ERIK DE WAARD

Engaging Environmental Turbulence

Organizational Determinants for Repetitive, Quick and Adequate Responses

ENGAGING ENVIRONMENTAL TURBULENCE

Organizational Determinants for Repetitive, Quick and Adequate Responses

ENGAGING ENVIRONMENTAL TURBULENCE

Organizational determinants for repetitive, quick and adequate responses

Strijden met omgevingsturbulentie
Organisatorische determinanten voor herhaalde, snelle en passende reacties

Proefschrift

ter verkrijging van de graad van doctor aan de
Erasmus Universiteit Rotterdam
op gezag van de
rector magnificus
Prof.dr. H.G. Schmidt
en volgens besluit van het College voor Promoties.

De openbare verdediging zal plaatsvinden op
vrijdag 22 januari 2010 om 13.30 uur

door
Erik Jurgen de Waard
geboren te Roosendaal en Nispen

ERASMUS UNIVERSITEIT ROTTERDAM

Doctoral Committee

Supervisors:
Prof.dr. H.W. Volberda
Prof.dr. J. Soeters

Other members:
Prof.dr. H.R. Commandeur
Prof.dr. S.B. Rodrigues
Prof.dr. W. van Rossum

PREFACE AND ACKNOWLEDGEMENTS

Many people feel that writing a dissertation thesis in combination with a full time job is like climbing the Mount Everest, only few reach the summit. Despite this general feeling, I embarked upon the scientific journey rather naïvely. I never doubted that I would succeed, which is of course a good thing, but at the same time I really underestimated my own perfectionism and the ins and outs of the research process itself. As a result, most of my deadlines were not met, and my scheduled end date had to be moved forward a number of times. In the end, my initial goal of four years had doubled into eight years. Reading these words one may think that I have reached the finish line exhausted. Luckily, this is not the case. Obviously, I am glad to have finished, but my energy-levels are still quite high. Probably, one reason stands out for my ongoing research enthusiasm: my strong personal connection with the study's central case.

When I left the Netherlands armed forces in 1996 the organization was in the early stages of its transformation process. Downsizing was one of the first organizational measures that had to be taken. For many young officers the career prospects became a lot less appealing. Many of them, including myself, decided to start a new career outside the military. For me, leaving the army has been one of the most difficult personal choices I have had to make until today. The armed forces are a special kind of organization to work in, you either love it or you hate it. The physical challenges, the adventurous job content, but also the tricky task-setting give the organization a unique culture of camaraderie and 'getting things done', which is nice to be part of. Nevertheless, speaking for myself, all these positive sentiments could not take away a feeling of turmoil and uncertainty that surrounded the reorganization taking place. Looking back at my decision to leave, I do not feel any regrets about how things have turned out. On the contrary, I feel privileged that in my current position at the Netherlands Defense Academy, I can still contribute to the organization, albeit in a completely different way than before.

In this respect, I hope that the Netherlands armed forces' senior management welcomes my research findings. On the whole, I strongly believe that what organizationally has been achieved over the last two decades is a major accomplishment. If you ask me, the prevailing opinion

that military organizations are inert and inflexible is being refuted by the empirical findings of this study. Yet, the study also warns for the fact that the scales of organizational flexibility can easily tip in the direction of improvisation. I, therefore, at the same time, would encourage military policymakers and politicians to not go in the defensive too much on the issue of short-term knowledge absorption and imperfect modularization that the study has brought to the surface. In my opinion, it would be better to take advantage of the conclusions and see them as positive feedback that could help the organization ahead. After all, over 1.200 field officers in active duty have contributed to this research project, which makes it a strong internal voice that deserves to be heard.

Having said this, I do not really expect the organization to be closed or stubborn. The fact that the Netherlands armed forces' senior management has facilitated me in conducting this research project makes clear that the top is eager to learn and is looking for ways to improve the organization. In this respect, I would like to seize the opportunity to thank the organization for its overall support. More specifically, I would like to thank the 1.533 officers that have filled-in and returned the questionnaire and the 18 high-ranking representatives that were willing to contribute to the session of focused interviews. In particular, I want to thank Lieutenant General van Osch, the former head of the Netherlands Defense Academy, who opened some very important doors for me. In addition, I thank all the other military colleagues at the Academy that helped met out on a number of issues, such as translating the survey questions to a military crisis response setting, reading draft versions of some of the chapters, and supplying me with current organizational information.

Furthermore, I sincerely want thank my supervisors, Prof. Dr. Volberda and Prof. Dr. Soeters. Without their guidelines and professional feedback this dissertation thesis would never have become what it is today. Moreover, despite its rather long time-frame, they continued to believe in the scientific potential of this research project. I would also like to thank the entire promotion committee for their willingness to participate in the ceremony; and, more importantly, to reflect upon the structure and outcome of this thesis.

I also would like to extend some words of thanks to a number of close colleagues. Tom and Ivar, thank you for founding Karapax, which has been a distraction but also a motivation. Let's find out what the future has in store for us as entrepreneurs. Eric-Hans, thank you for your motivational support and I hope that our shared scientific interest will lead to high-quality publications in the future. Paul, thanks for your conceptual ideas and your academic advice. Manon and Bart, I would like to thank you both for acting as my statistical feedback group, but also for the chit-chat conversations we had during lunch. Robert, thanks for your humorous way of putting the dynamics of the PhD process into perspective. Jos and Jacqueline, thank you both, for pulling me from behind my desk every morning to drink a cup of coffee and talk about the normal things in life. Finally, Myriame, thanks for getting us accredited!

Bart, you were best man at my wedding, and now you are my personal assistant during the dissertation ceremony. So, in two very important personal events you have played a key role. As you know, our friendship is very precious to me. It is, therefore, very special to have you right beside me during the final stage of my PhD journey. What, perhaps, has touched me most is that despite your busy personal and business life abroad you insisted on fulfilling this role. I want to very much thank you for that.

Stefan, when defending this thesis you will be the second man assisting me. For you to play this role is also very special to me. We have known each other ever since I started my officers' education at the Royal Military Academy. We were roommates during basic infantry training, and after leaving the Academy we have always kept a close contact. I left the army, you stayed, but my choice has never affected our friendship. All in all, it was quite obvious for me to ask you to be my second aide during the PhD closing act. Thanks, Steef!

Furthermore, I would like to say a word of thanks to my in-laws, Jeanne and Fred. Fred, you have experienced the demanding process of writing a dissertation thesis yourself. Your words that this solitary exercise is all about perseverance and character have motivated me to continue and to go for quality. Jeanne, it is great to have a mother in-law with whom you can talk about cycling. Especially the incentive you came up with that a new

customized mountain bike would be waiting for me at the finish line has stimulated me to give the thesis its final push.

Naturally, I would also like to thank my father and mother. Kees and Yvonne, although the two of you most of the time, probably, did not have a clue of what I was doing, you were proud of me anyway and supported me all the same. In return, this is perhaps also a good moment to express how grateful I am to have you as my parents. I highly value your different personalities and admire the way in which you have raised me. Without the two of you I would not have been the person that I am today and I would certainly not have achieved the same things in life. I owe a lot to you!

Last, and most importantly, I would like to thank Aukje for supporting me the entire period. All the more, because this period has not only from a professional perspective been important, but perhaps even more so from a family perspective. In 2005 we got married; in 2007 our first daughter Meike was born, followed in 2009 by Evelien our second girl. Although these events have made us very happy, they have also stirred-up the life that we were used to living. Finding a new balance in life and safeguarding professional goals and ambitions, such as writing a dissertation thesis, are two things that sometimes are difficult to combine. Nevertheless, I think that we have been very successful in doing just that. After all, when I focus on the outcome of this important period, I am not only proud of the thesis that I have written, but I am also very happy with the new life that we are living. Aukje, I really love you and I am looking forward to seeing our girls grow up, together with you.

Erik de Waard,

Breda, January 2010

CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1   CONTEXT, AIM, AND QUESTIONS

1.1   INTRODUCTION

A common organizational challenge that many of todays profit organizations face is how to remain successful and vital in a competitive arena that is becoming increasingly volatile. Over the last two decades rapid technological changes, the continuous fragmentation of markets, the convergence of different industries, the shortening of product life-cycles, and the enormous growth in telecommunications and inexpensive computing have made the competitive environment more turbulent than ever before (Lei, Hitt, & Goldhar, 1996). Being confronted with environmental turbulence means that organizations have to cope with a business environment that is highly dynamic, complex, and unpredictable at the same time (Volberda, 1996).

Dynamism refers to the changeability of competitive forces over time. The level of dynamism is based on both the frequency and the intensity of the competitive changes taking place. Environmental complexity has to do with the number and heterogeneity of factors and actors involved in the competition process, but also with the interrelatedness of these factors and actors. Unpredictability is a dimension that relates to the ambiguity and vagueness of cause-effect relationships within the competitive force field. Environmental unpredictability depends to a large extent on the availability and clarity of competitive information and on an organization's openness towards important signals coming from the environment (Volberda, 1998).

On the whole, the increasing level of environmental turbulence has put a strain on organizations to become more innovative and proactive. Making sense of what the business environment is about and relating these ideas to one's own strategic position, paradigm, and way of doing things is an ongoing process for every organization. In a rather stable, simple, and predictable environment organizations probably have little trouble in mapping out their competitive moves. Under turbulent circumstances this process is less straightforward. Generally speaking, organizations then face the challenge of deliberately trying to shape the competitive landscape to

their own advantage and thus have to play an active interpretation role. Organizations that assume the environment to be not analyzable and that take no concrete action to unravel important competitive forces and factors, run the risk of becoming a plaything of surrounding environmental dynamics (Daft & Weick, 1984).

With this competitive challenge in mind, D'Aveni (1994) has introduced the term hypercompetition. He defines hypercompetitive behavior as a "process of continuously generating new competitive advantages and destroying, obsoleting, or neutralizing the opponent's competitive advantage, thereby creating disequilibrium, destroying perfect competition, and disrupting the status quo of the marketplace" (D'Aveni, 1994: 218). His general idea comes down to the fact that under turbulent circumstances organizations continuously and deliberately need to challenge the existing status quo with their environment, aiming for consecutive, short-term, competitive advantages (D'Aveni, 1994; Sanchez, 1995; Teece, Pisano, & Shuen, 1997; Tushman & O'Reilly, 1996).

In the following academic debate on temporary advantages survival or organizational success is being presented as a result of activating innovative, quick response, flexible capabilities (Volberda, 1996). Teece et al. (1997: 515) use the term dynamic capabilities. In their seminal article they unravel the concept of dynamic capabilities as follows: "*The term 'dynamic' refers to the capacity to renew competences so as to achieve congruence with the changing business environment…………The term 'capabilities' emphasizes the key role of strategic management in appropriately adapting, integrating, and reconfiguring internal and external organizational skills, resources, and functional competences to match the requirements of a changing environment.*"

So far, literature on dynamic capabilities has had a strong conceptual character; for the main concern has been to firmly position the concept within its academic field (Eisenhardt & Martin, 2000; Helfat & Peteraf, 2003; Makadok, 2001; Winter, 2003; Zollo & Winter, 2002; Zott, 2003). Problematic is the fact that the body of empirical evidence, on how the concept works out in practice, has become rather fragmented; mainly, because it is being dealt with in separate research streams and not specifically under the umbrella of dynamic capabilities (Eisenhardt &

Martin, 2000). Both critiques and advocates argue that it is important to now move the concept beyond its conceptual and dispersed status and start operationalizing the promising ideas with dedicated empirical evidence (Helfat, et al., 2007; Priem & Butler, 2001; Williamson, 1999).

The empirical work that already exists concentrates on organizational learning as the most important competence for dealing with hypercompetition. The central idea is that only through continuous learning organizations can keep changing and innovating and, by doing so, stay ahead of the game. Within this general line of thinking two sub-streams of dynamic capabilities have emerged. The first stream relates organizational learning to certain managerial capabilities, such as external knowledge integration (Tripsas, 1997), strategic decision-making (Adner & Helfat, 2003), strategic resource utilization and coordination (Majumdar, 1999), market orientation (Menguc & Auh, 2006), and strategic political management (Oliver & Holzinger, 2008). The second stream links the desired organizational learning ability to specific organizational capabilities, such as research and development (Helfat, 1997), new product development (Deeds, DeCarolis, & Coombs, 1999; Marsh & Stock, 2006), marketing (Song, Droge, Hanvanich, & Calantone, 2005), and leadership (Pablo, Reay, Dewald, & Casebeer, 2007).

The advantage of these contributions is that organizations receive information on which specific dynamic capabilities to invest in when striving for temporary competitive advantages. It must, however, also be said that the emphasis of the vast majority of the contributions specifically relates the aspect of stimulating innovation or strategic renewal. After all, knowledge integration, strategic decision-making, research and development, new product development, and marketing are capabilities that primarily focus on the aspect of stirring up the existing quo by proactively seeking new competitive alternatives. An aspect that, so far, has remained rather underexposed in this academic debate refers to the underlying organizational determinants that may help to quickly and decisively render the activation of these sorts of managerial and organizational dynamic capabilities on a continuous basis.

Oxford Advanced Learner's Dictionary defines a determinant as "a thing that decides whether or how something happens" (Hornby, 2005: 416). The

point is that on meta-level organizations confronted with hypercompetition need specific organizational determinants that can deal with the *paradox of duality* (Volberda, 1996). On the one hand too much managerial emphasis on strategic renewal and innovation can create chaos. On the other hand a too strong focus on existing rules, routines, and procedures can lead to rigidity in the organization. The dilemma that organizations face, when in hypercompetition, is to balance these two contradictory requirements. In this respect, one important practical question left open, in the theoretical debate on dynamic capabilities, is which organizational determinants matter in the challenging process of quickly and repetitively initiating strategic changes and at the same time avoiding to become organizationally exhausted.

1.2 THE WESTERN MILITARY CRISIS RESPONSE ORGANIZATION

This study aims to make progress on this issue by introducing the contemporary Western expeditionary military organization as a typical example of a quick response organization for commercial firms to learn from. This choice is debatable according to several scholars. For example, Soeters, Van Fenema, and Beeres (2010) make clear that the military is a very unique organizational species with such specific characteristics that it becomes problematic to make one-on-one comparisons with other organizations, profit or non-profit. Moreover, Builder (1989) and Worley (2006) believe that it is actually impossible to approach the military or armed forces as an unequivocal organizational system. They argue that the military as a single entity does not exist. In reality, it is a network of different Services (Air force, Army, and Navy) that are separate organizations in themselves with their own task domains and cultural identities.

At the same time, it is also not uncommon to use the military as a sort of mirror for commercial business organizations. Especially within the strategic management domain scholars regularly use military examples and principles as the starting point of a discussion on the dynamics of competitive rivalry. Historically-grounded, military, basic principles such as a clear objective, maintaining the initiative, concentration, flexibility,

surprise, and simplicity are transformed into general strategic management lessons to successfully help fight competitive battles within the business domain. The general competitive lessons to be learnt are often illustrated with specific historical facts of military campaigns or operations that have taken place (Quinn, 1988; Resteigne & Soeters, 2009). To a large extent this study is based on the same philosophy.

Research into high reliability organizations (HROs) is also worth mentioning in this discussion on the military as a role model for commercial business organizations (Eisenhardt, 1993; Roberts, Stout, & Halpern, 1994; Rochlin, LaPorte, & Roberts, 1987; Sagan, 1993; Weick, 2001; Weick & Roberts, 1993). HRO research is specifically interested in the organizational characteristics of those organizations that have to function within dynamically complex and sometimes dangerous circumstances; and whose malfunctioning could have far-reaching consequences, such as the loss of human life or major environmental catastrophes. HRO theory relates, for example, to aircraft carrier operations, nuclear weapons operations, and friendly fire incidents to learn how organizational practices can help to minimize the risk of critical errors or accidents from occurring. These lessons are perceived to be helpful for commercial organizations as well. The general idea is that dealing with the increased uncertainty of today's continuously changing business environment asks for the presence of HRO-like, mindful practices in order to remain reliable, efficient, and effective, despite the ongoing focus on strategic renewal (Weick & Sutcliffe, 2001).

In a way, Aupperle (1996) combines both of the above approaches by using the historical, military example of Xenophon's *Anabasis* to investigate the underlying organizational characteristics of spontaneous and effective organizational reconfiguration within a hostile environment. With this article he actively wants to contribute to the discussion on dealing with hypercompetition. He argues as follows: "A historical case is used as a time-bridge to reveal the importance of rapid and substantive organizational redesign when confronting highly competitive and quickly shifting environments". Aupperle uses Morgan's (1986) organism, brain and cultures metaphor to draw conclusions on the organizational implications of the current competitive goal of creating continuous renewal. He concludes that in Xenophon's *Anabasis* especially the cultural

metaphor stands out in the process of organizational reconfiguration. He puts it as follows: "Most importantly, the Greek army succeeded *not* because it possessed a superior strategy, better soldiers, greater resources, or advanced technology……The Greek culture *became the strategy* –the strategy of continuous, ad-hoc adjustment to unique and adverse conditions" (Aupperle, 1996: 458).

Based on this historical example he (1996: 458) concludes that in the current hypercompetitive business arena "there is a need for transformational cultures characterized by human and visionary values which openly encourage renewal and continuous improvement…….Such a transformational organization would possess a cultural ethic where all employees personalize the need to advocate and facilitate change." The main question is, of course, how to actually realize an organizational culture like this. In this respect, Aupperle (1996) points to the added value of trying to incorporate Morgan's (1986) brain and organism metaphor into the organization. The brain metaphor stimulates openness, the exploration of divergent viewpoints, and the development of creative solutions down to the lowest organizational levels. The organism metaphor supports the need for constant architectural adjustment in response to environmental turbulence.

This study makes a big jump in time and transfers Aupperle's historical insights to a contemporary military setting. Just like in the commercial word the buzz word of the current international security environment has become 'uncertainty'. Uncertainty exists about the potential sources of military threats, their time and place of occurrence, and the form that they will eventually take. Experiences over the last two decades have shown that Western armed forces have been deployed for a variety of reasons, in a variety of forms, to a variety of regions. In the Gulf War of 1990 a rather conventional large-scale mechanized battle between different states was fought. The Balkans became a textbook example of limited warfare based on peace enforcement and peacekeeping principles. In Rwanda a humanitarian intervention was conducted by Western military forces. More recently, Afghanistan and Iraq have become examples of crisis areas in which counterinsurgency operations and reconstruction tasks are taking place simultaneously. Moreover, ever since the 9/11 attacks on the World Trade Center in New York the Western security community has

increasingly been preoccupied with fighting *the long war* against terrorists, extremists, or fundamentalists at home and abroad.

With this new security environment Western armed forces are facing the complex challenge of quickly and effectively responding to unforeseen threats or crisis situations (De Waard & Kramer, 2008; De Waard & Soeters, 2007). As a result they have been pushed to find ways to simultaneously deal with strategic and operational turbulence (Evans, 2003). First of all, Western armed forces are confronted with a changeable strategic security context, asking for organizational competences that support the generation and mobilization of different operational alternatives. Secondly, this demand of operational customization has to be combined with an effective military performance during each individual mission, over and over again. What makes it even more complex is that most missions have hypercompetitive-like characteristics themselves. After all, deployment generally takes place under circumstances, in which military units constantly and quickly need to react to changing local circumstances to keep or regain the initiative, always have to cope with intelligent actors actively trying to undermine their operations, continuously have to realize a high speed of reaction to stay ahead of their opponents, and have to bare in mind all the time that their malfunctioning could ultimately have far-reaching consequences (Kramer, 2007).

Refocusing on Aupperle's (1996) discussion of Xenophon's *Anabasis*, an interesting question is whether or not current Western armed forces have internalized the proposed metaphors into their organizational systems. In this respect, it should be said that in the historical example the Greek responded to a powerful opponent that tried to destroy their entire civilization; whereas, contemporary western armed forces do not face this one-off dramatic challenge of large-scale societal destruction. In their crisis response role Western armed forces act more or less as the protectors of universal human rights and international law. The fact that, in most cases, they do not primarily fight for personal freedom or to safe their country or civilization, but to go there where the international community deems necessary to just do their "job", makes the positive effect of an overarching, national supra-culture probably less strong. It could be argued that within such a situation of less profound, intrinsic ideological motivation, the focus shifts towards the use of concrete organizational

characteristics to still create an organizational culture that supports decisiveness and repetitive resourcefulness under threat. In this respect it must, however, also be said that for those Western countries that have actually suffered terrorist attacks at home this assumption is probably less applicable. These countries do strongly belief that fighting terrorists in, for example, Afghanistan is a matter of national security.

Nevertheless, this study is especially interested in the organizational determinants that are used to incorporate the brain and organism metaphor into Western crisis response organizations. Xenophon's *Anabasis* assumes that what contemporary Western military organizations need pursuing are those organizational determinants that not only activate learning to learn abilities but also facilitate the process of architectural adaptation. The study assumes that giving insight into the way in which Western military crisis response organizations apply commonly accepted organizational determinants to activate learning and reconfiguration abilities could serve as an interesting case for commercial organizations to take advantage of.

The Netherlands armed forces have been selected as the study's unit of analysis. This choice is based on the fact that this organization is a typical example of a quick response contemporary Western military organization with a main focus on conducting crisis response tasks. Moreover, the organizational transformation process that the Dutch have set in motion after the ending of the Cold War, to optimize their organization for its new, vast and unpredictable task environment, is part of a major trend influencing the entire transatlantic security community. Experiences so far indicate that within this general trend most Western countries have adopted a similar approach towards force transformation. So, basically the Dutch situation serves as an exemplary case of how most Western militaries have organizationally reacted to their turbulent security environment.

1.3   RESEARCH AIM AND QUESTIONS

The reasoning above has resulted in the following primary research goal: *to contribute to the theoretical status of the Dynamic Capability Approach by analyzing how the Netherlands armed forces apply commonly accepted organizational determinants, to activate learning and reconfiguration capabilities, in order to respond quickly and deal adequately with the turbulence of the security environment in general and the individual mission contexts in particular.*

Apart from strengthening the theoretical status of the Dynamic Capabilities Approach by offering specific empirical insights the study also has a secondary more practical focus. After all, by conducting this study the Netherlands armed forces receive a more comprehensive look at the implications of key organizational choices the organization has made after the ending of the Cold War. Therefore, the study's secondary aim is: *to supply the Netherlands armed forces with valuable knowledge on the practical results of key organizational choices that have been made to live up to the new crisis response role.*

In order to achieve both objectives the following central research question forms the core of this study:
How do organizational learning and reconfiguration determinants matter in quickly responding to and adequately dealing with environmental turbulence when taking the Netherlands armed forces as a typical example of a quick response organization?

Based on the central research question three sub-questions can be identified that the study seeks to address:

Sub-question 1: Which key determinants help quick response organizations to realize innovative organizational learning and architectural reconfiguration?

Sub-question 2: What has been the contribution of these organizational determinants to the Netherlands armed forces' crisis response performance?

Sub-question 3: What are the policy implications of these organizational determinants according to senior officers and civil servants of the Netherlands armed forces?

1.4   RELEVANCE OF THE RESEARCH

Three main groups may benefit from this dissertation thesis. First, the study offers both relevant empirical and conceptual knowledge to academics in the field of business. The study contributes to the development of the Dynamic Capability Approach and the Resource-Based View by providing statistical and qualitative evidence on how an organization actually uses organizational determinants to deal with environmental turbulence. Moreover, the comprehensive analysis of the organizational adjustments the Netherlands armed forces have initiated after the ending of the Cold War, gives a holistic and evidence-based view of a major strategic change process in the public domain. Second, the Netherlands armed forces, as facilitators of this research project, receive in-depth information on how their organizational choices have worked out in practice and may take advantage of these insights. Third, Western armed forces in general may profit from the empirical findings of this study. The need to quickly adapt to the turbulent security environment is not a unique Dutch phenomenon, but part of a major trend influencing the entire transatlantic security community. Yet, conceptual models and general directions seem to dominate the international discussion on force transformation (McAllister Linn, 2005), neglecting the need of countries for information on practical experiences and results (Codner, 2005). Thus, a detailed analysis of the Netherlands armed forces' organizational approach to live up to the demands of the changing security environment may be a useful reference point for other Western armed forces following a similar developmental path.

1.5   THESIS SET-UP

The overall architecture of the thesis is based on the so called empirical cycle (De Groot, 1961). The general idea is that by repeatedly going though this cycle the available body of scientific knowledge is incrementally being improved. The cycle itself is presented in figure 1-1 and constitutes of five different phases. Van der Velde, Jansen, and Anderson (2004) describe these phases as follows. First *observation*, this is the phase in which the researcher makes a general inventory of the scientific organizational phenomenon being studied, based on existing theoretical insights. Second *induction*, in this phase the researcher tries through alternative theoretical reasoning to uncover not yet investigated correlations between existing theoretical concepts or variables. Third *deduction*, this is the phase in which the researcher finalizes his process of theoretical conjecture by formulating specific, testable hypotheses. Fourth *testing*, within this phase actual empirical inquiry must help the researcher in determining the value of his hypotheses by analyzing if they are being confirmed or have to be rejected. Fifth *evaluation*, in this phase the researcher reflects upon the added value of his newly discovered theoretical insights regarding the tenability in different contexts and situations.
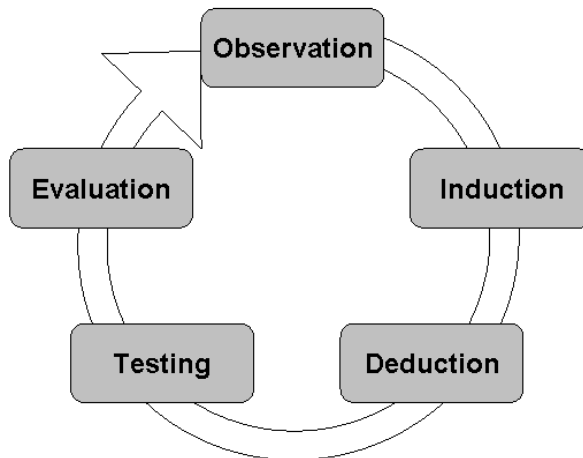
Figure 1-1: The empirical cycle
(De Groot, 1961)

So far, the theoretical contributions to the Dynamic Capabilities Approach have focused on the first three phases of the empirical cycle. Due to a lack of empirical testing, phase four and five, the Dynamic Capabilities Approach has not yet received the status of a sound theoretical construct. On the contrary, its position has frequently been challenged in the academic community of business research. For example, Williamson (1999:1093) states that "there being no apparatus by which to advise firms on when and how to reconfigure their core competences, the argument relies on ex post rationalization: show me a success story and I will show you (uncover) a core competence." Priem and Butler (2001) have also taken on the challenge of examining the theoretical state and the usefulness of the capability perspective for strategic management research. They conclude that it does not presently meet the empirical content criterion required of theoretical systems. As a result the competence and capability perspective remains tautological and vague and appears to be a fad of management scholarship. Yet, apart from their harsh critique, they also acknowledge the added value of the approach for business strategists. One of their main suggestions, in this respect, is that by concentrating on answering the 'how' questions with strong empirical data the perspective might still achieve a solid theoretical status and become a powerful strategic management tool.

This study aims to go through the empirical cycle in its entirety. In order to do so, conceptual knowledge that already exists is used to fill-in phase one, two, and three and come up with relevant testable hypotheses. The testing and evaluating steps of the phases four and five are linked to a specific case. As mentioned earlier, the Netherlands armed forces are selected as a typical example of a quick response organization from which commercial organizations confronted with hypercompetition can learn. In short, this military organization has to be capable of functioning effectively within all kinds of turbulent crisis arenas, in which it has to cope with environmental forces that could be interpreted as extreme metaphors of the conditions that commercial organizations are also confronted with when competing in a hypercompetitive business setting. The study's main assumption is that the meta organizational determinants that are used to combine strategic flexibility with continuous operational effectiveness probably have an added value in the less extreme business context as well.

The general structure of the empirical cycle has been transformed into the concrete research design presented in figure 1-2.

Following this introductory chapter, chapter 2 is devoted to answering the first sub-question and has a theoretical character. This part ends with a comprehensive research model of the key organizational determinants to deal with environmental turbulence.

Chapter 3 covers the general research strategy and the methodological foundations of the empirical study. In this chapter the study's research design will be expounded, explaining which research techniques have been used and why.

Chapter 4 is an empirical chapter. Based on a large-scale survey this chapter will answer the second sub-question. To be precise, the research model will be related to the Netherlands armed forces' crisis response performance, and its proposed interrelationships will be tested statistically within this specific military domain.

In chapter 5 the third research question will be answered. In this chapter the study's main variables are being discussed with representatives of the Netherlands armed forces' senior management to derive concrete policy implications. Eighteen high-ranking officials, military and non-military, of the Dutch Ministry of Defense have been interviewed for this purpose.

In chapter 6 the theoretical value of the research findings is being discussed. This chapter contributes to the development of the Dynamic Capabilities Approach by discussing the pros and cons of specific organizational determinants in dealing with environmental turbulence.

Chapter 7 concludes the thesis with answering the central research question. Furthermore, in this chapter practical recommendations will be made to the Netherlands armed forces' policymakers.
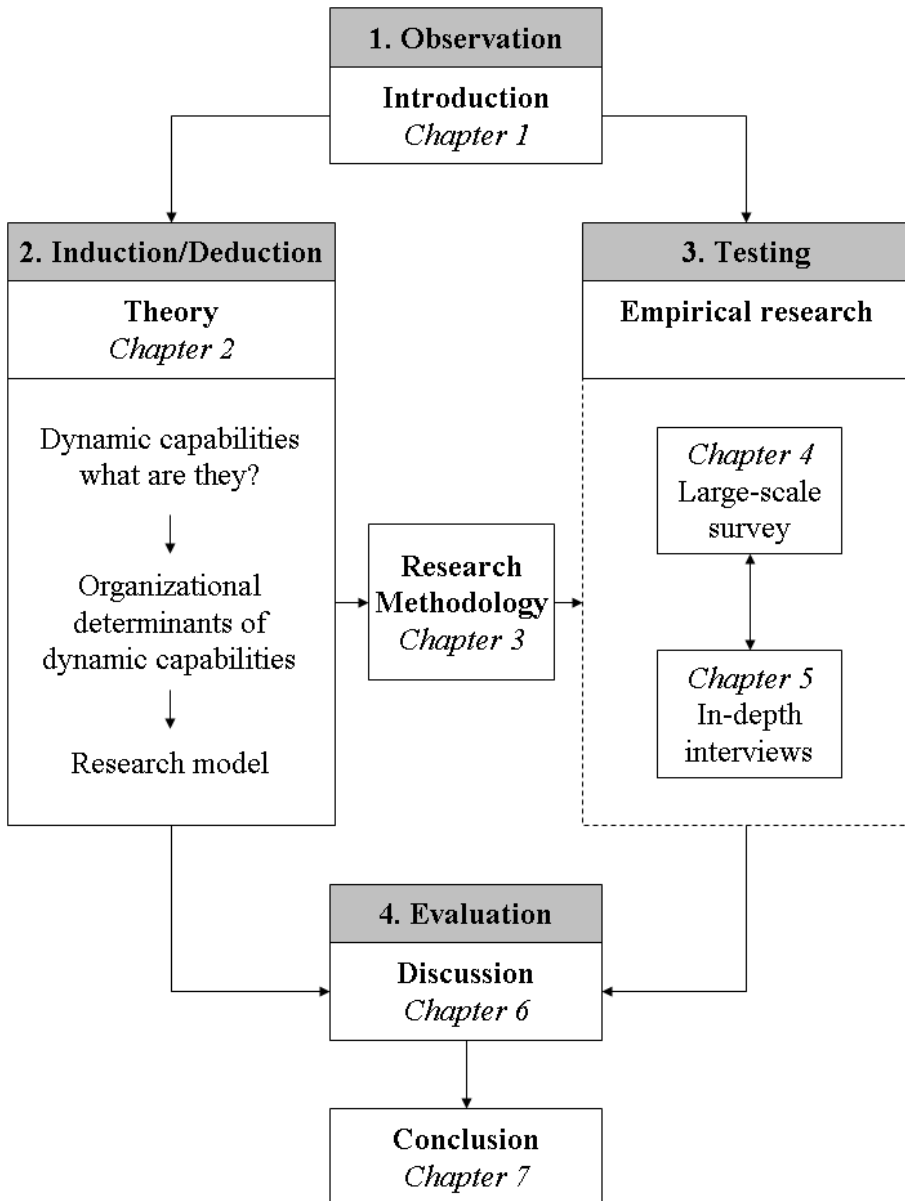
Figure 1-2: Structure and overview of the study

CHAPTER 2   ORGANIZATIONAL DETERMINANTS

2.1   INTRODUCTION

The previous chapter has explained that, so far, the Dynamic Capabilities Approach has paid little attention to the functioning of dynamic capabilities over a longer period of time. Especially the question of how consecutive temporary advantages can be created, without running the risk of becoming organizationally exhausted, has remained unanswered. It could be argued that organizational determinants play a central role in this balancing act. After all, when everything in the organization has to be put upside down for each attempt to create a temporary advantage, the organization is in serious jeopardy of becoming fatigue, because of all this bending, stretching, and changing. This chapter aims to uncover those key organizational determinants that stimulate organizational learning and support architectural adaption while simultaneously organizational stability is being safeguarded. In order to derive these determinants the *inside-out* strategic management paradigm has been selected as the study's theoretical point of reference, because this is the research stream from which the Dynamic Capabilities Approach originates.

