of the variance in Total performance (about 60 %) and Financial performance (20-40 %), a large proportion of the performance variance is not explained by the SRC. And the situation is similar for the variance in SRC.

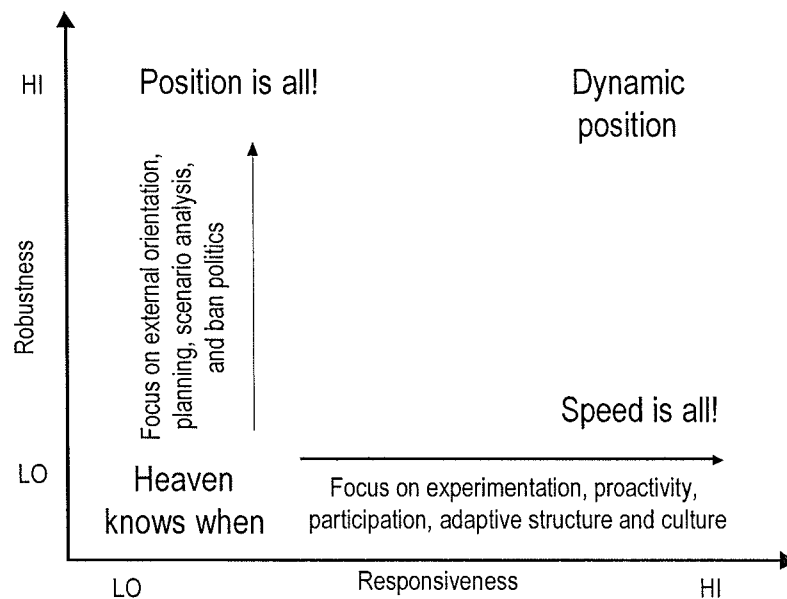
#### **7.4 Practical implications for managers in raplex environments**

The point of departure for this research was the real-world question: How do you compete successfully in this endlessly restless world?

The most obvious practical implications of the results are the need to give attention to the business environment, and the necessity of actively trying to influence it through a continuous search for more lucrative positions in the competitive landscape. So the advice would be: Never, never, never underestimate the need for external orientation, planning emphasis and proactive experimentation. And never forget to ban politics.

Give special attention to the company's SRC by building a robust organisation with well-defined business concepts – and at the same time, enhance responsiveness, försprång ('being ahead' in Swedish) in mind and action, through continuous search and innovation.

The strategic response capability has two dimensions and their antecedents differ to some extent. The practical implications could be illustrated by the following matrix:



**Figure 18. Strategies to improve Strategic response capability.**

The matrix illustrates the need for work on two fronts simultaneously. Improving the robustness of the business concept and organisation requires thorough analysis and bold decisions. It requires strategizing and deep-through thinking (Hamel 2000).

Improving robustness is largely a top-down process, starting on a strategic level, and the top management team has an important role to play. This process is improved by external orientation and emphasis on planning, and might be seriously damaged by politics. Scenario analysis could be used as a tool to improve out-of-the-box thinking, as well as to test the robustness of existing business concepts and organisational models. The more raplex the environment becomes, the more important robustness becomes – especially a robust business concept and long-term goals. Emphasis on planning, especially on the first part

of the planning-cycle, that is environmental scanning, vision, mission and long-term goals is important to develop a proactive and long-term focused culture that supports responsiveness.

To achieve responsiveness and strategic flexibility, an experimental and risk-taking strategic posture must be fostered, and the top-managers task is to design an organisation and cultural support systems to enhance such a change (Schein 1992). They must also be role models of the new behaviour themselves. To foster a team culture becomes increasingly important as raplexity increases. The result of increased responsiveness is largely an organisation wide search for new opportunities, where the organisation evolves, and an increased ability to quickly deal with new threats and opportunities in the business environment.

Outsourcing has during the 1990s been the formula for improved strategic manoeuvring and thus responsiveness and can under certain conditions help organisations to be more adaptive and innovative (Gilley and Rasheed 2000). But on the other hand, the more raplex the environment becomes, the more costly the outsourcing becomes. It is also important not to outsource core competence related activities (Bettis, Bradley et al. 1992).

The ideal situation in raplex environments seems to be a combination of robustness and responsiveness, where the thoroughly crafted business concepts and organisational principles provide a lasting framework that the organisation can rely on. The concept sets the rules, and the organisation is free to improvise and experiment itself into the future, following those basic rules. Hitt describes that in the following way (Hitt, Keats et al. 1998:24):  
"Managers now face the task of creating a balance between the stability necessary to allow development of strategic planning and decision processes and instability that allows continuous change and adaptation to a dynamic environment".

Williamson (1999:117), rooted in the complexity theory, concludes: "In the face of uncertainty and rapid change, companies must reengineer their strategy processes to create a portfolio of options for the future and integrate planning with opportunism." And Collins and Porras say (1996:65): "Companies that enjoy enduring success have core values and core purpose that remain fixed while their business strategies and practices endlessly adapt to a changing world."

These concepts are very similar to jazz improvisation or jamming (Kao 1997; Krets de Vries 1997). When jazz groups are jamming, they follow some basic rules, a sequence of harmonies, a beat steadily kept by the bassist etc. The bass is the base. But on top, there are improvised solos searching for new possibilities, new harmonies and new expressions. To continue this metaphor, as the pace increases, the more important it is, that the bassist keeps the beat (Strandberg 1999).

And as the world-renowned trombonist Bertil Strandberg says (Strandberg 1999): "If it doesn't swing, shoot the bassist!"

Or, to follow the words of John Kao (1997:29): "Jazz – like business – implies a series of balancing acts. It must always be disciplined – but never driven – by formulas, agendas, sheet music. It must always be pushing outward, forward, upward – and therefore, inevitably, against complacency."

## **7.5 The learning process**

Doctoral research has been described as a journey, but also an apprenticeship. Hopefully, that journey makes you a better, or at least different, person.

During my journey, I at least became a better researcher. Looking back, I realise that there are many things that are completely natural today, I did not even know of three years ago. Some are related to the research process, some to the research topic.

Professionally, I have been a consultant for more than 15 years, working on futures studies and strategic issues in numerous contexts. There are indeed similarities between consultancy work and academic research. But there are also major differences. As a consultant, you are extremely case-driven and often under great time-pressure. It is often better to be approximately right and on time, than completely correct and late. And your projects are often short, ranging from days to months.

Besides all the practical experience gained from the doctoral research journey, four general conclusions are:

Realism. Doctoral research is about adding a small grain to the sea of sand. But what often want to do is to solve the eternal questions. To get through your doctoral research though, you need to choose your small part of Life's questions and to focus on that. And you should never underestimate all the problems along the way, for instance such 'minor matters' as getting people to respond to your questionnaire.

Focus. Research is fun. On your way, there are thousands of paths and alleys to follow, each as attractive as the road you decided to walk along. But if you do not keep to the path, you will never reach the shore. You will get lost in the forests of knowledge.

Comprehensiveness. "Never build a house on the sand." Research demands extensiveness, thoroughness, comprehensiveness. To do things right from the beginning is the easiest way out.

Endurance. Research is one percent inspiration and ninety-nine perspiration. To get through you need to realise and accept that. Winston Churchill's advice fits research as well: "Never, never, never give up."



## 8 References

Andrews, K. (1971). The concept of strategy. Homewood, Illinois, Irwin.

Ansoff, H. I. (1965). Corporate strategy; An analytical approach to business policy for growth and explanation. New York, McGraw Hill.

Ansoff, I. H. (1984). Implanting strategic management. USA, Prentice-Hall.

Argyris, C. and D. Schön (1978). Organizational learning: A theory of action practice. USA, Addison-Wesley.

Arora, A. and A. Gambardella (1997). "Domestic markets and international competitiveness." Strategic Management Journal **18**(Summer Special Issue).

Ashby, W. R. (1956). An introduction to cybernetics. London, Chapman & Hall.

Bacharach, S. B., P. Bamberger, et al. (1996). "The organizational transformation process: the micropolitics of dissonance reduction and the alignment of logics of action." Administrative Science Quarterly **41**: 477-506.

- Bantel, K. and S. Jackson (1989). "Top management and innovations in banks." Strategic Management Review **10**: 107-124.
- Barnett, W. P. and R. A. Burgelman (1996). "Evolutionary perspectives on strategy." Strategic Management Journal **17**: 5-19.
- Barney, J. (1991). "Firm resources and sustained competitive advantage." Journal of Management **17**: 99-120.
- Beinhocker, E. D. (1999). "Robust Adaptive Strategies." Sloan Management Review **40(3)**: 95-106.
- Bettis, R., S. Bradley, et al. (1992). "Outsourcing and industrial decline." Academy of Management Executive **6(1)**: 7-22.
- Bettis, R. A. and M. A. Hitt (1995). "The new competitive landscape." Strategic Management Journal **16**: 7-16.
- Bettis, R. A. and C. K. Prahalad (1995). "The dominant logic: retrospective and extension." Strategic Management Review **16**: 5-14.
- Blaxill, M. F. and T. M. Hout (1998). Make decisions like a fighter pilot. Perspectives on strategy. C. W. Stern and G. J. Stalk. USA, John Wiley.

- Boeker, W. (1997). "Strategic change: the influence of managerial characteristics and organizational growth." Academy of Management Journal **40**: 152-170.
- Bourgeois, L. (1985). "Strategic goals, perceived uncertainty, and economic performance in volatile environments." Academy of Management Journal **28**: 548-573.
- Bourgeois, L. J. and K. Eisenhardt (1988). "Strategic decision process in high velocity environments: Four cases in the microcomputer industry." Management Science **34**: 816-835.
- Boyd, B. K. (1991). "Strategic planning and financial performance: a meta-analytical review." Journal of Management **28**: 353-374.
- Boyd, B. K. and J. Fulk (1996). "Executive scanning and perceived uncertainty: a multidimensional model." Journal of Management **22**(1).
- Boyd, B. K. and E. Reuning-Elliot (1998). "A measurement model of strategic planning." Strategic Management Journal **19**: 181-192.
- Bracker, J. (1980). "The Historical Development of Strategic Management Concept." Academy of Management Review **5**: 219-24.
- Brett, P. O. (1998). Survey of the Management Systems Approach's Impact on Performance Improvement of Organizations.

- Brown, S. L. and K. M. Eisenhardt (1997). "The art of continuous change: linking complexity theory and time-paced evolution in relentlessly shifting organizations." Administrative Science Quarterly **42**: 1-34.
- Brown, S. L. and K. M. Eisenhardt (1998). Competing on the edge. USA, Harvard Business School Press.
- Camerer, C. F. (1994). Does strategy research need game theory? Fundamental Issues in strategy. R. P. Rumelt, D. E. Schendel and D. J. Reece. USA, Harvard Business School Press: 636.
- Caruana, A., L. Pitt, et al. (1994). Excellence, market orientation and service quality: are they related? UK, Henley Management College.
- Chakravarthy, B. (1997). "A new strategy framework for coping with turbulence." Sloan Management Review(Winter 1997): 69-82.
- Chandler, A. D. (1962). Strategy and Structure: Chapters in the History of the American Industrial Enterprise. Cambridge, MA, MIT Press.
- Child, J. (1972). "Organizational structure, environment and performance: The role of strategic choice." Sociology **6**: 2-22.

- Choudhury, V. and J. L. Sampler (1997). "Information specificity and environmental scanning: an economic perspective." MIS Quarterly(March): 25-53.
- Churchill, G. A. (1979). "A paradigm for developing better measures of marketing constructs." Journal of Marketing Research: 186-192.
- Collins, J. C. and J. I. Porras (1996). "Building your company's vision." Harvard Business Review(September-October): 65-77.
- Collins, J. C. and J. I. Porras (1997). Built to last. USA, HarperBusiness.
- Courtney, H., J. Kirkland, et al. (1997). "Strategy under uncertainty." Harvard Business Review(November-December): 67-79.
- Covin, J. G. and D. P. Slevin (1989). "Strategic management of small firms in hostile and benign environments." Strategic Management Journal **10**: 75-87.
- D'Aveni, R. (1994). Hypercompetition: Managing the dynamics of strategic manoeuvring. New York, Free Press.
- Daft, R., J. Sormunen, et al. (1988). "Chief executive scanning, environmental characteristics, and company performance: An empirical study." Strategic Management Journal **9**: 123-139.

- Dean, J. W. and M. P. Sharfman (1993). "The relationship between procedural rationality and political behaviour in strategic decision-making." Decision Sciences **24**(6): 1069-1083.
- Dean, J. W. and M. P. Sharfman (1996). "Does decision process matter? A study of strategic decision-making effectiveness." Academy of Management Journal **39**(2): 368-396.
- Dess, G. G. and D. W. Beard (1984). "Dimensions of organisational task environments." Administrative Science Quarterly(March): 52-73.
- Dess, G. G., F. T. Lumpkin, et al. (1997). "Entrepreneurial strategy making and firm performance: test of contingency and configurational models." Strategic Management Journal **18**(9): 677-695.
- Dess, G. g. and R. Robinson (1984). "Measuring organizational performance in the absence of objective measures: The case of privately-held firm and conglomerate business unit." Strategic Management Journal **5**: 265-273.
- Dooley, R. S., D. M. Fowler, et al. (1996). "The benefit of strategic homogeneity and strategic heterogeneity: theoretical and empirical evidence resolving past differences." Strategic Management Journal **17**: 293-305.
- Downey, H. and J. Slocum (1975). "Uncertainty: Measures, research and sources of variation." Academy of Management Journal **18**: 562-577.

- Doyle, P. (2000). "Radical strategies for profitable growth." European Management Journal **16**(3): 253-261.
- Drew, S. (1996). Managing Intellectual Capital for Strategic Advantage. Henley-on-Thames, Henley Management College: 27.
- Duncan, R. B. (1972). "Characteristics of organizational environments and perceived uncertainty." Administrative Science Quarterly **17**: 313-327.
- Easterby-Smith, M., R. Thorpe, et al. (1991). Management Research. An introduction. GB, Sage Publications.
- Edvinsson, L. and M. S. Malone (1997). Intellectual capital. Realizing your company's true value by finding its hidden brainpower. US, HarperBusiness.
- Eisenhardt, K. (1999). "Strategy as Strategic Decision Making." Sloan Management Review **40**(3): 65-72.
- Eisenhardt, K., M. and S. L. Brown (1999). "Patching. Restitching business portfolios in dynamic markets." Harvard Business Review **1999**(May-June): 72-82.
- Eisenhardt, K. M. (1989). "Building theories from case study research." Academy of Management Review **14**(4): 532-550.

- Eisenhardt, K. M. (1989). "Making fast strategic decisions in high-velocity environments." Academy of Management Journal **33**(3): 543-576.
- Eisenhardt, K. M. and L. J. Bourgeois III (1988). "Politics of strategic decision making in high-velocity environments: toward a midrange theory." Academy of Management Journal **31**(4): 737-770.
- Eisenhardt, K. M., J. L. Kahwajy, et al. (1997). "How management teams can have a good fight." Harvard Business Review(July-August): 77-85.
- Eisenhardt, K. M. and C. B. Schoonhoven (1990). "Organizational growth: linking founding team, strategy, environment and growth among U. S. Semiconductor ventures, 1978-1988." Administrative Science Quarterly **35**: 504-529.
- Eisenhardt, K. M. and B. N. Tabrizi (1995). "Accelerating adaptive processes: Product innovation in the global computer industry." Administrative of Science Quarterly **40**: 84-110.
- Eisenhardt, K. M. and M. J. Zbaracki (1992). "Strategic decision making." Strategic Management Journal **13**: 17-37.
- Elenkov, D. S. (1997). "Environmental scanning systems and performance: an empirical study of Russian companies." Journal of Management Development **16**(2-3): 111-124.



Elenkov, D. S. (1997). "Strategic uncertainty and environmental scanning: the case for institutional influences on scanning behaviour." Strategic Management Journal **18**(4): 287-302.

Emery, F. and E. Trist (1965). "The causal texture of organizational environments." Human Relations **18**: 21-32.

Fahey, L. and W. R. King (1977). "Environmental scanning for corporate planning." Business Horizons **20**(4): 61-71.

Fairbairn, L. P. (1997). Quick response and global sourcing: organizational and performance implications for U.S. retailers. Marketing and supply chain management. Michigan, US, Michigan State University: 207.

Feigenbaum, A., S. Hart, et al. (1996). "Strategic reference point theory." Strategic Management Journal **17**: 219-235.

Finkelstein, S. and D. C. Hambrick (1990). "Top-Management-Team tenure and organizational outcomes: the moderating role of managerial discretion." Administrative Science Quarterly **35**: 484-503.

Fredrickson, J. W. (1984). "The comprehensiveness of strategic decision process: Extension, observations, future directions." Academy of Management Journal **27**: 445-466.

- Fredrickson, J. W. and T. R. Mitchell (1984). "Strategic decision process: Comprehensiveness and performance in an industry with an unstable environment." Academy of Management Journal **27**(2): 399-423.
- Freeman, J. (1995). Business strategy from the population level. Resource-based and Evolutionary Theories of the Firm: Toward a Synthesis. C. Montgomery. Massachusetts, USA, Kluwer Academic Publishers.
- Gelatkanycz, M. A. and D. C. Hambrick (1997). "The external ties of top executives: Implications for strategic choice and performance." Administrative Science Quarterly **42**: 654-681.
- Geletkanycz, M. A. (1997). "The salience of culture's consequences: the effects of cultural values on top executive commitment to the status quo." Strategic Management Journal **18**(8): 615-634.
- Gilley, M., K. and A. Rasheed (2000). "Making more by doing less: An analysis of outsourcing and its effects on firm performance." Journal of Management **26**(4): 763-790.
- Glick, W. P., G. P. Huber, et al. (1990). "Studying changes in organizational design and effectiveness: Retrospective event histories and periodic assessments." Organizational Science **1**: 293-312.