The chapter is structured as follows. First, the chapter goes deeper into the evolution of the concept of dynamic capabilities. Second, the concept itself will be unraveled, focusing on the relationship between capabilities, resources, routines and processes, and on the fact that dynamic capabilities can either have a search and selection function or a configuration and deployment function. Third, based on the assumption that ambidexterity is a crucial organizational dynamic capability to strive for, when in hypercompetition, key organizational determinants supporting ambidexterity's contradictory demand of combining organizational change or exploration with organizational stability or exploitation are investigated. Within this discussion *absorptive capacity* and *modular organizing* are being introduced as important determinants. Existing literature makes clear that both determinants have the potential to activate a combination of operational, structural, and strategic flexible dynamic capabilities, concretizing the organizational ambidexterity demand. Moreover, *lateral*

coordination is being presented as a complementary organizational determinant that acts as a facilitator for both absorptive capacity and modular organizing. Fourth, the chapter pays specific attention to the relative effects of the different determinants, appointing predominance to absorptive capacity because of its overarching orchestration role. Fifth, apart from the fact that absorptive capacity and modular organizing support the activation of a mixture of dynamic capabilities, the chapter explains that these two determinants also have the built-in capacity to convert from a prudent to a more ad hoc way of reacting to environmental opportunities or threats. Based on all this theoretical reasoning a comprehensive research model is being presented in the chapter's final paragraph.

2.2   THE EVOLUTION OF DYNAMIC CAPABILITIES

The development of increasing hypercompetition within the business arena has resulted in doubts on the relevancy of the leading paradigm of successful competitive behaviour. Since roughly the 1980s the strategic management community had taken a strong governance perspective on business competition. In short, scholars propagated that organizations incrementally had to react to strategic developments and specific actions of rivalling firms to constantly create a fit with the surrounding business environment (Andrews, 1971; Ansoff, 1965; 1998). Organizations had to look for ways to keep restoring the status quo between environmental demands and organizational performance, aiming for a strong long term competitive position. In this process a key role was appointed to the organization's senior management. First, this management had to strategically position the organization within its industry or sector, taking forces into account such as the power of buyers and suppliers, the threat of new entrants and substitute products or services, and the competitive moves of rivalling firms (Porter, 1980). Second, senior management was held responsible for utilizing the tools of game theory to shape the way in which the strategic conflict was being fought, such as making specific investment, patenting, pricing, and advertising decisions (e.g. Dixit, 1980; Gilbert & Newberry, 1982; Milgrom & Roberts, 1982; Schmalensee, 1983). In hindsight, Hamel and Prahalad (1994) refer to the outside-in approach, emphasizing the fact that organizations primarily responded to opportunities in the market environment that suited their existing organizational resources and competences best.

Since the 1990s this ultimate goal of achieving a long term defensible competitive position through a combination of incremental strategic manoeuvring and organizational change has been losing ground rapidly. The shortening of product lifecycles, converging markets, globalization and customization have made the business environment more complex and volatile than ever before. These new circumstances asked for the organizational ability to radically change, innovate, and to rapidly create alternative strategic options (Sanchez, 1993); demands that could not be supported enough by the prevailing outside-in approach.

Based on the reinvention of Penrose's (1959: 24) early description of the organization as a "collection of productive resources", the strategic management focus gradually shifted towards internal organizational aspects as active drivers for strategic renewal. Wernerfelt (1984) was one of the first scholars showing renewed interest in analyzing firms from the resource side. He has introduced the Resource-Based View of the firm (RBV), in which he focuses on the relationship between profitability and resources, and ways to manage the firm's resource position over time. His work has been a starting point for others to elaborate on the added value of resources in creating competitive advantages.

Barney (1991: 101), one of Wernerfelt's predominant followers, defines *firm resources* as "all assets, capabilities, organizational processes, firm attributes, information, knowledge, etc. controlled by a firm that enable the firm to conceive of and implement strategies that improve its efficiency and effectiveness". Furthermore, he explains that resources can be categorized into three groups: physical capital resources (e.g. a firm's infrastructure and technological equipment), human capital resources (e.g. the know-how of a firm's staff and managers), and organizational capital resources (e.g. a firm's planning and control system). He stresses the fact that to achieve sustained competitive advantage a firm must exploit those resources that add value, are rare, difficult to imitate, and non-substitutable. Hamel and Prahalad (1994) have named this RBV the inside-out approach; for, it is the stretching and leveraging of internal organizational resources and competences that has to create new opportunities in the business environment. The competence perspective on gaining competitive advantage has in the following years been embraced

by many other business researchers (e.g. Combs & Ketchen Jr, 1999; Litz, 1996; Powell, 1992; Rindova & Fombrun, 1999).

However, soon after the introduction of the RBV its universal rule of exploiting unique resources to create phases of sustainable competitive advantage has also been brought up for debate. In a turbulent business environment a large stock of valuable resources is nice to have, but, according to Teece, Pisano, and Shuen (1997), it does not make the real difference. Pointing to firms that have actually been successful in global competitive battles, they explain that what organizations really need to excel are dynamic capabilities. They stress that competing is not a static game or analysis. It is a dynamic process of developing, accumulating, combining, and protecting unique skills and capabilities. What organizations, therefore, should pursue, in a business environment that continuously changes, are capabilities that help to pro-actively shape the competition process. To be more precise, capabilities are needed that are dynamic so that they can help to repetitively break the existing competitive status-quo and create short-term consecutive temporary advantages. In order to achieve this situation of continuous strategic renewal Zollo and Winter (2002) stress the fact that dynamic capabilities generally arise from an organization's ability both learn and unlearn. Table 2.1 summarizes the development of competitive paradigms since the 1980s.

	Outside-in approach	Inside-out approach	
		Resource Based View	Dynamic Capabilities View
Leading scholars	Porter (1980) Ansoff (1965) Andrews (1971)	Wernerfelt (1984) Barney (1991)	Teece (1997; 2007) Winter (2003) Helfat et al. (2007)
Strategic aim	Create defensible long term position	Create phases of sustainable advantage	Create consecutive temporary advantages
Competitive focus	Industry-level forces and strategic moves	Unique resources and competences	Dynamic capabilities
Managerial ambition	Incremental strategic adjustments	Waves of strategic renewal	Ongoing strategic renewal
Key adjective	Reactive	Adaptive	Proactive
Key verb	Fitting	Stretching	Learning

Table 2-1: Strategic management paradigms
Derived from López (2005) and Hamel and Prahalad (1994)

2.3   DYNAMIC CAPABILITIES, WHAT ARE THEY?

Now that we know why and how the idea of dynamic capabilities has entered the strategic management domain, the next step is to explain what dynamic capabilities actually are and how they work. In a recent review on dynamic capabilities Helfat, Finkelstein, Mitchell, Peteraf, Singh, Teece, and Winter (2007: 4) define a dynamic capability as follows. "*A dynamic capability is the capacity of an organization to purposefully create, extend, or modify its resource base*". A key element in this definition is the organization's resource base, which they describe as "all tangible, intangible, and human resources, as well as the capabilities which the organization owns, controls, or has access to" (Helfat, et al., 2007: 4). Two important nouns in this second definition are *resources* and *capabilities*.

The former refers to firm-specific assets crucial for the 'input-throughput-output' process, which can be categorized into physical resources, financial resources, human resources, and intellectual resources (e.g. Johnson, Scholes, & Whittington, 2006). The latter refers to "the ability of an organization to perform a coordinated set of tasks, utilizing organizational resources, for the purpose of achieving a particular end result" (Helfat & Peteraf, 2003: 999). In other words, linking resources in a coherent way to reach a certain organizational goal transforms resources into capabilities.

At the heart of this transformation process are organizational *routines* (Helfat & Peteraf, 2003; Winter, 2003; Zollo & Winter, 2002) or sets of routines called processes (Eisenhardt & Martin, 2000). Zollo and Winter (2002) differentiate between operating routines and search routines. "The first type of routine involves the execution of known procedures for the purpose of generating current revenue and profit, while the second seeks to bring about desirable changes in the existing set of operating routines for the purpose of enhancing profit in the future" (Zollo & Winter, 2002: 341). Manufacturing or supply chain routines are, because of their repetitive stable patterns of behaviour, presented as typical examples of operating routines. Routines or sets of routines that incorporate change, such as research and development, strategic decision making, and alliance building, are placed under the umbrella of search routines. There is broad consensus about the fact that because of their change capacity search routines are directly related to dynamic capabilities. They are perceived as the underlying processes by which dynamic capabilities are put into action, or as mechanisms to develop new or modify existing capabilities.

Furthermore, two categories of processes or routines can be derived from the definition introduced at the beginning of this paragraph, namely search and selection processes and configuration and deployment processes. The former deal with content related 'what' questions about the organization's strategic direction. Organizations have to activate the learning capabilities to gather knowledge from the environment and translate this information into viable new business solutions on a continuous basis. This intentional search and selection process is captured in the definition's words: "to purposefully create, extend, or modify". However, to successfully execute the managerial plans the organization also needs a "resource base" that has the capacity to keep adjusting to the fluctuating strategic demands.

Therefore, the latter processes, relate to "how" questions, regarding the configuration and deployment of new or existing resources in such a way to achieve congruence with the changing competitive moves. This indicates that a tight interaction between search and selection and configuration and deployment processes exists. They, therefore, also should be analyzed in close connection to judge their practical outcome properly. Helfat et al. (2007) speak of combining content and process to understand the functioning of dynamic capabilities.

This assumption seems appropriate. After all, under disruptive circumstances, "where management must periodically destroy what has been created in order to reconstruct a new organization better suited for the next wave of competition or technology" (Tushman & O'Reilly, 1996: 24), balancing search and selection with configuration and deployment will probably be the key to repetitive success. The crucial point is that too much emphasis on strategic change, innovation and renewal, without properly embedding the change strategies in the organization may create chaos. Yet, a too strong focus on improving existing organizational routines stimulates conservatism and may lead to rigidity in the organization (Volberda, 1998; Weick, 1979). Both directions are dangerous and can lead to business decline (Hambrick & D'Aveni, 1988). To overcome this dilemma Ashby (1956) beliefs that organizations need a variety of dynamic capabilities at least as great as the variety of disturbances they encounter from the environment.

Following this line of reasoning, Volberda (1996, 1998) argues that when organizations are faced with hypercompetition they should simultaneously pursue three different types of flexible dynamic capabilities. First, organizations need strategic flexible dynamic capabilities to react swiftly and adequately to strategic, competitive developments. He points, for example, to processes or routines that help to dismantle existing strategies, apply new technologies, develop new products, seek new product-market combinations, and anticipate competitive changes. It could be argued that Volberda's (1998) strategic manoeuvring capabilities rely on the search and selection processes advocates of the dynamic capabilities view refer to.

Second, organizational performance under turbulent circumstances also depends on structural flexible dynamic capabilities, meaning that the

organization's architectural system must have sufficient built-in flexibility to reconfigure the resource base in response to changes in demand or source capacity. In this respect one could think of routines that, for example, stimulate customized production, job rotation, co-makership, and co-design. Third, organizations need operational flexible dynamic capabilities to cope with the everyday instabilities within their task environment. This last form of capabilities asks for routines that, for instance, can help to vary the organization's production volume, keep inventories under control, or support the deployment of flexible workers. There seems to be a strong relationship between the activation of structural and operational dynamic capabilities and organizational processes focussing on configuration and deployment.

In order to cope with hypercompetition Volberda, furthermore, explains that this mix of different types of flexible dynamic capabilities should possesses a certain form of hierarchy. His main assumption is that strategic renewal and organizational adaptation can only prosper if, above all, the controllability of the organization is safeguarded. In this respect, a sort of causal hierarchy is expected, starting with the operational flexible dynamic flexible capabilities that lay the foundation for the activation of structural flexible dynamic flexible capabilities; and subsequently the organization's structural flexible dynamic capabilities create a solid base for the deployment of strategic flexible dynamic capabilities. Only when this hierarchical aligned mixture of dynamic capabilities exists strategic and structural flexible dynamic capabilities can fulfil their disequilibrium-creating key roles successfully.

Because of the tight relationship between search and selection and configuration and deployment processes dynamic capabilities seem to become rather idiosyncratic or firm-specific. Yet, Eisenhardt and Martin (2000) make clear that this assumption is only partially true. Based on a number of concrete business examples they explain that dynamic capabilities are in detail certainly unique but that the underlying processes can also be quite common across firms. Using cross-functional teams is, for example, a common approach for many organizations to stimulate the capability of new product development. However, within this common direction organizations have been able to positively distinguish themselves. Some organizations specifically excelled in assembling effective multi-

functional teams, some in applying workable knowledge creation routines within their teams, or others in effectively using their team leaders to buffer the team from outside interferences. This example shows that a dynamic capability and its underlying processes can be equal across firms, but it is the firm-specific interpretation of the actual routines to use that leads to a different practical emphasis. Figure 2.1 schematically summarizes the insights discussed in this paragraph. These insights have also led to the study's first hypothesis:

Hypothesis 1: Organizations that possess a combination of strategic, structural, and operational flexible dynamic capabilities perform successfully within turbulent environments.
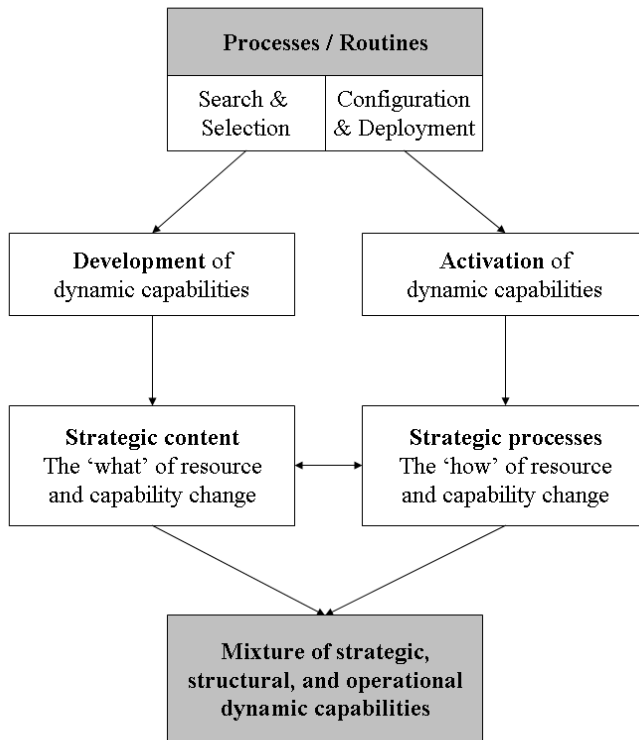
Figure 2-1: The 'what' and 'how' of dynamic capabilities
Derived from Helfat et al. (2007)

2.4   ORGANIZATIONAL DETERMINANTS OF DYNAMIC CAPABILITIES

Helfat and Peteraf (2009) have recently pointed out the basic chain of logic in leading dynamic capabilities articles (see figure 2.2 below). As already mentioned, they explain that dynamic capabilities rest on organizational processes. These processes are schematically presented as the determinants of the organization's search, selection, reconfiguration, and deployment capabilities. It must, however, be said that based on earlier work of Teece (2007) Helfat and Peteraf use the terminology opportunity identification, investment, and reconfiguration capabilities instead of search, selection, reconfiguration, and deployment capabilities.
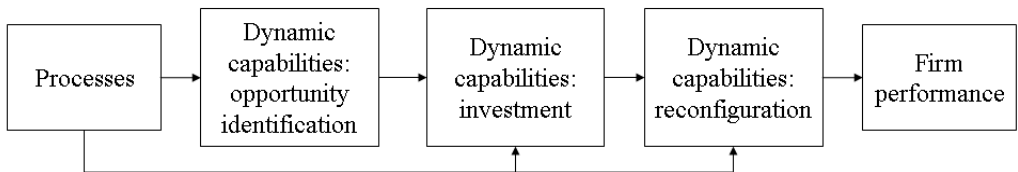
Figure 2-2: The logical chain of dynamic capabilities
Derived from Teece (2007) and Helfat & Peteraf (2009)

So far, the academic debate on dynamic capabilities has focused on stimulating strategic renewal or innovation. The central idea is that only through innovative business concepts, new products or product features firms can challenge their opponents and stay ahead of the game. Helfat and Peteraf (2009) explain that the existing body of work engages the innovation process from three different angles. First, one way to become more innovative is for organizations to improve their ability to identify new business opportunities, which means investing in dynamic capabilities, such as external knowledge integration (Tripsas, 1997), market orientation (Menguc & Auh, 2006), strategic political management (Oliver & Holzinger, 2008), and strategic decision-making (Adner & Helfat, 2003). Second, organizations can also concentrate on their potential to actually transform promising business opportunities into commercially

viable solutions. Dynamic capabilities, such as research and development (Helfat, 1997), new product development (Deeds, et al., 1999), and acquisition (Capron, Dussauge, & Mitchell, 1998), dominate this research stream. Third, organizations can stimulate innovation by the reconfiguration of new and existing processes and routines. Within this theoretical discussion dynamic capabilities, such as morphing (Rindova & Kotha, 2001), patching (Eisenhardt & Brown, 1999), and alliance-building (Draulans, De Man, & Volberda, 2003; Gerwin & Ferris, 2004; Powell, Koput, & Smith-Doerr, 1996; Sivadas & Dwyer, 2000), are being presented. The advantage of these contributions is that organizations receive information on specific dynamic capabilities that stimulate innovation. Yet, refocusing on figure 2-2, the academic main focus seems to be on the dynamic capabilities squares of opportunity identification, investment, and reconfiguration.

Concentrating on the box 'processes', recently the idea has taken root that ambidexterity is an important organizational dynamic capability to invest in when in hypercompetition (Jansen, Tempelaar, Van den Bosch, & Volberda, 2009; O'Reilly & Tushman, 2008). In short, ambidexterity means two-headedness in a sense that organizations should combine their striving for innovativeness with safeguarding organizational alignment (Benner & Tushman, 2003; He & Wong, 2004; Holmqvist, 2004; Rivkin & Siggelkow, 2003; Sidhu, Commandeur, & Volberda, 2007; Tushman & O'Reilly, 1996). Organizational learning and organizational design are the two most commonly mentioned drivers for achieving organizational ambidexterity. In this respect, Hanssen-Bauer and Snow (1996: 413), state that "without the ability to learn and to restructure internal and external relationships, companies in hypercompetitive environments inevitably will lose to compete successfully".

Generally speaking, business scientists believe that organizational learning is a crucial organizational ability for the development of dynamic capabilities and the evolution of operating routines (Zollo & Winter, 2002). Complementary to organizational learning organizational design has been introduced as an important enabler to deal with environmental turbulence, in a sense that an organizational framework with reconfiguration possibilities is needed to support the organization's successive strategic changes (Staber & Sydow, 2002). In line with these ideas, Volberda (1996,

1998) identifies the managerial task of creating dynamic capabilities and the organizational design task of safeguarding the controllability of the organization as two crucial drivers to merge ambidexterity's contradictory demands of organizational change and stability. In the next two paragraphs absorptive capacity and modular organizing are being introduced as organizational determinants that have the potential to respectively fulfil this managerial and organizational role. Absorptive capacity is being presented as a meta-managerial learning ability that supports the process of creating a mixture of dynamic capabilities needed to cope with the demands of the organization's varied business environment. The selection of modular organizing is based on Teece's (2009: 44) idea that an architectural framework based on the principles of decentralization, near-decomposability, and loose coupling could serves as a "key (micro)foundation of dynamic capabilities" because of the ability to continuously align and realign assets.

Absorptive Capacity

The discussion on organizational learning brings to the surface the problem of openness that all organizations have to face. Making sense of what the business environment is about and relating these ideas to one's own strategic position, paradigm, and way of doing things is an ongoing process for every organization (Weick, 1979). In this respect, a growing body of literature suggests that all organizations faced with the dynamism, complexity, and uncertainty of today's business environment need to strive for *absorptive capacity* as a sort of meta-learning capability; for it is the organization's interpretative capability that really makes the difference. After all, in the end it all comes down to answering the "what" and "how" questions in the best possible way and consequently choosing those strategic, structural, and operational dynamic capabilities to invest in that suit the environmental dynamics best.

Cohen and Levinthal (1989) were the first ones to introduce the concept of absorptive capacity. They explain that: "most innovations result from borrowing rather than invention……The ability to exploit external knowledge is thus a critical component of innovative capabilities. We argue that the ability to evaluate and utilize outside knowledge is largely a

function of prior related knowledge……Thus, prior related knowledge confers an ability to recognize the value of new information, assimilate it, and apply it to commercial ends. These abilities collectively constitute what we call a firm's *absorptive capacity*" (Cohen & Levinthal, 1990: 128).

So, according to them an organization's absorptive capacity depends above all on its level of prior related knowledge. One of their main assumptions is that organizational learning is a cumulative process, from which the outcome improves when it is based on what is already known. Another key assumption they make is that an organization's possession of related expertise will help to better interpret signals coming from the environment, which subsequently helps to proactively develop viable new business opportunities.

After the introduction of their basic idea Cohen and Levinthal's construct has gotten a lot of academic support. For example, Lane and Lubatkin (1998) divide the concept of absorptive capacity into three sub capabilities: (1) the ability to recognize and value new external knowledge (know-what); (2) the ability to assimilate new external knowledge (know-how), and (3) the ability to commercialize new external knowledge (know-why). Zahra and George (2002) have further unravelled these capabilities and introduced knowledge acquisition, assimilation, transformation, and exploitation as the four distinct dimensions of absorptive capacity.

Knowledge acquisition refers to an organization's processes and routines that help to identify and acquire external knowledge of strategic importance. Knowledge assimilation refers to those organizational processes and routines that support analyzing, processing, interpreting, and understanding the externally obtained knowledge. Knowledge transformation refers to the possession of specific organizational routines and processes that facilitate the process of combining existing knowledge with the newly acquired and assimilated knowledge. Knowledge exploitation refers to routines and processes that make it possible for an organization to incorporate the newly acquired, assimilated and transformed knowledge into its operations. These knowledge processes link the concept of absorptive capacity to the idea that deliberate learning stimulates the evolution of dynamic capabilities. In this respect, Zollo and

Winter (2002) argue that dynamic capabilities emerge from a recursive learning cycle, in which knowledge evolves through a series of interconnected stages similar to the ones discussed above.

On the whole, it could be argued that knowledge acquisition and assimilation have much in common with the "what- function" of organizational search and selection processes. In addition, knowledge exploitation and transformation resemble the "how-function" of organizational configuration and deployment processes introduced by advocates of the dynamic capabilities view. Basically, absorptive capacity is being presented as an organizational learning ability with the same two-headed focus. First, there is the strategic focus of deriving new commercial advantages from externally obtained knowledge. Second, there is the practical focus of how the commercial plans can be concretised into usable organizational practices. Generally speaking, absorptive capacity represents an organizational meta-learning ability that serves the goal of comprehensive interpretation before the actual process of organizational enactment is put into motion. To be more precise, it acts as an organizational determinant that fuels and directs the organization's strategic decision making process by helping to successfully answer the "what" and "how" questions. By doing so, absorptive capacity directly seems to contribute to the creation of a fit between the organization's strategic, structural, and operational dynamic capabilities.

Hypothesis 2: Absorptive capacity is positively related to an organization's strategic, structural, and operational flexible dynamic capabilities.

Modular Organizing

In the search for alternative organizational structures Daft and Lewin (1993: i) explain that: "The trend appears to be moving away from the paradigm within which organizations strive for mass production efficiencies, hierarchical organization, and bureaucratic structures that provide central control over activities divided into small parts". The traditional, bureaucratic structure is, according to them, loosing ground rapidly, because it cannot combine the high levels of speed, quality, and productivity needed in today's highly competitive, technology-driven,

global businesses arena. Moreover, it does not support the organizational ability to change rapidly and adapt easily to the continuously changing competitive circumstances. The new hypercompetition paradigm suggests that organizations have to aim for forms and functions that help them to rapidly attract and give up competencies (Baker, 1992; Ciborra, 1996).

In this search for new organizational structures Schilling (2000) has identified three factors, typical for the hypercompetitive environment, that have stimulated the migration toward increasing modularity. First, environmental urgency, divided into speed of technological change and increasing global competitive intensity, has pushed organizations to look for ways to innovate faster and to adjust easier. Second, heterogeneity of customer demands, in desired function or scale, has stimulated an organizational focus on customization. Third, the heterogeneity of inputs, such as differential capabilities among firms and diversity in technological options, has boosted inter-firm product cooperation.

Table 2-2 gives some definitions of modularity. All the definitions stress the fact that modularity is about independent or autonomous subsystems functioning together. The concept has gained importance because of its adaptability potential needed in today's turbulent business environment. Schilling (2000) explains the advantage of a modular system to be the capability of separating and recombining independent components into new configurations. Modular principles have been adopted by a number of industries; examples are: Woolsey (1994) for the aircraft industry, Lima (1997), Marx et al (1997), Nevins and Whitney (1989), and Tully (1993) for the automobile industry, Galvin and Morkel (2001) for the bicycle industry, Cusumano (1991) and Greenbaum (1997) for the computer software industry, and Langlois and Robertson (1992) and Baldwin and Clarke (1997) for the computer hardware industry.

Modularity theorists base their thinking primarily on Simon's (1962) work on the architecture of complexity. Simon sees all complex systems – biological, technical, or social- as hierarchically nested entities. He explains that each system is composed of interrelated finer subsystems, which in turn consist of finer subsystems themselves, and so on until ultimately the level of elementary particles is reached. The challenge in modular design is to find a structure that yields the best system

decomposition, meaning to set the boundaries in such a way that interdependencies between subsystems are minimized and the system can almost be cleanly decomposed (Langlois, 2002). This principle, known as near-decomposability, lays the foundation for the modularity design's potential to simultaneously activate strategic, structural, and operational flexible dynamic capabilities (Garud, Kumaraswamy, & Langlois, 2003; Karim, 2006; Sanchez, 1996).

Author	Definition
Samchez & Mahoney (1996)	*"Modularity is a special form of design which intentionally creates a high degree of independence or 'loose coupling' between component designs by standardizing component interface specifications."*
Baldwin & Clark (1997)	*"Modularity is building a complex product or process from smaller subsystems that can be designed independently yet function together as a whole."*
Schilling (2000)	*"Modularity is a general systems concept: it is a continuum describing the degree to which a system's components can be separated and recombined, and it refers both to the tightness of coupling between components and the degree to which the "rules" of the system architecture enable (or prohibit) the mixing and matching of components."*
Langlois (2002)	*"Modularity is a general set of design principles for managing the complexity of large-scale interdependent systems. It involves breaking up the system into discrete chunks that communicate with each other through standardized interfaces or rules and specifications."*

Table 2-2: Definitions of modularity

Sanchez (1995) argues that resource flexibility is an important source for achieving strategic flexibility. He explains that resource flexibility increases when: "there is a larger range of alternative uses…..the costs and difficulty of switching are lower…..the time required to switch is lower".

Organizational modularity is a typical design strategy that has the potential to create these conditions. Based on the principle of near-decomposability resources are being confined to modular component structures. In general, a module can be seen as an independent sub system, except for the restriction that the output has to comply with the general rules or specifications of the overall system it is entirely free in its own design. In this respect, Brusoni (2005: 1886) states that: "each module, at the extreme, could become the sole business of a specialist firm, which would have complete design authority over the specific module on which it focuses". Standardized interfaces allow the mixing and matching of these independent modules into different constellations. This ease of recombining modules has stimulated the development of different sorts of strategic flexible dynamic capabilities. For example, modular design has made it possible to rather easily invent and apply new technologies, develop new products, and add new features to existing products (e.g. Brusoni, 2005; Langlois & Robertson, 1992; Loch, Terwiesch, & Thomke, 2001; Sanchez, 1995, 1996; Sanchez & Mahoney, 1996; Ulrich, 1995; Worren, Moore, & Cardona, 2002).

To understand the relationship between modular design and the activation of structural flexible dynamic capabilities it is useful to focus on the contrast with traditional design strategies. The traditional design methodology is characterized by highly integrated and tightly coupled component designs. Sanchez et al. (1996) explain that tightly coupled component designs require intensive managerial coordination, since a change in the design of one component is likely to require extensive compensating changes in the design of many interrelated components. Sanchez et al. (1996: 65) states that modularity "is a special form of design which intentionally creates a high degree of independence or 'loose coupling' between component designs by standardizing component interface specifications." The standardization process creates, what Sanchez et al. (1996) call embedded coordination. Basically, by controlling only the required output of components, effective coordination can be achieved without the continual exercise of managerial authority.

Modularity's underlying philosophy of loose coupling has positively influenced the activation of certain structural flexible dynamic capabilities. For example it has offered organizations the possibility to reorganize their

internal production processes in such a way that economies of scope and scale could be obtained simultaneously (Brusoni & Prencipe, 2006; Langlois, 2000). Moreover, the widely embraced standardization approach has also stimulated the development of modular value networks between organizations (Anand & Daft, 2007; Krikke, Le Blanc, & Velde, 2004; Majumdar, 1997; Mikkola, 2003). In this respect, Schilling and Steensma (2001) argue that organizations increasingly rely on modular organizational forms, such as contract manufacturing, alternative work arrangements, and alliance formations, to create the adaptability potential needed to operate successfully within the current turbulent competitive business environment. They state that "by breaking their hierarchies down into components that can be fluidly recombined in a variety of production configurations, firms can more quickly adapt to diverse customer needs and changing environments" (Schilling & Steensma, 2001: 1163).

The positive relationship between modular design and the activation of operational flexible dynamic capabilities also relates to the advantages of loosely coupled systems. According to Galbraith (1973) reducing the need to process information should be an alternative strategy for organizations to follow when uncertainty keeps rising to a level that using basic managerial techniques alone is no longer sufficient. One of the main options that he, in this respect, proposes is that organizations should try to create self-contained tasks. Modularity's principle of designing a system made up of loosely coupled component structures strongly complies with Galbraith's idea. Generally speaking, by using fixed, self-supporting, autonomous modules and by controlling only the required output of these modules an organizational system is created that can benefit from specific advantages such as the localization of adaptation and trouble, and the reduction of costs for coordination (Orton & Weick, 1990; Weick, 1976). These advantages effectively seem to contribute to the generation of very useful operational flexible dynamic capabilities. In this respect, one could think of having the ability to deal with time delays, change production sequences, adjust the overall production process by using other materiel or production devices, and to react to short term fluctuations in a firm's level of activity by building in different sorts of slack (Perrow, 1984; Sagan, 1993).

Hypothesis 3: Modular organizing is positively related to an organization's strategic, structural, and operational flexible dynamic capabilities.

Lateral Coordination

Moreover, within the general debate on organizational learning and organizational design as key drivers to deal with hypercompetition collaboration processes play a predominant role. The main idea is that successful competitive performance depends strongly on the ability of organizations, business units, subsidiaries and functional departments to cooperate, share knowledge and jointly develop new products, services or technologies (Argyris, 1992; Ashkenas, Ulrich, & Kerr, 1995; Kogut & Zander, 1992). In this theoretical discussion on intra and inter-organizational networking lateral coordination is being presented as an organizational determinant that facilitates the organization's absorptive capacity as well as its modular organizing ability. In doing so, lateral coordination basically plays a twofold indirect role in the process of activating a mixture of strategic, structural, and operational flexible dynamic capabilities.

The facilitating role of lateral coordination on a firm's absorptive capacity asks for a refocus on the work of Zahra and George (2002). Apart from the introduction of the four dimensions of absorptive capacity, they also pay attention to its antecedents. Based on Cohen and Levinthal's (1990) seminal article, they argue that social integration mechanisms have a positive effect on organizational knowledge absorption, because they facilitate the flow of information within the organization. Cohen and Levinthal (1990) argue that although an organization's absorptive capacity strongly relies on the knowledge and learning skills of its employees, it is more than just the sum of the absorptive capacities of these individual members. Especially assimilating and exploiting newly acquired knowledge asks, according to them, for organizational structures, processes, and routines that stimulate the transfer of knowledge across and within subunits.

Todorova and Durisin (2007) have worked out this idea. They explain that each of the four dimensions of absorptive capacity can be conceptualized as a set of social interactions; and, therefore, the knowledge processes that take place between them have to be influenced by social mechanism. Lateral coordination is believed to be one of the most important social mechanisms involved. For example, Kogut and Zander (1992) argue that the process of transferring and sharing knowledge between different knowledge areas depends to a large extent on the presence of combinative capabilities. Lateral coordination, between different individuals and units is, in this context, being presented as a key combinative capability. Taking up Kogut and Zander's ideas, Van den Bosch, Volberda, and De Boer (1999) have hypothesized a strong direct effect of coordination capabilities on a firm's absorptive capacity. In follow-up research conducted at a European multi-unit financial services firm Jansen, Van den Bosch, and Volberda (2005) conclude that coordination capabilities specifically enhance the organization's potential for knowledge acquisition and assimilation.

The general idea that lateral coordination stimulates the transfer of knowledge, developing a richer knowledge environment and, consequently, increasing the level of innovation is also supported by various other empirical studies from outside the absorptive capacity domain. See for example, Van de Ven (1986) and Tsai (2002) point to the added value of informal lateral relations in the sharing of knowledge; Tushman (1977) discusses the effect of using liaisons as special boundary spanners on the process of organizational innovation; Cummings (2004) stresses the positive effect of multifunctional teams on external knowledge sharing; and besides liaison positions, Gupta and Govindarajan (2000) also mention the positive influence of task forces and permanent committees on the flow of knowledge across organizational boundaries.

Hypothesis 4: As an antecedent for absorptive capacity, lateral coordination is indirectly related to an organization's strategic, structural, and operational flexible dynamic capabilities.

Apart from its stimulating effect on an organization's absorptive capacity, lateral coordination also influences the organization's modular organizing potential. A point of concern worth mentioning regarding modular

organizational design is the fact that Baldwin and Clark (1997) have derived their modularity rules from the development of the IBM System/360 family of mainframe computers. By speaking in terms of rules and parameters, they have adopted a strong 'engineering' approach to modular design. The problem is that their technical insights coming from modular product design can only partially be applied in the context of social systems, such as team-based organizations.

Practical business experiences have shown that in reality Simon's (1962) concept of near-decomposability is difficult to achieve. Simon (1962) describes near-decomposability as breaking up the system in separate modules, whereas the interactions among the modules are weak but not negligible. Modularity theory strongly relates to this concept because it creates autonomous sub-units that can easily be recombined into other configurations. Ethiraj and Levinthal (2004b: 172) have analyzed modularity and innovation in complex organizational systems, and based on their research findings have come to the following conclusion: "Designers engage in acts of creation, but unlike a divine creator, they lack omniscience. Choices of modules are guesses about appropriate decompositions –decompositions that even in reality are only partial." Basically, they conclude that suitable partitions, capturing the nearly decomposable structure of complex organizational systems, are not self-evident. This leads to situations in which firms end up with organizational systems that are either characterized by an excessive level of integration or an overly refined level of modularization.

The fact that it is very difficult to create autonomous organizational modules puts a strain on the aspect of interfaces. So far, modularity theory has primarily focused on the need for compatible technology to achieve synthesis within modularly built products or inter-organizational value networks (Langlois & Robertson, 1992). However, one can imagine that to reach a satisfactory plug-and-play end state within a social system consisting of suboptimal organizational modules the coupling and de-coupling processes should not only be based on technical aspects, but also on organizational aspects (Hellström & Wikström, 2005).

Various scholars have pointed to lateral coordination as a crucial organizational mechanism to deal with this issue. For example, Mohrman,

Cohen and Mohrman (1995) argue that the complexity of today's multi-team collaboration structures asks for mutual adjustment with other teams, organizational elements, or incumbents. Ancona and Caldwell (1992) have acknowledged the importance of inter-team collaboration as well, and have, therefore, focused their scientific attention on the external activities teams use in the interaction with their task environment. They conclude that a combination of ambassador and coordinator activities positively influences team performance. The former category refers to activities such as protecting the team form outside pressure, persuading others to support the team, and lobbying for resources. The latter category refers to activities such as discussing problems with others, obtaining feedback, and negotiating with outsiders. All in all, their findings support the idea that lateral coordination is an important ability for teams to make local, ad-hoc choices on how to deal with problems, deviations and new information.

Sinha and Van de Ven (2005) have specifically linked the implications of today's hypercompetitive business environment to the aspect of work design within organizations and have come to the same basic conclusion. They argue that since outsourcing, relational contracts, strategic alliances, and value chain networks are becoming the predominant organizational form for doing work, "the use of cross-functional, non-hierarchical methods of integration is emerging to coordinate modular work designs that are distributed within and between organizations" (Sinha & Van de Ven, 2005: 393). Hoegl et al. (2004) have investigated this assumption in an actual modular, multi-team, project context. They have found out that task interdependencies, originating from a system's sub optimal architecture, indeed lead to a situation in which teams become dependent on the input of other teams for the execution of their main tasks. Teams, therefore, have to put extra energy into, for example, synchronizing technical data and attuning activities to meet their time schedules and stay within their budgets. Moreover, they stress the fact that many complex modular projects are characterized by high levels of uncertainty, which makes it necessary to have lateral coordination mechanisms available that help to effectively react to changing or new circumstances.

Hypothesis 5: As an antecedent for modular organizing, lateral coordination is indirectly related to an organization's strategic, structural, and operational flexible dynamic capabilities.

The relationship between Modular Organizing and Absorptive Capacity

Apart from their direct effects on the development of a mixture of different types of dynamic capabilities, strategic management theory also has hypothesized a strong interrelationship between modular organizing and absorptive capacity. Grant's (1996) identification of three different types of knowledge absorption has been the starting point of this assumed relationship. First, he mentions the scope of knowledge absorption that refers to the spectrum of specialized knowledge an organization has access to. Second, he introduces the flexibility of knowledge absorption that refers to the ability to tap into additional sources of knowledge or reconfigure an organization's existing knowledge base. Third, he recognizes the efficiency of knowledge absorption that refers to the productivity of a firm in utilizing the knowledge that its individual organizational members possess

Van den Bosch et al. (1999) have analyzed the impact of three basic organizational forms, the functional, divisional, and matrix form, on these different types of knowledge absorption. They argue that the functional form has a negative impact on absorptive capacity, because under turbulent circumstances the functional compartmentalization hampers the internal and external communication flow too much. The divisional form is perceived to have a moderate impact on absorptive capacity. On one hand the autonomy of divisions or business units stimulates decentralized reciprocity with the business environment; on the other hand the autonomous position of these subsystems could also handicap the transfer of knowledge between them. They believe the matrix form to have a positive impact on absorptive capacity, because matrix structures have the ability to combine functional expertise with the formation of rather autonomous (temporary) structures. This dual character enables the allocation of available means and persons to various projects, which positively influences the scope and flexibility of knowledge absorption (Van den Bosch, et al., 1999: 555). On the whole could be argued that the matrix form supports the demand of multiplexity better than the other organizational forms. Staber and Sydow (2002: 414) define multiplexity as "the number and diversity of relations between actors in organizations or inter-organizational networks". According to them, multiplexity is

important because it makes it possible to gain access to different sources of knowledge, improving the organization's innovative ability.

Van den Bosch et al. (1999) have conducted two qualitative case studies to analyze their hypotheses. They focused on the transformation process that two Dutch publishing firms have gone trough since the 1980s to develop from mainly folio businesses into hybrid businesses capable of commercializing both folio and new media products and services. The results show that during this process one of these publishers largely retained its functional design at the macro level. However, at the micro-level, within a newly erected new business development department, the organization increasingly started using inter and intra organizational project structures. This type of organizing is also being referred to as a project matrix design (Gobeli & Larson, 1987). The other publisher changed its macro structure twice. First, the functional form was abandoned and converted into a divisional form. Later, this divisional form was changed into a matrix design. For both publishers the decision to change their design characteristics was based on the fact that they wanted to increase their level of multiplexity.

It could be argued that the proposed mixing and matching merits of modular design strongly relate to the knowledge absorption advantages of the project matrix and the permanent matrix form discussed above. The general idea of product modularity is to be capable of creating new system configurations through the recombination of new or existing components. When this principle of reconfiguration is being applied to a context of modular organizing, organizational structures emerge that have matrix-like advantages. Using Karim's (2006: 799) words: "reconfiguring structures and their resources makes it possible for firms to use resources in new combinations, improving the effectiveness of resources and furthering innovation". So, here too functional expertise is being recombined into new temporary structures, stimulating organizational learning and innovativeness through the transfer and sharing of new and existing knowledge and resources.

Hypothesis 6: Modular organizing is positively related to absorptive capacity.

2.5   THE RELATIVE EFFECTS OF THE DIFFERENT DETERMINANTS

After having derived absorptive capacity, modular organizing, and lateral coordination from strategic management theory as three critical organizational determinants for dealing with environmental turbulence, the next step is to focus on their relative effects. Although the theoretical review has made clear that these three determinants in close connection are capable of activating a broad mixture of flexible dynamic capabilities, it is useful additional information for organizations to learn what the division of power is like between the three determinants. Moreover, existing research has hardly paid attention to the underlying organizational processes for activating dynamic capabilities, let alone giving insight into the relative power effects of usable organizational determinants.

The predominance of Absorptive Capacity

Lane, Koka and Pathak (2006) have assessed 289 papers on absorptive capacity. They argue that it is a key determinant that basically surpasses all organizational capabilities, processes, and routines. Initially absorptive capacity was introduced as a driver to improve an organization's R&D processes; and R&D spending was used as a concrete indicator for a firm's level of absorptive capacity (Cohen & Levinthal, 1990). By relying solely on this performance indicator Lane et al. (2006) argue that the concept has too much been treated as a static resource instead of the meta-learning capability that follow-up research presents it to be. In this respect, they explain that the commercial outputs that absorptive is made responsible for exceeds the development of new products, technologies, or patents. Knowledge outputs with commercial value, such as new business concepts, technical innovations, and operational improvements can also be the outcome of a firm's absorptive capacity. This general ability makes absorptive capacity a managerial dynamic capability of strategic importance. After all, facilitating the transfer, sharing, integration, and creation of knowledge in order to stir-up the existing status-quo by creating innovating business solutions, covering the organization's entire sphere of influence, assumes it to be a deliberate process with an integral focus. It can be perceived as a meta-determinant that on a repetitive basis helps the

organization's senior management to move from its starting position to a new 'desired' competitive end state, taking into account the search and selection dimension as well as the configuration and deployment dimension of dynamic capabilities.

Approaching absorptive capacity as a key managerial learning capability, that stimulates a wide range of organizational reactions, reaching from the strategic down to the operational level, ties it to the construct of *asset orchestration* brought forward by advocates of the dynamic capabilities approach. In short, Helfat et al. (2007: 26) state that an important managerial task is "to collect information, analyze it, synthesize it, and act on it inside the firm" in order to successfully anticipate changes in the competitive environment. So, assessing signals from the environment, relating this information to one's own business processes, and then translating the insights gathered into new viable business solutions is basically what both asset orchestration and absorptive capacity are about. It could even be argued that asset orchestration and absorptive capacity refer to the same capability.

Given the fact that absorptive directs both the organization's strategic moves and the reorganization of its internal routines and processes it is probably fair to say that this orchestration function makes it the most important organizational determinant of all. A significant part of its function is, after all, to set the preconditions for subordinate capabilities, routines, and processes. To be more specific absorptive capacity has to make it possible to understand the demands coming from the environment, translate these demands into, for example, a suitable organizational architecture, and ultimately decide on a number of concrete design issues. Therefore, the choice to implement a modular organizational design is, basically, the outcome of a firm's absorptive capacity and important decisions on, for example, the partition of modules, the configuration of the separate modules, and the interactions between modules are also a result of this overarching strategic interpretation process.

Hypothesis 7: Absorptive capacity has the strongest relative effect on an organization's strategic, structural, and operational flexible dynamic capabilities.

Knowledge absorption: Modular Organizing versus Lateral Coordination

Recapitulating, existing research has pointed out that organizational form and combinative capabilities are antecedents for an organization's absorptive capacity (Van den Bosch, et al., 1999). In this work the question which of the two has the upper hand in the process of organizational knowledge absorption remains, however, unanswered. What this research does show is that only after changing the organizational form it became possible for organizations to exploit the knowledge transfer and sharing potential of the available combinative capabilities to their full potential. This seems to indicate that a proper organizational design is a prerequisite for a successful knowledge absorption process. Regarding the organizational determinants modular organizing and lateral coordination, this would mean that the former plays a more profound role than the latter.

Although this assumption sounds logical, there are is also evidence available that judges in favour of the organizational determinant lateral coordination. To be more precise, Ahuja (2000) makes an explicit connection between innovativeness and organizational form. He explains that network forms consisting of partners with many interlocking and redundant ties, such as the matrix form that Van den Bosch et al. (1999) describe, primarily facilitate the development of trust and cooperation. Networks of many non-overlapping, weak ties yield more information benefits, according to him. In other words, loose ad-hoc networks between individuals that strongly rely on lateral relations and that are not hampered by the existence of structural, functional, or hierarchical boundaries, and do not have to comply with enforced explicit time and financial constraints, are in a better position to exchange information freely. Based on this theoretical insight it is also reasonable to suggest that, between the two determinants, lateral coordination has the most profound influence on a firm's absorptive capacity. Because the available scientific sources are pointing in opposite directions on this issue two contradicting hypotheses have been formulated.

Hypothesis 8a: Modular organizing has a stronger relative effect on absorptive capacity than lateral coordination.

Hypothesis 8b: Lateral coordination has a stronger relative effect on absorptive capacity than modular organizing.

Modular Organizing and the effect of Lateral Coordination

Regarding the relationship between lateral coordination and modular organizing the theoretical insights have made clear that the desired goal of creating a system that consists of subsystems that have no or minimal exchange or transaction processes with other external modules is difficult to achieve in a social system's context. As a result organizations have to invest in lateral coordination mechanisms in order to achieve a sufficient level of system integration. This is an interesting situation that cannot be taken for granted too easily. After all, it could mean that the much propagated advantages of loose coupling, based on the ideal situation that a module is a completely independent sub system with only a module input and output, are perhaps being exaggerated (Orton & Weick, 1990; Weick, 1976). Taking a more subtle stand point, it could also mean that despite the need to laterally coordinate a workable situation could still be created and the advantages of loose coupling would only mildly be affected.

To come to a judgement on this issue, it is useful to relate to Ethiraj and Levinthal (2004a: 432) who conclude that: "*Local and incremental processes can be used to identify useful, if not optimal modules in structures that have some inherent hierarchy and decomposability*". The point is that this condition of structures having some inherent hierarchy and decomposability seems to be applicable to most organizations. After all, dividing labor and grouping specialized functions along certain hierarchical lines and functional boundaries is a common organizational approach (Mintzberg, 1983). This implies that the derivation of clearly decomposable structures is in most cases feasible.

However, when these structures are not real modules, because they rely on too many functional and hierarchical interdependencies, coordination mechanisms become vital. Within the realm of organizing this is not a remarkable situation. Of old, coordination mechanisms have been presented as integrators to organically merge the surplus of organizational

relationships into a workable overall system (Galbraith, 1973; Lawrence & Lorsch, 1967; Mintzberg, 1979; Thompson, 1967). Therefore, the fact that coordination mechanisms are needed in modularly built organizations is not surprising.

Moreover, the fact that a certain level of lateral coordination is needed does also not entail that all advantages of loose coupling will be lost or badly hampered. In this respect, a defendable view point could be that the relationship between lateral coordination and modular organizing is curvilinear. In short, it seems obvious that an excessive level of lateral coordination should be avoided because it fosters chaotic communication, which will have a negative impact on the smoothness of cooperation and thus organizational performance. Yet, if the level of lateral coordination can be minimized, for example by containing it to certain key persons, activities, or milestones, loose-coupling advantages can probably still be obtained. What organizations, therefore, should always be aware of is the fact that a transition point exists between a beneficial and excessive level of lateral coordination. Once this invisible line is crossed and the level of lateral coordination become to high, the organization will most likely encounter a drop in performance due to all kinds of adjustment problems.

Hypothesis 9: Lateral coordination has a moderately positive effect on modular organizing.

2.6 COMBINING AD HOC AND HIGHLY PATTERNED CHANGE MODES

So far, the theoretical narrative has pointed out that the organizational determinants absorptive capacity, modular organizing, and lateral coordination form a tightly interrelated triad that helps to activate a mixture of strategic, structural, and operational flexible dynamic capabilities. This mixture is deemed necessary to cope with the wide variety of environmental forces an organization in hypercompetition has to deal with. Time or speed of reaction is an important factor that, as yet, has remained untouched in this debate on dealing with environmental turbulence.

When specifically focusing on the wide spectrum of competitive demands organizations are confronted with under turbulent circumstances, a picture would emerge similar to what is presented below. On the left, most advantageous side of this spectrum, organizations have to be capable of absorbing clear and slowly developing external non-critical influences. Most of the time influences like this fit the organization's existing mixture of flexible dynamic capabilities and do not ask for radical changes or innovations. On the right side of the spectrum, organizations have to be capable of creating a temporary advantage by pro-actively engaging a suddenly enfolding window of opportunity or threat situation. In this case, a too strong focus on the alignment of strategic, structural, and operational dynamic capabilities may take to long, or it would prevent organizations from being genuinely creative and innovative. In the end this could be harmful, because opposed to well-considered interpretation, immediate and innovative action will most likely be the key to success under these circumstances. Of course, in between these extremes numerous alternative situations can occur, varying from for example reacting upon a very suddenly rising convenient threat, to incrementally developing a commercial innovation, or timely anticipating an unforeseen competitive move.

In this respect, Volberda (1998: 91) refers to a distinction between acting decisively and prudently. The former, means that management immediately decides to act upon an emerging environmental influence. The latter, implies that management only acts when the situation develops into a clearer picture, which improves the possibility to react adequately. In sum, it could be argued that hypercompetition compels organizations to constantly weigh the pros and cons of two different types of competitive demands: (1) to react adequately, (2) to react quickly. For competitive developments that belong to the left side of the spectrum mentioned above the first demand will dominate at the expense of a high speed of reaction. Under these circumstances the main concern is that an organization takes adequate measures to prevent a slowly emerging convenient situation from turning into something more serious. After all, if a predictable situation gets out of control because of malpractice the costs in time, energy, and money that have to be made in order to 'repair' the situation will really be unnecessary. When the occurring competitive influences belong to the mid section of the spectrum, balancing the two demands is achievable, because the changes are to a large extent foreseeable and they do not carry

immediate danger. However, when the forces are unforeseeable and critical, thus belonging to right side of the spectrum, the scale will tip in favour of the quickness of the reaction. Although this stimulates improvisation based on principles such as learning by doing and trial and error, which means taking risks, the alternatives of taking more time or doing nothing at all would probably lead to a situation much worse within a disruptive environment. Figure 2-3 below tries to visualize this trade-off.
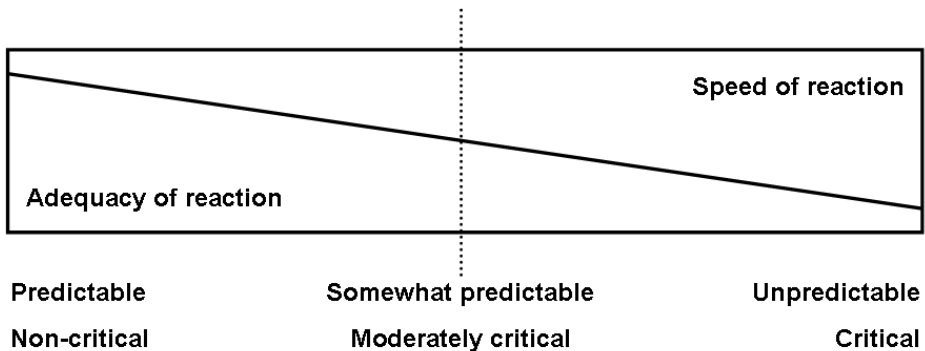
Figure 2-3: The spectrum of hypercompetition
(derived from Volberda (1998))

Within the dynamic capabilities research stream this difference between structured action and improvisation has also been noticed. Winter (2003) makes a distinction between a highly patterned change mode and an ad hoc way of problem solving. To his opinion the largest part of the competitive spectrum consists of first order change inputs that can largely be solved with first order dynamic capabilities. In this respect one could think of capabilities that would change de product, the production process, the scale, or the markets served. The outcome of applying these capabilities is that the organizational reactions get a routine and highly patterned character. Yet, regarding ad hoc problem solving he states the following (Winter, 2003: 992-993): "Ad hoc problem solving is not routine; in particular, not highly patterned and not repetitious…..it typically appears as a response to novel challenges from the environment or other relatively unpredictable events. Thus, ad hoc problem solving and the exercise of dynamic capabilities are two different ways to change."

Nonetheless, when organizations have to function within a hypercompetitive environment they have to be capable of dealing with both urgent ad hoc problems and first-order change demands. Therefore, organizations need organizational determinants that not only support a patterned way of reacting, but also have the potential to be switched into a sort of improvisation mode when this becomes necessary. Based on existing theoretical insights the assumption is defendable that absorptive capacity and modular organizing are determinants that can actually play this dual role.

As explained in the preceding theoretical discussion both determinants contribute to the development of a mixture of flexible dynamic capabilities. Thus, in terms of Winter (2003), absorptive capacity and modular organizing facilitate the exercise of dynamic capabilities, which leads to a highly patterned and routine type of reaction. This conclusion is, basically, a reiteration of what we already know. As yet, the relationship between the two determinants and ad hoc problem solving or improvisation has not been explicitly discussed.

The premise that absorptive capacity's focal point is to exploit knowledge on external stimuli can be the starting point of this discussion. It could be argued that when a stimulus is unexpected, time is scarce, and the risks are high absorptive capacity has a built-in possibility to compress and simply its four sequential knowledge absorption stages to come to a quick, yet more ad hoc, way of reacting. The key to this compression and simplification process can be found in the aspect of associative learning that individuals and organizations alike, in general, rely on for problem solving or enhancing their knowledge base (Cohen & Levinthal, 1990; Zollo & Winter, 2002). Cohen and Levinthal (1990: 129) explain it as follows: "the more objects, patterns and concepts that are stored in memory, the more readily is new information about these constructs acquired and the more facile is the individual in using them in new settings".

Relating this notion to absorptive capacity and the challenge of ad hoc problem solving paints a picture in which organizations take past experiences as a predominant, hardly debatable, point of reference for the sequence of acquiring, assimilating, transforming, and exploiting external

knowledge. The emphasis will be placed on absorptive capacity's first two stages, where the organization has to pigeon-hole the new, unexpected stimulus into a known category of prior knowledge. The measures that the organization has to take to deal with the new situation, or in other words the outcome of the knowledge transformation and exploitation stages, will to a large extent be based on how the organization has reacted during earlier events. As a result of this approach the organization can increase its speed of reaction and at the same time take advantage of earlier lessons. Yet, a major drawback is that real innovative behaviour is not to be expected, since the organization acts upon existing mental models. Another point of concern is that engaging a new type of situation with old tactics carries an inherent level of risk.

Knowledge on the improvisation potential of modular organizing can be drawn from Weick's (1982) seminal insights. He explains that each organization has to retain a sort of architectural slack, so that it has a flexibility potential readily available to react to sudden, unexpected opportunities or threats. In line with Weick's reasoning Quinn (1980) and D'Aveni (1994) also believe that organizations should try to design flexibility into their operations in order to react swiftly to changes in the environment. To create such an internal context Weick refers to the differences between tightly and loosely coupled systems. According to Weick a tightly coupled system is best suited for adapting to well-known circumstances. Loosely coupled systems, he argues, are better capable of dealing with unforeseen changes, because they support "opportunistic adaptation" (Weick, 1982: 387). In accordance with Weick's ideas Quinn (1980) argues that a manifestation of designed flexibility is the ability to quickly and easily switch between resources.

Sanchez (1995) explains in this respect that "the services of resources are obtained through resources use, and a firm's strategic flexibility (i.e. its set of strategic options), therefore, is constrained by the ways in which a firm can use available resources. Strategic flexibility, thus, depends jointly on the inherent flexibilities of the resources available to the firm and on the firm's flexibilities in applying those resources to alternative courses of action" (Sanchez, 1995: 138). He, furthermore, makes clear that modular design, because of its loose coupling advantages, works as a lever to increase an organization's resource flexibility. It is to be expected that

when changes in the competitive environment are labelled unpredictable this, probably, has to do with the fact that rivalling firms have been able to commercialize an unexpected, configuration of new and/or existing resources. The advantage of a modular organizational system seems to be that, under these circumstances, the opposing firm can relatively easy adjust to this new situation by decisively reconfiguring his own resource base. Moreover, when a modularly built organization is not so much confronted with an acute and serious threat, but wants to take advantage of a suddenly emerging window of opportunity it can also take advantages of its potential to quickly recombine its resource base into the desired configuration without having to turn the entire organization upside down.

On the whole, these insights imply that absorptive capacity and modular organizing are organizational determinants that not only have an indirect effect on organizational performance through the activation of a broad mixture of flexible dynamic capabilities, but can also directly influence performance by facilitating a second, immediate, ad hoc problem solving type of approach.

Hypothesis 10: Absorptive capacity is directly related to organizational performance within turbulent environments.

Hypothesis 11: Modular organizing is directly related to organizational performance within turbulent environments.

2.7   RESEARCH MODEL

This chapter's theoretical reasoning has resulted in the research model presented in figure 2-4. One should take notice of the fact that the model itself is being placed within a turbulent environmental context. The model's main assumption is that under turbulent circumstances absorptive capacity and modular organizing, with lateral coordination as an important antecedent, positively contribute to the activation of a mixture of strategic, structural, and operational flexible dynamic capabilities, concretizing the

crucial demand of organizational ambidexterity. Moreover, the model presents a second outcome effect, namely a direct effect of both absorptive capacity and modular organizing on a firm's overall performance. This second effect is being determined by the fact that these two determinants can also play a facilitating role when the organization has to convert from a prudent to a more ad hoc way of problem solving.
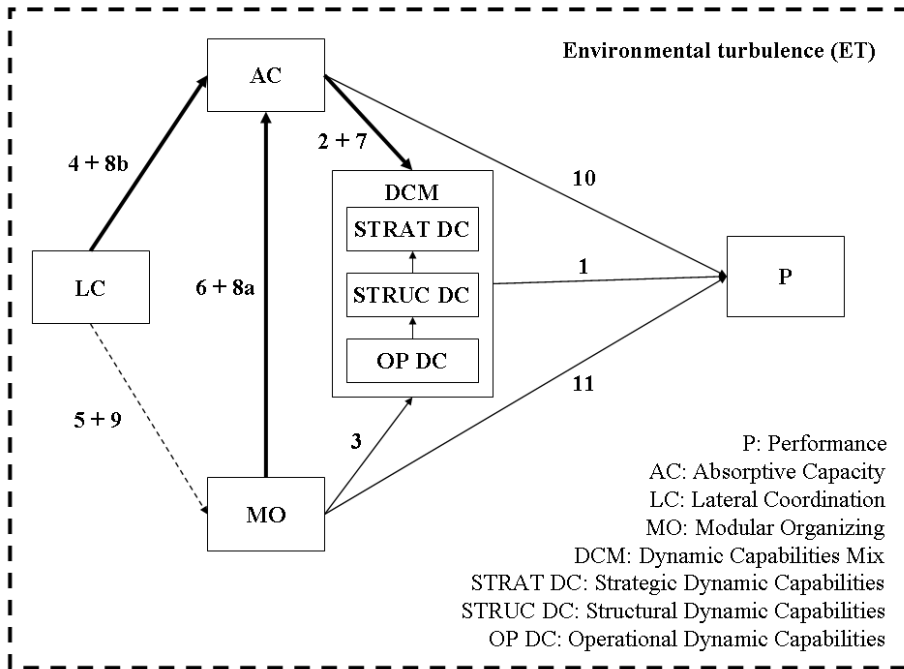
Figure 2-4: Research Model

Every numbered arrow in the research model represents a specific hypothesis. The numbers in the model correspond with the numbers of the hypotheses mentioned in the text. Four relationships have double numbers. This has to do with the fact that these hypotheses deal with the relative effect or strength of a proposed relationship. Hypothesis 7 assumes that absorptive capacity has the most profound influence on the activation of a broad mixture of flexible dynamic capabilities. Therefore, the arrow between AC and DCM is drawn thicker. The same schematic principle has been applied to hypothesis 8a and 8b, which state that respectively modular organizing or lateral coordination has the strongest impact on absorptive

capacity. Therefore, the arrows between MO and AC and LC and AC are also drawn thicker. Hypothesis 10 concentrates on the relationship between lateral coordination and modular organizing. Here, the assumption is that modular organizations can only properly function if the necessary level of lateral coordination is kept at a moderate level. Because a rather weak positive relationship is expected, the arrow between LC and MO is dashed.

CONCLUSION

This chapter has analyzed, through the strategic management inside-out lens, which organizational determinants play an important role in the competitive challenge of dealing with hypercompetition. Absorptive capacity and modular organizing have been identified as determinants of predominant value because they are capable of activating a combination of operational, structural, and strategic flexible dynamic capabilities, concretizing the overarching demand of organizational ambidexterity. Lateral coordination has been presented as a third determinant of major importance, because it facilitates the knowledge absorption process needed for innovativeness, but it also positively influences the reconfiguration capabilities of a modular organizational system. Furthermore, the theoretical investigation has made clear that, apart from activating a mixture of flexible dynamic capabilities, absorptive capacity and modular organizing can also directly affect a firm's performance. This second outcome effect is being determined by the fact that these two determinants have the built-in capacity to help the organization to convert from a prudent into a more ad hoc way of problem solving.

CHAPTER 3 RESEARCH METHODOLOGY

3.1 INTRODUCTION

The previous chapter has given insight into the main organizational determinants and dynamics for dealing with hypercompetition. The next step is to provide a methodological framework to operationalize the proposed theoretical assumptions in a structured way. Methodology can be referred to as the procedural framework, within which a research project takes place. It deals with the logical relationship between philosophical paradigm, research design, and research techniques. This chapter covers the specific methodological foundations of this study. First, the study's general philosophical rationale will be described. Second, the specific research design of this study will be set out in more detail, introducing the survey as the study's overarching research method. Third, the research techniques that were actually used to retrieve evidence will be discussed separately. Per research technique the data collection process will be described, also paying attention to the important methodological issues of instrument and construct validation.

3.2 THE POSITIVIST APPROACH

The philosophical stance or paradigm of this research project is known as positivism. Taking this standpoint "implies that the researcher is working with an observable social reality and that the end product of such research can be the derivation of laws or law-like generalizations similar to those produced by the physical and natural scientists" (Remenyi, Williams, Money, & Swartz, 2002). Generally speaking, the positivist approach uses observations of the world around us to create or expand scientific knowledge. Looking at this study, the Netherlands armed forces, its organizational characteristics, and external environment are, in combination, acknowledged as an observable social reality from which unique empirical evidence can be obtained to strengthen the theoretical status of the Dynamic Capability Approach.