- Gottschalk, P. (1998). Content characteristics of formal information technology strategy as implementation predictors. Henley Management College. London, Brunel University.
- Greenwood, R. and C. R. Hinings (1996). "Understanding radical organizational change: bringing together the old and the new institutionalism." Academy of Management Review **21**(4): 1022-1054.
- Haeckel, S. H. and R. L. Nolan (1993). "Managing by wire." Harvard Business Review(Sept/oct).
- Hagen, A. F. and S. G. Amin (1995). "Corporate executives and environmental scanning activities: an empirical investigation." SAM Advanced Management Journal **60**(2): 41-48.
- Hair, J. (1998). On scales, Personal communication. Henley Management College 1998-12-01.
- Hair, J. (2000). On missing values and imputation. Personal communication.
- Hair, J. F., R. E. Anderson, et al. (1998). Multivariate Data Analysis. US, Prentice-Hall.
- Hambrick, D. C., M. A. Geletkanycz, et al. (1993). "Top executive commitment to the status quo: some tests of its determinants." Strategic Management Journal **14**: 401-418.

- Hambrick, D. C. and P. A. Mason (1984). "Upper Echelons: The organization as a reflection of its top managers." Academy of Management Review 9(2): 193-206.
- Hamel, G. (1998). "Strategy innovation and the quest for value." Sloan Management Review(Winter): 7-14.
- Hamel, G. (2000). Leading the revolution. Boston, Harvard Business School Press.
- Hamel, G. and A. E. Heene (1994). Competence-based competition. Great Britain, John Wiley & Sons.
- Hamel, G. and C. K. Prahalad (1989). "Strategic Intent." Harvard Business Review 67(May-June): 63-76.
- Hamel, G. and C. K. Prahalad (1990). "The Core Competence of the Corporation." Harvard Business Review 68(May-June): 79-91.
- Hamel, G. and C. K. Prahalad (1994). Competing for the Future. Boston, Harvard Business School Press.
- Hamel, G., C. K. Prahalad, et al., Eds. (1998). Strategic flexibility. Strategic management series. GB, John Wiley & Sons.

- Hamrefors, S. (1999). Putting Putting into perspective into perspective. School of Economics. Stockholm, Stockholm School of Economics.
- Hannan, M. T. and J. Freeman (1984). "Structural inertia and organizational change." American Sociological Review **49**(April): 149-164.
- Hannan, M. T. and J. Freeman (1989). Organizational ecology. Cambridge, MA, Harvard University Press.
- Hart, S. (1991). Intentionality and autonomy in strategy-making process: Modes, archetypes and firm performance. Advances in Strategic Management. P. Shivastrava, A. Huff and J. Dutton. Greenwich, CT, JAI Press. **7**: 97-127.
- Hart, S. and C. Banbury (1994). "How strategy-making processes can make a difference." Strategic Management Journal **15**: 251-269.
- Hart, S. L. (1992). "An integrative framework for strategy-making process." Academy of Management Review **17**(2): 327-351.
- Haveman, H. A. (1992). "Between a rock and a hard place: Organizational change and performance under conditions of fundamental environmental transformation." Administrative Science Quarterly **37**: 48-75.

- Heide, J. B. and R. L. Stump (1995). "Performance implications of buyer-supplier relationships in industrial markets: A transaction cost explanation." Journal of Business Research **32**: 57-66.
- Henderson, R. and W. Mitchell (1997). "The interactions of organizational and competitive influences on strategy and performance." Strategic Management Journal **18**(Summer Special Issue): 5-14.
- Hitt, M. A., B. W. Keats, et al. (1998). "Navigating in the new competitive landscape: Building strategic flexibility and competitive advantage in the 21st century." The Academy of Management Executive **12**(4): 22-42.
- Hitt, M. A. and B. B. Tyler (1991). "Strategic decision models: integrating different perspectives." Strategic Management Journal **12**: 327-351.
- Homburg, C., H. Krohmer, et al. (1999). "Strategic consensus and performance: The role of strategy type and market-related dynamism." Strategic Management Journal **20**: 339-357.
- Hopkins, W. E. and S. A. Hopkins (1997). "Strategic planning – financial performance relationships in banks: A causal examination." Strategic Management Journal **18**: 635-652.
- Itami, H. (1987). Mobilizing invisible assets. Cambridge, MA, Harvard University Press.

Jain, S. C. (1984). "Environmental Scanning in US Corporations." Long Range Planning: 117-128.

Jehn, K. A., G. B. Northcraft, et al. (1999). "Why differences make a difference: A field study of diversity, conflict, and performance in workgroups." Administrative Science Quarterly(December): 741-763.

Jennings, D. F. and J. R. Lumpkin (1992). "Insights between environmental scanning activities and Porter's generic strategies: an empirical analysis." Journal of Management **18**(4): 791-803.

Jennings, D. F. and S. L. Seaman (1994). "High and low levels of organisational adaptation: an empirical analysis of strategy, structure and performance." Strategic Management Journal **15**: 459-475.

Johnson, G. and K. Scholes (1999). Exploring corporate strategy, Prentice-Hall.

Judge, W. Q. and A. Miller (1991). "Antecedents and outcomes of decision speed in different environmental contexts." Academy of Management Journal **34**(2): 449-463.

Kao, J. (1997). Jamming: The art and discipline of business. USA, Harper business.

Kaplan, D. P. and R. S. Norton (1996). The balanced scorecard. Translating strategy into action. USA, Harvard Business School Press.

Kaplan, R. S. and D. P. Norton (1992). "The balanced scorecard – measures that drive performance." Harvard Business Review(January-February): 71-79.

Keck, S. L. (1997). "Top management team structure: differential effects by environmental context." Organizational Science 8(2): 143-156.

Khandwalla, P. (1977). The design of organizations. New York, NY, Harcourt, Brace, Jovanovich.

Kotter, J. (1996). Leading change, Harvard Business School Press.

Krets de Vries, M. F. R. (1997). "Creative leadership: Jazzing up business." Chief Executive(121): 64-66.

Kukalis, S. (1991). "Determinants of strategic planning systems in large organizations: a contingency approach." Journal of Management Studies 28: 143-160.

Lawrence, P. R. and J. Lorsch (1967). Organisation and environment. Boston, MA, Harvard University.

Lawrence, P. R. and J. Lorsch (1969). Developing organizations. USA, Addison-Wesley.



- Lei, D., M. A. Hitt, et al. (1996). "Dynamic core competencies through meta-learning and strategic content." Journal of Management **22**(4): 549-569.
- Lengnick-Hall, C. A. and J. A. Wolf (1999). "Similarities and contradictions in the core logic of three strategy research streams." Strategic Management Journal **20**: 1109-1132.
- Lovas, B. and S. Ghoshal (2000). "Strategy as guided evolution." Strategic Management Journal **21**: 875-896.
- Lumpkin, G. T. and G. G. Dess (1995). "Simplicity as a strategy-making process: the effects of stage of organizational development and environment on performance." Academy of Management Journal **38**(5): 1386-1407.
- Lumpkin, G. T. and G. G. Dess (1996). "Clarifying the entrepreneurial orientation construct and linking it to performance." Academy of Management Review **21**(1): 135-.
- Lyles, M. A. and C. R. Schwenk (1992). "Top management, strategy and organizational knowledge structures." Journal of Management Studies **29**(2): 155-174.
- Løwendahl, B. and i. Revang (1998). "Challenges to existing strategy theory in a postindustrial society." Strategic Management Journal **19**: 755-773.

- Macintosh, R. and D. Maclean (1999). "Conditioned emergence: A dissipative structures approach to transformation." Strategic Management Journal **20**(20): 297-316.
- Makadok, R. (1998). "Can first-mover and early-mover advantages be sustained in an industry with low barriers to entry/imitation." Strategic Management Journal **19**: 683-696.
- March, J. G. (1996). "Continuity and change in theories of organizational action." Administrative Science Quarterly: 278-287.
- March, J. G. and H. A. Simon (1958). Organizations. New York.
- McDougall, P. P., J. G. Covin, et al. (1994). "The effects of industry growth and strategic breadth on new venture performance and strategy context." Strategic Management Journal **15**: 537-554.
- McGahan, A. M. and M. E. Porter (1997). "How much does industry matter really?" Strategic Management Journal **18**(Summer Special Issue): 15-30.
- McKenzie, J. E. (1994). Chaos, paradox and learning -key composites in the revolutionary change process: towards a more holistic paradigm for transformation. Henley Management College. London, Brunel University: 489.

- Middelton Stone, M. and C. Greer Brusch (1996). "Planning in ambiguous contexts: the dilemma of meeting needs for commitment and demands for legitimacy." Strategic Management Journal **17**: 633-652.
- Miles, G., C. C. Snow, et al. (1993). "Industry variety and performance." Strategic Management Journal **14**: 163-177.
- Miles, R. H. and C. C. Snow (1978). Organizational strategy, structure and process. New York, McGraw Hill.
- Miller, C. C., L. M. Burke, et al. (1998). "Cognitive diversity among upper-echelon executives: implications for strategic decision processes." Strategic Management Journal **19**: 39-58.
- Miller, C. C. and L. B. Cardinal (1994). "Strategic planning and firm performance: a synthesis of more than two decades of research." Academy of Management Journal **37**(6): 1649-1665.
- Miller, D. (1987). "Strategy making and structure: Analysis and implications for performance." Academy of Management Journal **30**: 7-32.
- Miller, D. (1988). "Relating Porter's business strategies to environment and structure: analysis and performance implications." Academy of Management Journal **31**(8): 280-308.
- Miller, D. (1990). The Icharus Paradox. New York, HarperCollins.

- Miller, D. (1991). "Stale in the saddle: CEO tenure and the match between organization and environment." Management Science **37**(1): 34-52.
- Miller, D. (1993). "The architecture of simplicity." Academy of Management Review **18**: 116-138.
- Miller, D. and C. Dröge (1986). "Psychological and traditional determinants of structure." Administrative Science Quarterly **31**: 539-560.
- Miller, D., C. Dröge, et al. (1988). "Strategic process and content as mediators between organizational context and structure." Academy of Management Journal **31**(3): 544-569.
- Miller, D. and P. H. Friesen (1978). "Archetypes of strategy formulation." Management Science **24**: 921-933.
- Miller, D. and P. H. Friesen (1982). "Innovation in conservative and entrepreneurial firms: two models of strategic momentum." Strategic Management Journal(3): 1-25.
- Miller, D., T. K. Lant, et al. (1996). "The evolution of strategic simplicity: exploring two models of organizational adoption." Journal of Management **22**(6): 863-887.
- Mintzberg, H. (1994). The rise and fall of strategic planning. USA, Free Press.

Mintzberg, H. and J. Lampel (1999). "Reflecting on the Strategy Process."

Sloan Management Review **40**(2): 21-30.

Mintzberg, H., J. Quinn, et al. (1995). The strategy process. UK, Prentice Hall.

Mintzberg, H., J. Quinn, et al. (1995). The strategy process. USA, Prentice Hall.

Mohan-Neill, S. I. (1995). "The influence of firm's age and size on its environmental scanning activities." Journal of Small Business Management **33**(4): 10-22.

Money, A. (1998). On research methodology, Research Methodology course at Henley Management College, UK.

Mosalowski, E. (1993). "A resource-based perspective on the dynamic strategy-performance relationship: an empirical examination of the focus and differentiation strategies in entrepreneurial firms." Journal of Management **19**(4): 819-838.

Mosalowski, E. (1997). "Strategy making under causal ambiguity: Conceptual issues and empirical evidence." Organizational science **8**(4, July-August): 414-442.

- Nahapiet, J. and S. Ghoshal (1998). "Social capital, intellectual capital and the organizational advantage." Academy of Management Review **23**(2): 242-266.
- Nordström, K. A. and J. Ridderstråle (1999). Funky business. Talent make capital dance. Falun, BookHouse Publishing.
- Normann, R. (1975). Skapande företagsledning (Creative corporate management), Aldus.
- Norrgrén, F., H. Hart, et al. (1996). Förändringsstrategiers effektivitet (The efficiency of change strategies). Stockholm.
- Nunnally, J. C. (1967). Psychometric Theory. New York, McGraw-Hill Book Company.
- Nørretranders, T. (1991). Märk världen (See the world), Bonnier Alba.
- ogilvy, d. and W. H. Glick (1990). A study of strategic planning processes and how information systems are used in strategic planning, Graduate School of Business, University of Texas.
- Olivers, A. L. and M. Ebers (1998). "Networking network studies: an analysis of conceptual configurations in the study of inter-organizational relationships." Organization studies **19**(4): 549-583.

Oswald, S. L., K. W. Mossholder, et al. (1994). "Vision salience and strategic involvement: implications for psychological attachment to organization and job." Strategic Management Journal **15**: 477-489.

Ozsomer, A., R. J. Cantalone, et al. (1997). "What makes firms more innovative? A look at organizational environmental factors." Journal of Business & Industrial Marketing **12**(5-6): 400-416.

Papadakis, V., S. Lioukas, et al. (1998). "Strategic decision-making process: The role of management and context." Strategic Management Journal **19**: 115-147.

Pascal, R. T. (1989). Managing on the edge. New York, Simon & Shuster.

Pascal, R. T. (1999). "Surfing the edge of chaos." Sloan Management Review **40**(3): 83-94.

Pearce II, J. A., E. B. Freeman, et al. (1987). "The tenuous link between formal strategic planning and financial performance." Academy of Management Review **12**(4): 658-675.

Pearce, J. A. and S. A. Zahra (1991). "The relative power of CEOs and boards of directors: Associations with corporate performance." Strategic Management Journal **12**(2): 135-154.

- Pelled, L. H., K. M. Eisenhardt, et al. (1999). "Exploring the black box: An analysis of work group diversity, conflict, and performance." Administrative Science Quarterly **44**: 1-28.
- Picken, J. C. and G. Dess (1997). "Out of (strategic) control." Organizational Dynamics **25**(1): 35-48.
- Popper, K. (1959). The logic of scientific discovery. London, Hutchinson.
- Porter, M. (1980). Competitive Strategy. Techniques for analyzing industries and companies. USA, Free Press.
- Porter, M. (1985). Competitive Advantage. New York, Free Press.
- Porter, M. (1996). "What is strategy?" Harvard Business Review(November-December): 61-78.
- Powell, T. C. (1992). "Strategic planning as competitive advantage." Strategic Management Journal **13**: 551-558.
- Quinn, J. B. (1978). "Strategic change: Logical incrementalism." Sloan Management Review **Fall 1978**: 7-21.
- Quinn, J. B. (1995). Strategies for change. The Strategy Process. H. Mintzberg, J. B. Quinn and J. Voyer. USA, Prentice-Hall.



- Railo, W. (1988). Först till framtiden (First to the future). Oslo, Railo international.
- Raimond, P. (1998). Where do strategic ideas come from? Strategic Flexibility. G. Hamel, C. K. Prahalad, H. Thomas and D. O'Neil. UK, John Wiley & Son.
- Ruef, M. (1997). "Assessing organizational fitness on a dynamic landscape: an empirical test of the relative inertia thesis." Strategic Management Journal **18**: 837-853.
- Rumelt, R. P. (1991). "How much does industry matter?" Strategic Management Journal **12**(3): 167-185.
- Sastry, A. M. (1997). "Problems and paradoxes in a model of punctuated organizational change." Administrative Science Quarterly **42**: 237-275.
- Schein, E. H. (1992). Organizational culture and leadership. San Francisco.
- Schoonhoven, C. B. (1981). "Problems with contingency theory: Testing assumptions hidden within the language of contingency "theory"." Administrative Science Quarterly **26**(349-377).
- Schwartz, P. (1991). The art of the long view. Planning for the future in an uncertain world, Currency Doubleday.

- Schwenk, C. R. (1990). "Effects of devil's advocate and dialectical inquiry on decision making: A meta-analysis." Organizational Behaviour and Human Decision Processes **47**: 161-176.
- Schwenk, C. R. (1995). "Strategic decision making." Journal of Management **21**(3): 471-493.
- Segars, A. H. (1994). Strategic information systems planning: The coalignment of planning system design, its relationships with organizational context, and implications for planning systems success, University of South Carolina, USA.
- Senge, P. (1990). The Fifth Discipline: The Art and Practice of the Learning Organization. New York, Doubleday/Currency.
- Sharma, S., R. G. Netermeyer, et al. (1990). In Search of Excellence Revisited: An Empirical Evaluation of Peters and Watersman's Attributes to Excellence. Enhancing Knowledge Development in Marketing. W. O. Bearden and A. Parasuraman. Chicago, American Marketing Association. **1**: 322-328.
- Shaw, M. (1981). Group dynamics: The psychology of small group behaviour. 3rd ed. New York, McGraw-Hill.
- Shoemaker, P. J. K. (1994). "Scenario Planning: A tool for strategic thinking." Sloan Management Review(Winter): 25-40.

- Shortell, S. M. and E. J. Zajac (1990). "Perceptual and archival measures of Miles and Snow's strategic types: a comprehensive assessment of reliability and validity." Academy of Management Journal **33**(4): 817-832.
- Sinha, R. K. and C. H. Noble (1997). "The performance consequences of subfield entry." Strategic Management Journal **18**(6): 465-481.
- Slevin, D. P. and J. G. Covin (1997). "Strategy formation patterns, performance, and the significance of context." Journal of Management **23**(2): 189-209.
- Smith, K. G., K. A. Smith, et al. (1994). "Top management team demography and process: the role of social integration and communication." Administrative Science Quarterly **39**: 412-438.
- Steiner, G. A. (1969). Top management planning. New York, Macmillan.
- Strandberg, B. (1999). If it doesn't swing, shoot the bassist. Personal communication.
- Subramanian, R., N. Fernandes, et al. (1993). "Environmental scanning in U.S. companies: their nature and relationship to performance." Management International Review **33**(3): 271-286.

- Sutcliffe, K. M. (1994). "What executives notice: accurate perceptions in top management teams." Academy of Management Journal **37**(5): 1360-1379.
- Sutcliffe, K. M. and A. Zaheer (1998). "Uncertainty in the transaction environment: an empirical test." Strategic Management Journal **19**: 1-23.
- Teece, D. J., G. Pisano, et al. (1997). "Dynamic capabilities and strategic management." Strategic Management Journal **18**(7): 509-533.
- Thompson, J. D. (1967). Organizations in action. New York, NY, McGraw-Hill.
- Tushman, M. L. and E. Romanelli (1985). Organizational evolution: A metamorphosis model of convergence and reorientation. Research in Organizational Behaviour. L. L. Cummings and B. M. Staw. Greenwich, CT, JAI Press: 171-222.
- Van der Heijden, K. (1996). Scenarios: The art of strategic conversation, Wiley.
- Vandenbosch, B. and S. L. Huff (1997). "Searching and scanning: How executives obtain information from executive information systems." MIS Quarterly Journal(March): 81-107.