Observations of the world around us can, however, from a scientific point of view be made in different ways. The *passive observation* method is most frequently used in positivist business research (Remenyi, et al., 2002). This project also uses the passive observation method, meaning that the researcher collects evidence from a variety of sources (e.g. interviews, policy documents, questionnaires), after which he reflects the evidence gathered upon the specific variables being studied. Figure 3-1 presents a model that shows the main research phases of the passive observation method.

```
┌─────────────────────────────┐
│    1. Literature review     │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│  2. Assessment of established │
│    theoretical frameworks    │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│  3. Theoretical conjecture  │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│   4. Hypotheses / empirical │
│   generalized formulation   │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│   5. Measuring instrument   │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│ 6. Sampling / data collection│
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│     7. Testing analysis     │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│  8. Confirmation of theory  │
│ conjecture and development of│
│   fuller / refined theory   │
└─────────────────────────────┘
```
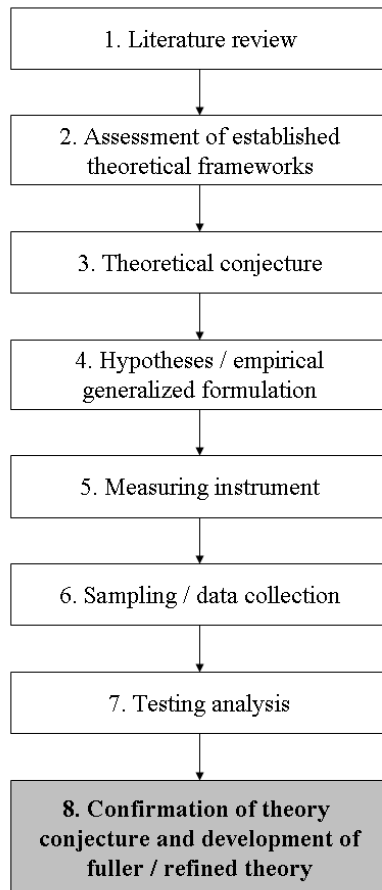
Figure 3-1: The passive observation research method
(Remenyi, et al., 2002)

Research methodology

This research project follows the same phases as presented in the model. The study has started with a literature review on the theoretical concept of dynamic capabilities. This step has led to a twofold conclusion. First, the concept is still missing necessary empirical comprehensibility. Second, the organizational practicalities to facilitate the everyday functioning of dynamic capabilities over a longer period of time have remained largely untouched in the academic debate so far (phase 1). Next, a more focused assessment of existing strategic management theory has been set in motion to find out which organizational determinants specifically matter in dealing with the challenges of environmental turbulence. The key variables absorptive capacity and modular organizing, with lateral coordination as an important facilitator for both, have been derived from this analysis (phase 2). A deeper investigation into the outcome effects of these determinants has led to the conclusion that in combination they support the activation of a mixture of operational, structural, and strategic dynamic capabilities. Together, these first two phases have resulted in a theoretical conjecture in the form of a research model that can be split up into twelve separate hypotheses (step 3 and 4). The next step has been to translate the research model into a questionnaire and an interview protocol (phase 5). The former has been distributed among a large group of officers to develop a broad understanding of the interrelationships between the determinants being studied. The latter has been developed to complement the large scale quantitative survey approach and gain specific in-depth qualitative knowledge on the policy implication of these organizational determinants (phase 6). The data coming out of the questionnaire have been statistically analyzed, using SPSS and AMOS structural equation modeling techniques. The interview results have been analyzed by using first level and pattern coding techniques (phase 7). Finally, reflecting on the complete set of evidence gathered has led to a refinement of the dynamic capabilities theory by explaining why and how the organizational determinants extracted from strategic management theory could matter in dealing with hypercompetition (phase 8).

3.3   THE RESEARCH DESIGN

Philips (1971: 93) defines research design as "the blueprint for the collection, measurement, and analysis of data". The quality of such a blueprint depends to a large extent on choices the scientist has to make in advance of his actual empirical research process (Blumberg, Cooper, & Schindler, 2008), such as: what kind of answers is the study looking for and which research method is needed in order to find them? what kind of sample should be used to draw valid conclusions? which specific techniques can be used to collect valuable data?

Research method and sampling

When concretizing the first of these three questions for this specific study, it is important to refocus on the study's primary goal of contributing to the theoretical status of the Dynamic Capabilities Approach. Being primarily interested in theory development the study is, basically, looking for answers that could help to create a broad view of a complex social organizational phenomenon with the intention of further generalization. After all, this study's main assumption is that the Netherlands armed forces' organizational approach to deal with environmental turbulence could be translated into more general lessons for commercial organizations confronted with hypercompetition.

However, the study's central research question is a "how" question, stressing its explanatory aim. In this question it is the depth of enquiry, or in other words the search for rich and complex evidence, that dominates to deliver in-depth insight into the complex phenomenon being studied. By offering comprehensive, detailed empirical evidence on how specifically the Netherlands armed forces apply commonly accepted organizational determinants to activate organizational learning and reconfiguration capabilities, in order to counter the turbulent security environment, should help to strengthen the general theoretical status of the Dynamic Capability Approach.

Research methodology

To balance the study's breadth versus depth dimension a large-scale survey was conducted, supplemented with data coming from focused interviews. For the survey a large number of questionnaires was distributed among a specific sample population within the Netherlands armed forces. This group consisted of Majors, Lieutenant-Colonels, and Colonels from all four Operational Commands of the Netherlands armed forces. The sampling deliberately concentrated on the middle and higher officer echelons as the comprehensive research required respondents who not only had experience with and knowledge of missions abroad, but, quite emphatically, also had an insight into all sorts of strategic and organizational aspects of the Netherlands armed forces.

Although the Netherlands armed forces organization consists of four rather autonomous operational Commands (Navy Command, Army Command, Air Force Command, and the Royal Netherlands Marechaussee[1]), the officers were explicitly asked to describe the armed forces collectively. After all, the main concern was to gain an overall understanding of the extent to which the variables, derived from strategic management theory, also played their predicted role in the Netherlands armed forces as a whole. Moreover, crisis response operations are increasingly becoming a joint effort of all four Commands, which makes it interesting to find out how the organization's collective functioning within crisis response circumstances is being judged by its members.

The focused interview technique was used to strengthen the survey data with more practical and detailed information. A focused interview is a specific type of interview, in which the researcher poses a certain set of pre-planned semi-structured questions. The advantage of this way of interviewing is to corroborate certain facts that in the eyes of the researcher have already been established. The specific goal of this study's session of focused interviews was to gain more insight into the practical implications of absorptive capacity, modular organizing, and lateral coordination as basic organizational determinant to give direction to the organization's search, selection, reconfiguration and deployment processes.

---

[1] The Royal Marechaussee is an organization with tasks within the military domain, such as military police and security sector reform tasks. However, the Royal Marechaussee also conducts specific police tasks in a national setting, such as border control, immigration, and criminal investigation activities.

The interviewees were selected because of their knowledge of the organizational implications of crisis response deployment. When using people as a main source of evidence, Verschuren and Doorewaard (1999) argue that it is important to know which information role these people actually play. A distinction should be made between people acting as respondents, informants, or experts. A respondent is a person supplying information about him or herself. An informant provides information about other persons or issues not directly relating to him or herself. An expert is a person who acts as a supplier of specific knowledge.

The people interviewed in this study clearly wore two hats. On one hand, they played the role of experts; in a sense that organizational members, who had knowledge of the strategic considerations underlying the organizational adjustments that had been made since the ending of the Cold War, and with a helicopter-view on the operational consequences of these strategic choices, were deliberately selected for the interviews. On the other hand, they also acted as respondents by giving individual opinions based on their own crisis response experiences.

As mentioned above, the Netherlands armed forces organization consists of four operational Commands. The Chief of Defense directs the Operational Commands and bears primary responsibility for the execution of military operations[2]. For this primary task he can rely on three staff departments. First, the Directorate Operations (abbreviation in Dutch: DOPS) is an advisory-body focusing on policy issues regarding running missions. Second, the Directorate Operational Readiness (abbreviation in Dutch: DAOG) is an advisory-body that helps to translate the political military ambitions into concrete deployment decisions on the necessary quantity and quality of troops. This department basically formulates the actual preparation and formation demands to prolong running missions and to initiate new ones. Third, the Directorate Operational Policy, Requirements, and Integral Planning (abbreviation in Dutch: DOBBP) has a long-term focus. This directorate has two main tasks. Its first task is to uncover critical developments that may influence the Netherlands armed forces

---

[2] This text is based on the brochure: Introducing the Central Staff of the Netherlands Ministry of Defense.

organization in the future. Its second task is to fathom the organizational, human resources', and technological implications of these developments.

To cover the information spectrum from running missions to future operational developments a number of representatives of all directorates has been selected and interviewed. Moreover, to bridge the gap between strategic apex and Operational Commands the operational commanders of Navy Command, Army Command, Air Force Command, and the Royal Netherlands Marechaussee have been added to the sample. Because of their position within the organization these directors could give a balanced judgment about the practical implications of certain strategic decisions. Furthermore, a staff officer of Task Force Urzugan has been added to the sample to obtain recent information on the practical outcome of the strategic choices that have been made. In total the sample consisted of eighteen senior officials, military and non-military (see Appendix I for an overview of the incumbents).

3.4   THE QUESTIONNAIRE

The total number of Majors, Lieutenant-Colonels, and Colonels from all four Operational commands was targeted as the study's research population, leading to a headcount of 4085 potential respondents. Because the study focuses on the Netherlands armed forces' crisis response setting, it was decided to exclude certain functional specialists from the target group, such as military physicians, advocates, and officers of the territorial reserve. Based on this empirical refinement a mailing of 3,706 questionnaires was sent out. In total 1,533 persons filled out and returned the questionnaire. The dataset was cleaned up by leaving out the questionnaires with missing values on the model and background variables. However, of the 1,465 respondents that remained, 211 had no actual mission experience. These questionnaires were also disregarded, leading to a total number of usable questionnaires of 1,253 and, thus, a response rate of approximately 34%. The sample was tested for representativeness by comparing the distribution of the respondents with the composition of the initial target population. Although some minor deviations became apparent, the overall distribution was judged satisfactory with an average response rate of 30% per Operational Command and rank level. Table 3-1

presents the composition of the target population, the sample population, and the percentage of the sample population versus the target population.

		MAJOR	LTCOL	COL	TOTAL
ARMY	1	1,060	695	138	1,893
	2	370	258	48	676
	3	34%	37%	34%	35%
AIR FORCE	1	620	364	95	1,079
	2	169	101	26	296
	3	27%	27%	27%	27%
NAVY	1	518	339	100	957
	2	122	85	29	236
	3	24%	25%	29%	25%
MARECHAUSSEE	1	92	44	20	156
	2	29	12	4	45
	3	31%	27%	20%	28%
TOTAL	1	2,290	1,442	353	4,085
	2	690	456	107	1,253
	3	30%	31%	30%	30%
(1) Target population; (2) Sample population; (3) Sample versus target population					

Table 3-1: Research sample

The background variable *mission experience* was measured by asking how many times the respondents had been on an operational deployment abroad. They had to fill in the name of the mission and specify the duration of the mission in months. To be counted as a single operational deployment the duration of a mission had to be at least two months. Table 3-2 shows the categorization of mission experience over rank and Operational Command.

The actual crisis response missions in which the respondents had participated were numerous and took place all over the world. An overview of the respondents' most recent operational deployment is given in table 3-3. A number of smaller missions, and missions further back in time, are labeled "other". Missions such as, UNIFIL, UNPROFOR, UNTAC, UNMIL, UNMIH, and UNTAES are placed in this collective category.

		Number of deployments					
		1	**2**	**3**	**4**	**5**	**(sub)total**
Army	MAJOR	138	132	59	25	16	370	
	LTCOL	118	78	40	14	8	258	676
	COL	26	16	4	2	0	48	
Air Force	MAJOR	76	49	20	12	12	169	
	LTCOL	43	31	20	3	4	101	296
	COL	14	8	2	1	1	26	
Navy	MAJOR	43	29	31	11	8	122	
	LTCOL	31	32	14	5	3	85	236
	COL	13	8	3	4	1	29	
Marechaussee	MAJOR	20	7	2	0	0	29	
	LTCOL	6	4	2	0	0	12	45
	COL	4	0	0	0	0	4	
	Total	532	394	197	77	53	1,253	

Table 3-2: Operational experience

	Army	**Air Force**	**Navy**	**Marech.**	**Total**
Individual deployment	47	17	4	6	78
ISAF	141	99	27	2	272
OEF	20	26	50	0	96
SFIR	59	13	24	6	103
EUFOR	33	3	2	3	41
SFOR	209	38	2	10	259
IFOR	23	5	2	1	31
AFOR	0	5	2	0	7
KFOR	44	6	7	2	59
UNMEE	3	8	16	2	29
Navy deployment	0	0	69	0	69
Air Force deployment	0	48	0	0	48
Other	97	28	31	13	161
				Total	1,253

Table 3-3: Most recent deployment

Instrument and construct validation

Likert-type scales were developed to measure the model variables (see Appendix II). Wherever possible, existing scales were used. However, a new scale had to be developed to measure modular organizing, because no usable alternative one was found in literature. Moreover, with a Western military expeditionary organization as the study's central case, a general point of concern became to translate the existing individual scale items from a commercial business context into a military crisis response context. A number of these changes were rather straightforward, such as replacing the word "team" for "unit". Yet, others turned out to be more fundamental. To give an example, competitors, suppliers, and customers are univocal entities within the commercial business jargon. However, applying these terms in an international, political-driven, crisis response setting, would certainly lead to ambiguous interpretation.

To overcome this problem, experts, with knowledge of both the business and military domain, were consulted to help with the actual translation process. The resulting draft questionnaire was then discussed with a methodologist to get feedback on wording issues and the nature of the questions. After corrections had been made the draft questionnaire was pre-tested within a small group of ten military experts, coming from different services and officer ranks. Based on their remarks, on wording, layout, and length, the questionnaire was adjusted to its final form.

The variable *dynamic capabilities mixture* consisted of Volberda's (1996, 1998) separate scales for measuring operational, structural, and strategic flexible dynamic capabilities. Given the rather small number of items in each scale and the fact that the items had to be translated from a business context into a military context, the separate reliability scores decreased to unsatisfactory levels. To be precise, the scales for strategic, structural, and operational dynamic capabilities scored Cronbach's alphas of respectively 0.52, 0.55, en 0.61. However, when the three separate scales were combined into one overall scale (DCM) the Conbrach's alpha increased to a score of 0.70. An alpha of 0.70 is generally used as the lower limit for scale reliability (Field, 2005). To respectively measure operational, structural, and strategic flexible dynamic capabilities questions where asked, such as: during crisis response operations Dutch units can easily

adjust to changing operational circumstances; the Netherlands armed forces have the capacity to easily shift functions and tasks in case a crisis response operation requires this; if needed the Netherlands armed forces can add new types of missions to its existing operational product portfolio.

To measure *absorptive capacity* Volberda's metaflexibility scale was used, mainly because at the time of developing the questionnaire the absorptive capacity construct was still in its conceptual stage, so no usable scales were available yet. Although it may seem as sailing under false colors, this feeling is not entirely true. This scale was deliberately chosen, for Volberda's explanation of metaflexibility shows remarkable resemblance with what later was to be named absorptive capacity: "At a higher level of the organization there must therefore be a reflective capacity to effectuate an appropriate composition of the flexibility mix and design of the organization. This so-called metaflexibility can be viewed as management's supporting monitoring system or learning system" (Volberda, 1998: 198). Moreover, the scale he developed to measure metaflexibility actually captures the main learning processes of absorptive capacity in concrete survey questions. Translating the scale and applying it to a military setting had resulted in a satisfactory Cronbach's alpha score of 0.74. One of the questions posed sounds, for example: the Netherlands armed forces systematically keep track of technological developments that could influence operational tasks and performance.

To measure the contextual variable *environmental turbulence* again an available scale of Volberda (1996, 1998) was used. The scale, consisting of 13 items, covers the dimensions dynamism, complexity, and unpredictability. Some examples of the questions asked are: changes in the area of operation were very intense; in the area of operation everything was interrelated; and, it was very hard to predict what was going to happen in the area of operation. Although the original scale had to be translated to a military crisis response context it still reached a Cronbach's alpha score of .84.

Three exploratory factor analyses were conducted to validate Volberda's constructs within a military crisis response setting. Because the sample size exceeds 250, a combination of the Kaiser criterion and the scree plot were used to decide on how many factors to extract from the separate factor

analyses (Field, 2005). All analyses resulted in the extraction of a single factor to respectively measure dynamic capabilities mixture, absorptive capacity, and environmental turbulence.

In addition to Volberda's scales, Jaworski and Kohli's (1993) scale was embraced to measure organizational *performance*. This three-item scale proved to be reliable with a Cronbach's alpha score of 0.80. Furthermore, Hoegl, Weinkauf and Gemuenden's (2004) scale on inter-team coordination was used to measure *lateral coordination*. Their scale is based on two fundamental forces that stimulate the need to coordinate: (1) task interdependencies and (2) emerging changes within the task environment. They have captured these two forces in five items focusing on task execution, information sharing, and conflict resolution dynamics between teams.

Within a military setting, however, two distinct forms of cooperation between teams or units can be recognized. First, coordination between units from different Operational Commands takes place. Military jargon speaks of *joint* cooperation. Second, crisis response operations also depend to a large extent on multinational, or what is known as *combined*, cooperation. Therefore, in translating Hoegl, Weinkauf and Gemuenden's original scale to a crisis response context their items had to be addressed twice. The result has been a 10-item scale covering the same elements in both a combined and joint context. Some examples of the scale items are: during crisis response operations interrelated processes, tasks, and activities are well coordinated with units from other countries, or during crisis response operations Dutch units have no problems in coordinating with each other. After running a factor analysis, again using the Kaiser criterion in combination with the scree plot, a single factor was extracted. The scale reliability was 0.74, which is sufficient, yet lower than the original scale (α = 0.85). Again, the translation of the scale items to a military crisis response setting probably accounts for this difference.

For measuring *modular organizing* a new scale was developed, embarking upon earlier work of Sanchez and Mahoney (1996) and Worren, Moore, and Cardona (2002). The main assumption is that a modular organization is built upon an architectural system capable of recombining organizational elements into tailor-made configurations. In order to make this

architectural system work, organizations should also strive for organizational and technological interoperability. Organizational interoperability means that by using standardized interfaces, such as standardized rules, procedures, and programs a plug-and-play situation is created, in which organizational modules can be clicked together, removed, replaced, and reconnected fairly easy. This same principle applies to the organization's technological resource base. To reach the desired plug-and-play end state it is of equal importance for an organization to have compatible technological means available. Moreover, looking at the human side of the matter, a modular organization needs people with a broad operational knowledge base and a cooperative mindset to be able to function properly within different operational contexts and in varying organizational constellations.

Based on this theoretical assessment a scale, consisting of 14 items, was developed covering these four aspects to measure modular organizing. Questions where formulated, such as: to execute crisis response operations the Netherlands armed forces merge units, parts of units, and individuals into tailor-made formations, or during crisis response operations standardized work processes, such as doctrines, standard operating procedures, and drills, make it possible to cooperate with units from other services and countries. A factor analysis resulted in the extraction of a single factor. Despite the fact that four items had factor loadings below 0.40, they were kept in the newly developed scale to reach the minimum reliability limit of 0.70.

3.5   THE FOCUSED INTERVIEW

The session of focused interviews started with a profound analysis of three key Defense Bills to gain insight into the actual strategic organizational choices that have been made after the ending of the Cold War to counter the new turbulent crisis response environment. All in all, two reasons stand out for specifically choosing the Defense Bills of 1993, 2000, and 2003. First, the information in these documents represents a written down rationalization of the main steps and key arguments underlying the Netherlands armed forces' strategic transformation process. Second, these three policy documents have played a leading role in the transformation

process itself, serving as ex-ante road maps to steer the actual change process. In a general sense, this study assumes the policy documents to be the concrete outcome of the Netherlands armed forces absorptive capacity process.

The qualitative data-analysis program Kwalitan (Wester & Peters, 2004) was used to analyze the policy documents. The program was mainly selected because of its functionalities to support the process of first-level coding and pattern coding (Miles & Huberman, 1994). First-level coding supported dividing the text files into logical segments of data. Next, pattern coding helped to uncover sub-themes within these different segments. The first-level coding process made clear that all three Defense Bills were structured roughly the same, covering the following main steps: (1) scanning the environment, (2) formulating a suitable defense policy, (3) defining the organizational adjustments, (4) selecting assets, and (5) explaining the financial consequences. For this study step 3 was perceived most relevant. Applying the principles of pattern coding to this step resulted in three main themes: (1) a discussion on the general organizational adjustments needed, (2) a discussion on the personnel adjustments needed, and (3) a discussion on the materiel adjustments needed.

Within these themes three main transformation choices could be distinguished: (1) The crisis response deployment strategy of the Netherlands armed forces was to be based on the formation of tailor-made organizational modules that, most of the time, had to function within larger multi-national task forces; (2) taking part in expeditionary crisis response operations asked for an interoperable, multi-functional technological resource base; (3) and taking part in expeditionary crisis response operations asked for a cooperative mindset of the participating Dutch units.

These three choices were used as a first step in the interview to investigate the variable absorptive capacity. To be precise, they were presented to the interviewees to, first of all, verify whether the choices identified were also being acknowledged by representatives of the Netherlands armed forces' current senior management; and second, to analyze how in hindsight these representatives judged the practical value of the key organizational choices made by their predecessors.

The next step in the interview was to unravel the variables absorptive capacity, modular organizing and lateral coordination individually. First, Zahra and George's (2002) sub dimensions knowledge acquisition, assimilation, transformation, and exploitation were used to categorize the answers on the organization's current absorptive capacity process. Second, based on Baldwin and Clarke's (1997) design rules for modular systems specific questions were formulated to learn more about the supporting architecture, interfaces, and standards of modularly built military task forces. Third, existing work of Kogut and Zander (1992) and Van den Bosch et al. (1999) was used to find out which combinative capabilities, with a primary focus on lateral coordination, were used to integrate the different organizational elements of a composite military task force.

The interview's third part focused on the outcome effects of the organizational choices that had been made. Specific attention was paid to the general organizational challenge of balancing strategy, structure, and operational practices. First, the interviewees were asked if the strategy of mixing and matching smaller organizational elements into tailor-made task forces hampered the operational performance in a crisis area, because the units deployed were not enough settled in. Second, each interview ended with asking the interviewees to give their opinion on the success of the Netherlands armed forces' crisis response performance in general.

The theoretical insights used made it possible to largely pre-code the interviews, which resulted in a rather strict interview protocol (see Appendix III). The interviews themselves were not recorded, since the pre-coding approach made it possible to categorize and write down the answers given during the interview process itself. Moreover, with this structured interview technique a large amount of relevant information could be gathered in a relatively short period of time. Given the fact that time was a scarce resource, since senior officials were being interviewed, this positive side-effect came in helpful. Another advantage of the pre-coding exercise was that the results could be compared very easily across the different interviewees. Before actually starting off the session the interviews a high-ranking officer at the Netherlands Defense Academy, with relevant operational and managerial experience, was invited to participate in a trial run of the interview. This test offered relevant information on the duration

of the interview and the quality of the interview questions. Based on this information some refinements were made to the interview protocol.

After conducting the interviews, the field notes were converted into a comprehensive text file. This file was sent back to the interviewees for confirmation. In a few cases some minor adjustments had to be made to the text. When all text files were approved another process of first-level and pattern-coding started. For this purpose a checklist matrix was developed. Miles and Huberman (1994: 105) define such a matrix as follow: "A checklist matrix is a format for analyzing field data on a major variable or general domain of interest. The basic principle is that the matrix includes several components of a single coherent variable, though it does not necessarily order the components."

The Microsoft Office's Excel program was used to create this checklist matrix. The matrix consisted of rows and columns. The rows were drawn from the main topics of the interview protocol; the columns were used to present the answers of the individual interviewees on a certain topic (see Appendix IV). After the matrix had been filled with the answers of the experts, the next step was to cluster the answers given. Now, the actual process of first level and pattern coding could be started. The first step of this process was to group similar answers together, giving insight into the most important arguments and considerations. These groups of answers were then related to the underlying theoretical concepts to uncover relevant themes. Chapter 5 will be entirely devoted to discussing the actual results of this first level and pattern coding exercise.

3.6   CONCLUSION

This chapter has discussed the study's methodological foundations. The survey has been presented as the overarching research method. The main assumption is that a survey has the capacity to create a broad overview of the complex interaction process taking place between the variables absorptive capacity, modular organizing, lateral coordination, dynamic capabilities mixture, and performance. Within the context of this survey two specific research techniques were used. First, a questionnaire was distributed among a large group of mid and high level officers. Basically, this questionnaire was used to find out whether or not the variables and dynamics of the research model, which was introduced at the end of chapter 2, were indeed applicable to the turbulent crisis response context of the Netherlands armed forces. Second, to color the general quantitative picture with more specific and relevant practical information a session of focused interviews was conducted to gain more insight into the policy implications of actually applying the organizational determinants uncovered from strategic management theory.

CHAPTER 4   THE SURVEY FINDINGS

4.1   INTRODUCTION

Based on chapter's 2 theoretical reasoning this chapter will investigate how *absorptive capacity*, *modular organizing*, and *lateral coordination* have contributed to the crisis response performance of the Netherlands armed forces. For this purpose, chapter 4 discusses the results of a questionnaire that has been distributed among a sample of 1,253 Dutch officers, varying in rank from Major to Colonel. Basically, this chapter analyzes whether the organizational dynamics to deal with hypercompetition, compressed in chapter 2's research model, also persist within a turbulent crisis response environment. The structure is as follows. First, before testing the proposed research model in its entirety the outcome of a number of necessary basic statistical SPSS tests will be discussed. Second, Structural Equation Modeling (SEM) will be introduced as the study's statistical backbone. In this paragraph, five predominant fit indexes for reporting SEM results will be presented. Third, the actual SEM results will be reported. Fourth, specific attention will be paid to the effects of the combined variable *Dynamic Capabilities Mixture* (DCM) that in reality consists of three separate scales to measure operational, structural, and strategic dynamic capabilities.

4.2   INITIAL ANALYSES IN SPSS

The questionnaire was first of all tested for common method variance by conducting Harman's one-factor test. The unrotated principal component factor analysis, principal component analysis with varimax rotation, and principal axis analysis with varimax rotation all revealed the presence of multiple factors. The first two of these factors accounted for 60 % of the total variance. Moreover, the first (largest) factor did not account for a majority of the variance. Thus, no general factor became apparent, which eased the concerns about potential problems associated with common method bias.

Second, a correlation analysis was run to find out if significant relationships existed between the model variables. Table 4-1 presents the correlation matrix and includes three important descriptive statistics of all model variables, namely mean, standard deviation, and Cornbach's alpha. Apart from the variable *Environmental Turbulence* (ET) the matrix indicates significant relationships between all other model variables. The fact that no linear correlations were found between ET and MO, DCM, and P was not a real point of concern. After all, within the research model ET is treated as a background variable and not as a predictor, mediator, or moderator variable. What this study is primarily interested in is the question whether or not the interrelationships between the dependent and independent variables change when the level of environmental turbulence changes.

	M	*SD*	*α*	1	2	3	4	5	6
1. MO	3.51	0.37	0.70	1					
2. LC	3.17	0.43	0.74	0.41**	1				
3. AC	3.09	0.59	0.74	0.46**	0.40**	1			
4. DCM	3.43	0.38	0.70	0.46**	0.42**	0.46**	1		
5. P	4.01	0.52	0.80	0.32**	0.24**	0.35**	0.33**	1	
6. ET	3.49	0.51	0.84	-0.01	-0,09**	-0.07*	0.03	0.04	1

**. Correlation is significant at the 0.01 level (2-tailed)
*. Correlation is significant at the 0.05 level (2-tailed)

Table 4-1: Descriptive statistics and intercorrelations

Third, the question whether or not differences existed between early and late respondents was investigated. A t-test showed no significant differences between these two groups on all model variables.

Fourth, because the Netherlands armed forces organization in reality consists of four rather autonomous Operational Commands, with their own

specific task domains, a one-way ANOVA analysis was conducted to compare the means of all the model variables and see if significant differences between the organizational parts would emerge. Table 4-2 presents the results of this analysis. The table makes clear that for the variables *Performance* and *Environmental Turbulence* significant differences between Operational Commands indeed occur.

		N	*M*	*SD*	F	*Df*	Sig.
LC	Army	676	3.16	.44	2.27	3, 1249	.079
	Navy	236	3.23	.39			
	Air Force	296	3.15	.44			
	Marechaussee	45	3.24	.42			
AC	Army	676	3.08	.61	.74	3, 1249	.530
	Navy	236	3.11	.57			
	Air Force	296	3.08	.58			
	Marechaussee	45	3.21	.57			
MO	Army	676	3.52	.36	2.21	3, 1249	.085
	Navy	236	3.46	.36			
	Air Force	296	3.54	.38			
	Marechaussee	45	3.52	.27			
DCM	Army	676	3.44	.38	.99	3, 1249	.394
	Navy	236	3.43	.37			
	Air Force	296	3.40	.37			
	Marechaussee	45	3.44	.34			
P	Army	676	4.04	.52	10.99	3, 1249	**.000**
	Navy	236	3.84	.52			
	Air Force	296	4.08	.50			
	Marechaussee	45	4.06	.45			
ET	Army	676	3.53	.50	3.10	3, 1249	**.026**
	Navy	236	3.44	.47			
	Air Force	296	3.45	.52			
	Marechaussee	45	3.45	.50			

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

Table 4-2: One-way ANOVA on Operational Commands

A post-hoc analysis (Hochberg) made clear that the respondents from Navy Command scored significantly lower on P than the respondents from the other Operational Commands. With an average performance rating of 3.84 the opinion with regard to operational performance is still very positive, but in comparison with the others it is significantly lower. Although the ANOVA also pointed to a significant difference between the Operational Commands on the variable ET the Hochberg post-hoc analysis did not support this conclusion. Only after running the LSD post-hoc analysis (LSD) a significant difference between the Commands came to the surface. This analysis showed that Army Command and the Royal Marechaussee scored significantly higher on ET than Navy and Air Force Command.

		N	*M*	*SD*	F	*Df*	Sig.
ET	INDIV	78	3.58	.47	11.41	12, 1240	**.000**
	ISAF	272	3.65	.47			
	OEF	96	3.48	.49			
	SFIR	103	3.60	.43			
	EUFOR	41	3.11	.45			
	SFOR	259	3.31	.49			
	IFOR	31	3.43	.40			
	AFOR	7	3.63	.56			
	KFOR	59	3.65	.42			
	UNMEE	29	3.39	.46			
	NAVY	69	3.30	.50			
	AIR FORCE	48	3.33	.58			
	OTHER	161	3.60	.49			

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

Table 4-3: One-way ANOVA on mission context

Fifth, given the fact that environmental turbulence is a critical background variable in this study's research model, another one-way ANOVA was conducted to compare means of the variable ET, discriminating between different missions. Table 4-3 shows the results of this analysis. The table makes clear that the level of environmental turbulence varies from mission

to mission. The overall mean of this variable is 3.49; however, when concentrating on the separate missions ups and downs can be found with scores ranging from 3.65 to 3.11. A post-hoc analysis (Hochberg) showed that these peaks have led to significant differences between certain missions. Of the missions in which all Operational Commands had participated a significant contrast was found between SFOR and EUFOR as missions with a moderate level of environmental turbulence, and ISAF, OEF, and SFIR as missions with a high level of environmental turbulence.

The sixth analysis was triggered by the existing academic debate on absorptive capacity, in which prior knowledge is being presented as a key factor for recognizing, assimilating, transforming, and exploiting new external knowledge. One of the variables measured in the questionnaire is mission experience. So, an interesting analysis to do was to compare the means of respondents with little and respondents with much operational crisis response experience. Therefore, the sample population was divided into two groups. Respondents who had been on a crisis response mission once or twice were labeled as being moderately experienced. Respondents who had been deployed three times or more were labeled as being highly experienced.

After this step an independent t-test was run to compare the means of all model variables between the two groups (see table 4-4). The results showed a significant difference between the moderately and highly experienced respondents on the variable *environmental turbulence*. Moreover, with a score of .05 the differences in group scores on the variable *performance* proved to be just marginal significant. A remarkable additional result was, in this respect, that the respondents with a moderate level of mission experience were more positive about the Netherlands armed forces performance in comparison with the highly experienced respondents.

		N	M	SD	t	df	Sig.
LC	Moderate	926	3.18	.42	.99	1251	.32
	High	327	3.16	.46			
AC	Moderate	926	3.10	.58	1.56	1251	.12
	High	327	3.05	.62			
MO	Moderate	926	3.52	.36	1.33	1251	.18
	High	327	3.49	.37			
DCM	Moderate	926	3.43	.37	.69	1251	.49
	High	327	3.42	.39			
P	Moderate	926	4.03	.52	1.94	1251	**.05**
	High	327	3.97	.52			
ET	Moderate	926	3.47	.50	-2.17	1251	**.03**
	High	327	3.54	.50			

Table 4-4: T-test moderate versus high level of operational experience

Based on the ANOVA and T-test results it was decided to use Structural Equation Modeling (SEM) techniques to go deeper into three specific empirical issues. First, given the fact that the sample population consists of respondents of different Operational Commands it was deemed important to find out if the proposed research model in its entirety would also persist within these different sub groups. The main statistical issue to address was whether or not group dependency would have an interaction effect on the model's structure and interrelationships. After all, before a clear-cut opinion could be given on the way in which the Netherlands armed forces, as a whole, use organizational learning and reconfiguration determinants to develop and deploy dynamic capabilities, it was important to make sure that all Operational Commands also separately supported the default model. This issue became especially important after the ANOVA results had shown that Navy Command scored significantly lower on the model's dependent variable *performance*.

Second, based on the significant differences that had emerged in the level of environmental turbulence between different mission contexts the research model was also tested in its entirety within these different operational settings. In this respect, the main question to answer was whether or not an increase or decrease in the level of environmental

turbulence would have an effect on the overall structure of the model and on the strengths of the interrelationships between the variables within the model. The ANOVA results that had made clear that the SFOR and ISAF mission significantly differed on the variable *environmental turbulence* made it possible to use these specific missions to find out how the model would behave under SFOR's conditions of moderate environmental turbulence and compare this situation with the ISAF model that represents a context of high environmental turbulence.

Third, after finding out that differences existed (albeit in one case only marginal) between respondents with a moderate level and a high level of operational experience on crucial model variables, a logical follow-up step was to find out if these differences would also have an effect on the research model as a whole. Moreover, based on existing theoretical insights on the construct of absorptive capacity it became especially interesting to focus on possible differences in the relationship between the variables *absorptive capacity* and *organizational performance*.

4.3   STRUCTURAL EQUATION MODELING

As explained above this study relies on SEM techniques to test the proposed research model in its entirety. Covariance analysis and covariance structure modeling are other terms used for the same statistical approach, stressing the fact that SEM is primarily based on covariance statistics. AMOS Version 6 was selected as the actual software program for running the SEM analyses (Arbuckle, 2005).

A structural equation model can be defined as a complex composite statistical hypothesis that describes relations of dependency—usually accepted to be in some sense causal—between variables (McDonald & Ho, 2002). For the interplay between theory and empirical data SEM is a very useful technique, mainly because it gives the researcher the possibility to model relationships among multiple predictor and criterion variables (Chin, 1998). Yet, it is important to realize that SEM is not a universal remedy to fathom any given model. Kline (2005) explains that SEM has above all an a priori character, meaning that the researcher should

beforehand supply as much information as possible about the perceived interrelationships between the variables under investigation. Only if this is the case, SEM can really add value and give relevant information about the fit between the researcher's empirical data and the model he or she proposes. Because this study is based on a well formulated research model with complex interactions between variables, which was very hard to test as a whole by relying on traditional linear regression techniques alone, SEM was chosen as the main statistical method.

In most cases SEM analyses are conducted upon research models that combine observed and latent variables. These kinds of models are named structural models. This study uses existing scales to measure its variables and, therefore, only consists of observed variables. In this respect McDonald (1996: 239) notes that "a random variable is observable if and only if its values can be obtained by means of a real-world sampling experiment". A model that solely consists of observed variables is in SEM terminology known as a path model. See figure 4-1 for this study's path model that was drawn using the AMOS software package.

The rectangles in figure 4-1 represent the observed variables. Between these variables single headed arrows are drawn. These arrows symbolize a proposed, direct effect of one observed variable on another. More specifically, they represent the hypotheses formulated in chapter 2. The variable *lateral coordination* (LC) is an exogenous variable, meaning that its causes are unidentified. This is shown schematically in de model by the fact that no directed arrows are ending on LC. The variables *absorptive capacity* (AC), *modular organizing* (MO), *dynamic capabilities mixture* (DCM), and *performance* (P) are endogenous. In this case the presumed causes of the variables are considered known and made explicit in the model. This situation is schematically concretized in figure 4-1 by the fact that each endogenous variable has at least one directed arrow ending on it, originating from either LC or of one of the other endogenous variables. The small circles with outgoing arrows, positioned over each endogenous variable, are known as disturbances (named e1 to e4). A disturbance represents, per endogenous variable, all causes of this variable that the path model does not take into account.
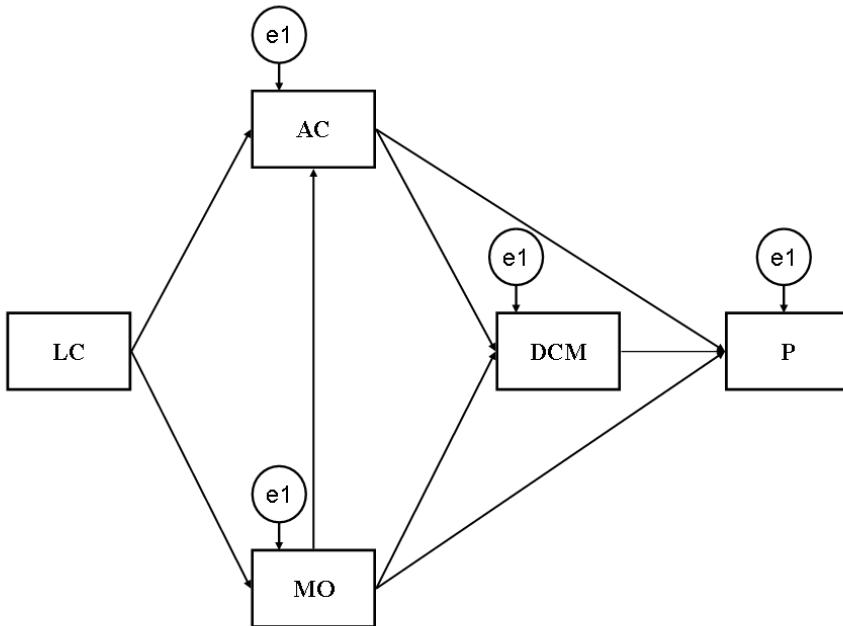
Figure 4-1: Default path model

Fit indexes

As explained earlier AMOS was used to test the overall fit of the model and the statistical significance of each of the hypothesized direct effects between the observed variables. The predominant fit statistic in reporting SEM results is the model Chi-square. The Chi-square statistic ($\chi 2$) tests the null hypothesis that the model is correct. Kline (2005) explains that it is the failure to reject the null hypothesis that supports the researcher's model. In other words, the researcher believes in his model and nothing but his model until empirical evidence makes this assumption very incredible. Basically, the model is given the benefit of the doubt. Compared to traditional statistical testing this logic implies inverse reasoning. After all, normally the null hypothesis relates to the situation in which the researcher's predication is wrong and that the presupposed effect does not exist. In this case it is the rejection of the null hypothesis that supports the

researcher's ideas. Put it differently, the null hypothesis gets the benefit of the doubt and the researcher sticks to it as long as possible. Only if the null hypothesis becomes very incredible it is legitimate for the researcher to reject the null hypothesis and to accept his own alternative hypothesis.

Technically, the Chi-square test assesses the discrepancy between the variance/covariance matrix implied by the path model and the variance/covariance matrix coming from the actual empirical sample. Only if the associated level of statistical significance (P) exceeds .05 it is allowed to accept the researcher's model. This is where the contrast between traditional testing and SEM becomes apparent. After all, in traditional testing P should be less than .05 in order to reject the null hypothesis and accept the researcher's alternative hypothesis.

As a fit index the Chi-square test has been under debate for a long time. One of the big issues is that it is being influenced too much by sample size. Kline states (2005: 136): "Specifically, if the sample size is large, which is required in order to interpret the index as a test statistic, the value of χ^2 may lead to rejection of the model even though differences between observed and predicted co-variances are slight". As a result, a number of alternative fit indexes have been developed. These indexes are less affected by sample size and come with specific interpretive norms. However, a large number of these fit indexes are available, which makes it difficult for the researcher to choose. In this respect Tabachnik and Fidell (2007) state that "good-fitting models produce consistent results on many different indices in many, if not most, cases. If the indices lead to similar conclusions, the issue of which indices to report is a matter of personal preference and, perhaps, the preference of the journal editor". This study follows the existing norm in behavioral science research and reports the four most commonly used indexes in this domain (Kline, 2005; McDonald & Ho, 2002). These specific indexes are discussed in more detail below.

The root mean square error of approximation (RMSEA; Steiger, 1990) does not assume a perfect fit between the researcher's model and the sample population. It basically serves as a badness of fit index that uses the non-centrality parameter (δ) to measure the degree of falseness of the null hypothesis. A general rule followed when reporting SEM results is that an RMSEA $\leq$ .05 indicates a small error of approximation, values between

.05 and .08 represent a reasonable error, and all values above .10 are perceived unsatisfactory (Browne & Cudeck, 1993). Together with the RMSEA overall value computer programs, such as AMOS, also present a 90% confidence interval. When using the RMSEA value as a model fit indicator, this interval has to be reported. The lower bound should be less than .05 and the upper bound must not exceed .10.

The comparative fit index (CFI; Bentler, 1990) compares the researcher's model with an independent, 'baseline' model. The baseline model assumes that no population co-variances among the observed variables exist. Comparing the two models makes it possible to assess the relative improvement of fit of the researcher's over the baseline model. If the researcher's model does not indicate a considerable improvement, there is no reason to defend it as the best one available. The prevailing norm is that CFI values exceeding .90 suggest a reasonably good fit (Hu & Bentler, 1999).

The standardized root mean square residual (SRMR) transforms the variance/covariance matrix of the path model and the variance/covariance matrix of the actual empirical sample into correlation matrices. Subsequently, the differences between the observed and predicted correlations are measured. Kline (2005) offers as a rule of thumb that an SRMR overall value of less than .10 is generally considered favorable.

The goodness-of-fit index (GFI; Jöreskog & Sörbom, 1981) calculates a weighted proportion of variance in the sample covariance accounted for by the path model's estimated covariance matrix (Bentler, 1983; Tanaka & Huba, 1989). Tanaka and Huba (1989) argue that the GFI is comparable with the R^2 in multiple regression. A GFI score of 1.0 suggests a perfect fit, values exceeding .90 indicate a good fit, and values close to zero indicate a poor fit (Kline, 2005).

4.4 AMOS RESULTS

Before testing the research model in AMOS, first, the potential problem of all variables converging on one common factor had to be addressed. After all, why go defending a complex composite model if a simpler version also fits the empirical data. Based on the norm values of the different fit indexes discussed above this assumption could unambiguously be rejected (see table 4-5).

Chi-square	*Df*	P	RMSEA	CFI	SRMR	GFI
1112.477	6	.000	.384 L90: .365 H90:.403	.178	.290	.178

Table 4-5: Fit indexes one-factor model

Testing the proposed research model in AMOS

After this potential problem was ruled out the main focus shifted towards the proposed path model. First, the default model was tested against the complete set of empirical data. The analysis did not lead to a very good model fit (see default model table 4-6). Especially the Chi-square and RMSEA fit indexes received unsatisfactory scores.

After this negative result the model was subjected to a more thorough analysis. The main concern was that perhaps a suggested or missing relationship hampered the overall power of the model. Based on existing theoretical insights, not taken into account in the default model, it was argued that maybe a direct relationship between LC and DCM was missing in the proposed model. In short, these existing sources made clear that apart from its specific facilitating role in modular organizing and absorptive capacity, lateral coordination could also in a broader sense contribute to balancing the necessary mixture of dynamic capabilities.

A general assumption that over the years has persisted within management literature is that lateral coordination should be the key mode of coordination within dynamic, complex, and uncertain environments (Galbraith, 1981; Mintzberg, 1983; Thompson, 1967). The central idea is that when the level of environmental uncertainty increases it becomes more important to invest in organizational alignment and connectedness (Jaworski & Kohli, 1993; Rowley, Behrens, & Krackhardt, 2000). Because of its informal and boundary-spanning character lateral coordination is not only perceived to be an ideal instrument to integrate different organizational teams but also to connect different hierarchical levels (Henderson & Cockburn, 1994; Matusik, 2002; Peters & Waterman, 1982), functional areas (Barki & Pinsonneault, 2005; Gupta & Govindarajan, 2000), and ideological standpoints (Nonaka & Takeuchi, 1995).

Based on these ideas a second SEM analysis was run, this time incorporating a direct relationship between LC and DCM into the default path model. The results of this analysis are also presented in table 4-6 (refined model). A major improvement can be seen. The Chi-square dropped from 57.1 to 1.5, reaching a probability level of .225, which means that the null hypothesis that supports the research model was not rejected at the .05 and .01 level. All other fit indexes also reached satisfactory values. The RMSEA is smaller than .05 which indicates a small error of approximation. The CFI and GFI exceed .90 and the SRMR has a value of less than .10.

Model	Chi-square	Df	P	RMSEA	CFI	SRMR	GFI
Default	57.1	2	.000	.148 L90: .117 H90:.183	.959	.042	.982
Refined	1.5	1	.225	.019 L90: .000 H90:.081	1.0	.007	1.0

Table 4-6: Model fit of default and refined path model

The adjustment made to the default model has led to the refined model presented in figure 4-2. Apart from identifying an additional relationship

between LC and DCM, the results in this figure also reveal that the proposed relationships, which make up the overall structure of the research model, are indeed significant (p<0.001). To be more specific this means that the hypotheses 1, 2, 3, 4, 5, 6, 10, and 11 are being supported by the empirical evidence. See table 4-7 for an overview of the hypotheses formulated in chapter 2 and the results coming out of the SEM analysis.

Next to this confirmation of the path model's proposed general structure, the SEM-analysis also provides relevant insight into the strengths of the model variables and their interrelationships. Figure 4-2 presents the standardized regression weights of the relationships between the model's variables and the explained variances of these separate variables.

In general, the scores show that *Lateral Coordination* (β= .20), *Absorptive Capacity* (β= .26), and *Modular Organizing* (β= .26) more or less equally influence the organization's dynamic capabilities mixture. Together these three variables account for a substantial part (32%) of the variation in the composition of this mixture. Moreover, the model makes clear that with just these three organizational enablers 18% of the variation in *performance* under turbulent circumstances can, directly or indirectly, be accounted for. Given the complex force field within which crisis response operations take place, 18% actually represents a profound part of the overall performance. After all, important external factors, such as politics, finances, opposing forces, international law, climate, and terrain, are not addressed in the research model.

Knowing that the hypotheses 7, 8a, 8b, and 9 all give a verdict on the strength of a specific path in the research model, the information provided in figure 4-2 is also important for the confirmation or rejection of these four remaining hypotheses.

Hypothesis 7 states that *Absorptive Capacity* has the strongest influence on an organization's *Dynamic Capabilities Mixture*. The regression weights do not really confirm this hypothesis. The influence of AC on DCM is just as strong as the other path of MO on DCM, in both cases the regression weight is .26. What the results do make clear is that both AC and MO

stronger influence DCM than LC does. Moreover, the direct effect of AC on P (β= .20) is slightly stronger than MO directly on P (β= .14).

Between *Modular Organizing* and *Lateral Coordination,* hypothesis 8a assumes a stronger effect of *Modular Organizing* on *Absorptive Capacity.* Based on the empirical results this hypothesis can be supported. After all, with a score of .36 MO has a stronger effect on AC than LC does (β= .26). Because of this outcome, the alternative hypothesis 8b that states that LC has a stronger influence on AC than MO needs to be rejected.

Hypothesis 9 suggests that *Lateral Coordination* ought to have a moderately positive effect on *Modular Organizing*. Again, the empirical results seem to indicate otherwise. With a regression weight of .41 LC has a rather strong influence on modular organizing. After all, comparing this score with the other regression weights in the model makes clear that the relationship between LC and MO is the strongest of them all. Moreover, the 17% explained variance of modular organizing that lateral coordination solely accounts for is also quite high.
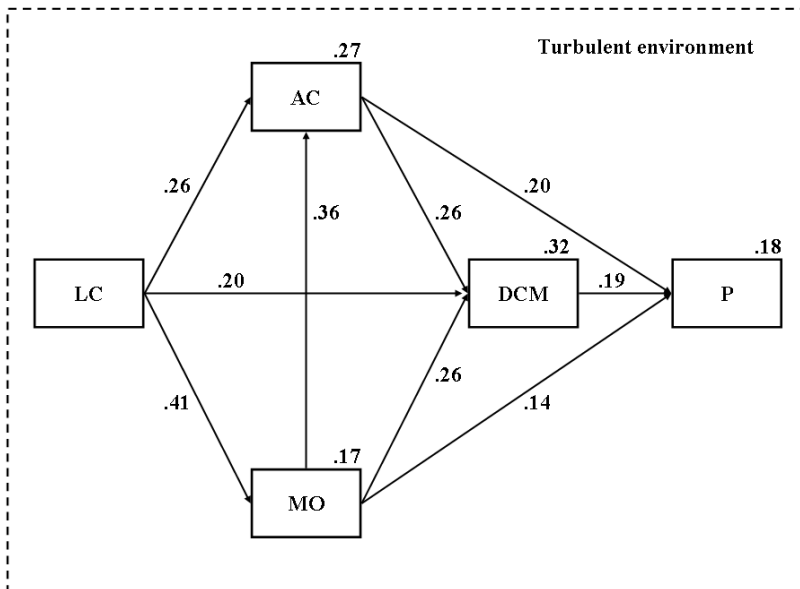
Figure 4-2: Refined path model

No.	Hypothesis	Result
1	*Organizations that possess a combination of strategic, structural, and operational flexible dynamic capabilities perform successfully within turbulent environments.*	Supported
2	*Absorptive capacity is positively related to an organization's strategic, structural, and operational flexible dynamic capabilities.*	Supported
3	*Modular organizing is positively related to an organization's strategic, structural, and operational flexible dynamic capabilities.*	Supported
4	*As an antecedent for absorptive capacity, lateral coordination is indirectly related to an organization's strategic, structural, and operational flexible dynamic capabilities.*	Supported
5	*As an antecedent for modular organizing, lateral coordination is indirectly related to an organization's strategic, structural, and operational flexible dynamic capabilities.*	Supported
6	*Modular organizing is positively related to absorptive capacity.*	Supported
7	*Absorptive capacity has the strongest relative effect on an organization's strategic, structural, and operational flexible dynamic capabilities.*	Rejected
8a	*Modular organizing has a stronger relative effect on absorptive capacity than lateral coordination.*	Supported
8b	*Lateral coordination has a stronger relative effect on absorptive capacity than modular organizing.*	Rejected
9	*Lateral coordination has a moderately positive effect on modular organizing.*	Rejected
10	*Absorptive capacity is directly related to organizational performance within turbulent environments.*	Supported
11	*Modular organizing is directly related to organizational performance within turbulent environments.*	Supported

Table 4-7: Hypotheses overview

Comparing Operational Commands

Because the ANOVA's in SPSS had uncovered differences between Operational Commands in the mean scores of some of the model variables, the next step in AMOS was to find out if these differences would also have an effect on the research model as a whole. Therefore, a simultaneous analysis of several groups was conducted with AMOS. The Marechaussee was not taken into account in this analysis. Only Army, Navy, and Air Force Command were compared with each other. This choice was based on the fact that the Marechaussee as a group did not have enough respondents for this kind of analysis.

After having done the analysis the output again presented a good model fit (see unconstrained model in table 4-8). In general, it could be stated that the output of this analysis confirms the fact that the path model's structure is equal for all three Operational Commands. However, when concentrating on the parameter estimates, differences emerged between the different Commands. In a second step this matter was investigated more thoroughly. Additional constraints were imposed to our model to test the hypothesis that the regression weights significantly differed across the three Operational Commands. The analysis made clear that this was not the case, showing another good model fit (see structural weights model in table 4-8).

Model type	Chi-square	Df	P	RMSEA	CFI	SRMR	GFI
Unconstrained	4.7	3	.195	.022 L90: .000 H90:.057	.999	.00121	.998
Structural Weights	22.898	21	.349	.009 L90:.000 H90:.026	.999	.0436	.992

Table 4-8: Multiple group analysis of Navy, Air force, and Army Command

Although the differences between the unstandardized regression weights were not significant some of them are still worth mentioning, because they

give insight into the subtle distinctions between the Operational Commands. In this respect, the first thing to notice regarding Navy Command (see figure 4-3) is that, in line with the ANOVA results, this Operational Command deviates most from the refined path model. Perhaps most striking is the fact that the explained variance of Performance of .28 is, compared with the refined path model and the other two Operational Commands, considerably higher. This, basically, means that within the Navy context the triad of absorptive capacity, modular organizing, and a mixture of dynamic capabilities seems to have a more profound effect on organizational performance. Moreover, with a regression weight of .26 the individual effect that DCM plays within this triad also seems to be more important compared with the other Operational Commands.
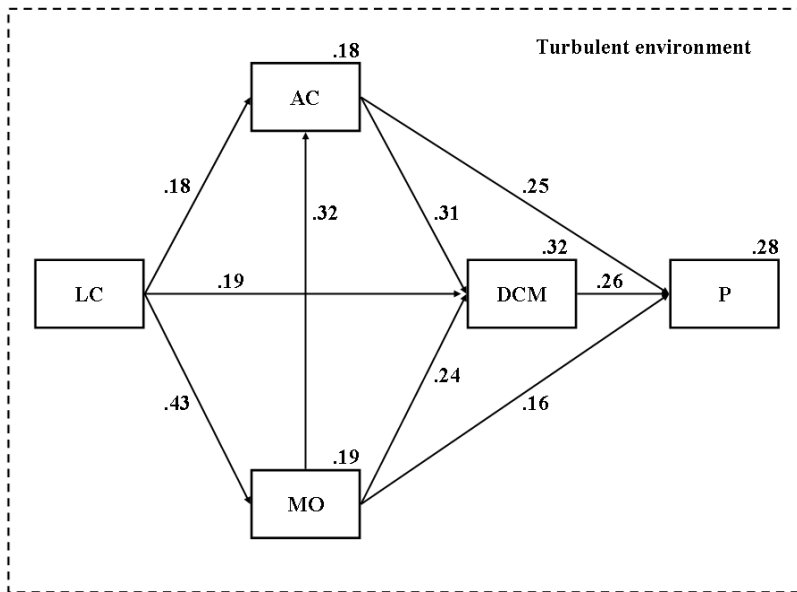
Figure 4-3: Navy Command

Second, hypothesis 7, which states that *Absorptive Capacity* has the strongest influence on an organization's *Dynamic Capabilities Mixture*, is only being supported in the Navy context. The direct effect of AC on DCM

(β= .31) is stronger than the influences of MO and LC on DCM, respectively scoring regression weights of .24 and .19. Moreover, the direct effect of AC on P (β= .25), also has a higher regression weight in comparison with the refined baseline model and the separate models of Air force and Army Command.

A third interesting issue is related to the role of lateral coordination and modular organizing as determinants of absorptive capacity. In the refined path model 27% of the explained variance of AC is being accounted for by only these two variables. Figure 4-3 shows a different situation for the Navy; namely, in this specific case only 18% of the explained variance of absorptive capacity is being determined by a combination of lateral coordination and modular organizing. This decreasing number seems to the result of a less profound direct effect of LC (β= .18 instead of β= .26) on AC.

Finally, the relationship between lateral coordination and modular organizing is also worth mentioning. Of the three Operational Commands this path is the most strongest with a score of .43 within the Navy setting. This result came a bit as a surprise, mainly because the Navy with its maritime task holds a rather independent position within the Netherlands armed forces. Of their nature, land and air operations are more directly linked, whereas Navy operations often take place independently. If there is cooperation, this often takes place in international fleet settings. The ships that take part in these fleet settings can, basically, be seen as ideal organizational modules. Therefore, one would expect the level of lateral coordination to be rather limited in a naval context. After all, standardized command and control processes and periodic maneuvers ought to be sufficient to integrate the different ships into a well-working larger fleet formation.

Figure 4-4 below indicates that Air Force Command does not differ much from the refined path model. However, one thing that does attract attention is the effect of DCM on P. The regression weight of .13 is not only lower than the refined path model suggests but in comparison with the Navy and Army Command models this figure is even substantially lower. In general, this result seems to indicate that Air Force Command relies less on the

existence of a mixture of strategic, structural, and operational dynamic capabilities for its crisis response performance.
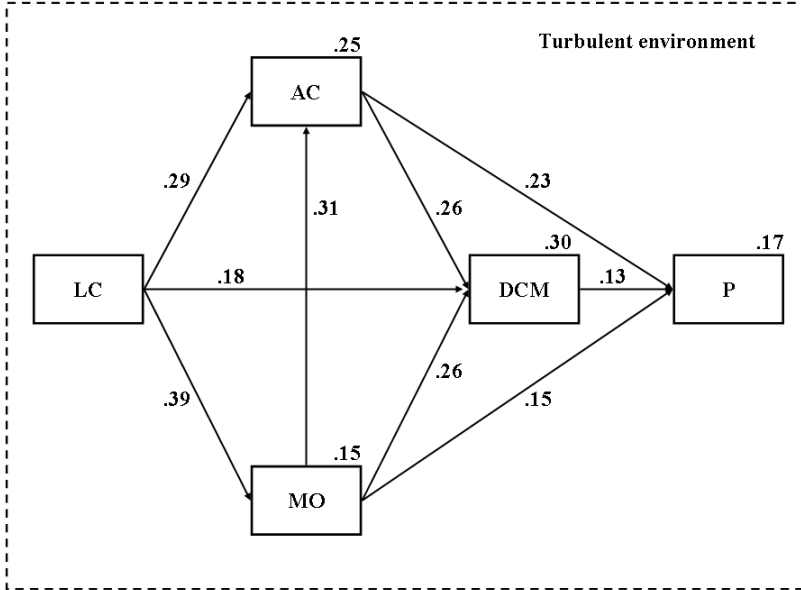
Figure 4-4: Air force Command

One interesting remark can be made about the situation of Army Command, presented in figure 4-5. Within the Army context *Absorptive Capacity* has an explained variance of .32, which is higher than the refined path model suggests. This rise seems to be influenced by an increasing effect of MO on AC (β= .41 instead of β= .36). Moreover, Comparing this regression weight of .41 with the other two Operational Commands (Navy = .32, Air Force = .31), seems to indicate that of the three Commands the Army most strongly depends on modular organizing practices for its ability to recognize, assimilate, transform, and exploit external knowledge.
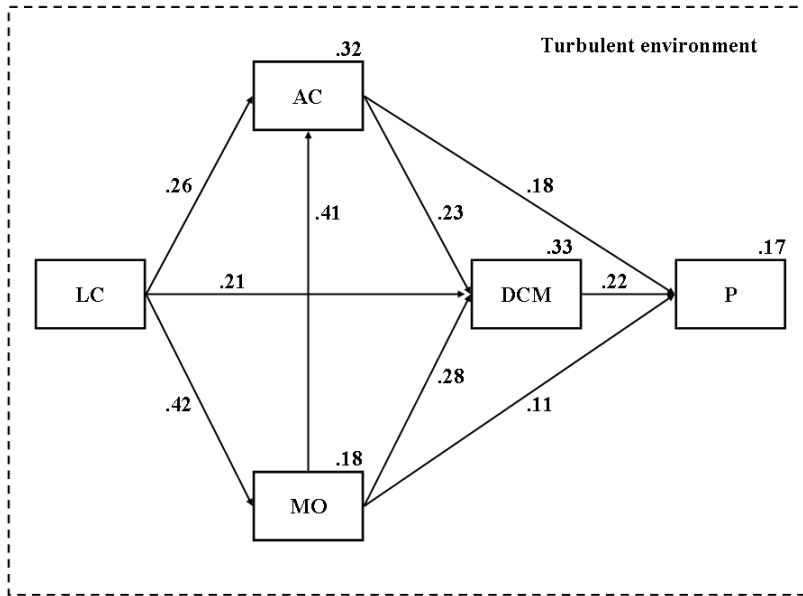
Figure 4-5: Army Command

Comparing mission contexts

The next phase in the SEM analyses was to investigate whether or not differing levels of environmental turbulence would lead to substantial changes in the model's structure and interrelationships. The ANOVA results were used to select two crisis response missions, comparable in size but with significantly different levels of environmental turbulence. SFOR was selected as a representative mission context of moderate environmental turbulence and ISAF as a context of high environmental turbulence.

Another multiple group analysis was conducted. The output showed a very good model fit (see unconstrained model in table 4-9). The next step was to analyze if significant differences in parameter estimates between the SFOR and ISAF mission would surface. This was not the case. The constrained analysis also showed a good model fit (see structural weights model in table 4.9).

Model type	Chi-square	Df	P	RMSEA	CFI	SRMR	GFI
Unconstrained	.754	2	.686	.000 L90: .000 H90:.065	1.00	.0111	.999
Structural Weights	14.08	11	.229	.023 L90:.000 H90:.054	.995	.0382	.990

Table 4-9: Multiple group analysis of moderate versus high environmental turbulence

Based on these results it could be concluded that the model's overall structure persists within the two specific environmental contexts of moderate and high turbulence. However, a closer look at the unstandardized regression weights of the two different unconstrained models drew attention to the fact that some of the proposed paths lost their statistical significance. To be specific, within SFOR's moderately turbulent task environment modular organizing and a mixture of flexible dynamic capabilities still had a profound influence on organizational performance. Yet, the other proposed relationship between absorptive capacity and performance was no longer significant under these circumstances. In contrast with this situation, ISAF's context of high environmental turbulence painted an opposite picture. Under these environmental conditions absorptive capacity had become the sole significant contributor to organizational performance at the expense of the other two paths.

After these findings it was decided to test the mission models separately. The main goal was to analyze if per model a fit could still be found while leaving out the not significant relationships. For both the SFOR and ISAF context this proved to be the case (see table 4-10). Table 4-10 makes clear that all fit-indexes reached satisfactory levels. The RMSEA was the only fit index that did not reach its most desirable level of ≤ 05. Kline (2005) argues, however, that scores between .05 and .08 are still considered reasonably fine. Moreover, he explains that the mixed results of the confidence intervals (0↔.147 and 0↔.126), where the lower bounds reach a satisfactory level and the upper bounds do not, probably have to do with the smaller sample sizes.