- Venkatraman, N. and J. E. Prescott (1990). "Environment-strategy coalignment: An empirical test of its performance implications." Strategic Management Journal **11**: 1-23.
- Venkatraman, N. and V. Ramanujam (1986). "Measurement of business performance in strategy research: A comparison of approaches." Academy of Management Review **11**: 801-814.
- Venkatraman, N. and V. Ramanujam (1987). "Measurement of business economic performance: An examination of method convergence." Journal of Management **13**: 109-122.
- von Krogh, G., P. Erat, et al. (2000). "Exploring the link between dominant logic and company performance." Creativity and Innovation Management **9**(2).
- Wernerfelt, B. (1984). "A resource-based view of the firm." Strategic Management Journal **5**(2): 171-180.
- Williamson, O. E. (1994). Strategizing, economizing, and economic organization. Fundamental Issues in strategy. R. P. Rumelt, D. E. Schendel and D. J. Reece. USA, Harvard Business School Press.
- Williamson, P. J. (1999). "Strategy as options for the future." Sloan Management Review(Spring 1999): 117-126.

Zahra, S. A. (1991). "Predictors and financial outcomes of corporate entrepreneurship: A exploratory study." Journal of Business Venturing **6**: 259-285.

Zahra, S. A. (1993). "Environment, corporate entrepreneurship, and financial performance: a taxonomic approach." Journal of Business Venturing **8**: 319-340.

## 9 Appendix 1: Overview of instruments

This appendix consists of an overview of selected instruments measuring the dependent and independent variables in the research. The instruments are presented together with minor comments.

Scale	Items	Reliability/Alpha	Reference
Politics	4 items, 7-point Likert	0.66	Developed by Dean & Sharfman, 1993a
Social integration	9 items, 7-point Likert	0.85	Developed by Smith et al, 1997
Comprehensiveness	5 items, 7-point Likert	Not reported	Developed by ogilvy & Glick, 1990, reported in Miller, Burke & Glick, 1998
Organic structure	7 items, 7-point Likert	0.80	Developed by Khandwalla 1976/77, reported in Covin & Slevin, 1989; Ozsomer et al, 1997
Strategic planning (emphasis)	7 items, 5-point Likert	0.84	Developed by Boyd & Reuning-Elliott, 1998
Strategic posture	9 items, 7-point Likert to measure innovation, proactiveness, risk-taking	0.87	Developed by Covin & Slevin, 1989
Entrepreneurial strategy making	5 items (of 25 describing 4 strategy modes), 5-point Likert	0.64	Dess, Lumpkin & Covin, 1997
Innovative differentiation	6 items, 7-point Likert	0.64	(Miller 1988)
Financial performance	ROA, Sales Growth	0.84	Dess & Robinson, 1984
Performance	13-items, 7-point Likert to measure profit; growth; future position; quality; social responsibility	0.64-0.75 for sub-scales	Hart & Banbury, 1994
Excellence	16 items	0.89	Sharma, Netermeyer & Mahajan, 1990, reported in (Caruana, Pitt et al. 1994)
Environmental uncertainty	12 items, 7-point Likert to measure complexity (2 items); munificence (2); dynamism (8)	0.63-0.67 for sub-scales	Hart & Banbury, 1994

## 9.1 Management

### 9.1.1 TMT Functional background

Reference: Bantel & Jackson (1989)

### 9.1.2 Politics

Reference: Dean and Sharfman (1996)

Alpha: 0,66

Were group members primarily with their own goals, or with the goals of the organisation?	1	2	3	4	5	6	7
To what extent were people open with each other about their interests and preferences in the decision?	1	2	3	4	5	6	7
To what extent was the decision affected by the use of power and influence among the group members?	1	2	3	4	5	6	7
To what extent was the decision affected by negotiation among group members?	1	2	3	4	5	6	7

“To calculate values for each construct for each decision, we calculated item means across the informants on each team, which were averaged across items to form scales.”

### 9.1.3 Social integration

Reference: Smith, Smith et al. (1994))

Alpha: 0,85

The members of the TMG are quick to defend each other from criticism by outsiders.	1	2	3	4	5
The success of other members of the TMG help me to achieve my own objectives.	1	2	3	4	5
Everyone's input is incorporated into most important company decisions.	1	2	3	4	5
The members of the TMG get along together very well.	1	2	3	4	5
Relationships between members of the TMG are best described as “win-lose”, if he/she wins, I lose (reverse coded).	1	2	3	4	5
The members of the TMG are always ready to co-operate and help each other.	1	2	3	4	5
When final decisions are reached, it is common for at least one member of the TMG to be unhappy with the decision (reverse coded).	1	2	3	4	5
There is a great deal of competition between the members of the TMG (reverse coded).	1	2	3	4	5



The members of the TMG really stick together.	1	2	3	4	5
---	---	---	---	---	---

5-point Likert type

Adopted from Shaw (1981) and supplemented by researchers.

## 9.2 Organisation – structure

### 9.2.1 Organic structure

Reference: Covin and Slevin (1989). Developed by Khandwalla (1977), used by Ozsomer, Cantalone et al, (1997))

Alpha: 0,80

Reported: Mean 5,07. SD 1,10

In general, the operating management philosophy in my firm favours:

	1	2	3	4	5	6	7	
Highly structured channels of communication and a highly restricted access to important financial and operating information								Open channels of communication with important financial and operating information flowing quite freely throughout the organisation
A strong insistence on a uniform managerial style throughout the firm								Managers' operating styles allowed to range freely from the very formal to the very informal
A strong emphasis on giving the most to say in decision-making to formal line managers								A strong tendency to let the expert in a given situation have the most say in decisions-making, even if this means temporary bypassing of formal line authority
A strong emphasis on holding fast to tried and true management principles despite any changes in business conditions								A strong emphasis on holding fast to tried changing circumstances without too much of concern for the past practice
A strong emphasis to always getting personnel to follow the formally laid down procedures								A strong emphasis on getting things done even if this means disregarding formal procedures
Tight formal control of most operations by means of sophisticated control and information systems								Loose, informal control; heavy dependence on informal relationships and norm of cooperation for getting work done
A strong emphasis on getting line and staff personnel to adhere closely to formal job descriptions								A strong tendency to let requirements of the situation and the individual's personality define proper on-job behaviour

### 9.2.2 Liaison devices (integration) and control

Reference: Miller (1987)

Sample: a multiple industry sample of firms in Quebec and Montreal-area.

Factor	Mean	SD	Alpha
Liaison devices	32.48	9.39	0.84
Controls	4.85	1.23	0.78

Exact formulation of question unclear.

### 9.2.2.1 *Liaison devices*

To what extent does your company use the following integrative mechanisms to assure compatibility among decisions in one area (e.g. marketing) with those in other areas (e.g. production)?

	Used rarely				Used very frequently		
Interdepartmental committees set up to allow departments to engage in joint decision making	1	2	3	4	5	6	7
Task forces, temporary bodies set up to facilitate interdepartmental collaboration on specific projects	1	2	3	4	5	6	7
Liaison personnel whose specific job is to co-ordinate the efforts of several departments for purposes of a specific project	1	2	3	4	5	6	7

To what extent does participative, cross-functional discussion characterise the decision making at top levels in your company?

	Rare use of committees or infrequent informal collaboration				Frequent use of committees or informal inter-departmental collaboration		
Product and service decisions concerning production, marketing and R&D strategies	1	2	3	4	5	6	7
Capital budget decisions – selection and financing of long-term investments	1	2	3	4	5	6	7
Long-term strategies (growth, diversification etc) and decisions related to changes in a firm's operating philosophy	1	2	3	4	5	6	7

How are decisions in general made in your company?

Each department makes decisions more or less on its own, without regard to other departments	1	2	3	4	5	6	7	There is a great deal of departmental interaction on most decisions
--	---	---	---	---	---	---	---	---

### 9.2.2.2 *Control*

To what extent does your company use the following control devices to gather information about performance?

	Used rarely or for small part of operations				Used frequently or throughout the firm		
Comprehensive management control and information system	1	2	3	4	5	6	7
Cost centres for cost control	1	2	3	4	5	6	7
Profit centres and profit targets	1	2	3	4	5	6	7
Quality control of operations via sampling and other techniques	1	2	3	4	5	6	7
Cost control by fixing standard costs and analysing variations	1	2	3	4	5	6	7
Formal appraisal of personnel	1	2	3	4	5	6	7

### 9.2.3 Decentralisation

Reference: Sutcliffe (1994). Adapted from (Glick, Huber et al. 1990).

Averaged scale, no weights. 7-point Likert. No reported anchoring. Alpha 0.74

To what extent is decision-making authority delegated in each of the following areas

- Entering new market segments?
- Changing policies that affect a major proportion of the organisation?
- Hiring mid-level management personnel?
- Making capital expenditure greater than 1 % of your organisation's annual budget?
- Altering responsibilities of first –line managers?
- Changing the way your organisation serves customers/clients?
- Making changes in the way your organisation produces its products/services?

### 9.2.4 Performance monitoring

Reference: (Sutcliffe 1994). Based on (Eisenhardt 1989)

Averaged scale no weights. 7-point Likert. Not reported anchoring. Alpha 0.80

How often does the Top Management Team:

- Review operational measures of internal performance such as bookings, backlog, margins, engineering milestones, cash flow, or inventories?
- Get briefed by subordinates on the competitive environment?
- Hold meetings to review current operations?
- Get briefed by subordinates on measures of internal performance?

## 9.3 Process

### 9.3.1 Executive scanning intensity

Reference: Elenkov (Elenkov 1997; Elenkov 1997)

(Subramanian, Fernandes et al. 1993))

### 9.3.2 Executive scanning intensity

Reference: Jennings & Lumpkin (1992). Used in Hagen & Amin (1995)

5-point Likert scale. Instrument available from Jennings (no reported Alpha).

- Opportunities and threat scanning
- Formalised evaluation of customer attitudes

- Explicitly tracking policies and tactics of competitors
- Formalised evaluation of opportunities for new acquisitions, investments, and markets
- Formalised evaluation of threats from competitors and regulatory changes

### 9.3.3 Organisational scanning

Reference: Sutcliffe (1994). Based on Glick, Huber et al. (1990) and Fahey and King (1977)  
Averaged scale no weights. 7-point Likert. No reported anchoring. Alpha 0.88

To what extent

- Does your firm actively collect information about its external environment?
- Do subordinates intensively collect information from sources outside the organisation?
- Is environmental scanning conducted by a specialised unit?
- Is environmental information collected only in response to specific problems, crises, or events? (a)
- Does your firm continuously collect information about its external environment?
- Does your firm extensively monitor the external environment?

### 9.3.4 Strategic planning emphasis

Reference: Boyd & Reuning-Elliott (1998)

Alpha: 0,84 when tested on the 300 largest firms in a US state

This section examines several common planning activities. Please indicate the emphasis placed on each activity within your organisation:

	No emphasis		Moderate emphasis	Very strong emphasis	
Mission statement	1	2	3	4	5
Trend analysis	1	2	3	4	5
Competitor analysis	1	2	3	4	5
Long-term goals	1	2	3	4	5
Annual goals	1	2	3	4	5
Short-term action plans	1	2	3	4	5
Ongoing evaluation	1	2	3	4	5

### 9.3.5 Procedural rationality

Reference: Dean & Sharfman (1993;1996)

Alpha 0.80 reported in (Dean and Sharfman 1993)

Mean 4.64, std .81

	Not at all		Moderately		Extensively		
How extensively did the group look for information in making this decision?	1	2	3	4	5	6	7
	Not at all		Moderately		Extensively		
How extensively did the group analyse the relevant information before making a decision?	1	2	3	4	5	6	7
	Not at all important		Moderately important		Very important		
How important were quantitative analytic techniques in making the decision?	1	2	3	4	5	6	7
	Mostly analytical				Mostly intuitive		
How would you describe the process that had the most influence on the group's decision?	1	2	3	4	5	6	7
	Not at all effective		Moderately effective		Very effective		
In general, how effective was the group at focusing its attention on relevant information and ignoring irrelevant information?	1	2	3	4	5	6	7

### 9.3.6 Participation

Reference: Segars (1994:163). Reported in Gottschalk (1998)

Alpha= 0.88

- Top management is actively involved in strategic IS planning
- A variety of functional managers participate in the process of IS planning
- Our process for strategic IS planning includes numerous participants
- Strategic IS planning is a relatively isolated organisational activity (a)
- The level of participation in SISP by diverse interests of the organisation is high

### 9.3.7 Strategic involvement

Reference: Oswald, Mossholder et al. (1994). Based on Pearce and Zahra (1991)

Alpha: 0.7

Sample: managers in an organisation under transition.

Scale 1-5. Two items were used to measure involvement, and two focused on the need for long-term thinking.

- To what extent are you currently involved in strategic planning for the organisation
- To what extent are you currently involved in strategic planning "in your unit" (1= little extent, 5=great extent)

- My job requires that I think about the long-term future of my business unit (1=strongly disagree, 5 =strongly disagree)
- I have little say in determining the long-range plans of my business unit (a)

### 9.3.8 Comprehensiveness

Reference: Miller, Burke et al. (1998)). Developed by ogilvy & Glick (1990) and used in Glick, Huber et al. (1990)

Alpha: Not reported

When confronted with an important, non-routine problem or opportunity, to what extent does your firm ...

	Not at all		To a great extent				
Develop many alternative responses?	1	2	3	4	5	6	7
Consider many diverse criteria for eliminating possible courses of action?	1	2	3	4	5	6	7
Thoroughly examine multiple explanations for the problem or opportunity?	1	2	3	4	5	6	7
Conduct multiple examinations of any suggested course of action?	1	2	3	4	5	6	7
Search extensively for possible responses?	1	2	3	4	5	6	7

## 9.4 Strategy

### 9.4.1 Entrepreneurial strategy making

Reference: Dess, Lumpkin et al. (1997) based on Hart (1991).

Reported alpha: 0.64

Consists of 25 items that fall into four categories of strategy making styles.

### 9.4.2 Innovative differentiation

Reference: Miller (1988)

Alpha: 0.64

6 items, 7-point Likert

Items:

- Use of major and frequent product-services innovation
- Annual R&D costs as percentage of sales
- Percentage of sales spent on costs of initiating and implementing product-market innovations each year
- Tendency to beat competitors to market (follow or be ahead)

- Innovative orientation (we follow the tried and true – we are growth-, innovation- and development-oriented)
- Competitive aggressiveness

### 9.4.3 Strategic posture

Reference: Covin & Slevin (1989). Items adapted or original from Miller and Friesen (1982) and Khandwalla (1977)

The scale was used to measure innovation (first three items), proactiveness (4-6) and risk-taking (7-9)

Internal consistency checked by factor analysis. All factor loadings above 0.5.

Alpha: 0,87

Mean 4,33. SD 1,23

	1	2	3	4	5	6	7	
<i>In general, the top managers of my firm favour...</i>								
A strong emphasis on the marketing of tried products and services	1	2	3	4	5	6	7	A strong emphasis on R&D, technological leadership, and innovations
How many new lines of products or services has your firm marketed in the past 5 years?								
No new lines of products or services	1	2	3	4	5	6	7	Very many new lines of products or services
Changes in most products or services have been mostly of a minor nature	1	2	3	4	5	6	7	Changes in product or service lines have usually been quite dramatic
<i>In dealing with its competitors, my firm...</i>								
Typically responds to actions which competitors initiate	1	2	3	4	5	6	7	Typically initiates actions which competitors then respond to
Is very seldom the first business to introduce new products/services, administrative techniques, operating technologies, etc	1	2	3	4	5	6	7	Is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc
Typically seeks to avoid competitive clashes, preferring a "live-and-let-live" posture	1	2	3	4	5	6	7	Typically adopts a very competitive, "undo-the-competitors" posture
<i>In general, the top managers of my firm have...</i>								
A strong proclivity for low-risk projects (with normal and certain rates of return)	1	2	3	4	5	6	7	A strong proclivity for high-risk projects (with chances of very high returns)
<i>In general, the top managers of my firm believe that...</i>								
Owing to the nature of the environment, it is best to explore it gradually via timid, incremental behaviour	1	2	3	4	5	6	7	Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives
<i>When confronted with decision-making situations involving uncertainty, my firm...</i>								
Typically adopts a cautious, "wait-and-see" posture in order to minimise the probability of making costly decisions	1	2	3	4	5	6	7	Typically adopts a bold, aggressive posture in order to maximise the probability of exploiting potential opportunities

## 9.5 Performance

### 9.5.1 Total performance

Reference: Hart & Banbury (1994)

Following the work of Venkatraman and Ramanujam (1986) Hart and Banbury identified three types of performance: financial, business and organisational effectiveness with five dimensions altogether:

Factor	Mean	SD	Alpha	No items
Current profit	4.34	1.44	0.75	2
Growth/share	4.40	1.37	0.69	2
Future position	3.78	1.08	0.64	4
Quality	5.49	0.80	0.64	3
Social responsibility	3.95	1.57	0.72	2

The dimensions were factor analysed with satisfactory results.

Exact formulation of question not presented in the paper.

Assess your company's performance on each of the following performance aspects, compared to that of other companies in the same market and at a similar stage of development:

	Low performer				High performer			
Profitability/ROA	1	2	3	4	5	6	7	
Cash flow	1	2	3	4	5	6	7	
Sales growth	1	2	3	4	5	6	7	
Market share	1	2	3	4	5	6	7	
Market diversification	1	2	3	4	5	6	7	
Product/service change	1	2	3	4	5	6	7	
New products next year	1	2	3	4	5	6	7	
Product/service development	1	2	3	4	5	6	7	
Overall company quality	1	2	3	4	5	6	7	
Employee satisfaction	1	2	3	4	5	6	7	
Product/service quality	1	2	3	4	5	6	7	
Environmental responsibility	1	2	3	4	5	6	7	
Social responsibility	1	2	3	4	5	6	7	

Comments: Not clear whether performance measures only cover 1 or 5 years.

Prior research has indicated that subjective measures of performance can be consistent with objective measures, thus enhancing reliability and validity (Dess & Robinson (1984); Venkatraman & Ramanujam (1987)).



### 9.5.2 Excellence

Reference: Sharma, Netermeyer et al. (1990). Reported in Caruana, Pitt et al. (1994)

16 items covering different aspects of excellence

Alpha: 0.89 (Sharma, Netermeyer et al. 1990),

Items:

- In this organisation we encourage employees to develop new ideas
- This organisation has a small staff that delegates authority efficiently
- It is the belief of top management in this organisation that its people are of outmost importance to the company
- In this organisation we instil a value system in all our employees
- We provide personalised attention to all our customers
- In this organisation top management creates an atmosphere that encourages creativity and innovativeness
- The company's values are the driving force behind our operation
- This firm is flexible and quick to respond to problems
- This company concentrates in product areas where it has a high level of skill and expertise
- We have a small, but efficient management team
- This company develops products that are natural extensions of its product line
- This organisation truly believes in its people
- This company considers after-the-sales service just as important as making the sale itself
- This company believes in experimenting with new products and ideas
- The company believes that listening to what customers have to say is a good skill to have
- This organisation is flexible with employees but administers discipline when necessary

### 9.5.3 Financial performance 1

Reference: Dess & Robinson (1984)

Alpha: 0.84

2 items: ROA and Sales Growth

### 9.5.4 Financial performance 2

Reference: Miller (1987)

Miller divided successful and unsuccessful companies by defining the successful as those who scored above the median on all three performance variables, and the unsuccessful as those who scored below the median on all three variables. The three performance variables were self-reported average long-term profitability, actual average annual growth rates in net income and the average rates of return on investments over the previous 5 years.

## 9.6 Control/contingency variables

### 9.6.1 Firm size

Could be operationalised as the natural logarithm of the number of employees, as suggested by Fredrickson and Mitchell (1984).

### 9.6.2 Firm complexity

Reference: Miller (1987)

Items:

1. What is the number of operating sites (plants and branches) of the firm?
2. What is the proportion of managerial personnel to total personnel (include all levels of management with foremen)?
3. What is the proportion of clerks to total personnel? (Clerks are staff in all functional areas who are not directly engaged in making, designing, or selling the product.)
4. How many levels are there in the organisation? (That is, count the number of levels in the longest line between direct workers and the chief executive – include both these levels – in the production or service function.)

### 9.6.3 Perceived instability

Reference: Sutcliffe (1994). Based on Duncan (1972) and Bourgeois (1985).

Averaged scale no weights. 7-point Likert. Not reported anchoring. Alpha 0.71 when 2 items (of 9) omitted

How strongly do you agree or disagree with each of the following statements?

- Customer demand and preferences are relatively stable in your industry
- Your firm must frequently change the way it produces its goods or services in order to be competitive
- The total value of assets for the firm in your industry varies a lot from year to year
- Capital expenditures within your firm's principal industry are relatively constant from year to year
- The actions of major suppliers (including materials, equipment, or labour suppliers) change very little from year to year (reverse)
- The volume of sales for firms in your industry fluctuates very little from year to year (reverse coded)
- Your firm frequently changes its technology to keep up with competitors

#### 9.6.4 Perceived munificence

Reference: Sutcliffe (1994). Based on the work of Glick, Huber et al. (1990).

Averaged scale no weights. 7-point Likert. Not reported anchoring. Alpha 0.88

How accurate are the following statements?

- Demand for the products/services of your principal industry is growing and will continue to grow
- The investment or marketing opportunities for firms in your principal industry are very favourable at the present time
- The opportunities for firms in your principal industry to expand the scope of their existing products/markets are extremely limited (reverse)
- Resources for growth and expansions are easily accessible in your industry
- In your industry, sales have been growing and are likely to grow
- The total value of assets for the firms within your industry is declining and will continue to decline (reverse)
- Capital expenditure in your firm's principal industry are growing and will continue to grow

#### 9.6.5 Turbulence

Reference: Miller, Burke et al. (1998).

Alpha 0.62

How strongly do you agree or disagree with each of the following statements? (7-scale from strongly disagree to strongly agree)

- Products/services become obsolete very slowly in your firm's principal industry (a)
- Your firm seldom needs to change its marketing practices to keep up with competitors (a)
- Customer demand and preferences are very easy to forecast in your firm's principal industry (a)
- Your firm must frequently change its products/service technology to keep up with competitors and/or consumer preferences

#### 9.6.6 Environmental uncertainty

Reference: Hart and Banbury (1994).

Environmental factors were conceptualised using Dess and Beard's (1984) three-dimension approach – dynamism, complexity and munificence. These were operationalised through 12 questions. Factor analysis revealed that dynamism consisted of unpredictability and change.

The measure of turbulence was constructed by combining dynamism and complexity into a single index.

Factor	Mean	SD	Alpha	Items
Complexity	4.77	1.43	0.67	2
Munificence	2.78	0.74	0.63	2
Dynamism	4.32	0.87	0.63	8

Items:

Complexity	Actions affect competitors
	Complex business environment
Munificence	Market will grow
	12 month business outlook good
Dynamism	Changing customer preferences
	Changing social values
	Changing business environment
	Difficult to anticipate change
	New competitors unpredictable
	Unforeseen threats
	Innovation on the market
	Performance public policy link

## 10 Appendix 2: Operationalisation of predictors

In this appendix the procedure of operationalisation of the selected constructs is described.

### 10.1 Procedure of operationalisation

- Identify performance predictors (in literature review)
- Rank predictors (let external reference group do that)
- Identify possible instruments capturing measuring predictors/constructs
- Modify instrument if necessary
- Alternatively: develop new instrument following standard procedures
- Compile a questionnaire
- Pretest questionnaire
- Modify questionnaire

### 10.2 Hypothesis in summary

Hypothesis	SRC	Performance	Raplexity– performance dependence	Support from reference group
1. External orientation in TMT	+	+	+	VSS
2: Perspective diversity	+	+	+	VSS
3. Politics in TMT	-	-	-	SS-VSS
4. Social integration in TMT	+	+	+	SS
5. Adaptive structure	+	+	+	SS
6. Organisational integration	+	+	+	MS
7. Cultural control	+	+	+	SS
8. Planning emphasis	+/-	+	+/-	MS
9. Comprehensiveness	+/-	+	+	WS
10. Participation in planning	+	+	+	MS
11. Proactive experimentation	+	+	+	MS-SS
12. SRC		+	+	SS-VSS

Support from reference group based on means of pre-questionnaire:

More than 6.0	Very strong support (VSS)
5.5–6.0	Strong support (SS)
5.0–5.5	Medium support (MS)
–5.0	Weak support (WS)

10.2.1 Hypothesis 1: External orientation of the TMT will be positively related to SRC and performance, and more positively related to performance in more raplex environments

#### **10.2.1.1 Variable**

External orientation

#### **10.2.1.2 Definition**

The degree to which the top management team access and evaluate information from the business environment.

#### **10.2.1.3 Theory**

Managers and organisations acquire information for two reasons. In the reactive or problemistic or decision-oriented mode, information is acquired to solve an actual problem. In the proactive mode the purpose is exploratory, to detect potential threats or opportunities (Choudhury and Sampler 1997).

What could be expected is that the more the members of the TMT expose themselves to unexpected and new information, explore the environment, the more original strategies they will craft. The more competitive the industry is, the more important competitor focus will become. Thus the overall external focus, both on opportunities and unexpected information, and active search for relevant information will be a predictor of strategic response capability and performance.

It is the attempt to understand the business environment at every single moment that counts. The more the TMT focus on the external environment, the higher their contextual awareness will be, and their ability to quickly respond to opportunities and threats in the environment.

#### **10.2.1.4 Measurement**

Description of scale:

Q1. To what extent does the Top Management Team of your company scan the external environment for threats and opportunities through:

	Not at all				To a great extent		
Formalised evaluation of customer attitudes?	1	2	3	4	5	6	7
Explicitly tracking policies and tactics of competitors?	1	2	3	4	5	6	7
Formalised evaluation of opportunities for new acquisitions, investments, and markets?	1	2	3	4	5	6	7

Formalised evaluation of threats from competitors and regulatory changes?	1	2	3	4	5	6	7
Formalised evaluation of new opportunities for production and distribution?	1	2	3	4	5	6	7

#### **10.2.1.5 Instrumentation**

Instrument from Jennings & Lumpkin, 1992. Used in Hagen & Amin, 1995

5-point Likert scale. Instrument available from Jennings (no reported Alpha). Alpha reported above 0.80 in Hagen & Amin in both Egypt and Jordan

Item 1 and 3 used to tap “opportunities scanning” and 2 and 4 used to tap “threat scanning”. Item 5 was added in an attempt to tap scanning for “organisational opportunities”.

10.2.2 Hypothesis 2: Perspective diversity of the TMT will be positively related to SRC and performance, and more positively related to performance in more raplex environments

#### **10.2.2.1 Variable**

Perspectives diversity

#### **10.2.2.2 Definition**

The heterogeneity of the TMT with respect to the team members’ information sources and perception.

#### **10.2.2.3 Theory**

Diversity related to information could be of different kinds. First there is diversity in information sources. Second there is diversity in information filters (perspectives – what we actually see). Diversity in “information” or “perspectives” could be expected to directly increase SRC and both directly and indirectly increase performance (through SRC). Perspectives diversity could be expected to give the TMT access to more varied information sources, to more “action environments” (Hamrefors 1999). The manager’s selectively perceives only some of the phenomena included in the field of vision (Hambrick and Mason 1984).

Such a perspectives diversity could result from diversity in the TMTs functional background and education, gender, age, ethnic background, private and professional network. There is a risk, however, that this perspectives diversity would also lead to diversity in preferences (goals) and causality (system models), which would not be expected to increase performance since such diversity could slow down the decision-making process.

Cognitive diversity (in terms of causality and preferences/goals) among executives inhibits rather than promotes creativity, long-range planning and comprehensive examination of threats and opportunities (Miller, Burke et al. 1998). Cognitive diversity in this meaning is what we here call ‘system model diversity’.

However, this risk could be expected to be of minor importance.

#### **10.2.2.4 Available instruments**

No relevant available instrument was found.

#### **10.2.2.5 Measurement**

Q2. How would you consider the diversity of the top management team (TMT) with respect to different aspects such as:

	A very homogeneous TMT				A very heterogeneous TMT			
Gender	1	2	3	4	5	6	7	
Age	1	2	3	4	5	6	7	
Ethnic background	1	2	3	4	5	6	7	
Educational background	1	2	3	4	5	6	7	
Educational level	1	2	3	4	5	6	7	
Family situation	1	2	3	4	5	6	7	
Private social network (friends)	1	2	3	4	5	6	7	
Private interests and hobbies	1	2	3	4	5	6	7	
Professional or business network	1	2	3	4	5	6	7	
Company network (contacts within the company)	1	2	3	4	5	6	7	

#### **10.2.2.6 Instrumentation**

The instrument was developed to tap several dimensions of informational diversity. Ideas from Smith, Smith et al. (1994) (Q 5)



10.2.3 Hypothesis 3: Politics within the TMT will be negatively related to SRC and performance, and more negatively related to performance in more raplex environments

**10.2.3.1 Variable**

Politics

**10.2.3.2 Definition**

The extent to which the TMT focus on 'inside the organisation', towards the mixture of interests, power bases and positions, rather than on what is feasible given current environmental forces. (Dean and Sharfman 1996)

**10.2.3.3 Theory**

In order to make quick decisions a minimal influence of politics in the decision-making process could be expected to increase SRC and performance. Open climate and debate based on facts, ability to solve conflicts creatively and commitment to the team and company are such components that could be expected to increase performance through increased quality and speed in decision-making. Besides that, the role-model function of the TMT should not be underestimated (Schein 1992).

**10.2.3.4 Measurement**

Q3. Here follows some questions about the decision-making process within the Top Management Team.

	Not at all							To a great extent	
	1	2	3	4	5	6	7		
To what extent are members of the TMT (top management team) primarily with their own goals, rather than with the goals of the organisation?									
To what extent are the people in the TMT open with each other about their interests and preferences to decisions?									
To what extent are decisions in general affected by the use of power and influence among the TMT members?									
To what extent is there in the TMT an active debate based on facts, when major decisions are being made?									
To what extent are the decision affected by negotiation among group members?									

To what extent is the TMT capable of solving conflicts in a creative way, rather than by the use of power and politics?	1	2	3	4	5	6	7
---	---	---	---	---	---	---	---

#### **10.2.3.5 Instrumentation**

Adapted from a 7-point Likert described in Dean and Sharfman (1993). Alpha 0,66

Dean & Sharfman used the scale in TMTs where each member of the TMT gave his/her answer to the questions related to a specific decision and means were calculated among the TMT members.

Items were rephrased to fit the present situation, with one informant giving a general opinion of the political climate within the TMT.

Item 4 and 6 were added, based on the research of Eisenhardt et al. (Eisenhardt 1989; Eisenhardt, Kahwajy et al. 1997).

#### **10.2.4 Hypothesis 3: Social integration of the TMT will be positively**

related to SRC and performance, and more positively related to performance in more raplex environments

##### **10.2.4.1 Variable**

Social integration

##### **10.2.4.2 Definition**

The extent to which the members of the TMT stick together and co-operate in order to achieve common goals. (See (Smith, Smith et al. 1994))

##### **10.2.4.3 Theory**

To be able to make quick decisions and make the organisations move quickly there needs to be a basic trust within the TMT and an ambition to pull in the same direction. When quick, and sometimes painful, decisions are made, it is necessary that the TMT really support them.

Consequently, socially well-integrated TMTs where the members stick together, trust each other and co-operate to achieve common goals – when there is companionship and team-play rather than competition – could be expected to be associated with high response capability and performance (Smith, Smith et al. 1994; Eisenhardt 1999).

##### **10.2.4.4 Measurement**

Q4. How would you describe the interaction within the Top Management Team?

	Disagree						Agree
The members of the TMT (top management team) are quick to defend each other from criticism by outsiders.	1	2	3	4	5	6	7
The success of other members of the TMT helps me to achieve my own objectives.	1	2	3	4	5	6	7
Everyone's input is incorporated into most important company decisions.	1	2	3	4	5	6	7
The members of the TMT get along together very well.	1	2	3	4	5	6	7
Relationships between members of the TMT are best described as "win-lose", if he/she wins, I lose (reverse coded).	1	2	3	4	5	6	7
The members of the TMT are always ready to co-operate and help each other.	1	2	3	4	5	6	7
When final decisions are reached, it is common for at least one member of the TMT to be unhappy with the decision (reverse coded).	1	2	3	4	5	6	7
There is a great deal of competition between the members of the TMT (reverse coded).	1	2	3	4	5	6	7
The members of the TMT really stick together.	1	2	3	4	5	6	7

#### ***10.2.4.5 Instrumentation***

The scale was developed by Smith, Smith et al. (1994), through a scale adopted from Shaw (1981) and supplemented by researchers. It was originally a 5-point Likert type. Alpha reported 0.85.

The article does not give the exact formulation of the initial question or definition of the endpoints of the scale.

TMG was changed to TMT and the 5-point scale to a 7-point scale in order to be in line with other questions.

### **10.2.5 Hypothesis 4: Adaptive structure will be positively related to SRC**

and performance, and more positively related to performance in more raplex environments

#### ***10.2.5.1 Variable***

Adaptive structure

### 10.2.5.2 Definition

The extent to which the company has a flexible, informal and task-oriented structure and culture.

### 10.2.5.3 Theory

The need for adaptive structures in order to be able to cope with a changing environment is an old notion. Lawrence and Lorch (1969:26) already noted that “life in an organizational unit must become more complex in order to deal adequately with an uncertain and rapidly changing sector of the environment. To have more points of contact with the environment, a flatter organization is employed. Formal rules cannot be formulated ... all-to-all communication ... longer time orientation”.

According to complexity theory, to be able to adapt quickly to shifting environments there is a need for an adaptive flexible structure where each part of the organisation is free to search for optima in its own competitive landscape. That is also a basic consequence of the law of requisite variety (Ashby 1956).

### 10.2.5.4 Measurement

Q5. In general, the operating management philosophy in my firm favours:

Highly structured channels of communication and highly restricted access to important financial and operating information	1	2	3	4	5	6	7	Open channels of communication with important financial and operating information flowing quite freely throughout the organisation
A strong insistence on a uniform managerial style throughout the firm	1	2	3	4	5	6	7	Managers' operating styles allowed to range freely from the very formal to the very informal
A strong emphasis on giving the most to say in decision-making to formal line managers	1	2	3	4	5	6	7	A strong tendency to let the expert in a given situation have the most say in decision-making, even if this means temporary bypassing of formal line authority
A strong emphasis on holding fast to tried and true management principles despite any changes in business conditions	1	2	3	4	5	6	7	A strong emphasis on adapting to changing circumstances without too much of concern for the past practice
A strong emphasis to always getting personnel to follow the formally laid down procedures	1	2	3	4	5	6	7	A strong emphasis on getting things done even if this means disregarding formal procedures
Tight formal control of most operations by means of sophisticated control and information systems	1	2	3	4	5	6	7	Loose, informal control; heavy dependence on informal relationships and cooperation for getting work done

A strong emphasis on getting line and staff personnel to adhere closely to formal job descriptions	1	2	3	4	5	6	7	A strong tendency to let requirements of the situation and the individual's personality define proper on-job behaviour
--	---	---	---	---	---	---	---	--

#### **10.2.5.5 Instrumentation**

Instrument reported in Covin & Slevin (1989). Originally developed by Khandwalla (1977) and recently used by Ozomer et al, (1997). Alpha reported by Covin & Slevin 1989 0,80.

Reported mean value: 5,07. SD 1,10

Formulation of question 4 was changed from "A strong emphasis on holding fast to tried changing circumstances without too much of concern for the past practice" to " A strong emphasis on adapting to changing circumstances without too much of concern for the past practice".

The formulation of question 6 was changed from "information relationships and norm of cooperation" to "informal relationships and cooperation"

10.2.6 Hypothesis 5: Integration will be positively related to SRC and performance, and more positively related to performance in more raplex environments

#### **10.2.6.1 Variable**

Integration

#### **10.2.6.2 Definition**

The extent to which decision-making at the top level in the firm is characterised by participative, cross-functional committees in which different departments get together to decide specific classes of decisions.

#### **10.2.6.3 Theory**

In order to be able to adapt quickly to shifting environments there is a need for an adaptive flexible structure where each part of the organisation is free to search for an optimum in its own landscape.