Model type	Chi-square	Df	P	RMSEA	CFI	SRMR	GFI
SFOR	3.593	2	.166	.056 L90:.000 H90:.147	.993	.0252	.994
ISAF	5.262	3	.154	.053 L90:.000 H90:.126	.993	.0349	.992

Table 4-10: Model fit of the SFOR and ISAF models

The actual models are presented in figure 4-6 and 4-7 below. Apart from the alterations that have been made to the refined path model, a second topic these models bring forward has to do with the variable *lateral coordination*. A comparison of figure 4-6 and 4-7 makes clear that when the level of environmental turbulence increases the influence of LC on both MO and AC rises. This seems to indicate that the ability to recognize, transform, and exploit new external knowledge and to modularly organize comes to depend more strongly on an organization's lateral coordination capabilities. The explained variance of the variables AC and MO support this assumption. With LC as a sole predictor variable of absorptive capacity the explained variance of AC increases from .24 under moderately turbulent circumstances to .31 under highly turbulent circumstances. The same trend is applicable to the relationship between lateral coordination and modular organizing, where the explained variance of MO has doubled from .10 to .20.
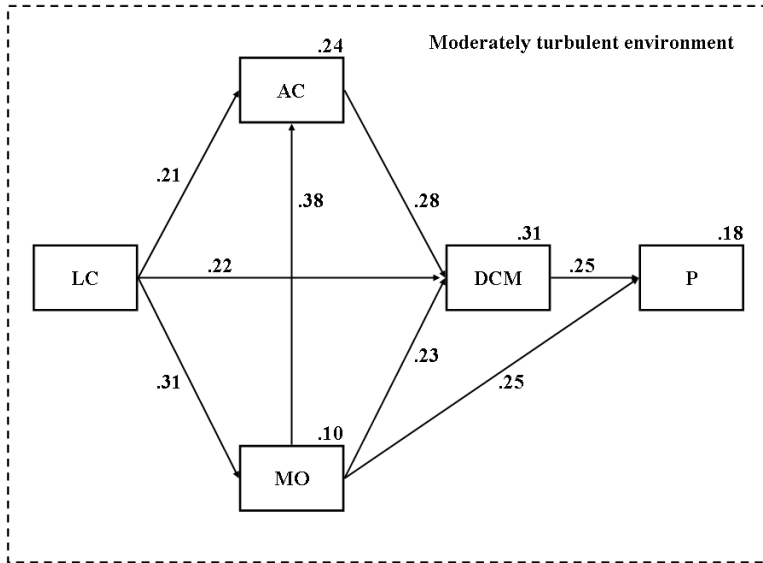
Figure 4-6: The SFOR model
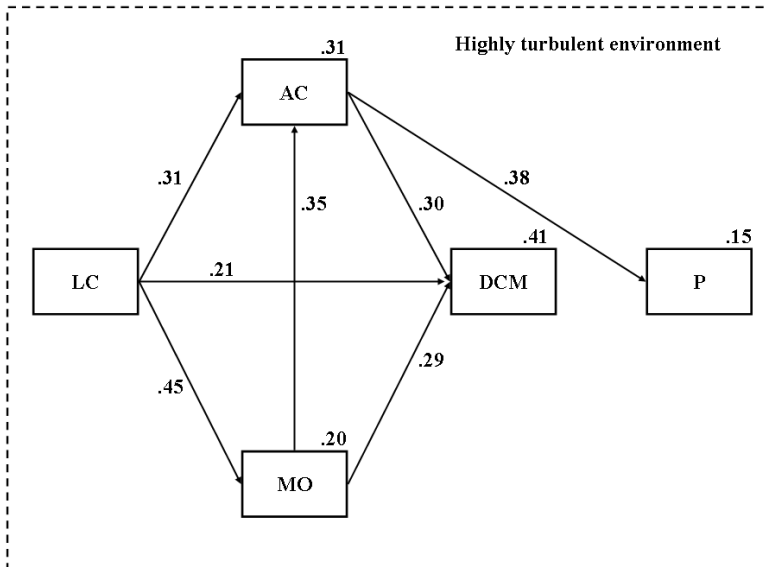
Figure 4-7: The ISAF model

Comparing levels of operational experience

The varying levels of mission experience between the respondents served as the input for a third multiple group analysis. AMOS was used to find out if a distinction between little and much operational experience would have an effect on the refined path model and especially on the key variable *Absorptive Capacity*. A multiple group analysis showed no significant differences on the model's overall structure and the interrelationships between the model's variables between a group of moderately experienced respondents and a group of highly experienced respondents. Table 4-11 shows that the unconstrained model and structural weights model both obtained a good model fit.

Model type	Chi-square	Df	P	RMSEA	CFI	SRMR	GFI
Unconstrained	1.936	2	.380	.000 L90: .000 H90:.055	1.000	.0092	.999
Structural Weights	5.267	11	.918	.000 L90:.000 H90:.055	1.000	.0115	.998

Table 4-11: Multiple group analysis moderate versus high level of operational experience

However, a closer look at the standardized regression weights pointed to some nuances between the two groups when focusing on the effects of the variable *Absorptive Capacity* (see figure 4-8 and 4-9). The effect of AC on DCM is stronger within the group of highly experienced officers than within the group of less experienced officers. At the same time, however, within this group of highly experienced respondents the effects of AC on P and DCM on P are less strong.
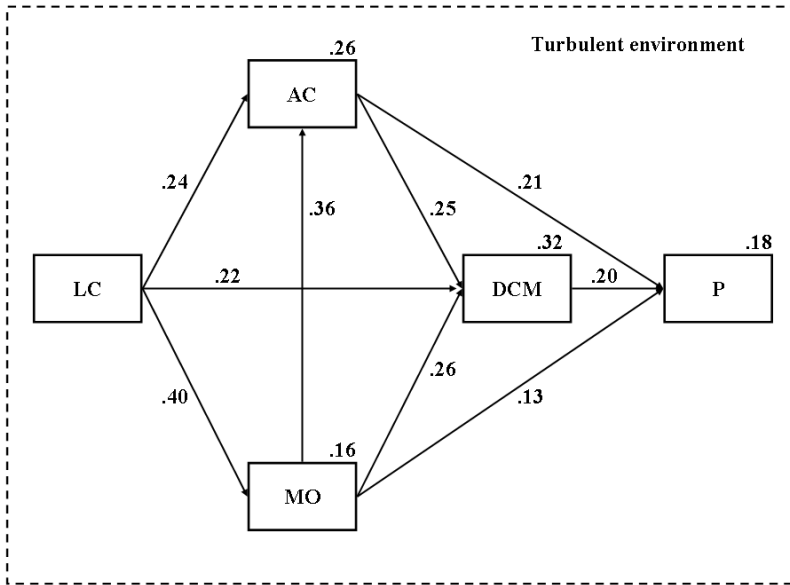
Figure 4-8: Moderate level of mission experience
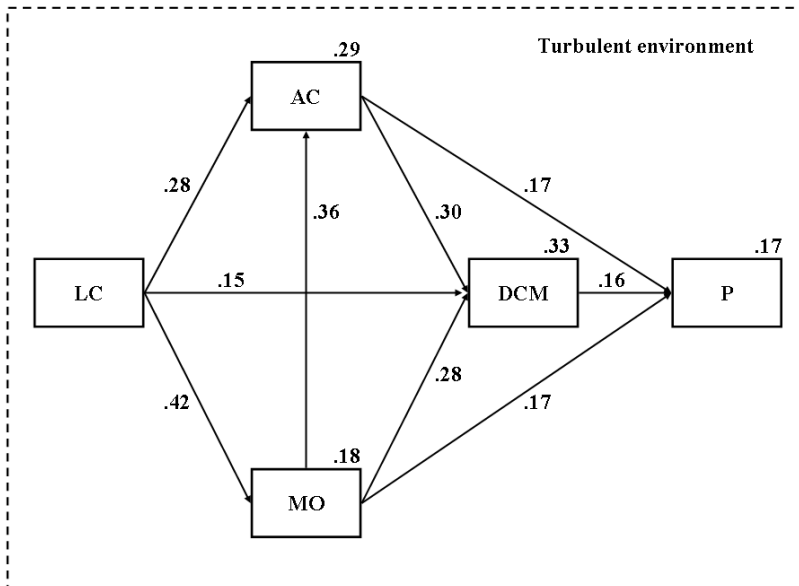
Figure 4-9: High level of mission experience

4.5 DISCUSSING THE RESULTS

After having done the statistical analyses in AMOS the research focus shifted to giving explanations for the numerical data that was retrieved. The final question of the questionnaire was used as a starting-point for this process. This final question was an open question, in which the respondents were invited to write down individual comments and other relevant information and remarks. After scanning these comments it became clear that some very relevant themes were being addressed in this undirected part of the questionnaire. Themes emerged that could be linked to a number of issues that the AMOS analyses had brought to the surface and that could color them with more practical meaning. Table 4-12 below gives an overview of the central themes that were being addressed in these comments. Moreover, it presents the actual number of relevant comments that were written down on the survey form.

Themes	Number of comments
1. Configuring tailor-made crisis response units	19
2. Cooperation between different Operational Commands	16
3. The Netherlands armed forces organizational learning ability	19
4. Differing task domains between Operational Commands	16
5. Differing mission contexts	4
Total	74

Table 4-12: Categorization of comments

Explaining lateral coordination's role in organizational alignment

The fact that a general model fit could only be found when an extra relationship between *Lateral Coordination* and *Dynamic Capabilities Mixture* was added to the model could directly be related to a large number of comments that were made. The theoretical assumption underlying this

specific relationship of using lateral coordination as a basic organizational tool to connect and align different hierarchical levels, functional areas, and ideological standpoints was being supported by these comments.

The comments pointed to a specific gap that asked for extra communication and coordination efforts. According to 16 respondents a command and control gap exists between the Netherlands armed forces' strategic apex in The Hague and the actual military formation that is, or is going to be, deployed. The Chief of Defense bears primary responsibility for planning and directing crisis response operations. He, however, has no national permanent joint headquarters at his disposal to support him in his role of commander-in-chief. As a result, during the planning and preparation phase of a mission many responsibilities are being delegated to the Operational Commands. Depending on the composition of the actual crisis response formation the contributor of the largest number of troops is appointed *Coordinating Operational Command*. Because of this approach of structural delegation important planning and preparation issues are being settled through horizontal, ad-hoc, relations between the Coordinating Operational Command and the other Operational Commands that are participating in the mission.

Most comments (14) make clear that this process of horizontal coordination does not always go smoothly. Conflicts of interest and cultural differences between the Operational Commands may lead to miscommunication, misunderstanding, delays, and sub-optimal decision-making. It must, however, also be said that because of the increasing level of participation of the Netherlands armed forces in all kinds of crisis response operations the organization is at the same time, according to 2 of the respondents, gradually making progress when it comes to joint inter-staff cooperation.

Explaining the strong influence of lateral coordination on modular organizing

A second theme that emerged after reading the open remarks could directly be related to hypothesis 9. This hypothesis suggests that lateral coordination ought to have a moderately positive effect on modular

organizing in order to retain the advantages of loose coupling. Yet, looking at the refined path model a regression weight of .41, which represents the strongest effect within the entire model, indicates a rather profound effect of LC on MO. Moreover MO's explained variance of 17% based on the sole contribution of LC is also quite considerable. Moreover, a similar situation occurs within the separate models of the different Operational Commands.

The open comments offer a probable cause for the stronger than expected relationship between LC and MO, namely design constraints. First of all, 7 respondents explain that the Netherlands armed forces' permanent structure is not attuned to its crisis response role. For each mission tailor-made configurations have to be composed. The process of mixing and matching that follows cuts through all kinds of existing hierarchical and functional boundaries. As a result, the tailor-made military formations that are being deployed have to deal with the problem of organizational unfamiliarity. The fact that they are composed on an ad hoc project basis for very specific operational assignments leads to situations in which units and individuals have to work closely together, without actually knowing each other very well. To overcome this problem the organization has to invest time and money in for example extra training programs, but also in the deployment of additional staff specialists to successfully coordinate the wide variety of functional components that are being deployed.

Regarding the aspect of imperfect modularization it is also useful to refocus on the specific model of Navy Command. Figure 4-3 had shown that against all expectations the relationship between lateral coordination and modular organizing was most powerful within the Navy context. Based on 3 remarks of Navy respondents it could be argued that this has to do with fact that Navy personnel are increasingly being deployed for land-based operations. The three comments specifically referred to ISAF's land-based mission in Afghanistan, for which in August 2005 the Navy had to man what is known as a Provincial Reconstruction Team (PRT). This PRT mission became an organizational eye-opener for the Navy. Because the traditional naval building blocks of ships and crews did not fit the work force composition of a PRT, many of the people needed were hand-picked from the permanent organization to do the job. The implications of this approach were twofold. First, the Navy had to invest extra time, money

and energy in training and team building programs to create a deployable unit out of all the selected individuals. Second, by suddenly withdrawing people from their daily jobs, the administrative, functional, and vocational processes of the Navy itself suffered dramatically. Given the opportunity to do it all over again, the respondents believe that Navy Command probably has to stick to its original organizational modules and use a ship's fixed crew on land to take on unfamiliar tasks.

Explaining the strong influence of modular organizing on absorptive capacity

All multiple group analyses demonstrated that the relationship between modular organizing and absorptive capacity is stronger than the one between lateral coordination and absorptive capacity. With this concrete empirical evidence hypothesis 8a could be supported and 8b could be rejected. On the whole, the outcome seems to indicate that team-based structures have a more profound influence on an organization's absorptive capacity than expected.

No concrete remarks could be related to this finding. Perhaps a logical explanation could be that coordination capabilities primarily relate to the rather swift exchange of knowledge and insights between individuals; whereas, modular organizing stimulates a more profound way of learning. The cooperation that takes place between different military units, over a longer period of time, deepens the understanding of each other's ways of doing things. This probably leads to a situation in which not only new knowledge is acquired, but also more detailed insights are gathered about the transformation of this new knowledge into concrete, usable routines and processes.

Explaining the relative influence of absorptive capacity and modular organizing

Hypothesis 7 is based on the idea that because of its learning and orchestrator capabilities absorptive capacity has the strongest influence on an organization's strategic, structural, and operational flexible dynamic

capabilities. Within the refined baseline model this hypothesis could not be confirmed. The effect of AC on DCM proved to be just as strong as MO on DCM. Within the large number of open comments no real clue could be found on this issue. Yet, the multiple group analysis, in which SFOR's moderately turbulent mission context was compared with the ISAF's highly turbulent mission context, offers relevant additional information on the relative power of absorptive capacity in relation to the other key determinant modular organizing.

To a large extent the SEM outcome seems to be in line with what theoretically has been discussed in paragraph 2.6. Recapitulating, this paragraph explains that within a turbulent environment organizations are confronted with a wide spectrum of competitive demands. Most of the time these demands ask for a prudent organizational approach, but sometimes an organization also has to act quickly and decisively. The former situation, results in a highly patterned way of reacting based on the execution of dynamic capabilities. The latter, stimulates a tactic of improvisation and ad hoc problem solving, not necessarily based on the activation of existing dynamic capabilities. Absorptive capacity and modular organizing are both presented as organizational determinants that can deal with the entire spectrum of competitive demands, supporting highly patterned but also improvisational organizational reactions.

Especially the refined path model seems to fit this theoretical picture extremely well. After all, both AC and MO directly contribute to the activation of a broad mixture of flexible dynamic capabilities, but also directly influence organizational performance. However, when the level of turbulence decreases (the SFOR situation) or increases (the ISAF situation) some interesting alternative dynamics emerge. What the results make clear is that, when the level of environmental turbulence becomes less extreme, reconfiguration capabilities offer the organization enough flexibility to successfully react to emerging changes in the environment. In this case it is only the orchestrator role of absorptive capacity that adds value, helping to create a durable balance between strategic ambitions and organizational capabilities. In the research model this leads to a situation in which AC only indirectly influences P, and in which a direct effect between AC and P no longer exists. At the same time, the results show that, when level of environmental turbulence gets really high, absorptive capacity starts acting

as the sole contributor to organizational performance. In a general sense, this result assumes that within highly turbulent environments the existing organizational status quo has to be more or less taken for granted. The real difference has to be found in thinking and acting quickly beyond existing practices; basically, making it a case of creatively exploiting what you have got.

When this outcome is being related to the competitive spectrum presented in figure 2.3 it could be argued that AC and MO take up different positions. Absorptive capacity seems to be the predominant organizational determinant on the right side of the spectrum. Modular organizing plays this leading role on the left side of the spectrum and in the mid section both determinants are required. So, basically, it is not about being the strongest, but far more a matter of being the most appropriate organizational determinant given the environmental circumstances.

Explaining the differences between Operational Commands

Much of the differences between the models of Army, Navy and Air force Command can probably be related to their different operational domains. 16 open remarks explicitly emphasize the fact that different task settings lead to different organizational dynamics.

First of all, the Navy, with its maritime task, holds a rather independent position within the Netherlands armed forces. In their nature, land and air operations are more directly linked, whereas Navy operations often take place independently. Any form of cooperation will often take place in international fleet settings. On account of their autonomous position, it is therefore probable for Navy personnel to find it hard to be outspoken on the crisis response operations of the armed forces as a whole. Therefore, the respondents from Navy Command probably scored significantly lower on performance than the respondents from Army and Air force Command.

Next, for the Navy the new crisis response role has not led to drastic operational changes compared to the past. Basically, sea time has remained sea time, and it does not matter much for Navy personnel whether they are employed in a regular maritime patrol, a counter-drug operation in the

Caribbean, or in for example CTF150 within the Enduring Freedom framework. It could even be argued that the status quo between organizational capabilities and strategic capacity has not really been stirred up. So, despite the expansion of operational tasks no drastic organizational changes were needed. Figure 4-3 supports this idea by showing that of all Operational Commands the *Dynamic Capabilities Mixture* has the strongest influence on performance within the Navy setting. Moreover, this figure also makes clear that in combination absorptive capacity, modular organizing, and a mixture of dynamic capabilities account for a profound part of the organization's performance. Where, these three determinants only explain 17% of the performance of the Air force and Army, they explain a more substantial part of 28% within the Navy context.

Similar argumentation can be applied to Air force Command. Just like the Navy the Air force has encountered less far-reaching changes in its operational repertoire than the Army did. Flying an F-16 fighter jet or Apache attack helicopter over Europe in a Cold War setting is in a practical sense not very different from flying a mission over Bosnian, Ethiopian, or Afghan air space. However, one thing that did urge the Air force to react was the increasing level of operational deployment. In almost all land-based operations aerial support was indispensable. Especially helicopters proved to be a crucial operational asset for crisis response missions. Given its relative small size, the problem that Air force Command, in this respect, encountered was that the increasing demand was difficult to satisfy.

The open comments make clear that sometimes only ad-hoc and "creative" organizational measures helped the Air force to meet its operational demands. One of the respondents explained that F16 technicians had to be retrained to create a larger pool of technicians that could do maintenance jobs on the Apache attack helicopter. This measure positively contributed to the sustainability of Air force Command's contribution to the ISAF mission in Afghanistan. From a theoretical perspective, the example makes clear that the existing mixture of dynamic capabilities was not sufficient, which could explain the somewhat weak relationship between DCM and P in figure 4-4. Moreover, the example also supports the relative strong effect of absorptive capacity on performance. After all, in the end

organizational ingenuity was the main reason for the coming about of a satisfactory solution.

Focusing on Army Command, the comments make clear that this organizational part has faced substantial changes in its operational task-setting. The traditional context of preparing for a large-scale, mechanized, predictable conflict had disappeared. A new environment of unknown and asymmetrical threats had caused Army Command to start conducting crisis operations along a broad spectrum of conflict types, varying from high intensity conflict operations to reconstruction and humanitarian operations. Moreover, within a specific mission context the organization has to be capable of switching between defense, development, and diplomacy types of tasks.

7 open comments stress the fact that of all Operational Commands Army Command has embraced the strategy of mixing and matching different kinds of units into tailor-made task forces most strongly. The leading assumption is that because of the highly changeable character of crisis response missions, and the high level of task uncertainty, it is not feasible to create organizational units that are perfectly fit for the new crisis response task-setting. Therefore, Army Command has decided to stick to its traditional building blocks of brigades as the operational backbone of the organization. When troops are needed for a certain mission they are drawn from all over the organization and not specifically from one and the same brigade.

The situation sketched above perhaps explains the strong effect of *Modular Organizing* on *Absorptive Capacity* in figure 4-5. For Army Command each crisis response formation acts as specific operational learning portal. After all, the temporary, ad-hoc project structures that are being deployed are the organization's primary link to the actual task environment. During the Cold War period the fit between task and organization caused organizational learning to be an incremental process within fixed operational units, whereas the new deployment approach of customization has made organizational learning more a process of learning by doing in different operational settings and organizational structures.

Explaining the differences between varying levels of mission experience

Figure 4-8 and 4-9 have shown that respondents with a high level of operational experience, on one hand, assign a strong effect to the relationship between AC and DCM, on the other hand, these figures also indicate that there is a less profound effect of DCM on P and of AC directly on P. This situation could theoretically be explained as follows. One of the main goals of the variable absorptive capacity is to create alignment in the available mixture of strategic, structural, and operational flexible dynamic capabilities. If, however, the result of this matching process is not entirely satisfactory it could lead to a mix of capabilities that is not completely in line with the operational demands, weakening the influence that absorptive capacity directly and indirectly has on organizational performance.

The theoretical assumption mentioned above is being supported by open remarks that are made by a number of respondents with a high level of operational experience. These remarks point in two directions. First, they specifically go into the Netherlands armed forces learning capacity in general. The main assumption ventilated by 19 respondents is that the Netherlands armed forces are too much being swayed by the issues of the day that they do not really learn from past experiences. Several times respondents have stated that the organization "keeps reinventing the wheel". Second, some of the remarks can be linked to a concrete strategic choice that thwarts the idea of a balanced mixture of strategic, structural, and operational dynamic capabilities. To be precise, 4 respondents are negative about the fact that task generalization is increasingly being preferred over functional specialization during crisis response operations. Concrete examples that are being mentioned vary from, for example, Navy and Air force personnel that have to take on unfamiliar tasks on land, to artillery and technical units from the Army that are being deployed to conduct certain infantry-like tasks. The overall opinion is that the resulting lack of functional qualities ultimately leads to a lesser operational performance.

4.6   UNCOVERING THE DYNAMIC CAPABILITIES BOX

The final part of this chapter has a theoretical background, referring to the variable DCM. DCM plays a central role in the research model, but should actually not be treated as a single variable. After all, in reality DCM is made up of the variables strategic, structural, and operational flexible dynamic capabilities. Since these three scales did not reach the satisfactory Cronbach's Alpha score of .70 separately they have been combined into one overall scale. Regretfully, this has resulted in a simplified theoretical picture of the organizational dynamics being studied. After all, within the refined path model discussed in this chapter it is impossible to make concrete statements about the individual effects of absorptive capacity on strategic, structural, and operational dynamic capabilities. The same applies to the variables modular organizing and lateral coordination. Moreover, it is also not possible to say anything about the interrelationships between the different flexible dynamic capabilities themselves and their effects on performance.

Given the fact that these insights could be of much interest for both the academic community and the Netherlands armed forces, it was interesting to do some additional analyses incorporating the variables *strategic*, *structural*, and *operational dynamic flexible capabilities* into the refined path model despite their unsatisfactory Cronbach's alpha scores of respectively .52, .55, and .61. This approach is not uncommon within the academic community. See for example Buenger, Daft, Conlon, & Austin (1996) who also held on to a number of variables with too low reliability scores, because they had a profound theoretical value and proved to be strong factors in the SEM analysis.

The additional hypotheses that make up the advanced model are derived from chapter's 2 theoretical reasoning but also from the insights coming from the previous SEM analyses. The combination of existing theory and practical clues gives the model an explanatory as well as exploratory character. The advanced model is being presented in figure 4-10 and explained in more detail below.
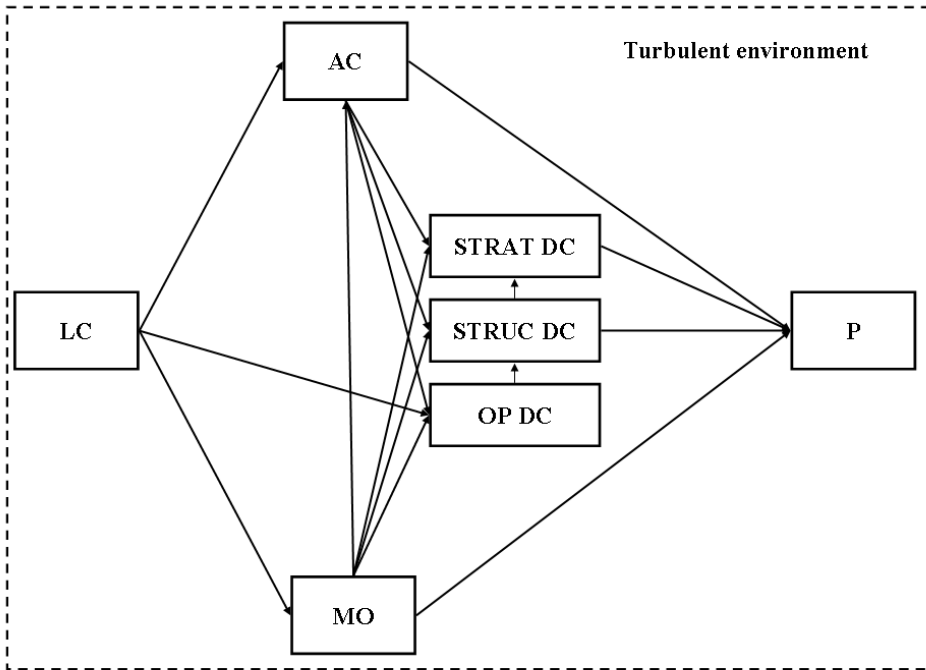
Figure 4-10: Advanced model

Explaining the advanced model

According to the theoretical discussion in chapter 2 absorptive capacity acts as an organizational determinant that directs both the organization's strategic maneuvering process and the reorganization of its internal resources and processes. Based on these strategic learning and orchestrator abilities *Absorptive Capacity* is expected to contribute to the alignment of strategic, structural, and operational dynamic capabilities. Within the advanced model this assumption has been schematically concretized by drawing three directed arrows, leaving from AC and ending on STRAT DC, STRUC DC, and OP DC. Moreover, the powers of these three relationships are expected to be roughly the same, emphasizing the fact that equal attention is needed in order to create a solid balance between the three different types of flexible dynamic capabilities.

A same kind of reasoning can be applied to the variable *Modular Organizing*. In chapter 2 it was stated that by using fixed, self-supporting, autonomous organizational modules and by controlling only the required output of these modules, a loosely coupled system is created that can be reconfigured into different forms to react to changing competitive circumstances, but that is also capable of dealing with everyday operational instabilities and fluctuations. In a more general sense modular organizing is being presented as a design approach that deliberately tries to recombine the aim for strategic and structural flexibility with the retention of organizational stability. Based on this principle, the variable *Modular Organizing* is also expected to, more or less, equally contribute to the alignment of strategic, structural, and operational flexible dynamic capabilities. Schematically, this has resulted in three directed arrows coming from MO and landing on STRAT DC, STRUC DC, and OP DC.

Next, an interesting issue that has, so far, remained underexposed is the proposed hierarchical relationship between de different types of flexible dynamic capabilities, which has been discussed in Chapter 2. The question whether this relationship indeed exists could not be answered with the initial path model, in which the different types of flexible dynamic capabilities were blended into one overall variable (DCM). Recapitulating, Volberda (1998) argues that operational dynamic capabilities lay the foundations for a successful activation of the higher order structural and strategic flexible dynamic capabilities. Volberda's assumption is made concrete in figure 4-10 by creating a sort of causal hierarchy between the variables OP DC, STRUC DC, and STRAT DC. The directed arrow coming from OP DC and landing on STRUC DC assumes that the operational flexible dynamic capabilities lay the foundations for the organization's structural flexible dynamic capabilities; and subsequently the arrow going from STRUC DC to STRAT DC indicates that structural flexible dynamic capabilities influence the coming about of strategic flexible dynamic capabilities.

Another issue to address, regarding the proposed paths of the advanced model, has to do with the relationship between *Lateral Coordination* and the mixture of dynamic capabilities. Paragraph 4.4 made clear that a direct relationship between LC and DCM had to be incorporated into the default path model in order to get a good model fit. Moreover, the open comments

made clear that these lateral coordination processes primarily related to the intra-organizational planning and preparation efforts that had to take place in support of the actual deployment of a tailor-made crisis response formation. Because these empirical results had pointed out that a direct link existed between lateral coordination and operational performance, it was decided to only draw one directed arrow between LC and OP DC.

Finally, unpacking the DCM rectangle also has consequences for the relationship with performance. Within the initial path model a single arrow is drawn from DCM to P. The question within the unpacked version is, of course, if all three variables separately contribute to organizational performance or that perhaps one or two dominate this specific relationship. Based on two reasons it is suggested that especially structural and strategic dynamic flexible capabilities contribute to organizational performance.

First, the questionnaire has taken a strategic management perspective on organizational performance. The performance scale aims to measure crisis response performance in general and not the specific operational achievements of individual missions. Basically, respondents are invited to judge the performance of the Netherlands armed forces across a wide spectrum of operational task-settings. The fact that the Netherlands armed forces have to be capable of conducting crisis response operations varying from humanitarian aid to large scale combat operations makes the availability of strategic dynamic capabilities of crucial importance. Therefore, a directed arrow is drawn between STRAT DC and P and no direct relationship between OP DC and P is incorporated into the advanced model.

Second, based the open comments can be concluded that structural dynamic capabilities play a crucial role in supporting the Netherlands armed forces' aim of strategic versatility. Numerous times respondents mention the fact that the organization's versatility is primarily based on a process of organizational customization. Therefore, the advanced model also suggests a direct relationship between STRUC DC and P. Moreover, given the large amount of comments that were made on this issue, it is expected that this relationship is stronger than the one between STRAT DC and P.

AMOS results

Testing the proposed model in AMOS has resulted in a good model fit. All fit indexes reached satisfactory scores (see table 4-12), meaning that the model's proposed structure was being supported by the actual empirical results.

Chi-square	*Df*	P	RMSEA	CFI	SRMR	GFI
7.787	5	.168	.021 L90: .000 H90:.048	.998	.0135	.998

Table 4-13: Model fit of the advanced model

Figure 4-11 indeed shows that both the variables AC and MO have an effect on all three types of dynamic capabilities. However, the standardized regression weights show some minor differences in the effects of both variables on either STRAT DC, STRUC DC, or OP DC. It seems to be the case that AC and MO both have the most profound effect on STRAT DC, followed by STRUC DC and then OP DC.

Moreover, the assumption that OP DC acts as an enabler for STRUC DC and that STRUC DC does the same for STRAT DC was also being confirmed by the empirical data. To be certain of this hierarchical effect, two alternative models were tested. One model assumed a reversed relationship, in which STRAT DC influenced STRUC DC and STRUC DC influenced OP DC; and a second model suggested that STRUC DC affected both STRAT DC and OP DC. Testing these two alternative models in AMOS led to worse fit indexes.

The influence of LC on OP DC was being confirmed by the data too. Three alternative models in which LC influenced either STRAT DC, or STRUC DC, or both significantly worsened the statistical results. To be precise, the Chi-square increased from 7.8 to respectively 123.3, 123.4, or 122.9. More specifically, for these alternative models not even a model-fit could be

created, which supported our assumption that only a relationship should be drawn between LC and OP DC.

Finally, the proposed effects of STRAT DC and STRUC DC on P were being supported by the empirical evidence as well. Moreover, with a regression weight of .18 against .08 the predominant role of STRUC DC over STRAT DC was also being confirmed. Overall could be stated that the Netherlands armed forces have put the emphasis on structural dynamic capabilities to become versatile in order to counter the turbulent crisis response environment they are confronted with.
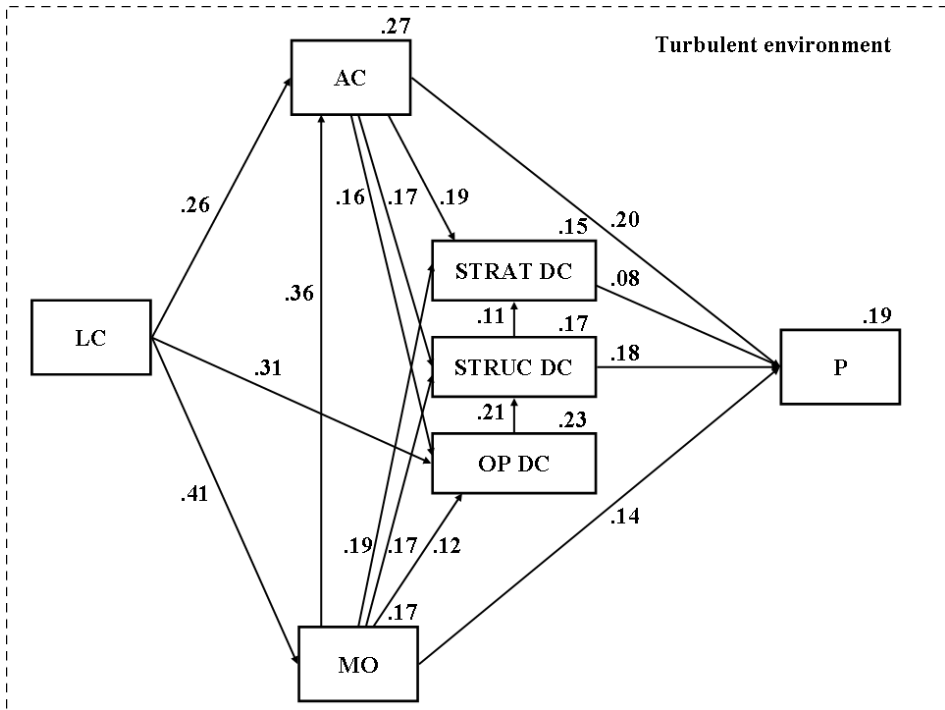
Figure 4-11: Regression weights and variances of the advanced model

4.7   CONCLUSION

This chapter has analyzed the contribution of the organizational determinants absorptive capacity, modular organizing, and lateral coordination to the crisis response performance of the Netherlands armed forces. Based on the information coming from a large scale survey among a large sample of Dutch officers, it could be concluded that all three determinants play an important role. To be precise, 18% of the perceived overall crisis response performance of the Netherlands armed forces is being accounted for by only these three variables. The results have also made clear that lateral coordination not only acts as a facilitator of absorptive capacity and modular organizing, but also directly supports the organization's operational flexible dynamic capabilities. Moreover, these operational flexible dynamic capabilities seem to be of crucial importance themselves. The empirical findings indicate that they, basically, lay the foundation for the activation of structural and strategic dynamic flexible capabilities. What the results also show is that when the level of environmental turbulence increases the effects of modular organizing and a mixture of dynamic capabilities seem to become of marginal importance, whereas absorptive capacity becomes the sole significant contributor to organizational performance. This probably has to do with the fact that within turbulent crisis situations the real difference can be made by thinking and acting beyond existing practices; basically making it a case of creatively exploiting of what you have got.