But to be able to see the same long-term picture and co-ordinate joint activities there is a need for co-ordination of perceptions of opportunities and threats, responses to those threats and short-term actions.

Integration in this respect focuses on integration of plans and activities, not of culture and norms.

Integration is one of the least considered aspects of organisational structure (Fairbairn 1997). Integration has been defined as “lateral linkages that coordinate differentiated subunits, reduce conflict and duplication, foster mutual adjustment, and coalesce subunits toward meeting overall organisational objectives” (Miller and Dröge 1986:542). Miller (1987) defined it as liaison devices, including task forces and coordinative committees. Such integrative devices seek to “encourage rationality in decision-making by precipitating contacts among decision-makers that may motivate systematic attempts to develop, scrutinise, and reconcile divergent perspectives” (Miller 1987:11).

#### 10.2.6.4 Measurement

Q6. To what extent does your company use the following integrative mechanisms to assure compatibility among decisions in one area (e.g. marketing) with those in other areas (e.g. production)?

	Used rarely				Used very frequently		
Interdepartmental committees set up to allow departments to engage in joint decision making	1	2	3	4	5	6	7
Task forces, temporary bodies set up to facilitate interdepartmental collaboration on specific projects	1	2	3	4	5	6	7
Networking personnel whose specific job is to co-ordinate the efforts of several departments for purposes of a specific project	1	2	3	4	5	6	7

Q7. To what extent is decision-making at top levels in your firm characterised by participative, cross-functional committees in which different departments, functions or divisions get together to decide the following classes of decisions?

	Use rarely				Use very frequently		
Product and service decisions concerning production, marketing and R&D strategies	1	2	3	4	5	6	7
Capital budget decisions – selection and financing of long-term investments	1	2	3	4	5	6	7
Long-term strategies (growth, diversification etc) and decisions related to changes in a firm’s operating philosophy	1	2	3	4	5	6	7

#### 10.2.6.5 Instrumentation

Developed by Miller (1987).

Sample: a multiple industry sample of firms in the Quebec and Montreal area.

Factor	Mean	SD	Alpha
Liaison devices	32.48	9.39	0.84

Recently used in a modified form by Fairbairn (1997). Fairbairn’s formulation of the second question was used (but not her additional items). The last of Miller’s 7 questions was excluded.

“Liaison devices” was changed to “Networking devices” in item 3 after pre-testing on a small group of Swedes.

### 10.2.7 Hypothesis 6: Cultural control will be positively related to SRC

and performance, and more positively related to performance in more raplex environments

#### 10.2.7.1 *Variable*

Cultural control

#### 10.2.7.2 *Definition*

The extent to which organisational behaviour is controlled by rewards, culture, and boundaries.

#### 10.2.7.3 *Theory*

Cultural control is focused on implementation of strategies. The traditional approach to cultural control emphasises boundaries and constraints (Picken and Dess 1997). But as the competitive environment becomes more raplex, the demand for both flexibility and quick response increases. As firms simultaneously down-size and face the need for increased co-ordination across organisational boundaries, a control system based primarily on boundaries and constraints becomes dysfunctional. The use of rewards and culture to align individual and organisational goals becomes increasingly important.

The implicit long-term contract between the organisation and its key employees has been eroded. Today’s managers face an increasingly complex-complex environment (Løwendahl and Revang 1998) where not only the external environment becomes raplex, but the internal environment becomes more complicated to control when employees (and young managers) see themselves as free agents and view their career as a series of opportunistic changes. Thus organisational culture becomes increasingly important as a loyalty builder (Collins and Porras 1996; Collins and Porras 1997).

#### 10.2.7.4 *Measurement*

Q8. How would you describe the systems used to implement a desired culture and strategy?

	Very definitely false			Very definitely true			
	1	2	3	4	5	6	7
We carefully hire people that already identify with and have attributes that are consistent with the organisation’s desired values							
Rituals (coffee breaks, information meetings, arenas for dialogue etc) are carefully tailored to support							

desired behaviours, culture and strategy							
The compensation “system” is designed to support desired culture and strategy and consists of both financial and non-financial incentives	1	2	3	4	5	6	7
The compensation “system” is perceived as fair and equitable	1	2	3	4	5	6	7
Performance feedback to individuals and groups is prompt, clear and unambiguous	1	2	3	4	5	6	7
Managers are implementing the goals and culture by being role models	1	2	3	4	5	6	7
There is a constant dialogue in the organisation on individual and organisational goals	1	2	3	4	5	6	7
We monitor not only pure performance indicators (such as sales and costs), but all kinds of indicators that are critical to long-term performance and the desired culture and strategy (i.e. customer satisfaction, personnel satisfaction, educational expenditures, innovation etc)	1	2	3	4	5	6	7

#### **10.2.7.5 Instrumentation**

The instrument was developed to cover two dimensions: cultural and informational support (items 1, 2, 6, 7, 8) and incentive systems (items 3, 4, 5, 9).

Ideas from Schein (1992) (1, 3, 5), Picken and Dess (1997) (1, 2, 3, 4, 5, 6, 7, 8), Brown and Eisenhardt (1997) (7).

Format of question used by Brett (1998).

#### **10.2.8 Hypothesis 7: Planning emphasis will be positively related to**

SRC and performance, and more positively related to

performance in more raplex environments

##### **10.2.8.1 Variable**

Planning emphasis

##### **10.2.8.2 Definition**

The emphasis the organisation puts on each stage of the planning process from environmental scanning to evaluation.



### 10.2.8.3 Theory

Ambitions to understand the environment, set out direction, and make plans for implementation could be expected to be important. Although detailed plans in raplex environments quickly tend to get outdated, the planning process or emphasis on planning creates a “preparedness” for change that could be expected to increase the strategic response capability and performance. Since such preparedness could be expected to be more important in raplex environments, this planning emphasis-performance link could be expected to be stronger in more raplex environments.

In recent years several meta-analytical studies (Boyd 1991; Miller and Cardinal 1994) have provided strong evidence that extensiveness of strategic planning positively influences firm performance, especially in turbulent industries.

### 10.2.8.4 Measurement

This section examines several common planning activities. Please indicate the emphasis placed on each activity within your organisation:

	No emphasis		Moderate emphasis			Very strong emphasis	
Mission statement	1	2	3	4	5	6	7
Continuous scanning of the business environment	1	2	3	4	5	6	7
Market and consumer behaviour analysis	1	2	3	4	5	6	7
Trend analysis	1	2	3	4	5	6	7
Competitor analysis	1	2	3	4	5	6	7
Vision statement	1	2	3	4	5	6	7
Long-term goals	1	2	3	4	5	6	7
Annual goals	1	2	3	4	5	6	7
Short-term action plans	1	2	3	4	5	6	7
Ongoing evaluation	1	2	3	4	5	6	7

### 10.2.8.5 Instrumentation

Boyd & Reuning-Elliott (1998)

Alpha: 0,84 when tested on the 300 largest firms in a US state

Original instrument is changed by changing the scale from a 5-point Likert scale to a 7-point Likert scale and adding the following components:

- Vision statement (ideas from (Collins and Porras 1997))
- General scanning of business environment (Elenkov 1997)
- Market and consumer behaviour analysis.

## 10.2.9 Hypothesis 8: Participation will be positively related to SRC and performance, and more positively related to performance in more raplex environments

### 10.2.9.1 Variable

Participation

### 10.2.9.2 Definition

The extent to which co-workers on all levels in the organisation participate in various planning activities.

### 10.2.9.3 Theory

Participation from both managers and employees in the planning process could be expected to be positive first of all to SRC, but also to performance. Participation means that more people are involved in the active scanning of the external environment and the thinking on challenges for the organisation. Participation also creates a sense of involvement in the organisation and the strategic decisions, which could increase commitment to the organisation and to decisions taken. Finally, people who are involved in decisions are often both more capable and willing to implement them. The importance of participation in the planning and implementation processes has been demonstrated for instance by Norrgren, Hart et al. (1996), demonstrating the need for participative change planning and Oswald, Mossholder et al. (1994) focusing on the need for middle-management involvement.

### 10.2.9.4 Available instruments

Two instruments were found, developed for other purposes and not suiting the situation. The first was developed by Segars (Segars 1994) to capture involvement in IT-projects, the other by Oswald, Mossholder et al. (1994) (based on (Pearce and Zahra 1991)) to capture managers' perception of involvement under transition.

### 10.2.9.5 Measurement

To what extent do co-workers on all levels in the organisation participate in the ongoing planning process? Please indicate the **emphasis placed on organisation-wide participation** within your organisation regarding:

	No emphasis		Moderate emphasis			Very strong emphasis	
	1	2	3	4	5	6	7
✓ Scanning the business environment for threats and opportunities							

Developing long-term strategies (including mission and vision)	1	2	3	4	5	6	7
Setting annual goals	1	2	3	4	5	6	7
Short-term action planning	1	2	3	4	5	6	7
Ongoing evaluation	1	2	3	4	5	6	7

#### ***10.2.9.6 Instrumentation***

The instrument was developed as a simplified version of the Planning-emphasis instrument. But since many organisations do not put too much emphasis on some of the planning activities the list was considered too detailed. Therefore a condensed version was developed to measure the degree of participation in each of the five planning phases – from environmental scanning to ongoing evaluation.

#### ***10.2.9.7 Alternative measurement***

An alternative instrumentation based on by Oswald, Mossholder et al. (1994) was considered but rejected since it was 'indirect'.

To what extent are co-workers and managers at all levels involved in strategic planning...

	To a little extent				To a great extent		
...for the organisation	1	2	3	4	5	6	7
...for their own unit	1	2	3	4	5	6	7

How much do you agree or disagree with the following statements:

	Strongly disagree				Strongly agree		
Lower managers and co-workers in our organisation are required to think about the long-term future of their business units	1	2	3	4	5	6	7
Lower managers and co-workers in our organisation have much say when it comes to determining the long-term future of their business units	1	2	3	4	5	6	7

10.2.10 Hypothesis 9: Comprehensiveness will be positively related to SRC and performance, and more positively related to performance in more raplex environments

#### 10.2.10.1 Variable

Comprehensiveness

#### 10.2.10.2 Definition

The extent to which an organisation when confronted with an important non-routine problem or opportunity tends to extensively examine alternative explanations and solutions.

#### 10.2.10.3 Theory

The comprehensiveness with which decision-alternatives are evaluated could be expected to increase performance in complex environments. Extensiveness or comprehensiveness could be expected to lead to more adequate (or effective) decisions and thus increase the “precision dimension” of the SRC. But comprehensiveness reached through a sequential examination of decision-alternatives risks slowing down the decision process. Therefore, comprehensiveness in terms of ambition to make thorough and parallel evaluation of decision-alternatives could be expected to increase performance and SRC, and could be considered more important in more raplex environments.

Decision-speed has also been found to correlate to simultaneous consideration of many alternatives, regardless of context (Judge and Miller 1991). It was also found correlate to performance only in high-velocity environments.

#### 10.2.10.4 Measurement

When confronted with an important, non-routine problem or opportunity, to what extent does your firm ...

	Not at all		To a great extent				
	1	2	3	4	5	6	7
Develop many alternative responses?	1	2	3	4	5	6	7
Consider many diverse criteria for eliminating possible courses of action?	1	2	3	4	5	6	7
Thoroughly examine multiple explanations for the problem or opportunity?	1	2	3	4	5	6	7
Conduct multiple examinations of any suggested course of action?	1	2	3	4	5	6	7
Search extensively for possible responses?	1	2	3	4	5	6	7
Simultaneously evaluate different alternative explanations or courses	1	2	3	4	5	6	7

of action, rather than evaluating them sequentially?							
--	--	--	--	--	--	--	--

#### **10.2.10.5 Instrumentation**

Miller, Burke et al. (1998) (Developed by ogilvy & Glick (1990) and used in Glick, Huber et al. (1990)

Alpha: 0.87 (Miller, Burke et al. 1998)

Last item added, based on Eisenhardt (1989) to capture parallel processing of decisions.

10.2.11 Hypothesis 10: Proactive experimentation will be positively related to SRC and performance, and more positively related to performance in more raplex environments

#### **10.2.11.1 Variable**

Proactive experimentation

#### **10.2.11.2 Definition**

The degree to which the organisation applies an innovative, aggressive and risk-taking strategic posture.

#### **10.2.11.3 Theory**

In raplex environments, the ability to exploit the variety of possible strategic configuration could be expected to be critical to long-term performance. Since the strategic uncertainty in the raplex environment is high, the only way to figure out what works and what doesn't, is experimentation. Since raplex environments are also rapidly changing, the window of opportunity is often narrow and consequently speed is crucial.

A strategic posture characterised by proactive experimentation and the ambition to strike first, create new markets and break down industry barriers could be expected to increase both SRC and overall performance, and could be expected to be more important in more raplex environments than less raplex ones.

#### **10.2.11.4 Measurement**

Q12. How would you describe your company's strategic posture?

<i>In general, the top managers of my firm favour...</i>								
A strong emphasis on the marketing of tried products and	1	2	3	4	5	6	7	A strong emphasis on R&D, technological leadership, and

services								innovations
How many new lines of products or services has your firm marketed in the past 5 years?								
No new lines of products or services	1	2	3	4	5	6	7	Very many new lines of products or services
Changes in most products or services have been mostly of a minor nature	1	2	3	4	5	6	7	Changes in product or service lines have usually been quite dramatic
<i>In dealing with its competitors, my firm...</i>								
Typically responds to actions which competitors initiate	1	2	3	4	5	6	7	Typically initiates actions which competitors then respond to
Is very seldom the first business to introduce new products/services, administrative techniques, operating technologies, etc	1	2	3	4	5	6	7	Is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc
Typically seeks to avoid competitive clashes, preferring a "live-and-let-live" posture	1	2	3	4	5	6	7	Typically adopts a very competitive, "undo-the-competitors" posture
<i>In general, the top managers of my firm...</i>								
Prefer low-risk projects (with normal and certain rates of return)	1	2	3	4	5	6	7	Prefer high-risk projects (with chances of very high returns)
<i>In general, the top managers of my firm believe that...</i>								
Owing to the nature of the environment, it is best to explore it gradually via timid, incremental behaviour	1	2	3	4	5	6	7	Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives
<i>When confronted with decision-making situations involving uncertainty, my firm...</i>								
Typically adopts a cautious, "wait-and-see" posture in order to minimise the probability of making costly decisions	1	2	3	4	5	6	7	Typically adopts a bold, aggressive posture in order to maximise the probability of exploiting potential opportunities
<i>In dealing with the balance between present and future, my firm...</i>								
Focuses on existing products, services and markets in order to maximise short-term profit	1	2	3	4	5	6	7	Adopts a long-term orientation, encourage visionary thinking and involve futurists in projects in order to view present activities in a wider perspective
Extensively develops and thoroughly tests new products and services before they are released in order to ensure acceptance from the market	1	2	3	4	5	6	7	Adopts an experimental approach to the future, frequently testing new experimental products and services in order to both influence the market and to get quick feedback from the market

#### **10.2.11.5 Instrumentation**

Reference: Covin and Slevin (1989). Items adapted or original from Miller and Friesen (1982) and Khandwalla (1977).

The scale was used to measure innovation (first three items), proactiveness (4-6) and risk-taking (7-9)

Internal consistency checked by factor analysis. All factor loadings above 0.5.

Alpha: 0,87

Mean 4,33. SD 1,23

The last two items were added to cover:

- Experimentation and the use of low-cost probes into the future (Brown and Eisenhardt 1997)
- Strategy innovation (Hamel 1998)
- Long-term orientation and
- Use of futurists (Brown and Eisenhardt 1997)

On item 7 “a strong proclivity” was changed to “prefer” after initial pre-testing.

10.2.12 Hypothesis 11a: Organisations with higher strategic  
response capability will perform better than those with lower  
SRC

#### **10.2.12.1 Variable**

Perceived strategic response capability

#### **10.2.12.2 Definition**

The capability to deliver a quick and adequate response to threats and opportunities in the environment.

#### **10.2.12.3 Theory**

The strategic response capability can be compared to the stimulus-response paradigm of biology where the capability of an organism to respond to stimuli in the environment is the key determinant of its fitness for survival (Bettis and Hitt 1995)

The strategic response capability consists of several dimensions and aspects (Bettis and Hitt 1995):

- threats and opportunities

- robustness and response (time and adequacy)
- sense change in the environment; 2) conceptualise a response to that change; and 3) reconfigure resources to execute the response.

#### 10.2.12.4 Available instruments

No relevant instrument during an extensive search was found covering the strategic response capability.

#### 10.2.12.5 Measurement

Robustness can be defined as a company's ability to adapt to new challenges in the business environment (threats and opportunities) without being forced to change strategy or structure. Assess your company's **robustness to changes in the competitive landscape** compared to other companies in the same market and at a similar stage of development. Compared to those other companies, how robust are your:

	Highly vulnerable			Highly robust			
Business concept	1	2	3	4	5	6	7
Long term goals	1	2	3	4	5	6	7
Financial strategy	1	2	3	4	5	6	7
Market strategy	1	2	3	4	5	6	7
Supplier strategy	1	2	3	4	5	6	7
R & D strategy	1	2	3	4	5	6	7
Human resource strategy	1	2	3	4	5	6	7
Organisational structure	1	2	3	4	5	6	7
Financial platform	1	2	3	4	5	6	7
Product/service portfolio	1	2	3	4	5	6	7
Competence/knowledge base	1	2	3	4	5	6	7

Assess in a similar way your **company's ability to give quick and adequate responses to changes in the environment** (legislative, technological, competitive, customer demands etc). Compared to other companies in the same market and at a similar stage of development, how would you consider your own company's performance?

	Low performer				High performer			
Senses potential threats (legislative, technological, competitive, customer demands etc)	1	2	3	4	5	6	7	
Conceptualises a response and makes decisions and plans to meet threats	1	2	3	4	5	6	7	



Reconfigures resources and implements necessary changes to meet threats	1	2	3	4	5	6	7
Senses new business or technological opportunities	1	2	3	4	5	6	7
Conceptualises a response and makes decisions and plans to exploit opportunities	1	2	3	4	5	6	7
Reconfigures resources and implements necessary changes to exploit opportunities	1	2	3	4	5	6	7

#### ***10.2.12.6 Instrumentation***

The instrument was developed following the theory of Bettis & Hitt (1995).

The first 5 items of the robustness variable were chosen to represent the external dimension in terms of behaviour on the market. The last six items were chosen to represent internal robustness in terms of organisational capabilities and strengths.

The responsiveness instruments consisted of 6 questions covering the three dimensions proposed by Bettis and Hitt: ability to sense changes (threats and opportunities) in the environment (items 1, 4); ability to conceptualise responses to those changes (2, 5); and ability to reconfigure resources to execute the response (3, 6).

**10.2.13 Hypothesis 11b: SRC will be more positively related to performance in raplex environments than in more stable environments**

#### ***10.2.13.1 Variable***

Overall performance

#### ***10.2.13.2 Definition***

A company's overall performance is defined as the combination of financial, business and organisational effectiveness, and the ability to successfully invest in future capabilities.

#### ***10.2.13.3 Theory***

Performance is a broad construct. The most common way to measure performance in literature is financial performance over the last 3-5 years, either as self-reported perceived performance or as self-reported or objective actual performance. However, a strong focus on growth, development, or quality over a period of years could temporarily decrease the financial performance (profitability). Therefore, a broader performance measure could be as accurate, or even more relevant than pure financial performance. Venkatraman & Ramanujam, (1986)

identified three relevant types of performance in their work: financial, business and organisational effectiveness.

However, it is necessary to avoid overlapping with the independent constructs. Thus, broad performance instruments such as the Excel-scale scale (Caruana, Pitt et al. 1994), with items very close to some of the items in the independent scales, should not be used.

Self-reported perceived performance could also be considered as a good measure of financial performance as self-reported actual data or objective external measures. Hart & Banbury tested the data on ROA and sales growth with actual data provided by the respondents and found a highly significant correlation. Other researchers have found subjective assessments of business performance obtained from senior managers to correlate strongly with secondary measures (Dess and Robinson 1984; Venkatraman and Ramanujam 1987).

#### ***10.2.13.4 Available instruments***

The Excel scale was not chosen since many of the variables in that scale measure dimensions covered by independent variables in the research model.

#### ***10.2.13.5 Measurement***

Assess your company's performance on each of the following performance aspects over the last 3 years, compared to that of other companies in the same market and at a similar stage of development:

	Low performer				High performer		
Profitability/ROA	1	2	3	4	5	6	7
Cash flow	1	2	3	4	5	6	7
Sales growth	1	2	3	4	5	6	7
Market share	1	2	3	4	5	6	7
Market diversification	1	2	3	4	5	6	7
Product/service change	1	2	3	4	5	6	7
New products next year	1	2	3	4	5	6	7
Product/service development	1	2	3	4	5	6	7
Overall company quality	1	2	3	4	5	6	7
Employee satisfaction	1	2	3	4	5	6	7
Product/service quality	1	2	3	4	5	6	7
Environmental responsibility	1	2	3	4	5	6	7
Social responsibility	1	2	3	4	5	6	7

#### ***10.2.13.6 Instrumentation***

Adopted from Hart & Banbury (1994).

Following the work of Venkatraman & Ramanujam (1986), Hart and Banbury identified three types of performance: financial, business and organisational effectiveness, with five dimensions altogether:

Factor	Mean	SD	Alpha	No. items
Current profit	4.34	1.44	0.75	2
Growth/share	4.40	1.37	0.69	2
Future position	3.78	1.08	0.64	4
Quality	5.49	0.80	0.67	3
Social responsibility	3.95	1.57	0.72	2

The dimensions were factor analysed with satisfactory results. However, the exact formulation of the question is not presented in the paper.

E-mail correspondence with Hart ended with Hart's comment "It's all in the paper."

Comment: item no 9 is probably wrong in table in article (overall company performance) since the text in the article refers to "overall company quality", not to "overall company performance". The pre-test of the questionnaire also indicates that. Performance was consequently changed to quality in the questionnaire.

10.2.14 Hypothesis 11c: SRC will be more positively related to  
performance in raplex environments than in more stable  
environments

#### ***10.2.14.1 Variable***

Raplexity

#### ***10.2.14.2 Definition***

The degree of raplexity in the business environment is a measure of the environment's variance in terms of complexity and change rate.

#### ***10.2.14.3 Theory***

In this research, I am interested in the mechanisms that make some companies able to exploit opportunities and "destroy" threats in the business environment. I am therefore not only interested in the uncertainty in terms of unpredictability and change, but also in the ability to exploit opportunities in terms of growing markets. On rapidly growing markets, the ability to grow with the market is critical to long term success.

Measurement

Complexity	Actions affect competitors
	Complex business environment
Munificence	Market will grow
	12-month business outlook good
Dynamism	Changing customer preferences
	Changing social values
	Changing business environment
	Difficult to anticipate change
	New competition unpredictable
	Unforeseen threats
	Innovation from the market
	Performance public policy link

Please describe your company's business environment by responding to the statements below.

	Completely disagree				Completely agree		
Actions taken by my firm will heavily affect our competitors	1	2	3	4	5	6	7
Our business environment is very complex with many unclear factors and relations influencing our firm	1	2	3	4	5	6	7
The market will grow for several years	1	2	3	4	5	6	7
The business opportunities for the next 12-months look good	1	2	3	4	5	6	7
Our customers' preferences are continuously changing	1	2	3	4	5	6	7
The social values in society are continuously changing	1	2	3	4	5	6	7
The business environment is continuously changing	1	2	3	4	5	6	7
It is very difficult to foresee change	1	2	3	4	5	6	7
New and unpredictable competition is constantly occurring	1	2	3	4	5	6	7
There are many unforeseen threats that we have to cope with	1	2	3	4	5	6	7
The innovation rate in the market is high	1	2	3	4	5	6	7
The performance of our firm is highly influenced by unpredictable public policies	1	2	3	4	5	6	7

#### ***10.2.14.4 Instrumentation***

Adopted from Hart and Banbury (1994).

Environmental factors were conceptualised using Dess and Beard (1984) tree dimension approach – dynamism, complexity and munificence. These were operationalised through 12 questions. Factor analysis revealed that dynamism consisted of unpredictability and change.

The measure of turbulence was constructed by combining dynamism and complexity into a single index.

Factor	Mean	SD	Alpha	Items
Complexity	4.77	1.43	0.67	2
Munificence	2.78	0.74	0.63	2
Dynamism	4.32	0.87	0.63	8

“Anticipate change” was changed to “foresee change” in item 8.

Banbury and Hart combined complexity and turbulence into one single measure of turbulence. Since munificence leads to increased opportunities, it is also an aspect of raplexity. Therefore, the raplexity was measured as the sum of all twelve items in the question.

## **Appendix 3: Research focus group**

### **10.3 Round-table discussion April 12, 1999**

No. participants: 7

#### **10.3.1 Programme**

17. 00	Introduction to the research model
17.30	Discussion on the research model's relevance to practice. Suggestions for changes
18.00	Identification of performance predictors in the meta-constructs management, organisation, process and strategy

#### **10.3.2 Comments on research model and SRC**

- The group gave positive response on the research model and the SRC concept. "It fits with my experiences", said one of the CEOs in the group.
- Management was identified as a critical factor. A company can survive for a while with weak management, especially if there is a well-functioning organisation. But it only works for a while.
- Another issue identified was dot.com-companies' management. Will it work when they grow big and mature?

#### **10.3.3 Success factors – Management**

- Ability to co-ordinate the relations between Management, Organisation, Process and Strategy – make "match the concept"
- Enabling management – supportive, human-growth management
- Diversity of experiences, perspectives
- Shared information in the whole organisation – "we are informed"-feeling (it's the TMT's responsibility to achieve it)
- Trust in the management, credibility
- Ability to tell the truth, to speak clearly even if it might be painful
- Ability to develop and communicate a shared vision/shared goals quickly throughout the organisation

#### 10.3.4 Success factors – Organisation

- Ability to change organisation, culture, rules and regulations
- A firm principles and values-based control system that works as a backbone in the organisation
- Understanding of the need for change in the organisation
- Ability to handle layoffs constructively
- Obligatory arenas for personal meetings and communication
- Trust, shared information, transparent organisation
- The TMT must understand what core competence is within the organisation so that they keep and develop it
- Virtual organisation, ability to adapt (expand/concentrate) with the market
- Being able to move on
- Focus on 'need-to-know information' not 'nice-to-know'
- Condensed and packaged information
- Personal information

#### 10.3.5 Success factors – Process

- Delegation of operative decisions
- Dialogue-based strategic decisions (makes implementation easier)
- No eternal, non-focussed processes
- Clear visions that give long-term direction and are possible to comprehend

#### 10.3.6 Success factors – Strategy

- Clear strategy that is easy to communicate (compare ABB's simple models)
- Innovative strategies (compare Mazda's roadster) – in fast-moving markets there are no alternatives
- Differentiation – focus on uniqueness
- Myths as strategy – create a myth about the company
- Long-term, endurance

## 11 Appendix 4: Data collection procedure

Week	Activity	Result
10-20	Selection of addresses/sample	
22	Ordering addresses from PAR, Major companies	"Major companies" – vanished, PAR couldn't get in contact. New trial/selection
22	Printing of Q + post cards ordered	
23	Direct address order from Germany, Holland and GB via PAR	Received addresses after 2 weeks continuous discussion. Problems with delivering right quality
24/99	First mailing of post card	
25	Intended mailing of Q (3 days after post card)	Not mailed due to misplaced (missing) Qs at the mail administration company
26	Mailing of Q, July 1	(Too late, too late)
27	Mailed reminder (postcard)	
27	Received misplaced responses (questionnaires) due to mistakes from Posten (post office). Angry phone calls to the Managers in charge	First 15 responses (Maybe it'll work?)
28-32	Waiting for responses	Received altogether 9 responses. Total: 24
32	Decided to change strategy, to start to call respondents and mail/fax/e-mail Qs to those who agree to participate	
33/99-2/00	Systematic calling, mailing, reminding, e-mailing etc	66 more responses (last received in week 8/00. Total 90)
32/99-11/00	Waiting, waiting	(Despair!)

### 11.1.1 New data collection strategy (Week 32/99–)

The general principles of the data collection strategy applied from week 32 were the following:

- The target was 150 responses evenly spread over industries and countries. The 150 ambition was later changed to 100, and the country distribution ambition was abandoned.
- Based on these ambitions, a priority order was set and companies selected randomly within each group (based on country and industry).
- The ambition was to get direct contact with the managing director or other appointed person, and to get his/her e-mail address in order to ease the follow-up.
- An iterative process was applied with continuous revision of the strategy based on the result of the efforts.

General findings during this process were:

- It was very hard to get in contact with the right person (most often the managing director). Often the secretary answered and gave permission to send a mail/fax or e-mail.
- Quite often, this person was reluctant to give the e-mail address.
- The geographical differences were obvious in several ways.



- First, the address quality was best in Sweden and Great Britain.
- In Sweden and Great Britain, people were also more willing to participate and help.
- On the Netherlands, quite often the conversation ended up in a negotiation on terms of participation. And in Germany, the language was an obstacle.
- On average, 3 phone calls were made before contact with the company was established.
- On average, 9.4 percent of the addresses were wrong, or unusable.
- On average, 39 percent did not agree to participate in the survey, either directly or after receiving the questionnaire.
- On average, 3 follow-ups, either by phone or e-mail, were made to each person.

Country	Sample size	Direct responses to mailing	Phone follow up					
			No. phone-contacted companies	No. of reached companies	No. of companies agreeing to participate	No. of Responders	Percent of Responders of those reached	Percent of Responders of those participating
Sweden	300	15	220	142	127	32	22.5	25.2
Germany	300	1	99	69	38	2	2.9	5.3
Holland	300	2	192	112	86	12	10.7	14.0
Great Britain	300	6	189	139	78	21	15.1	26.9
Total	1200	23	700	462	329	67	14.5	20.4

## 12 Appendix 5: Validation focus group

The reference group of top managers and strategists were invited to a second round-table discussion on June 14, 2000. An additional 10 managers were invited to the second round, while 5 who had changed jobs, left the country or for other reasons were no longer relevant, were not invited. In total, 62 were invited, 9 agreed on participation and 6 did show up to the 2.5 hour round-table discussion.

### 12.1 Agenda

- Presentation of major results of the research
- Reflections and conclusions
- Practical implications for managers and organisations

### 12.2 Reflections and practical conclusions

The group gave positive feedback on the results. The overall reflection was that they correspond to practical experience.

Several of the participants made the reflection that the increasing importance of robustness in raplex environments was counter-intuitive at first, but after penetrating the question more deeply, sounded good.

Most useful for the participants was the insight of the need for, and importance of, planning and robustness. "There is no conflict between robustness and responsiveness, and that's good", one of the participants concluded. "It's possible to 'withdraw' and reflect." "There is no need to panic, be cool and reflect over the situation."

Several metaphors for the successful company emerged during the session. The Catholic church came up as a good example of a "robust and responsive" organisation that has successfully survived for 1700 years. The mature man/woman was another metaphor used. The "only robust" person is rigid, the "only responsive" person is like a person with multiple-personality disorder. A third metaphor was Asian sports such as Aikido etc that all focus on the need to focus and be centred.

One of the participants found that the balance between robustness and responsiveness is a continuous two-front war, or balancing act, where you oscillate between emphasis on robustness and responsiveness. "We don't need any office in Malmö', we declare firmly to our employees. And the next month the opportunity arises, and we open one. Consequently we are called opportunists."

Other comments:

- "It's hard to know whether you want a guerrilla trope or a brigade. When you have the guerrilla troop you want the brigade and vice versa."
- "What happens when your "old" robust concept doesn't work any more? And you give up robustness for responsiveness? Is it even possible to go from 'rigidity' to 'responsive robustness?'"

- “It’s nice to know that many principles are the same. But everything is happening much more rapidly, so we need to run the reflective planning processes more rapidly.”
- “What about networking? Is that not a success factor? Individual networking as behaviour is absorbed by proactive experimentation. But what about organisational networking and alliance building?”
- “The results are very relevant. I’ll bring back the conclusions about the need for planning, proactivity and non-politics. The simple model with robustness and responsiveness is very useful.”
- “The jamming metaphor I’ll bring back.”
- “Non-politics is extremely important. It’s all about putting the company’s well-being first!”
- “Everything goes so rapidly that nothing happens. Since everything changes, you could as well wait until tomorrow. And then everything has changed and you could wait until the next day ...”

## 13 Appendix 6: Data purification

### 13.1 Missing-value analysis

No. of missing values	No. of cases	Type of missing value
22	1	All values from non-financial Performance including Environment, company
13	2	One with Performance missing (plus 2 more), one with Robustness missing
8	1	Single positions, parts of constructs
5	6	Single positions, parts of constructs
4	2	Single positions, parts of constructs
3	3	Single positions
2	8	Single positions
1	12	Single positions
0	70	

The analysis of the pattern of missing values revealed that most of them are “single points”, that is one missing item in a variable. The three cases with 13 and 22 missing values had whole blocks/variables missing.

The following strategy for imputation was followed:

- Whole blocks/constructs should not be imputed, especially not output (performance, SRC) or control (environment) variables
- Single items should be replaced by manual imputation instead of mean values or other automatic method based on a systematic imputation procedure.
- The criteria and information used for the manual imputation were:
  - Identification of twins based on relevant information, when possible (the cases were sorted by industry and country to simplify identification of possible twins)
  - Use of surrounding information, pattern recognition, correlations with other variables
  - Using knowledge of company and industry when relevant (for instance when there are missing values in the environment variable).
- Based on that strategy, all missing values except for some of the data for the three cases with 22 and 13 missing were imputed; in total 80 missing values were inserted.
- The missing blocks were treated similarly, but there each item was not imputed. Instead, the composite variable values missing were imputed manually based on the above criteria.