CHAPTER 5   ASSESSING POLICY IMPLICATIONS

5.1   INTRODUCTION

The previous empirical chapter has shown that absorptive capacity, modular organizing and lateral coordination are important organizational determinants for the Netherlands armed forces to cope with the turbulence of the security environment. This chapter digs deeper into the policy implications of these determinants. Studying the Defense Bills of 1993, 2000, and 2003 has been the starting point of this analysis. Yet, the chapter's main goal is to look beyond these written documents by finding out how senior officers and civil servants of the Netherlands armed forces' in hindsight judge the practical outcome of these organizational determinants. Eighteen high-ranking officials from the Ministry of Defense -military and non-military- were interviewed for this purpose.

The chapter is split-up in five main paragraphs. First, the Defense Bills of 1993, 2000, and 2003 are being discussed to give insight into the Netherlands armed forces' incremental path-dependent absorptive capacity process and into the concrete transformation decisions that the organization has made. In addition to this rather 'static' analysis, interview results are used to judge the support for the concrete transformation choices and to come up with suggestions to improve the Netherlands armed forces current process of knowledge absorption. Second, the variable modular organizing is being investigated from a practical point of view by discussing the pros and cons with senior officials. Third, the role of lateral coordination, as a system integrator to create a well working overall system out of a mixture of structurally dependent organizational elements, is being analyzed. Fourth, the issue of balancing strategy, structure, and operational practices is being discussed. Finally, the chapter will concentrate on the opinion of the senior officials regarding the performance outcome that has been achieved so far.

5.2 THE NETHERLANDS ARMED FORCES' ABSORPTIVE CAPACITY

Studying the Defense Bills of 1993, 2000, and 2003 has been the starting point for analyzing the Netherlands armed forces absorptive capacity, mainly because, in a general sense, these documents present the official and explicit outcome of the organization's strategic interpretation process. When looking at the three Defense Bills from a comprehensive perspective, shows that the transformation process itself did not take the shape of a systematic, step-by-step, chronological strategic plan. It was far more a process of learning by doing, fitting the picture of what Quinn (1988) calls *logical incrementalism*. He (1988: 94) explains logical incrementalism as follows: "the full strategy is rarely written down in any one place. The processes used to arrive at the total strategy are typically fragmented, evolutionary, and largely intuitive. Although one can usually find embedded in these fragments some very refined pieces of formal strategic analysis [think of the separate Defense Bills], the real strategy tends to evolve as internal decisions and external events flow together to create a new, widely shared consensus for action among key members of the top management team."

On the whole, when the logical incrementalist nature of the Netherlands armed forces' search and selection process is related to the four distinct dimensions of absorptive capacity it could be argued that the Defense Bill 1993 presents the results of the organization's knowledge 'acquisition' and 'assimilation' processes. What the document shows, is that after the collapse of the Berlin Wall it took the West a couple of years to fathom the general direction the international security environment would take. The emerging tensions in the Balkans and the further disintegration of the Soviet Union ultimately made two things clear. First, NATO's former opponent really posed no direct threat anymore. Second, the West could not turn away from the different crisis situations that surfaced in Europe and other parts of the world. Only after making this basic assessment could the Dutch government start explaining to its people that crisis response operations had to become the military's new core business, and genuinely begin reorganizing their armed forces in line with this new strategic course. Transforming from a conscript into an all volunteer organization became

the most essential, first organizational adjustment that had to be initiated before the new security ambitions could really take shape.

Next, the plans set out in 2000 can be described as a combination of knowledge acquisition, assimilation, and transformation. Generally speaking, the policy document's main goal was to make a big step forward with the actual transformation process set in motion in 1993. Concrete experiences in conducting crisis response operations made it possible to create a clearer picture of the environmental characteristics, task-setting, and organizational adjustments needed.

Finally, the Defense Bill of 2003 can be typified as a combination of all four dimensions: knowledge acquisition, assimilation, transformation, and exploitation. First, urgent budgetary considerations and the threat of international terrorism pushed the organization to further refine its strategic position and task-setting. Second, based on the increasing level of crisis response experience concrete organizational refinements were initiated to exploit past organizational choices. Third, from a more long-term perspective suggestions were made to anticipate and respond to important future developments.

An incremental path-dependent process

On the whole, the policy documents make clear that absorptive capacity does not have to be a determinant that gives an organization the possibility to, in a one-off manner, rationally predetermine the intended end state and systematically break up the way to go in well formulated logical steps. The case of the Netherlands armed forces shows a picture of a deliberate process outlined by the organization's senior management that took place in a rather sequential order and that followed an incremental developmental path in time

More specifically, the policy documents bring forward that, on one hand, the Netherlands armed forces faced the challenge of transforming their organization in order to counter the continuously changing security environment. On the other hand, the organization could not take too many risks during the reorganization process, because at the same time it had to

actually start fulfilling its new crisis response role. "The shop is not to be closed during repairs" was a one-liner posed quite often during these days. This situation was probably one of the main reasons why the Netherlands armed forces decided not to rock the boat too much and to follow an incremental transformation approach. This approach resembles a situation that Helfat et al. (2007) refer to as the relationship between path dependency and the reality of constrained change. Meaning that it is better for an organization to invest in dynamic capabilities that match the context in which it operates than to abandon the existing resource base in search of drastic strategic renewal. Although, this might narrow the future paths available to an organization, it also prevents the heavy organizational sacrifices and costs that have to be made in order to pull of a drastic change of course.

This incremental, path dependent strategic development process has above all been directed by the central assumption that each soldier trained for traditional large-scale combat tasks could also take on crisis response tasks with a lower level of risk. As a result of this assumption, the organization could straightaway use all its soldiers for every crisis response task imaginable. Moreover, there was no urgent need to radically alter existing training programs, routines, and procedures. So, basically from day one, the organization declared its smallest building block, the individual soldier, fit for its new task environment without having to make any drastic organizational changes.

With the basic idea in mind that the flexibility needed was to a large extent already incorporated in its work force, the Netherlands armed forces began putting the real transformation effort into three commonly accepted organizational subsystems. To be precise, in order to adjust the existing resource base to the new crisis response role the organization focused on its structural, technological, and cultural design parameters (Zelenovic, 1982).

The most important lead for change became the organizational structure. The old Cold War structure of clearly separated Operational Commands (Services) remained largely unchanged throughout the entire transformation process. The central question the organization asked itself was whether the diversity of crisis response operations could be handled

with the existing basic organizational structures. Because of the decomposable character of military organizations in general the question was ultimately answered with a 'yes'. Most traditional military structures, such as battalions, companies, squadrons and flights, but also weapon platforms such as frigates, submarines, fighter jets, and helicopters could be seen as separate organizational components. Recombining these different components into different temporary structures would give the organization enough flexibility to counter the changing and unpredictable security environment. So, by more intensively using its existing smaller structures in different constellations the organization found an efficient way to increase its adaptability without having to dramatically change the overarching, permanent organizational design.

Just like the organizational structure the technological means in use were still based on the traditional task of fighting a large-scale war on land, at sea, and in the air. The question the organization again had to answer was whether these technological assets could also be used in the new crisis response setting. The assessment that followed made clear that some specific new investments were needed, but that to a large extent the existing technological assets could very well be used for expeditionary crisis response tasks. Having said this, the organization started addressing two important issues to improve the flexibility potential of its existing technological means. First, in support of the new modular deployment strategy technological systems had to become more interoperable. After all, to let the smaller organizational structures work successfully together much depended on the effective linkage of their (weapon) systems. Second, the aspect of multi-functionality gained importance. Not only the servicemen and women needed the competences to conduct a wide range of crisis response operations. In doing their job properly they relied heavily on the multifunctional character of their technological systems. In addition to this dimension of an extensive crisis response portfolio, multi-functionality was also being related to the different climatic and geographic circumstances under which the systems had to be used.

Last, the Dutch government started putting much more emphasis on multi-service (joint) co-operation. During the Cold War Army, Navy, and Air force had their own specific military tasks and there was no direct operational relationship between them (Cobelens & Gijsbers, 2004). Since

the performance of most crisis response operations depended on the joint effort of all services, this situation had changed drastically. After all, a single Operational Command simply lacked the materiel and competences to execute a crisis response operation, from the planning until the redeployment, entirely on its own. Furthermore, the units that were being deployed were most of the time tailor-made 'small armies', built on a combination of ground, air, or sea elements. In these smaller operational settings Army, Navy, Air force, and Marechaussee units had to work more closely together than ever before. The organization estimated that formal coordination mechanisms alone would not be enough to realize successful cooperation in these joint settings; the willingness and ability of people to work together in different constellations was deemed just as important. The strategic apex, therefore, coercively stimulated an organization-wide focus on cooperation. As a result, high level staff elements were getting a more and more joint character with commanders and functional specialists coming from all four Operational Commands. Furthermore, the number of inter-service organizational elements was pro-actively being increased. Concrete examples are the formation of a joint air defense centre, a Netherlands Defense Academy, and a Defense Explosives and Ordnance Disposal Service.

Absorptive capacity: judging the outcome

Interesting to find out is how senior officials of the Netherlands armed forces in hindsight judge the practical value of the outcome of the organization's absorptive capacity process. In this respect, the following interview question was asked:

Do you think it is a wise strategy of the Netherlands armed forces to pick organizational units from the permanent organization and form them into tailor-made constellations that can then be deployed in multinational settings?

The table below presents the answers (Y=Yes, N=No) of the respondents (R1-R18) to this question. Due to limited interview time this specific question has not been posed to 4 respondents (see dark grey shading). The

table shows that the remaining 14 respondents have unanimously answered the question with a "yes".

R	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Y	░	░	░	░	░	░	░	░	░	■	■	░	░	■	░	░	■	░
N										■	■			■			■	

Table 5-1: Assessing the modular deployment approach

These positive answers can be categorized into two main arguments. First, the interviewees explain that the Netherlands armed forces are relatively small in size, which makes cooperation more a necessity than a real choice. To put it differently, as a member of institutions such as NATO, the EU, and the UN, the Dutch government can on one hand make its voice heard within the international security community despite the country's small size. On the other hand, being a member of these institutions also creates the obligation to make a real contribution. In other words, it is being broadly expected of the Netherlands armed forces to participate in this manner. Second, modular deployment gives the organization the possibility to customize its effort, which is crucial given the current unpredictable security environment. As one respondent explains:

"*With this new deployment approach the Netherlands armed forces are capable of contributing approximately 90 different types of operational products. This is a very efficient and flexible way of organizing, because otherwise a much larger parent organization would be needed if a separate organizational element was used for each operational product. The same F-16 fighter jet can now be deployed for close air support over Afghanistan, and six month later be used for finding a missing body in the Caribbean.*"

Regarding the technological resource base, all respondents agreed with the fact that taking part in changeable tailor-made crisis response formations asks for modern, multifunctional, interoperable technological systems. A follow-up question asked to which extent the Netherlands armed forces'

current technological resource base meets these demands. Table 5-2 shows that 10 of the respondents have answered this question with "yes" and 4 of them with "no". Due to limited interview time 4 respondents have not been able to answer this question (see dark grey shading).

R	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Y																		
N																		

Table 5-2: Assessing the technological resource base

The positive reactions point out that most weapon systems can be used for different types of crisis response missions. Moreover, they stress that the multi-role character of most main weapon systems supports the new effect-based approach philosophy. In this respect, one of the respondents explains that an Apache attack helicopter can, for example, be used in different ways depending on the mission or situations within the mission. This helicopter was originally designed as a platform to destroy tanks and other armored vehicles. Yet, apart from its ability to generate massive fire power, this weapon system can also be used to gather intelligence using its advanced sensors or just to deter adversaries by its sheer presence. A representative example of these positive sentiments is cited below.

"*Generally speaking, we have modern equipment at our disposal that can be deployed for different tasks and under different circumstances. Of course, the systems have certain domain-specific and technological boundaries. Yet, within these boundaries they can be used for different roles.*"

Three respondents argue, furthermore, that it is not only the multi-role character of weapon systems that offers flexibility, but perhaps even more so the feasibility to generate varying configurations by mixing and matching different multi-role technological assets. One of them puts it as follows.

"The Cold War principle of having large units with uniform weapon systems is being abandoned rapidly. Today's tailor-made network approach asks for a wide variety of different systems, because more variation = more configurations = more effects = more flexibility."

The respondents, who have answered "no", bring two issues before the footlight. First, three respondents explain that regarding certain specific assets the Netherlands armed forces are still busy catching up. Strategic and tactical airlift capabilities, ICT systems to support network-enabled capabilities, and precision guided munitions are examples of these assets. Second, one of the respondents states that the organization is not yet where it wants to be, but that it is moving in the right direction. He explains that most weapon systems have a long life cycle and most procurement procedures take a long time, which makes it difficult to adjust the technological resource base within a short time span.

The third question, whether a cooperative mindset was present within the organization, was also positively being answered by all respondents. They all argue that taking part in changeable tailor-made crisis response formations makes a cooperative mindset a basic necessity. The only marginal comments made stress the fact that cooperation should not become a goal in itself. The cooperation effort always has to be related to the actual operational task. It could be the case that a crisis response operation is being conducted by a single Operational Command. In this respect, one respondent mentions TF150 in which only Navy frigates have participated.

Interesting is, furthermore, that 10 of the respondents argue that a distinction should be made between the organization's operational and strategic level. At the operational level little cooperation problems occur; because this is the organizational level responsible for the actual execution of crisis response tasks and were people are very conscious of the need to cooperate. At the strategic level, however, this awareness is less apparent. The respondents explain that at this level conflicts of interest and differences of opinion occur between the Operational Commands, hampering cooperation during the planning and preparation phase of a mission. Some suitable citations on this issue are presented below.

"In the preparatory phase of a mission there usually is a lot of hassle between the Operational Commands, as soon as the troops are actually deployed this all disappears to the background."

"It is probably fair to say that every organizational part is busy safeguarding its own survival. At the operational level survival has a much more concrete meaning than at the strategic level. Therefore, cooperation develops more naturally at the operational level."

The interviewees also bring forward a number of problem areas regarding the threefold transformation approach. First, too much "Lego-thinking" is mentioned as an important disadvantage of the modular deployment strategy. In short, fine-grained modularization creates adjustment problems. Hence, units that hardly know each other are clicked together and are supposed to work as one team during a mission. In general, this problem is solved by investing extra time and energy in training programs during the preparation phase of a mission. This extra effort, however, contravenes the high-readiness, expeditionary ambitions of the Netherlands armed forces, since units cannot be deployed straightaway.

Second, the constellation of a crisis response module is above all the result of the Netherlands armed forces' overarching Effect-Based-Operations (EBO) philosophy. This philosophy propagates that it is not the weapon system that dominates, but far more the operational effect that the organization wants to achieve. A main consequence of this thinking in effects is that the traditional boundaries between the different services have become more and more permeable. Moreover, as a result of this approach Air force and Navy units are increasingly being used for operations on land. One of the respondents is not very supportive of this development as the quote below makes clear:

"A trend is going on in which other services take the place of Army units within land-based operations. Because of this choice the wheel is often being re-invented. A same development is taking place within the Army itself. Based on flexibility considerations all kinds of different Army units are increasingly being deployed to conduct basic infantry tasks. The question is whether this is wise. Running a PRT differs enormously from

the Air force's and Navy's core businesses. If someone brings up this issue I always pose the following question: Would you rather be operated by a surgeon or by an anesthesiologist who has had a crash course in surgery? I understand that from a flexibility perspective striving for more generalization can be very useful. However, the organization should always mind that choices like this endanger the actual core business. I don't know where to draw the line, but I do know that this trend is a cause for concern."

Other respondents also recognize the tension between specialization and generalization. They, however, propagate an organization-wide, renewed focus on basic soldiering skills. Every soldier is a rifleman has become a statement often posed. The following quote deal with this issue.

"Within the current task environment basic military skills have gained importance. There is no clear frontline anymore; danger can come from all directions. Therefore, possessing basic soldiering skills has become of crucial importance for every individual serviceman to secure his own safety."

Third, 4 respondents argue that the organization should not think too lightly about the necessary ability to switch between different operational tasks. Scaling up and down the level of military force when the level of threat increases or decreases is easier said than done and can only work if people have the personal flexibility to completely change their mental state when the situation requires it. One respondent gives the following comment.

"Our organization should start concentrating more on developing the mental toughness of its soldiers. The fact that at one moment they are fighting and at the next moment they are lending humanitarian aid asks for a work force that possesses a lot of mental flexibility. This crucial requirement is often publicly expressed, but so far it has hardly gotten any concrete attention. Especially now that we are increasingly being deployed in fragile and dangerous settings our professional development should focus on this issue."

Finally, 3 respondents express their concern about the trend that, knowing that the organization is becoming more and more technological advanced, it will become harder and harder to attract enough qualified personnel. The fight for personnel increasingly has to be fought head-on with large commercial organizations that are also confronted with a computerized and digitalized competitive environment. It is questionable, according to the respondents, if this battle over technological skilled labor can be won by the armed forces, knowing that the financial benefits in the commercial world are much higher and not accompanied by the physical dangers typical of crisis response operations.

Absorptive capacity: assessing the process itself

On the whole, the interview results make clear that there is a lot of support for the practical outcome of the organization's absorptive capacity process. Nevertheless, during the interviews some interesting remarks were also made that could be related to the different learning dimensions of the process itself.

5 respondents stress the fact that knowledge acquisition is a never ending process. In their opinion the Netherlands armed forces have made a good start in transforming the organization from a traditional, large-scale, mechanized Cold War organization into a more flexible military organization, suited for expeditionary crisis response tasks. They, however, also argue that certain aspects still leave room for improvement, such as increasing the organization's operational endurance and strengthening the organization's transport and logistical capabilities. Moreover, one respondent underlines the importance of keeping track of future developments.

"We have done quite some benchmarks. These have shown us that with our people and systems we have been able to strike a balance between ambition and usability.
However, some aspects still need attention, such as: effect-based operations, networking, and information processing. These core aspects of future military operations will have certain organizational consequences that need reconsidering. For example, the traditional organizational

design will be put under pressure and a new type of soldier is needed. As yet, we have no clear picture of these consequences but we are conscious of the fact that we need to do something."

Furthermore, 11 respondents explain that working in different constellations increases not only the scope of acquiring new knowledge but also the depth of the new knowledge that has been acquired. In short, joint and combined cooperation makes it possible to use capabilities of other services and countries, or even to exchange them. A positive side-effect of a more intense cooperation between arms, services, and countries is that units increase their frame of reference and can learn from each other. Moreover, the cooperation that takes place between different organizational groups, over a longer period of time and under extreme circumstances, deepens the understanding of each other's ways of doing things. According to the respondents this leads to a situation in which not only new knowledge is acquired, but also more detailed insights are gathered about the translation of this new knowledge into concrete, usable routines and processes. This viewpoint is in line with the strong relationship between *Modular Organizing* and *Absorptive Capacity* that was uncovered in the SEM analysis of the previous chapter.

Concentrating on the process of knowledge assimilation, five respondents explain that it is not a purely rational process but to a large extent political driven. The respondents bring forward that the decision-making process involves many stakeholders, both military and political. Reaching consensus between all the different parties takes a long time and does not always result in the military's most preferred option. What makes it even more complex is the fact that the process is also being influenced by media interference.

Next, three respondents believe that the organization's preoccupation with running missions hampers the assimilation of knowledge in a broader context. According to them organizational learning is too much dominated by the demands of the most recent crisis response operation, which prevents the organization from having a real innovative look in the future. One respondent argues in this respect:

"During the mid 90s the organization was almost completely focusing on peacekeeping tasks. Now, dealing with the dilemma of balancing combat and reconstruction tasks is the predominant theme within the organization. By continuously focusing on current missions we run the risk of being behind the times."

In relation to the aspect of knowledge transformation four respondents argue that the so called lessons-learned organization is too much compartmentalized. Each Operational Command has its own lessons-learned department and the exchange of relevant information between them is insufficient. On top of this national criticism, they stress the fact that organizational learning in an international context hardly takes place at all. In addition, three respondents believe that, in a general sense, the Netherlands armed forces are good at identifying important lessons from their crisis response deployments. At the same time, they argue that a real learning experience fails to occur, because the haze of the day prevents the organization from incorporating the lessons-learned firmly within its operating routines and training programs.

Focusing on the dimension of knowledge exploitation, three topics are being discussed. First, although, according to eleven respondents, the cooperation between the Operational Commands has much improved over the last decade, there is still room for improvement. Army, Navy and Air force Command still do the preparations for most of the crisis response missions largely autonomous. This creates overlap in the work to be done, but it also leads to situation in which the wheel is being reinvented.

Second, referring to knowledge exploitation three respondents bring up the implementation of a new fast track procurement process as a successful indicator of this process. Purchasing the Australian Bushmaster armoured personnel vehicle to cope with the sudden threat of hidden improvised explosive devices (IEDs) in Uruzan was, in this respect, cited several times.

"During the ISAF mission in Afghanistan our organization was suddenly confronted with a new kind of threat. Within a very short time span the opposing Taliban forces changed their operating tactics from a direct

assault approach to the use of IEDs. These explosives, buried along the roadside, used simple detonation tools that could be activated from a distance by using regular mobile phones. This new, invisible, yet devastating threat asked for immediate and effective countermeasures. In order to waste no time, our first reaction was to find out how partnering countries dealt with this threat. After this quick-scan a fast track procurement process was initiated to buy the technological means available that could help to trace these explosives and to jam their electromagnetic signals. Moreover, to defend our personnel against the blast of an explosion, in case an IED did go off, new vehicles offering better protection were also acquired within a very short time span."

This example can indeed be seen as good example of the organization's ability to exploit new external knowledge. However, one respondent also makes clear that buying these new assets and supplying them to the troops in Afghanistan is, basically, just half of the knowledge exploitation story. He stresses the fact that knowledge exploitation should exceed the current ad hoc, short-term status of supporting running missions. After all, the real success of the implementation of new technological assets, such as the ones mentioned above, depends above all on a number of crucial organizational measures that have to be taken to secure their added value in the long-term. To name a few examples, maintenance personnel has to be trained, maintenance programs have to be set up, the supply chain has to be organized, operating procedures have to be formulated, and operators have to be trained. It is important that the organization in an early stage thinks about consequences like these and sets up a plan to tackle these issues. Otherwise, the organization enters a circle of improvisation to stay on top of things, which most certainly will lead to feelings of turmoil within the organization.

Third, two respondents believe that the Netherlands armed forces should put more energy into regular peace-time training programs to increase knowledge exploitation. They explain that the repetitive formation of tailor-made organizational modules often leads to situations in which the basic structure of the parent organization is abandoned. As a result, the larger units staying behind quite often have to miss important sub-units, which negatively influences their potential to exercise and train as a complete operational unit. In addition to this problem, the organization has

the tendency to put most of its energy into running missions. Therefore, too often decisions are made that have a negative impact on planned training programs of units that stay at home. This could lead to situations in which programs are being shortened or even cancelled. According to the interviewees, this is a worrisome development because especially training programs can help to improve operational effectiveness in the long run. After all, during training programs units can get accustomed to working in various constellations and within different operational scenarios.

5.3   MODULAR ORGANIZING

The next part of the interview focused on the variable modular organizing. From a theoretical perspective modularity theory is strongly based on Baldwin and Clark's work on the development of the IBM System/360 family of mainframe computers. By speaking in terms of rules and parameters, they have adopted a strong 'engineering' approach to modular design. The interviews make clear that this engineering approach does not really comply with the unpredictability of the security environment. Especially, architectural questions about which modules have to be part of the system and what their functions will be are difficult to answer when future operations are uncertain and no clear goals can be formulated.

Consequently, this situation makes it problematic to exactly determine the composition of suitable organizational modules. Since the Netherlands armed forces are unable to predict what kinds of operational environments can be expected in the future they have decided to stick to their traditional building block design of brigades, squadrons, and frigates. As a result, the standing organization is increasingly being used as a big toolbox, from which all kinds of modules with specific operational capabilities can be picked. So far, this toolbox has been kept broad, because the bigger the number of different functionalities available the better the opportunity to create different combinations. One respondent explains the added value of the toolbox metaphor as follows:

"We need a broad toolbox with all kinds of different functionalities from which we can select and pick to deal with the changing task environment.

Important, for modern military operations, is the bundling of different capabilities."

The interview results also make clear that this choice works out differently for the Operational Commands. The respondents bring forward that regarding the nature of a mission and the design of the crisis response unit, basically, two options can occur: (1) the mission is familiar and fits the organization's traditional task-setting, or (2) the mission is new and cannot be directly linked to a specific, existing organizational capability. Patrolling with a frigate in the Persian Gulf is a good example of the former option. Manning a land-based PRT in Afghanistan with Navy personnel, as already mentioned in the previous chapter, is a typical example of the latter option. In general, Navy Command and Air force Command encounter missions of the first kind. Their technological character and fixed operational tasks create a natural fit between the traditional designs of their permanent organizations and the structure of a module that is to be deployed. One respondent, coming from Air force Command, formulates it as follows:

"From an organizational point of view the 'new' crisis response task does not really differ from our traditional one. Basically, there is nothing new under the sun for us."

Army Command, on the contrary, can depend less on the binding effect of its technological assets, has encountered dramatic changes in its operational repertoire, and is by far least capable of predicting what kind of operational environments will be encountered in the future. This situation makes it problematic to exactly determine the necessary composition of organizational modules. The Army, therefore, stresses the adaptability advantage of mixing and matching different functional components into customized formations.

Moreover, the mixing and matching process even continues during actual deployment. To deal with the unpredictable task environment that Army units in many crisis areas encounter, the deployed units often have to look for alternative ways of organizing to deal with changing local circumstances. Developing such alternatives is often based on a process of

tinkering with the available functional components. The Army respondents argue that this potential of strategic and operational variability counterbalances the disadvantages of a complex assembly process and the fact that local adjustments are sometimes necessary. Based on the advantage of customization Army Command has decided to put more effort in improving the cooperation capabilities of its servicemen and women, opposed to abandoning the existing building block design. The organization propagates that it far more wants to de-stimulate people thinking in traditional building blocks, than the actual way of organizing itself.

A second topic being discussed deals with the relationship between building block design and 'operational flexibility'. One respondent explains that regarding the architecture of crisis response modules the Netherlands armed forces constantly have to balance two contradictory requirements:

"On one hand holds that the more complicated the design of a combined/joint crisis response unit is the less effective it will be. On the other hand it is also true that the more building blocks are being used, the more tailored for its task the military formation will be."

Striking a balance between these two requirements becomes even more important because the respondents, furthermore, explain that during deployment the actual cooperation between organizational elements takes place at the lower organizational levels. Hence, failing cooperation directly influences the operational flexibility of a formation deployed. Acknowledging that there is no fixed building block size, the general opinion the respondents express is that the lower the level of connecting units and the smaller the unit size, the more important it becomes to train and exercise together to get to know each other. Moreover, when it comes to the formation and preparation processes that take place before actual deployment three respondents believe that there is a lot to be gained. Especially the fact that quite often individual experts or smaller specialist groups are added to the larger force structure halfway the preparation phase leads to collaboration problems. The time that remains is too short to really get to know each other, or to master necessary skills and drills, or a combination of both. As a result, a lack of trust develops between the well-

trained basic units and the badly integrated add-ons. The crisis response formation has to make up this leeway during actual deployment, which then distracts from the real mission objectives.

Within this discussion, three respondents bring forward that not always military-operational considerations determine the functional grouping process. Behind the scenes political bargaining influences the coming about of a national crisis response contribution. Especially in an international context, scarce assets, such as armed helicopters, medical units, and intelligence elements, can be a source of clapping hands: if you supply the helicopters, you can also become lead-country and appoint the task force commander. Moreover, some respondents argue that formation decisions are never purely based on modular design considerations. There are always specific national, political and organizational considerations that play an important role in this process. The fact that for many crisis response missions politicians determine a 'personnel ceiling' of a maximum number of troops to be deployed was an example that, in this case, was cited a lot.

5.4   LATERAL COORDINATION

Now that we know that the Netherlands armed forces aim to create a well working overall system out of a mixture of structurally dependent functional components puts the spotlight on lateral coordination. After all, lateral coordination is presented in Chapter 2 as a mechanism that plays an important role in integrating the surplus of interdependencies, and by doing so probably creates stability within the crisis response formation deployed. Three types of lateral coordination mechanisms were mentioned in particular by the respondents.

First, Exercises and training programs are brought forward as the most important coordination capability to transform a tailor-made mixture of different units into a well-oiled machine. 11 respondents explicitly mention teambuilding or training programs as a critical factor for making the modular deployment strategy work. Some revealing quotes are presented below.

"*You will always need extra training time to give the tailor-made formation that is to be deployed the opportunity to develop into a tightly coupled unit and to achieve the required level of competence.*"

"*A disadvantage of the far-reaching customization approach is that the organization needs more preparation time. People don't know each other well enough, or are not trained to drive certain vehicles or operate certain systems. Training programs, exercises, and courses become crucial to fill-up these holes.*"

"*For commanders it is important to get to know each other before the tailor-made module is being deployed. By means of teambuilding-like activities people can level in an informal setting, which will pay off during the operation itself.*"

Second, staff relations and liaison positions are being discussed as a second important coordination capability that the Netherlands armed forces use to integrate a composite crisis response formation. Five respondents explain that the SFIR mission in Iraq has learned that for complex composite missions the organization has to deploy additional staff capacity to take on the task of coordinating the different functional organizational elements. During the SFIR mission this task was initially appointed to the battalion commander, as head of the largest unit deployed. The battalion commander, however, became so much occupied with this coordinating task that he was being hampered in his main task of commanding his own battalion. During later rotations the organization, therefore, decided to also deploy a dedicated command and control element, comparable with a traditional brigade-staff, to take over this coordinating task. Based on positive experiences the Netherlands armed forces now follow this approach in other missions as well.

"*What we see in Uruzgan is that we have deployed a task force staff specifically for the process of commanding and controlling the different contributing functional elements. In our traditional structure we would have used a brigade staff for this purpose.*"

Second, within this staff element liaison officers (LSOs) are appointed to take care of all kinds of interdepartmental boundary-spanning roles. They can play the role of linking pin between participating countries to deal with language, cultural, or procedural problems. They can also have a specific functional responsibility. Think in this respect, for example, of an Air force LSO functioning in the task force staff to support and advise the task force commander on all issues related to air operations. 7 respondents argue that this coordination mechanism works very well in an operational setting. 2 of these 7 respondents stress, however, that a liaison officer should only be selected because of his expertise; randomly picking someone to fill-up a vacancy will work contra-productive.

"*A random person playing LSO has no added value. A liaison officer only positively contributes if he seamlessly understands what you mean and is capable of communicating it properly.*"

Informal mutual adjustment is the third coordination capability that is being mentioned. 9 respondents explain that the presence of an informal communication circuit offers flexibility advantages and increases the speed of reaction. Yet, they also stress the fact that the informal communication processes may never undermine the formal command and control structure of a military formation. This view is illustrated by the two phrases below.