## Appendix 7: Non-normality assessment

Number of valid observations (listwise) = 102,00

Variable	Mean	Std Dev	Kurtosis	S.E. Kurt	Skewness	S.E. Skew	Valid N
COMPRES01	4,23	1,17	-,11	,47	-,09	,24	105
COMPRES02	4,23	1,08	-,50	,47	,10	,24	105
COMPRES03	4,16	1,01	-,16	,47	,12	,24	105
COMPRES04	3,89	1,18	-,65	,47	,23	,24	105
COMPRES05	4,27	1,07	-,26	,47	-,17	,24	105
COMPRES06	4,33	1,21	-,39	,47	-,34	,24	105
CULTUR01	4,64	1,37	-,03	,47	-,61	,24	105
CULTUR02	3,39	1,46	-,79	,47	,26	,24	105
CULTUR03	4,07	1,57	-,61	,47	-,19	,24	105
CULTUR04	4,63	1,07	-,54	,47	,02	,24	105
CULTUR05	4,42	1,34	-,51	,47	-,44	,24	105
CULTUR06	4,82	1,30	-,04	,47	-,59	,24	105
CULTUR07	4,84	1,23	-,46	,47	-,35	,24	105
CULTUR08	4,95	1,55	-,60	,47	-,48	,24	105
DIVERS01	3,27	1,98	-,89	,47	,58	,24	105
DIVERS02	3,99	1,36	-,66	,47	,09	,24	105
DIVERS03	2,14	1,43	1,19	,47	1,35	,24	105
DIVERS04	3,82	1,48	-,60	,47	,10	,24	105
DIVERS05	3,45	1,54	-,83	,47	,38	,24	105
DIVERS06	3,29	1,45	-,85	,47	,22	,24	105
DIVERS07	4,39	1,32	-,21	,47	-,07	,24	105
DIVERS08	4,84	1,19	,23	,47	-,42	,24	105
DIVERS09	4,35	1,32	-,66	,47	-,32	,24	105
DIVERS10	3,91	1,54	-1,02	,47	-,03	,24	105
ENVIR01	4,52	1,51	-,62	,47	-,34	,24	104
ENVIR02	4,69	1,40	-,40	,47	-,53	,24	104
ENVIR03	5,13	1,66	-,46	,47	-,65	,24	104
ENVIR04	5,42	1,31	,90	,47	-1,01	,24	104
ENVIR05	4,78	1,31	-,26	,47	-,48	,24	104
ENVIR06	4,69	1,22	-,18	,47	-,30	,24	104
ENVIR07	5,35	1,10	1,21	,47	-,95	,24	104
ENVIR08	4,06	1,34	-,72	,47	,22	,24	104
ENVIR09	4,29	1,45	-,81	,47	-,17	,24	104
ENVIR10	4,18	1,31	-,49	,47	-,11	,24	104
ENVIR11	4,82	1,47	-,37	,47	-,47	,24	104
ENVIR12	3,79	1,69	-,86	,47	,41	,24	104
INTEGR01	4,40	1,65	-,81	,47	-,31	,24	105
INTEGR02	5,04	1,46	,01	,47	-,78	,24	105
INTEGR03	4,14	1,68	-1,03	,47	-,08	,24	105
INTEGR04	4,65	1,45	-,23	,47	-,52	,24	105
INTEGR05	3,92	1,68	-1,24	,47	-,04	,24	105
INTEGR06	4,76	1,44	-,07	,47	-,65	,24	105
ORIENT01	4,58	1,61	-,63	,47	-,40	,24	105
ORIENT02	4,27	1,32	-,42	,47	,00	,24	105
ORIENT03	4,18	1,43	-,91	,47	,10	,24	105
ORIENT04	4,40	1,33	-,80	,47	,05	,24	105
ORIENT05	4,67	1,39	-,25	,47	-,54	,24	105

Number of valid observations (listwise) = 102,00

Variable	Mean	Std Dev	Kurtosis	S.E. Kurt	Skewness	S.E. Skew	Valid N
PARTIC01	4,23	1,20	-,35	,47	-,22	,24	105
PARTIC02	3,92	1,45	-,83	,47	,04	,24	105
PARTIC03	4,52	1,44	-,92	,47	-,29	,24	105
PARTIC04	5,13	1,20	-,08	,47	-,63	,24	105
PARTIC05	4,60	1,21	-,59	,47	-,30	,24	105
PERFOR01	4,43	1,56	-,72	,47	-,30	,24	104
PERFOR02	4,69	1,31	-,26	,47	-,26	,24	104
PERFOR03	4,68	1,44	-,66	,47	-,24	,24	104
PERFOR04	4,86	1,29	-,59	,47	-,28	,24	104
PERFOR05	4,29	1,27	-,48	,47	-,21	,24	103
PERFOR06	4,81	1,26	-,28	,47	-,76	,24	103
PERFOR07	4,66	1,23	-,53	,47	-,46	,24	103
PERFOR08	4,95	1,12	1,40	,47	-,96	,24	103
PERFOR09	5,09	1,10	,01	,47	-,49	,24	103
PERFOR10	4,83	1,10	-,17	,47	-,29	,24	103
PERFOR11	5,23	1,03	,03	,47	-,32	,24	103
PERFOR12	4,73	1,17	,37	,47	-,38	,24	103
PERFOR13	4,86	1,18	-,10	,47	-,42	,24	103
PLANEM01	4,92	1,31	,19	,47	-,38	,24	105
PLANEM02	5,02	1,07	-,32	,47	-,23	,24	105
PLANEM03	4,77	1,30	-,51	,47	-,28	,24	105
PLANEM04	4,56	1,27	-,16	,47	-,61	,24	105
PLANEM05	4,69	1,30	-,09	,47	-,58	,24	105
PLANEM06	4,98	1,41	,07	,47	-,57	,24	105
PLANEM07	5,23	1,23	-,33	,47	-,54	,24	105
PLANEM08	5,92	1,01	,95	,47	-1,00	,24	105
PLANEM09	5,55	1,13	,06	,47	-,70	,24	105
PLANEM10	4,96	1,13	,41	,47	-,37	,24	105
POLIT01	3,46	1,52	-1,16	,47	,21	,24	105
POLIT02	4,88	1,46	-,54	,47	-,50	,24	105
POLIT03	4,13	1,42	-,93	,47	-,32	,24	105
POLIT04	5,12	1,15	-,24	,47	-,32	,24	105
POLIT05	4,04	1,33	-,66	,47	,05	,24	105
POLIT06	5,06	1,33	,09	,47	-,68	,24	105
RESPON01	4,84	1,22	-,18	,47	-,37	,24	105
RESPON02	4,73	1,16	,82	,47	-,70	,24	105
RESPON03	4,71	1,14	-,50	,47	-,25	,24	105
RESPON04	4,95	1,09	-,07	,47	-,32	,24	105
RESPON05	4,72	1,08	,65	,47	-,32	,24	105
RESPON06	4,61	1,15	,48	,47	-,27	,24	105
ROBUST01	5,37	1,08	,82	,47	-,78	,24	104
ROBUST02	5,08	1,27	,38	,47	-,89	,24	104
ROBUST03	4,91	1,37	-,15	,47	-,67	,24	104
ROBUST04	4,79	1,20	,76	,47	-,62	,24	104
ROBUST05	4,59	1,11	-,35	,47	,36	,24	104
ROBUST06	4,61	1,02	,10	,47	-,21	,24	104
ROBUST07	4,62	1,26	-,26	,47	-,37	,24	104

Number of valid observations (listwise) = 102,00

Variable	Mean	Std Dev	Kurtosis	S.E. Kurt	Skewness	S.E. Skew	Valid N
ROBUST08	4,54	1,30	-,66	,47	-,30	,24	104
ROBUST09	5,03	1,44	,06	,47	-,75	,24	104
ROBUST10	4,94	1,11	,11	,47	-,62	,24	104
ROBUST11	5,23	1,15	1,32	,47	-,97	,24	104
SOCIAL01	4,35	1,38	-,53	,47	-,21	,24	105
SOCIAL02	5,33	1,26	-,30	,47	-,54	,24	105
SOCIAL03	4,90	1,41	-,60	,47	-,34	,24	105
SOCIAL04	5,19	1,19	-,19	,47	-,55	,24	105
SOCIAL05	2,40	1,27	1,12	,47	1,11	,24	105
SOCIAL06	5,02	1,16	,24	,47	-,60	,24	105
SOCIAL07	2,99	1,44	-,32	,47	,64	,24	105
SOCIAL08	3,31	1,46	-1,16	,47	-,05	,24	105
SOCIAL09	4,71	1,26	-,69	,47	-,20	,24	105
STRATE01	4,49	1,59	-,82	,47	-,29	,24	105
STRATE02	5,06	1,34	-,14	,47	-,57	,24	105
STRATE03	4,79	1,46	-,58	,47	-,50	,24	105
STRATE04	4,77	1,32	-,10	,47	-,53	,24	105
STRATE05	4,86	1,37	,31	,47	-,70	,24	105
STRATE06	4,54	1,34	-,50	,47	-,04	,24	105
STRATE07	3,98	1,39	-,39	,47	-,03	,24	105
STRATE08	4,41	1,31	,01	,47	-,36	,24	105
STRATE09	4,33	1,29	-,54	,47	-,13	,24	105
STRATE10	4,50	1,40	-,31	,47	-,23	,24	105
STRATE11	4,30	1,23	-,79	,47	-,18	,24	105
STRUCT01	5,35	1,28	,03	,47	-,66	,24	105
STRUCT02	5,41	1,18	-,68	,47	-,49	,24	105
STRUCT03	4,84	1,37	-,41	,47	-,50	,24	105
STRUCT04	5,08	1,24	,38	,47	-,55	,24	105
STRUCT05	4,89	1,38	,02	,47	-,64	,24	105
STRUCT06	4,54	1,50	-,97	,47	-,01	,24	105
STRUCT07	5,10	1,20	-,41	,47	-,44	,24	105

Number of valid observations (listwise) = 105,00

Variable	Mean	Std Dev	Kurtosis	S.E. Kurt	Skewness	S.E. Skew	Valid N
COMPRES	4,18	,82	,25	,47	-,06	,24	105
CULTURE	4,47	,86	,56	,47	-,31	,24	105
DIVERS	3,74	,76	-,21	,47	-,13	,24	105
FINPERF	4,56	1,31	-,50	,47	-,19	,24	105
INTEGR	4,49	1,01	,44	,47	-,36	,24	105
NONPOL	4,69	,92	,37	,47	-,33	,24	105
ORIENT	4,42	1,01	-,04	,47	-,22	,24	105
PARTICIP	4,48	,98	-,54	,47	-,13	,24	105
PERFORM	4,76	,72	-,06	,47	-,07	,24	105
PLANEMP	5,06	,70	,39	,47	-,22	,24	105
RAPLEX	4,64	,74	-,14	,47	-,25	,24	105
RESPONS	4,76	,92	1,19	,47	-,52	,24	105
ROBUST	4,87	,74	-,24	,47	-,26	,24	105
SOCIAL	4,98	,84	-,05	,47	-,25	,24	105
SRC	4,82	,73	,56	,47	-,30	,24	105
STRATEGY	4,55	,95	,41	,47	-,42	,24	105
STRUCTUR	5,03	,87	,13	,47	-,13	,24	105

## 14 Appendix 8: Analysis of reference data

A second set of data was collected in order to get an external validation of the results. The sample was a convenience sample of Swedish companies in a variety of industries. The instruments used were simplified versions of those used in the main survey, and the questions were included in a broader questionnaire on strategic activities, development needs etc. The respondents were primarily (97 %) CEOs, or members of the Top Management Team.

The response rate was high. Of 142 companies that agreed on participation, 85 completed the mailed questionnaire. Of the 85 responses, 16 had an annual turnover less than 50 MSEK and were excluded from the final sample. A number of 69 companies from a variety of industries such as construction and real estate, IT, media, power, manufacturing, services, finance and pharmaceutical industry were selected.

### 14.1 Instrumentation

The instruments used were Robustness ( $\alpha = 0.76$ ), Responsiveness (0.88), Planning-emphasis (0.87), Performance (0.52) and Raplexity.

#### **Robustness**

“Robustness is an important business characteristic. Compared to other companies in the same market and at a similar stage of development how robust are your:

- Business concept
- Long-term goals
- Product/service portfolio”

#### **Responsiveness**

“Compared to other companies in the same market and at a similar stage of development, how good are you in quickly and adequately:

- Sensing changes (threats and opportunities) in the business environment and market
- Developing strategies and plans to handle those changes.
- Reconfiguring resources and make necessary changes in order to implement the strategies.”

#### **Performance**

“Compared to other companies in the same market and at a similar stage of development how well do you perform in terms of

- Profitability
- Growth
- Development, creativity and innovation.”

#### **Raplexity**

“How do you perceive the degree of turbulence, i. e. the degree of change and unpredictability, in your market and close business environment?”

#### **Planning emphasis**

“How much emphasis (time and energy) does your company put on:



- Continuous environmental scanning and futures analysis
- Continuous evaluation of existing businesses
- Futures-oriented business and product/service development
- An organisation-wide continuous dialogue around the future of the company.”

## 14.2 Comments

The planning-emphasis variable is broader than the variable used in the other research, covering also a development dimension (close to the STRATEGY variable) and a participation dimension. It is thus close to the composite variable INTELBUS.

The Cronbach alpha of the performance variable was low and below acceptable 0.6. The reason was the low inter-item correlations of both the first and third items (0.20 and 0.22). To overcome that obstacle, four performance variables were used in the analysis. They were:

PROFIT = item no 1 (profitability)

PROFGROW = item 2 + 3 (profitability and growth), alpha = 0.58

FUTPERF = item 2 + 3 (growth + development, creativity, innovation), alpha = 0.62

TOTPERF = all three items, alpha = 0.52.

Strategic response capability was computed as the sum of Robustness and Responsiveness.

## 14.3 Results

As seen below, the impact of planning emphasis on both SRC and Performance (except on profitability) was significant and positive. The correlation coefficients are 0.58 with SRC and 0.40 and 0.29 respectively on FUTPERF and TOTPERF. Consequently the result points in the same direction as before, where the correlation coefficients for the INTELBUS components (ORIENT, PLANEMP, PARTICIP, COMPRE and STRATEGY) were about 0.2 for FINPERF and 0.3-0.5 for PERFORM. The correlation with SRC was for the INTELBUS components between 0.40 and 0.65.

The correlations here are weaker but pointing in the same direction, with exception for the PROFIT-correlation, which was non-significantly negative.

Three multiple regression models were used, analysing the impact of the SRC components on the four different performance measures used. As seen from Table 53, all models except for the PROFIT-model are significant at a 0.01 level or better. The  $R^2$  for the models are between 0.2 and 0.42, except for the PROFIT-model for which it is only 0.09.

**Table 52. Correlation coefficients of reference data (n=69)**

		SRC SRC antecedent	Performance PROFIT antecedent	Performance PROFGROW antecedent	Performance FUTPERF antecedent	Performance TOTPERF antecedent
Planning	X8. Planning emphasis	0.58**	-0.06	0.07	0.40**	0.29*
SRC	X12. Strategic Response Capability		0.24*	0.44**	0.65**	0.63**
	Robustness		0.30*	0.43**	0.53**	0.56**
	Responsiveness		0.13	0.34**	0.61**	0.54**

Significance level \*=0.05 \*\*=0.01

**Table 53. Regression analysis of reference data (n=69)**

		Model 1 PROFIT Regression beta weight	Model 2 PROFGROW Regression beta weight	Model 3 FUTPERF Regression beta weight	Model 4 TOTPERF Regression beta weight
SRC	Robustness	0.32*	0.34*	0.28*	0.37**
	Responsiveness	-0.04	0.16	0.46**	0.34**

Significance level \*=0.05 \*\*=0.01

Model 1:  $R^2 = 0.09$  F/p=3.3/0.04Model 2:  $R^2 = 0.20$  F/p=8.3/0.0006Model 3:  $R^2 = 0.42$  F/p=24/0.0000Model 4:  $R^2 = 0.39$  F/p=21/0.0000

## 15 Appendix 9: Confirmatory factor analysis of constructs

All constructs (variables) in the research were analysed by confirmatory factor analysis in order to assess the construct validity. Some analyses were also made in order to identify common dimensions between variables showing high degrees of collinearity. The results of that second analysis are presented here.

### 15.1 Independent variables

#### 15.1.1 Politics and social integration – inter-correlation analysis

Correlation and collinearity analysis revealed a strong link between the TMT variables Social integration and Non-politics. Thus, the variables were factor analysed to check for hidden dimensions. The factor analyses revealed four new factors identified as Task orientation (7 items, 36.2 % of variance), Companionship (2 items, 10.9 %), Competition (3 items, 7.5 %) and Power (3 items, 6.9 %).

A new variable was constructed based on the items loading higher than 0.4. Cronbach alpha and item-construct correlation for the items are presented in Table 54. Correlation analysis revealed that the new variable correlated slightly higher than NONPOL and SOCIAL on Financial performance, Performance, SRC, Planning emphasis and Strategy.

**Table 54. Analysis of common factors in NONPOL and SOCIAL**

CONSTRUCT and items	item-construct correlation	Cronbach's alpha
<b>TASK ORIENTATION (TASKOR)</b>		0.86
To what extent are the people in the TMT open with each other about their interests and preferences to decisions?	0.64	
To what extent is there in the TMT an active debate based on facts, when major decisions are being made?	0.66	
To what extent is the TMT capable of solving conflicts in a creative way, rather than by the use of power and politics?	0.63	
The success of other members of the TMT helps me to achieve my own objectives.	0.59	
Everyone's input is incorporated into most important company decisions.	0.68	
The members of the TMT get along together very well.	0.59	
The members of the TMT are always ready to co-operate and help each other.	0.63	

## 15.2 Link- dependent and environment variables

### 15.2.1 The Strategic Response Capability and Performance constructs

In order to test the Strategic response capability construct and its interconnection with the performance construct, factor analysis was made on the three constructs Performance, Responsiveness and Robustness. Confirmatory factor analysis revealed that the Responsiveness only consisted of one factor, with high factor loadings of all the items. The Robustness construct consisted of four factors interpreted as Financial robustness (37.7 % of variance), Concept robustness (13.1), Organisational robustness (10.8), Resource robustness (9.2) (see Table 55).

Analysis of the Performance construct similarly revealed four factors in line with the theory and results of Hart and Banbury (1994). They were Financial return and growth, Innovation, Quality and Responsibility.

Preliminary correlation analysis indicated a high degree of interdependence between the SRC construct and Performance. Therefore, it was decided that a factor analysis of all the SRC and performance items should be made. That was a natural choice since the Performance construct itself consisted of several dimensions where some could be considered capabilities and antecedents to financial performance. As expected, the factor analysis indicated, some interaction between items from different variables. The factor analysis revealed 8 factors, where 2 consisted of items from both the SRC and the Performance constructs. However, those two factors were the first two, together counting for 43 percent of the variance. The 8 factors were interpreted as Responsiveness and innovativeness; Financial stability, return and growth; Concept robustness; Organisational robustness; Quality; Responsibility; Supplier strategy (see Table 56). Factors 2, 5 and 6 could be interpreted as “output”-factors, related to the organisation’s capability of delivering financial growth and profit, high quality and taking social and environmental responsibility. The other factors are aspects of process performance, such as the ability to respond to changes in the environment (1) and to build strategies and an organisation that show robustness to such changes (3, 4, 7).

The question at this stage is whether the new dimension (factors) is a better representation of reality than the old, theoretically developed, variables. A reason for keeping the old variables is that they are based on theory (Churchill 1979). If we consider for instance, factor 2 Financial stability, return and growth, it is obvious that a robust financial strategy or platform doesn’t necessarily imply a strong financial result. It is natural that they are strongly correlated and therefore load to the same factor, but they do not describe the same construct. A financial platform is an asset, a financial result or market growth an organisational output. And the situation is similar with the other composite factor, Responsiveness and innovativeness. It is natural that a responsive organisation actually performs better than other organisations in terms of product development and innovation. But that does not mean that responsiveness and innovative performance are a common factor. Rather is innovative performance a result of responsiveness.

**Table 55: Factor analysis of Robustness construct**

	Financial Robustness	Concept robustness	Organisational capabilities	Resource robustness
RO3. Financial strategy	0,87			

RO9. Financial platform	0,85			
RO10. Product/service portfolio	0,63			
RO1. Business concept		0,86		
RO2. Long-term goals		0,84		
RO4. Market strategy		0,65		
RO11. Competence/knowledge base		(0,41)		
RO7. HR strategy			0,87	
RO8. Organisational structure			0,80	
RO5. Supplier strategy				0,81
RO6. R & D strategy				0,76

**Table 56: Factor analysis of Strategic Response Capability and Performance**

Dimension	Responsiveness	Robustness	Performance
Responsiveness and innovativeness	All 6 items		4 items Innovation
Financial stability, return and growth		3 items Financial robustness	4 items Financial return and growth
Concept robustness		3 items Concept robustness	
Organisational robustness		3 items Organisational robustness (R&D strategy)	
Quality		1 item (Competence base)	3 items Quality
Responsibility			2 items Responsibility
Supplier strategy		1 item Supplier strategy	

## **16 Appendix 10: Questionnaire**

# First European Survey of Strategy and Performance in Raplex Environments

## Who has received this questionnaire?

This questionnaire has been delivered to top executives in 3 industries in 4 European countries.

## How to answer the questions?

Almost all the questions in this survey are in the form of scales where you are asked to answer the question by choosing the number best describing your perception. Do that by circling the number that most accurately reflects your answer to the question:

	Fully disagree			Fully agree			
Completing this questionnaire will be very useful to me	1	2	3	4	5	6	7

In the above example “1” represents the statement “Fully disagree” and “7” the statement “Fully agree”. The numbers in between represent other possibilities on a scale between those end points.

Remember though:

- It is important that you try to answer **all** the questions proposed to the best of your knowledge and capability.
- It is critical to the coding and analysis of the data that you follow the instructions given above.
- If you do not understand a question, please **ask us for help**. We understand that not all questions are simple, and that is why we will try to answer any questions you might have.
- When you have answered the questionnaire, please put it in the return envelope and post it as soon as possible.

The questionnaire consists of 18 questions and should take approximately 30 minutes to complete.

## What do we mean by “your company”?

Throughout the questionnaire we want you to answer the questions by **thinking of your own company**, that is the company of which you are the chief executive. If your company is a division or sub-unit of a larger corporation, please think of your own company, not of the whole corporation.

## Questionnaire return address

In the event of the return envelope being misplaced, the address is:

Kairos Future AB

Attn: Mats Lindgren

P.O. Box 804

SE-101 36 Stockholm

SWEDEN

Phone: +46 8 402 21 50

E-mail: [survey@kairos.se](mailto:survey@kairos.se)

## Part A: Top management team (TMT)

The following section includes some questions related to your company's top management team and its decision making. Please answer the questions as thoroughly as possible.

### External orientation

Q1. To what extent does the Top Management Team of your company scan the external environment for threats and opportunities through:

	Not at all				To a great extent		
Formalised evaluation of customer attitudes?	1	2	3	4	5	6	7
Explicitly tracking policies and tactics of competitors?	1	2	3	4	5	6	7
Formalised evaluation of opportunities for new acquisitions, investments, and markets?	1	2	3	4	5	6	7
Formalised evaluation of threats from competitors and regulatory changes?	1	2	3	4	5	6	7
Formalised evaluation of new opportunities for production and distribution?	1	2	3	4	5	6	7

### Diversity of the top management team

Q2. How would you consider the diversity of the top management team (TMT) with respect to different aspects such as:

	A very homogeneous TMT				A very heterogeneous TMT		
Gender (men/women)	1	2	3	4	5	6	7
Age	1	2	3	4	5	6	7
Ethnic background	1	2	3	4	5	6	7
Educational background	1	2	3	4	5	6	7
Educational level	1	2	3	4	5	6	7
Family situation	1	2	3	4	5	6	7
Private social network (friends)	1	2	3	4	5	6	7
Private interests and hobbies	1	2	3	4	5	6	7
Professional or business network	1	2	3	4	5	6	7
Company network (contacts within the company)	1	2	3	4	5	6	7



## Decision making

Q3. Here follows some questions about the decision-making process within the Top Management Team.

	Not at all <span style="float: right;">To a great extent</span>						
To what extent are members of the TMT (top management team) primarily with their own goals, rather than with the goals of the organisation?	1	2	3	4	5	6	7
To what extent are the people in the TMT open with each other about their interests and preferences to decisions?	1	2	3	4	5	6	7
To what extent are decisions in general affected by the use of power and influence among the TMT members?	1	2	3	4	5	6	7
To what extent is there in the TMT an active debate based on facts, when major decisions are being made?	1	2	3	4	5	6	7
To what extent are the decisions affected by negotiation among group members?	1	2	3	4	5	6	7
To what extent is the TMT capable of solving conflicts in a creative way, rather than by the use of power and politics?	1	2	3	4	5	6	7

## Social integration

Q4. How would you describe the interaction within the Top Management Team?

	Disagree <span style="float: right;">Agree</span>						
The members of the TMT (top management team) are quick to defend each other from criticism by outsiders.	1	2	3	4	5	6	7
The success of other members of the TMT helps me to achieve my own objectives.	1	2	3	4	5	6	7
Everyone's input is incorporated into most important company decisions.	1	2	3	4	5	6	7
The members of the TMT get along together very well.	1	2	3	4	5	6	7
Relationships between members of the TMT are best described as "win-lose", if he/she wins, I lose.	1	2	3	4	5	6	7
The members of the TMT are always ready to co-operate and help each other.	1	2	3	4	5	6	7
When final decisions are reached, it is common for at least one member of the TMT to be unhappy with the decision.	1	2	3	4	5	6	7
There is a great deal of competition between the members of the TMT.	1	2	3	4	5	6	7
The members of the TMT really stick together.	1	2	3	4	5	6	7

## Part B: Organisational structure

This section includes some questions about the organisational structure of your company.

### Structure and culture

Q5. In general, the operating management philosophy in my firm favours:

Highly structured channels of communication and highly restricted access to important financial and operating information	1	2	3	4	5	6	7	Open channels of communication with important financial and operating information flowing quite freely throughout the organisation
A strong insistence on a uniform managerial style throughout the firm	1	2	3	4	5	6	7	Managers' operating styles allowed to range freely from the very formal to the very informal
A strong emphasis on giving the most to say in decision-making to formal line managers	1	2	3	4	5	6	7	A strong tendency to let the expert in a given situation have the most say in decisions-making, even if this means temporary bypassing of formal line authority
A strong emphasis on holding fast to tried and true management principles despite any changes in business conditions	1	2	3	4	5	6	7	A strong emphasis on adapting to changing circumstances without too much of concern for the past practice
A strong emphasis to always getting personnel to follow the formally laid down procedures	1	2	3	4	5	6	7	A strong emphasis on getting things done even if this means disregarding formal procedures
Tight formal control of most operations by means of sophisticated control and information systems	1	2	3	4	5	6	7	Loose, informal control; heavy dependence on informal relationships and cooperation for getting work done
A strong emphasis on getting line and staff personnel to adhere closely to formal job descriptions	1	2	3	4	5	6	7	A strong tendency to let requirements of the situation and the individual's personality define proper on-job behaviour

### Integration

Q6. To what extent does your company use the following integrative mechanisms to assure compatibility among decisions in one area (e.g. marketing) with those in other areas (e.g. production)?

	Used rarely							Used very frequently
	1	2	3	4	5	6	7	
Interdepartmental committees set up to allow departments to engage in joint decision making								

	Used rarely						Used very frequently
Task forces, temporary bodies set up to facilitate interdepartmental collaboration on specific projects	1	2	3	4	5	6	7
Networking personnel whose specific job is to co-ordinate the efforts of several departments for purposes of a specific project	1	2	3	4	5	6	7

Q7. To what extent is decision-making at top levels in your firm characterised by participative, cross-functional committees in which different departments, functions or divisions get together to decide the following classes of decisions?

	Use rarely						Use very frequently
Product and service decisions concerning production, marketing and R&D strategies	1	2	3	4	5	6	7
Capital budget decisions – selection and financing of long-term investments	1	2	3	4	5	6	7
Long-term strategies (growth, diversification etc) and decisions related to changes in a firm's operating philosophy	1	2	3	4	5	6	7

### Culture and supporting systems

Q8. How would you describe the systems used to implement a desired culture and strategy?

	Very definitely false				Very definitely true			
We carefully hire people that already identify with and have attributes that are consistent with the organisation's desired values	1	2	3	4	5	6	7	
Rituals (coffee breaks, information meetings, arenas for dialogue etc) are carefully tailored to support desired behaviours, culture and strategy	1	2	3	4	5	6	7	
The compensation "system" is designed to support desired culture and strategy and consists of both financial and non-financial incentives	1	2	3	4	5	6	7	
The compensation "system" is perceived as fair and equitable	1	2	3	4	5	6	7	
Performance feedback to individuals and groups is prompt, clear and unambiguous	1	2	3	4	5	6	7	
Managers are implementing the goals and culture by being role models	1	2	3	4	5	6	7	
There is a constant dialogue in the organisation on individual and organisational goals	1	2	3	4	5	6	7	
We monitor not only pure performance indicators (such as sales and costs), but all kinds of indicators that are critical to long term performance and the desired culture and strategy (i.e. customer satisfaction, personnel satisfaction, educational expenditure, innovation etc)	1	2	3	4	5	6	7	

## Part C: Strategic planning

This part includes questions about the strategic planning process, types of activities performed by the firm, the degree of participation etc.

### Planning emphasis

Q9. This section examines several common planning activities. Please indicate the **emphasis placed on** each activity within your organisation:

	No emphasis			Moderate emphasis		Very strong emphasis	
Mission statement	1	2	3	4	5	6	7
Continuous scanning of the business environment	1	2	3	4	5	6	7
Market and consumer behaviour analysis	1	2	3	4	5	6	7
Trend analysis	1	2	3	4	5	6	7
Competitor analysis	1	2	3	4	5	6	7
Vision statement	1	2	3	4	5	6	7
Long-term goals	1	2	3	4	5	6	7
Annual goals	1	2	3	4	5	6	7
Short-term action plans	1	2	3	4	5	6	7
Ongoing evaluation	1	2	3	4	5	6	7

### Planning

Q10. When confronted with an important, non-routine problem or opportunity, to what extent does your firm...

	Not at all			To a great extent			
Develop many alternative responses?	1	2	3	4	5	6	7
Consider many diverse criteria for eliminating possible courses of action?	1	2	3	4	5	6	7
Thoroughly examine multiple explanations for the problem or opportunity?	1	2	3	4	5	6	7
Conduct multiple examinations of any suggested course of action?	1	2	3	4	5	6	7
Search extensively for possible responses?	1	2	3	4	5	6	7
Simultaneously evaluate different alternative explanations or courses of action, rather than evaluating them sequentially?	1	2	3	4	5	6	7

## Participation

To what extent do co-workers on all levels in the organisation participate in the ongoing planning process? Please indicate the **emphasis placed on organisation wide participation** within your organisation regarding:

	No emphasis			Moderate emphasis		Very strong emphasis	
	1	2	3	4	5	6	7
Scanning the business environment for threats and opportunities	1	2	3	4	5	6	7
Developing long term-strategies (including mission and vision)	1	2	3	4	5	6	7
Setting annual goals	1	2	3	4	5	6	7
Short-term action planning	1	2	3	4	5	6	7
Ongoing evaluation	1	2	3	4	5	6	7

## Part D: Strategy

Q12. How would you describe your company's strategic posture?

<i>In general, the top managers of my firm favour...</i>								
A strong emphasis on the marketing of tried products and services	1	2	3	4	5	6	7	A strong emphasis on R&D, technological leadership, and innovations
<i>How many new lines of products or services have your firm marketed in the past 5 years?</i>								
No new lines of products or services	1	2	3	4	5	6	7	Very many new lines of products or services
Changes in most products or services have been mostly of a minor nature	1	2	3	4	5	6	7	Changes in product or service lines have usually been quite dramatic
<i>In dealing with its competitors, my firm...</i>								
Typically responds to actions which competitors initiate	1	2	3	4	5	6	7	Typically initiates actions which competitors then respond to
Is very seldom the first business to introduce new products/services, administrative techniques, operating technologies, etc	1	2	3	4	5	6	7	Is very often the first business to introduce new products/services, administrative techniques, operating technologies, etc
Typically seeks to avoid competitive clashes, preferring a "live-and-let-live" posture	1	2	3	4	5	6	7	Typically adopts a very competitive, "undo-the-competitors" posture
<i>In general, the top managers of my firm...</i>								
Prefer low-risk projects (with normal and certain rates of return)	1	2	3	4	5	6	7	Prefer high-risk projects (with chances of very high returns)
<i>In general, the top managers of my firm believe that...</i>								
Owing to the nature of the environment, it is best to explore it gradually via timid, incremental behaviour	1	2	3	4	5	6	7	Owing to the nature of the environment, bold, wide-ranging acts are necessary to achieve the firm's objectives
<i>When confronted with decision-making situations involving uncertainty, my firm...</i>								
Typically adopts a cautious, "wait-and-see" posture in order to minimise the probability of making costly decisions	1	2	3	4	5	6	7	Typically adopts a bold, aggressive posture in order to maximise the probability of exploiting potential opportunities
<i>In dealing with the balance between present and future, my firm...</i>								
Focuses on existing products, services and markets in order to maximise short-term profit	1	2	3	4	5	6	7	Adopts a long-term orientation, encourages visionary thinking and involves futurists in projects in order to view present activities in a wider perspective

In dealing with the balance between present and future, my firm ...								
Extensively develops and thoroughly tests new products and services before they are released in order to ensure acceptance from the market	1	2	3	4	5	6	7	Adopts an experimental approach to the future, frequently testing new experimental products and services in order to both influence the market and to get quick feedback from the market

## Part E: Performance

### Robustness

Q13. Robustness can be defined as a company's ability to adapt to new challenges in the business environment (threats and opportunities) without being forced to change strategy or structure. Assess your company's **robustness to changes in the competitive landscape** compared to other companies in the same market and at a similar stage of development. Compared to those other companies, how robust are your:

	Highly vulnerable				Highly robust			
Business concept	1	2	3	4	5	6	7	
Long term goals	1	2	3	4	5	6	7	
Financial strategy	1	2	3	4	5	6	7	
Market strategy	1	2	3	4	5	6	7	
Supplier strategy	1	2	3	4	5	6	7	
R & D strategy	1	2	3	4	5	6	7	
Human resource strategy	1	2	3	4	5	6	7	
Organisational structure	1	2	3	4	5	6	7	
Financial platform	1	2	3	4	5	6	7	
Product/service portfolio	1	2	3	4	5	6	7	
Competence/knowledge base	1	2	3	4	5	6	7	

### Response capability

Q14. Assess in a similar way your **company's ability to give quick and adequate responses to changes in the environment** (legislative, technological, competitive, customer demands etc). Compared to other companies in the same market and at a similar stage of development, how would you consider your own company's performance regarding the ability to:

	Low performer				High performer			
Sense potential threats (legislative, technological, competitive, customer demands etc)	1	2	3	4	5	6	7	
Conceptualise a response and make decisions and plans to meet threats	1	2	3	4	5	6	7	
Reconfigure resources and implement necessary changes to meet threats	1	2	3	4	5	6	7	

	Low performer				High performer		
Sense new business or technological opportunities	1	2	3	4	5	6	7
Conceptualise a response and make decisions and plans to exploit opportunities	1	2	3	4	5	6	7
Reconfigure resources and implement necessary changes to exploit opportunities	1	2	3	4	5	6	7

## Performance

Q15. Assess your company's performance on each of the following performance aspects **over the last 3 years**, compared to that of other companies in the same market and at a similar stage of development:

	Low performer				High performer		
Profitability/ROA	1	2	3	4	5	6	7
Cash flow	1	2	3	4	5	6	7
Sales growth	1	2	3	4	5	6	7
Market share	1	2	3	4	5	6	7
Market diversification	1	2	3	4	5	6	7
Product/service change	1	2	3	4	5	6	7
New products next year	1	2	3	4	5	6	7
Product/service development	1	2	3	4	5	6	7
Overall company quality	1	2	3	4	5	6	7
Employee satisfaction	1	2	3	4	5	6	7
Product/service quality	1	2	3	4	5	6	7
Environmental responsibility	1	2	3	4	5	6	7
Social responsibility	1	2	3	4	5	6	7



## Part F: Business environment

Q16. What would you say characterises your company's business environment? Please describe your company's business environment by responding to the statements below.

	Completely disagree						Completely agree
Actions taken by my firm will heavily affect our competitors	1	2	3	4	5	6	7
Our business environment is very complex with many unclear factors and relations influencing our firm	1	2	3	4	5	6	7
The market will grow for several years	1	2	3	4	5	6	7
The business opportunities for the next 12 months look good	1	2	3	4	5	6	7
Our customers' preferences are continuously changing	1	2	3	4	5	6	7
The social values in society are continuously changing	1	2	3	4	5	6	7
The business environment is continuously changing	1	2	3	4	5	6	7
It is very difficult to foresee change	1	2	3	4	5	6	7
New and unpredictable competition is constantly occurring	1	2	3	4	5	6	7
There are many unforeseen threats that we have to cope with	1	2	3	4	5	6	7
The innovation rate in the market is high	1	2	3	4	5	6	7
The performance of our firm is highly influenced by unpredictable public policies	1	2	3	4	5	6	7

## Part G: Supporting information

To be able to interpret your answers we need some supporting information about your company and yourself.

### Firm characteristics

Q17. Please briefly describe your company by answering the following questions.

What is the number of operating sites (plants and branches) of your company?	
What is the proportion of managerial personnel to total personnel (include all levels of management with foremen)?	percent
What is the proportion of clerks to total personnel? (Clerks are staff in all functional areas who are not directly engaged in making, designing, or selling the product.)	percent

How many levels are there in the organisation? (That is, count the number of levels in the longest line between direct workers and the chief executive – include both these levels – in the production or service function.)	
What is the proportion of personnel with university or college education to all personnel.	percent
What is the number of employees (full time)?	
What is the company's market share in key markets?	percent
Is your company's primary market domestic, regional or international?	
Is your company a single- or multiple-business company?	

What sector of industry is your company's primary industry? \_\_\_\_\_

### **Respondents characteristics**

Q18. Please give us some guiding information about yourself by answering these supplementary questions.

What is your age? \_\_\_\_\_

Are you a man or a women? \_\_\_\_\_

What is your present position? \_\_\_\_\_

How many years have you been working in the company? \_\_\_\_\_

What is your highest educational degree? \_\_\_\_\_

*Thank you for completing the questionnaire.*

*Please check to make sure that you have not missed any questions.*

*Thank you again for your valuable efforts.*

*Append your business card to the questionnaire  
and we will send you a future book.*