"*In both a national and international context informal networks emerge. These networks are crucial for the performance of a deployed formation. They act as lubricant at all the different organizational levels. However, that the commander always is the real one in charge and, therefore, may never be missed out must remain clear for everybody.*"

"*Informal lateral adjustment is crucial, especially at the higher organizational levels. Commanders and staff officers must strive for a situation in which they can look each other straight in the eyes and ask: what do you really think of it. If you know and trust each other, you will less easy retreat to all kinds of bureaucratic processes and formalities.*"

However, apart from the interview's focus on coordination capabilities the respondents also bring up the integrative value other organizational

mechanism. The formal hierarchical command structure, typical for every military organization, is being mentioned by all respondents as the primary source for organizational alignment. Speaking with the words of one respondent:

"*We remain a military organization, which asks for a clear command structure. It must be clear, especially under extreme conditions, who the boss is and who makes the decisions.*"

The respondents, furthermore, share the opinion that a univocal command structure has to be supported by other system integrators than lateral coordination alone. They specifically mention ICT-systems, formalization, and socialization. Information and communication systems are essential for creating technical connectivity. The quote below explains the integration advantages of ICT systems within a military operational context.

"*Technical connectivity is essential to create situational awareness. The interoperability of technical systems is in this respect of crucial importance. The plugs and sockets must technically fit together to go through the decision-making process faster than the opponent.*"

All in all, 11 respondents mention ICT systems as an important system integrator. They, however, also conclude that failing compatibility, especially in an international setting, is a point of concern.

"*Technical connectivity of data and communication systems is very important; there is, however, a lot to be gained in this area. Dutch systems, such as TITAN and ISYS, have a huge potential for international connectivity. Regretfully the reality is different. Most countries play their own game and develop their own national systems. The resulting interoperability problems are most of the time being dealt with by using extra human interfaces. On the whole, this way of improvising works but also leads to delays and quality leaks.*"

Yet, of all respondents only one is really negative about the lacking interoperability of ICT systems. The general tenor of the remarks is that

interoperability can be improved, and that lacking interoperability only hampers but not really undermines the operational effectiveness of units deployed in a crisis area. One respondent uses the following phrasing:

"*ICT systems are important integration mechanisms. It is, however, not the case that lacking interoperability leads to insufficient cooperation. Cooperation depends far more on a state-of-mind. In other words, the will to cooperate dominates. Failing interoperability of ICT systems stimulates improvisation and costs more energy to keep the system running. All this, however, plays a subordinate part in relation to the will to cooperate*."

Apart from information and communication systems 11 respondents bring up formalization as another important system integrator. Overall, could be said that rules, regulations, and procedures help to standardize behavior, which stimulates organizational connectivity. Two respondents explain the added value of formalization as follows:

"*Within the profit sector far-reaching formalization is quite often judged as stifling, not innovative, and inflexible. In a military organization, however, the opposite effect occurs. Common procedures and drills make it easier to operate effectively under changing circumstances and within different constellations*."

"*Common doctrines, tactics, procedures, and drills are crucial for speaking the same military-operational language*."

Apart from these two alternatives, socialization is brought forward as a third crucial system integrator. 8 respondents explain that stimulating a shared sense of meaning regarding the openness to other organizational and national cultures must lead to, what is called, cultural connectivity.

"*Cultural interoperability must also be mentioned in this respect. Cultural differences exist between arms, services and other organizational parts. That is not a problem if, on the whole, people try to understand one another. The differences in perception must not work contra-productive. This means that people must be open to others, listen to others, and look*

for win-win situations. This also applies to cultural differences between countries."

The main conclusion expressed regarding cultural connectivity is that culture itself cannot and must not be standardized. After all, culture creates identity, which stimulates esprit de corps. What, however, should be standardized is a shared sense of openness to other countries and organizational cultures. 3 respondents again stress the fact that training and exercising together helps to improve cultural openness. Furthermore, the interview results make clear that, regarding international cultural connectivity, the Netherlands armed forces are gradually following a course that leads away from modularity towards more synergistic specificity. Synergistic specificity has to do with the fact that some combinations of components function better together than other configurations, leading the system away from modularity and towards more integration. The move from stand-alone software products (e.g. Word Perfect and Excel) to integrated software packages (e.g. Microsoft Office) is a good example of this phenomenon (Schilling, 2000). Regarding, crisis response operations a situation is developing in which established bilateral relations, but also positive crisis response experiences, have created preferences in multinational cooperation. The Netherlands armed forces prefer to go on a mission, especially when there is a high level of risk involved, with established partners, such as Germany, the United Kingdom, the Nordic countries, Canada, and Australia. The general idea is that cultural, political, and organizational like-mindedness offers a shared frame of reference, which stimulates mutual trust and eases cooperation.

"*In Uruzgan the Dutch troops work together with troops from the UK, Canada, and Australia. Basically, these countries have the same political and cultural preferences and possess the same can-do mentality as we do. In the future this development will probably continue, creating sub-groups within the NATO alliance when it comes to international cooperation.*"

Organizational, technical, and cultural connectivity

Recapitulating, in their approach to stimulate the integration of different functional components the Netherlands armed forces follow a three track

policy. First, they aim for organizational connectivity through formal and informal coordination mechanisms. Second, they focus on technical connectivity by means of compatible ICT systems. Third, they strive for cultural connectivity in terms of creating a common mindset of openness towards other organizational and national cultures. All three courses have standardization implications and the general assumption the respondents propagate, in this respect, is that the better and broader these aspects are standardised the easier it becomes to cooperate. Moreover, the following quote makes clear that the "softer" issues are deemed at least as important as technological connectivity.

"Technological standardization is important. Compatible means and systems make it easier to cooperate and, thus, improve the overall performance. At the same time cost advantages can be obtained. However, technological standardization is not the most important aspect. Speaking the same operational language is far more important."

When focusing on the "softer" issues, 6 respondents stress that English, as the official language, is an important facilitator for both organizational and cultural connectivity. They, however, also emphasize that from a national and international perspective there is enough room for improvement on this issue:

"In my opinion language plays a key role. The Western security community should press for higher demands regarding English as the official military language."

"Language is important but also a problem. The Netherlands armed forces should put more energy into improving English language skills. The Dutch speak English not as well as they themselves think they do; for example, to destroy is definitely not the same as to defeat."

"Although NATO partners from the south of Europe speak it not as well as the northern countries do, on the whole, English as the official language works good enough. However, one remark I would like to make in this respect is that, apart from the fact that we manage to get our message

across, the Dutch seem to overrate their competence level of the English language. On the whole, we express ourselves in English rather bluntly."

5.5   BALANCING STRATEGY, STRUCTURE, AND OPERATIONS

Given the fact that during the interview the respondents indicated that the modular deployment strategy to increase the organization's strategic flexibility clearly had some drawbacks, it became interesting to find out if these disadvantages hampered the crisis response performance of the troops on the ground. Therefore, the following question was asked.

Is the actual execution of crisis response tasks in a mission area negatively being influenced by the fact that the Netherlands armed forces on a continuous basis pick units from the permanent organization and group them into tailor-made crisis response formations?

The answers to this question (Y=Yes, N=No, ?= Neutral) are shown in the table below. One respondent (R16) was not taken into consideration due to a shortage of interview time.

R	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Y				▓					▓			▓	▓	▓		■		
N	▓				▓	▓										■	▓	▓
?		▓	▓				▓	▓			▓				▓	■		

Table 5-3: Assessing the balance between strategy, structure and operations

According to the 6 respondents who voted "Yes" the current deployment strategy indeed causes a loss of operational effectiveness. At the same time they argue that this loss of effectiveness is inevitable given the uncertain crisis environment the organization is confronted with. They explain that when the world is certain it becomes feasible to fine tune the organization to its predictable task, which in the end leads to an effective and efficient organization. However, when uncertainty increases a need for more freedom of choice develops. This focus on freedom of choice has a negative impact on organizational effectiveness and efficiency. Yet, the respondents also believe that the flexibility that is gained by creating

alternative courses of action compensates for this loss of effectiveness and efficiency. Moreover, they stress that the concessions that sometimes have been made have never led to real dangerous situations for the troops deployed in a crisis area. These respondents, furthermore, bring forward that cutting through existing organizational boundaries has negative operational consequences. At the same time, they believe that many of the negative effects can be counterbalanced by investing extra time and money in training programs and interoperable materiel.

The 5 respondents that do not recognize a loss of operational effectiveness stress, in the first place, that the operational-tactical level and the political-strategic level are two completely different worlds. The collaboration and adjustment problems occur far more empathically at the political-strategic level than on the work floor. Very soon after a formation has been assigned for a certain crisis response task a joint task culture evolves. Basically, every individual soldier knows that cooperation is an operational and tactical basic military necessity, especially under volatile circumstances. Two revealing quotes are presented below.

"It is common knowledge that in a military operation lacking cooperation can cost human lives. To put it briefly, everybody going on a mission realizes that cooperation is a basic necessity to survive"

"The saying 'to cooperate is to survive' is part of every soldier's soul.

The ones who have voted 'No' also stress that the Operational Commands experience the formation problems differently. Because Navy Command and Air Force Command have structured their organizations along the lines of their technological platforms, such as ships and airplanes, cutting through critical organizational boundaries does not happen as much as within troop-dominated organizations like Army Command and the Royal Marechaussee. Therefore, the design and linking problems mentioned earlier are being recognized less by the respondents from Navy and Air Force Command. The only cause for concern they express, in this regard, has to do with the formation practices that take place for those missions that do not comply with their original task-setting, such as manning a land-based PRT.

The 6 respondents who have not given a clear 'Yes' or 'No' answer bring forward that the flexibility gain that is being achieved with the modular deployment approach counterbalances the limited loss of operational effectiveness. At the same time, they argue that the political-strategic and the military-operational level should not be treated as separate worlds. After all, political-strategic decision-making could influence the military-operational task execution. According to one of the interviewees it is very important that military advice on a certain mission should be translated better to the level of the political decision-makers. If consensus between politicians and the military about the do's and don'ts of a military crisis response operation is reached sooner, the military crisis response formation will certainly benefit from it, not only during the preparation phase of a mission but also during the mission itself.

5.6   EVALUATING CRISIS RESPONSE PERFORMANCE

The interview ended with the question whether the crisis response performance of the Netherlands armed forces has been successful so far. On the whole, the respondents gave a rather univocal answer to this question, as none of the respondents calls it unsuccessful (see table 5-4). In general, there is a positive assessment. Furthermore, it is striking that 5 respondents do not give an unequivocal "Yes" or "No", but leave their opinion in the middle. In fact, these neutral-voters do not deviate far from the yes-voters, as all respondents indicate that assessing the success of a crisis response operation is difficult. The multitude of factors of influence makes it impossible to make objective statements on the effectiveness of this kind of operations. Nevertheless, for 12 respondents the balance is positive, while the 5 mentioned above do not come to a definite yes or no. On the whole, it could be concluded that in answering the performance question the senior officials go through a sort of self-evaluation, in which a summing up of various arguments leads to a mainly positive self-image of the operational achievements of the armed forces. The arguments given can be reduced to the five categories that will be discussed below.

R	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Y																		
N																		
?																		

Table 5-4: Successfulness of the Netherlands armed forces crisis response performance

First, success is linked to the fact that the Netherlands armed forces have participated in a large number of missions over the past few years. Looking back on these operations, 9 out of 17 interviewees indicate that, generally speaking, the Netherlands armed forces have realized their tasks and ambitions well. As one respondent states:

"Looking at Bosnia, Iraq and Afghanistan it can be concluded that, given our possibilities, we have been successful."

This sort of general statements is complemented with remarks such as:

"We reach the objectives that have been set, in spite of the fact that those objectives are not always clearly demarcated, measurable and are highly political."

"We see the results of what we have set out to do in a mission; our being there made a difference."

Second, according to nine respondents international recognition is also an expression of the success of the Dutch effort. Often heard statements in this respect are:

"We are a valued partner in the eyes of other countries."

"Internationally, the Netherlands armed forces are taken very seriously, indeed."

"*We are in the major league.*"

Nevertheless, one respondent stresses that it is not wise to rely too much on the opinions of other countries, as they may be expressions of (political) courtesy.

Third, personal experience constitutes a measure for the success of the operations. Almost all interviewees have mission experience in leadership positions and three of them indicate that in their role as military commanders they measure success according to their own standards. Thus, one interviewee states:

"I view "success" more in relation to the concrete improvements I have seen during my stint in the mission area, such as the restoration of social life in the streets and the number of new companies started."

Another interviewee uses more general terms to express his successful judgement of his operational activities as a commander in the sense that together with his people he has made a contribution to the creation of stability and reconstruction in a mission area, and everybody returned home safely.

Quality of personnel and materiel of the Netherlands armed forces is a fourth argument brought forward. Five interviewees say things like:

"The Netherlands armed forces are professional and well-equipped."
"We have good, professional, level-headed people who reach the result they have to reach."
"Missions have led to an enormous improvement of our own armed forces."

The fifth category is shaped by political-social considerations. In this respect two interviewees stress the political appreciation the armed forces receive when they state:

"In general the Dutch Parliament praises the achievement of the armed forces"
"Our political leadership is very satisfied about our effort".

The usefulness of measuring crisis response performance

The answers make clear that objective criteria are lacking, which gives the aspect of organizational performance a preponderantly subjective trait. The interview, therefore, shifted to finding out why objective criteria are lacking and whether it would be useful to spend more time, money and effort on making the crisis response performance of the armed forces measurable. Hence, two additional open interview questions were posed to the senior leaders of the Netherlands armed forces (see tables 5-5 and 5-6 below).

R	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Y	▒		▒		▒					▒		▒				■		
N													▒		▒	■		▒
?		▒						▒	▒					▒		■	▒	
F				▒		▒	▒				▒					■		
Y=Yes; N=No; ?=Neutral; F=Focusing																		

Table 5-5: Is it possible to measure crisis response performance?

R	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Y	▒		▒	▒	▒	▒	▒		▒	▒	▒			▒		■		
?		▒						▒								■	▒	
N													▒		▒	■		▒
Y=Yes; N=No; ?=Neutral																		

Table 5-6: Is measuring crisis response performance desirable?

In answering the question whether it is possible to measure operational performance, broadly speaking, four categories emerge. The yes-voters stress that in practice the armed forces have already been acquiring experience in measuring operations. The no-voters are of the opinion that it is precisely the complex, often political distribution of power relations,

within which crisis response operations take place that makes performance measurement virtually impossible. The third group does not give a clear answer either way, but these interviewees stress the difficulty of measuring operational performance, because of the complex mix of influencing factors. The fourth group holds that measuring operational effectiveness is only partially possible and the armed forces should focus (F) on those specific aspects that are best suited to measurement. In this respect, they explicitly mention reconstruction and humanitarian tasks as being best suited for formulating measurable performance indicators. In table 5-7 below the answer categories are colored with some concrete statements.

Yes	*"Since the 1990s the Netherlands armed forces have been increasingly emphasizing the achievement of concrete objectives, such as the number of returned refugees, the reconstruction of employment and the number of confiscated weapons."*
No	*"In my view measuring the operation is impossible. You can measure on different levels, which makes the results level-bound and subjective. Performance itself is not measurable, because when the shooting starts, different rules apply. Rules that cannot be phrased managerially, such as efficiency and effectiveness. I also do not see the point of measuring from a so-called beneficiary perspective. You know beforehand that when you come to a very poor country with a bag full of money, the local population itself will not react objectively either"*
Neutral	*"Making performance measurable is difficult in case of a crisis response operation. On the one hand, it is a good thing to be able to account for what you have done to reach your objectives. On the other hand, it is very hard to prove that you have employed the available resources effectively. Can you map the wellbeing of people? Can security be measured adequately?"*
Focusing	*"What you do in an operation cannot be made fully measurable. When the number of ambushes decreases, does that mean it is safer? Conversely, it is possible afterwards to systematically analyze the preset tasks, such as disarming, demobilizing, elections, number of policemen trained, establishing a demarcation zone."*

Table 5-7: Different opinions on the possibility to measure crisis response performance

In spite of their unequivocal reaction to the first question on performance measurement, eleven out of seventeen interviewees answer positively to the follow-up question (see table 5-6). One of them summarizes this shared

opinion, on the desirability of performance measurement in a military-operational context, very well when he states:

"The tendency for making our performance measurable must be continued. Not only does it ensure structure in our operations, it is also a continuous reminder of our primary task."

Apart from these proponents of performance measurement, there are three respondents who feel that making operational performance measurable is not a good idea. Two of these no-voters (respondents 13 and 18) emphatically base their opinion on their answer to the preceding question. According to them, measuring operational performance is simply not wise, in view of the aspect of violence, which will always come into play, and the complex mix of influencing factors. The third no-voter, respondent 15, introduces an interesting new perspective with his argument with respect to performance measurement:

"I think that we must accept that military operations cannot be made measurable. My objections focus much more on the effectiveness of the entire armed forces. Crisis response operations are our core-business and yet we only send out 10% of our personnel annually, and only 15 % of our money is spent on this main task. Sending out about 5,000 persons a year may meet our ambition level, but are we not making things a bit too easy for ourselves?"

By benchmarking the Netherlands armed forces to other countries that have similar armed forces, in quantity and quality, by applying more rigorously the readiness tables and by reaching a higher effectiveness from certain weapon systems, he believes, the total effectiveness of the armed forces can be increased enormously. With this argument, however, the idea of performance measurement shifts from the output to the input-side.

5.7 CONCLUSION

Based on this chapter's results it could be concluded that the Netherlands armed forces' senior management is on the whole quite positive about the concrete choices that their predecessors have been made to transform from a traditional Cold War large-scale military organization into a smaller, flexible crisis response organization. However, based on almost two decades of conducting crisis response operations current managers have identified some interesting policy implications regarding the organizational determinants absorptive capacity, modular organizing, and lateral coordination.

First, regarding absorptive capacity the interviews make clear that the organization is perhaps too much focused on running missions. As a result, the process of knowledge absorption has a short-term focus, which leads to improvisation and superficial learning and prevents the organization from keeping track of important future developments.

Second, regarding modular organizing the interviews have pointed to the challenge of balancing organizational customization and operational effectiveness. Furthermore, it becomes clear that Navy and Air Force Command can better deal with this dilemma than Army Command. The Air force and Navy are both technology-driven organizations and have rather fixed operational tasks, creating a natural fit between the design of their parent organizations and the structure of the units that they have to deploy. The Army, on the contrary, can depend less on the binding effect of its technological assets, and has encountered dramatic changes in its operational repertoire. Given the unpredictable security environment, Army Command has decided to stick to its existing organizational structure and put its effort in improving the cooperation capabilities of its servicemen and women. Hence, the search for alternative, useable, multi-task modules is not being pursued.

Third, regarding lateral coordination the interviews results indeed show that this organizational mechanism is an important system integrator. Especially, training programs are deemed crucial to cope with the above mentioned dilemma of balancing organizational customization and

operational effectiveness. However, the interviews also make clear that solely relying on lateral coordination is not enough. The organization also uses other, indispensable mechanisms to integrate, such as ICT systems, formalization and socialization.

Fourth, regarding organizational performance the feeling prevails that measuring the output of crisis response operations should be given more attention. A majority of the interviewed senior officials feels the need for meaningful indicators to grant their activities some transparency, especially when faced with reconstruction or humanitarian - parts of - missions. Compared to the overall mission objectives, often couched in vague language, reconstruction and humanitarian tasks usually are of enough substance to be operationalized into concrete targets or indicators. Over the past few years the armed forces have made some progress in this respect, but the process will have to acquire more profundity of content

CHAPTER 6   DISCUSSION

6.1   INTRODUCTION

Chapter 1 started with Aupperle's (1996) military historical example of Xenophon's Anabasis. Based on this Greek epos he concluded that incorporating Morgan's (1986) brain and organism metaphor could probably help commercial organizations to establish a cultural ethic of spontaneous renewal and adaptability, which they need to compete successfully in today's turbulent business environment. The aim of this study was to find out whether or not contemporary Western armed forces have adopted Aupperle's range of thoughts in their striving to become quick response crisis response organizations. Moreover, the study's main assumption is that specifically Western armed forces could serve as an interesting case for commercial organizations to learn from, because their core being is about the repetitive initiation of adequate quick responses to cope with a highly volatile and varied global security environment. Basically, they have to activate organizational dynamics similar to the ones commercial organizations have to strive for when in hypercompetition.

With this study's empirical evidence in the back of our minds, it could be concluded that in line with Aupperle's (1996) assumption the Netherlands armed forces, as a typical example of a contemporary Western military organization, have followed a two-track transformation approach. First, the organization has actively stretched its absorptive capacity to renew itself in order to keep pace with the continuously changing security environment. Second, the organization has embarked upon a modular deployment strategy to make its architectural framework more adaptable in response to the unpredictable and extremely varied task-setting.

However, one remarkable distinction between the historical Greek and the current Dutch situation has not been addressed so far. The fact is that the Greek were faced with a one-off challenge of avoiding large-scale societal destruction, whereas the Netherlands armed forces repetitively have to go on missions in foreign countries as the protectors of universal human rights and international law. This contrast is very interesting for commercial

organizations as well, knowing that they, when confronted with hypercompetition, just like the Netherlands armed forces have to aim for winning consecutive, short-term, innovative 'competitive battles' instead of dealing with a strong known competitor in a once-only situation.

Based on the study's empirical findings this chapter will start a discussion on how absorptive capacity and modular organizing deal with the issue of repetitiveness. Within this discussion the role of lateral coordination is not separately expounded, but perceived as a crucial organizational facilitator incorporated in both the functioning of absorptive capacity and modular organizing. The discussion will have a threefold character. First, it will be discussed in what way absorptive capacity and modular organizing support the repetitive activation of adequate organizational responses. Second, the organization's speed of reaction will be addressed. In other words, do absorptive capacity and modular organizing not only facilitate repetitive appropriate action but also help to respond within a short time frame, over and over again. A third important aspect that, as yet, has remained untouched, and that this chapter will further discuss, is whether absorptive capacity and modular organizing also help organizations to preserve organizational stability. Apart from this focused theoretical discussion, the chapter will, furthermore, go into the limitations of this study and the study's general contributions to existing theory on dynamic capabilities, absorptive capacity, modular organizing, and lateral coordination. The chapter will conclude with discussing some avenues for further research.

6.2 ADEQUATE ORGANIZATIONAL RESPONSES

This study's empirical results offer some intriguing insights to further elaborate on the general organizational ability to repetitively activate adequate responses. Moreover, they indicate that the variables absorptive capacity and modular organizing both seem to play a profound part in this matter. In chapter 2 it was argued that within the general characteristics of a turbulent business arena organizations have to be capable of dealing with a wide spectrum of competitive demands, varying in the level of urgency and predictability. In line with this assumption the Netherlands armed forces' overall crisis response environment can be typified as turbulent.

Yet, the survey results indicate that within this overarching context the separate mission circumstances can vary enormously when it comes to the level of turbulence. Therefore, just like in the commercial world, the Netherlands armed forces should possess the basic organizational skills to deal with a mishmash of environmental characteristics. What this study has uncovered, is that depending on the external forces that have to be dealt with the Netherlands armed forces rely either on absorptive capacity or on modular organizing to come up with an adequate response. When the external forces encountered are unequivocal and incorporated into the existing mixture of flexible dynamic capabilities, modular organizing seems to have the upper hand in supplying an adequate response. When, however, the environmental dynamics are ambiguous, critical and do not fit the existing dynamic capabilities mixture, absorptive capacity gets to play the leading role in offering an appropriate solution.

Concentrating on the latter situation sketch, the ISAF model makes clear that when the organization, within its general crisis response task-setting, is confronted with an extremely unpredictable crisis response operation that on a continuous basis asks for quick and decisive action, the Netherlands armed forces lapse into a process of improvisation to respond adequately to suddenly changing, local operational circumstances. The organization, basically, enters into a process of conscious experimenting behavior and its absorptive capacity, which follows the principles of learning by doing and trial and error, is primarily being directed at the operational demands of that specific mission. At the same time, the necessary mixture of operational, structural, and strategic dynamic flexible capabilities, which is primarily related to the organization's overall crisis response role, is more or less taken for granted. It does not actively seem to contribute to mission performance.

Opposed to the ISAF context, the Netherlands armed forces can also be facing low turbulent mission contexts. The SFOR model serves as a good example of how the organization engages more predictable and less critical circumstances. In short, in comparison to the ISAF situation the opposite occurs. Absorptive capacity loses its significant direct effect on organizational performance. It is in this situation only the orchestrator role of absorptive capacity that remains significant. Its sole concern seems to have become to keep investing in balancing the mixture of flexible

dynamic capabilities. What the results also make clear is that, when the level of environmental turbulence is less extreme, the reconfiguration merits of the modular organizing approach offer the organization enough flexibility to successfully react to emerging changes in the environment. This probably has to do with the fact that creativity and innovativeness are of less importance when the level of unpredictability, dynamism, and complexity is negligible. In many cases small-scale interventions that fit or complement the existing strategy, structure, and operating processes will do. In this respect one could think of adequate responses, in terms of bringing down the number of troops, withdrawing certain offensive weapon systems, or changing the composition of the crisis response formation deployed.

In addition to these two extreme mission contexts, the refined path model makes clear that when the Netherlands armed forces encounter an average level of environmental turbulence they basically follow a dual approach. It must, at the same time, be said that according to the survey results the majority of the crisis response operations that the Netherlands armed forces have, so far, participated in fall into this category. Under these circumstances, where the organization has to be prepared to simultaneously cover the left as well as the right side of the spectrum earlier discussed, modular organizing and absorptive capacity play an equally important role. Even more interesting is the fact that the available mixture of dynamic flexible capabilities seems to fulfill a crucial mediating role between the two determinants. Based on the AMOS model it could be argued that the prevailing dynamic capabilities mixture serves as a solid organizational platform, from which innovative and straightforward interventions alike can safely be activated and monitored. Generally speaking, it offers an organizational foundation that prevents everything from being put upside down over and over again in order to repetitively achieve temporary advantages.

6.3   SPEED OF REACTION

Based on the empirical results it could, furthermore, be concluded that absorptive capacity and modular organizing have had separate, yet clear,

effects on the Netherlands armed forces' speed of reaction. Both effects will be discussed separately, referring to both the quantitative and qualitative empirical result.

Absorptive capacity and speed of reaction

Refocusing on absorptive capacity as a theoretical construct, chapter 2 made clear that this organizational determinant plays a twofold role. First, it stimulates creative thinking and open-minded organizational learning to derive new competitive advantages from externally obtained knowledge. Second, it orchestrates the transformation of the competitive plans thought-out into concrete, usable organizational practices. Based on these two roles Zahra and George (2002) make a distinction between two dimensions of absorptive capacity. First, they distinguish potential absorptive capacity, which refers to an organization's ability to acquire valuable new external knowledge and to assimilate this new knowledge into usable ideas. It could, basically, be described as the creative thinking part of absorptive capacity. Second, they identify realized absorptive, which is not about thinking but about acting. This second dimension refers to an organization's ability to transform and exploit the newly acquired knowledge into concrete organizational practices to create a real competitive advantage. The general assumption is that under hypercompetitive circumstances organizations have to be capable of dealing with the two sequential dimensions within a very short time frame.

Complementary to the ISAF model, the interview results make clear that within a highly turbulent mission context the Netherlands armed forces have the capacity to go through absorptive capacity's sub processes rather quickly. There seems to be a sort of common organizational understanding that the organization has to do everything in its power to act quickly and decisively in support of a running mission, when the going gets tough and the external influences can not be sufficiently counterbalanced with the existing organizational resource base. In this respect, the organizational reaction to the suddenly emerging IED threat, discussed in the previous chapter, is a good example to refocus upon. The example makes clear that the Netherlands armed forces very rapidly activated the knowledge acquisition, assimilation, transformation, and exploitation processes to fathom the ins and outs of the IED threat, come up with alternatives,

acquire usable assets, and to implement them within the task force deployed.

Between the lines the example perhaps even more explains that settling the sequence from potential to realized absorptive capacity in a matter of weeks instead of months depends to a large extent on the organizational will to do so. This will is most likely to depend upon the level of agreement that exists within the organization and the amount of time that it takes to reach this level. In short, when a broadly shared sense of urgency develops quickly within the organization its drive to do something will certainly benefit. This, however, also implies that when organizational conformity is lacking, or it takes longer to develop, the organization probably misses the boat because the absorptive capacity processes are not focused enough or are too much spread out in time.

Modular organizing and speed of reaction

According to this study's findings modular organizing can both positively and negatively influence a quick organizational response. The positive influence of modular organizing can be related to the different dimensions of absorptive capacity discussed above. The Netherlands armed forces' modular deployment approach has led to an organizational situation in which the Dutch units quite intensively have to work together with other military and non military partners, coming from different national, professional, functional, and ideological backgrounds.

The sum of all the partnerships in which the Dutch have participated serves as an extensive knowledge pool from which the organization can learn in all sorts of ways. In short, the organization's knowledge acquisition, assimilation, transformation, and exploitation processes all benefit from using partnership experiences as a sort of general database or as a concrete point of reference. Moreover, because the organization does not have to find everything out for itself, the sequential learning steps can also be taken a lot quicker. It is obvious that one of the main reasons why the Netherlands armed forces were able to react so quickly and decisively to the IED threat was because the organization could respond on the basis of concrete experiences of its coalition partners. In terms of Zahra and George

(2002), the efficiency factor to transform potential absorptive capacity into realized absorptive capacity could be increased considerably because the Netherlands armed forces were able to answer very important questions rather easily based on explicit, available evidence, such as: what kind of technology, offensively as well as defensively, do our partners use? How do their procedures work? What tactical problems have they encountered so far?

For the negative influence of modular organizing on the organization's speed of reaction a national instead of a mission perspective has to be taken. The empirical results have made clear that, on a national level, differences occur between the Operational Commands in living up to modularity theory's basic principle of near-decomposability. Recapitulating, Simon (1962) describes near-decomposability as breaking up the system in separate modules, whereas the interactions among the modules are weak but not negligible. According to modularity theorists near-decomposability is a crucial organizational property to strive for, because it creates autonomous sub-units that can easily be recombined into other configurations. As Weick (1990; 1976) puts it, by relying on self-supporting, autonomous organizational modules and by controlling only the required input and output of these modules, a system is created that can benefit from the advantages of loose coupling.

When concentrating on the Netherlands armed forces a strong distinction regarding this near-decomposability demand exists between Army Command on one hand, and Air Force and Navy Command on the other hand (De Waard & Kramer, 2008). It could be argued that Navy and Air Force units to a large extent resemble what one might call 'proper modules'. Based on their rather fixed operational task-setting, which on top of that is dominated by the technological systems in use, they are able to function rather autonomously within larger troop formations. As a result of their largely modular character the process of assembly for crisis response deployment becomes rather straightforward. Units can be taken out of the parent organization quickly and easily and be added to a task force to perform a specific task in an autonomous way.

Opposed to that, army units are not what one would call 'proper modules'. Instead, it would be better to speak of components. They are

distinguishable organizational parts that, given their functional character, are not made to function autonomously. For each mission Army Command picks its units from all over the organization and composes a mixture of organizational functional parts that is capable of dealing with the specific operational demands of that particular deployment. Army Command stresses the importance of adaptability, because it is virtually impossible for the organization to predict what kind of operational task-setting can be expected in the future. This situation makes it problematic to create fixed organizational modules within the parent organization that can be used for each crisis response operation imaginable.

Mainly based on this aspect of uncertainty, Army Command has decided to stick to its existing organizational structure and to invest heavily in joint exercises and training programs to transform a tailor-made mixture of different functional units into a well-oiled machine before actual deployment takes place. Although this choice seems logical, in the end this extra training effort contravenes the high-readiness, quick response ambitions of the Netherlands armed forces, since units cannot be deployed straightaway.

6.4   PRESERVING ORGANIZATIONAL STABILITY

In chapter 2 it was explained that organizations in hypercompetition have to be capable of balancing search and stability, or in other words should try to become ambidextrous. Concentrating on the issue of organizational ambidexterity, the empirical findings also point to different roles for the organizational determinants absorptive capacity and modular organizing, especially regarding the aspect of safeguarding organizational stability. Below these separate roles will be discussed.

Absorptive capacity and preserving organizational stability

The fact that a too strong focus on aligning strategic, structural, and operational flexible dynamic capabilities may take too long under extremely turbulent circumstances seems quite self-evident. It could be

argued that immediate action is often more urgently needed than well-considered interpretation, transformation, and exploitation. Therefore, it is understandable that, within ISAF-like mission contexts, decisions on, for example, implementing new technologies, cooperating with alternative strategic partners, altering existing operating routines, etc. sometimes have to be made without having the time to assess all their pros and cons within a broader and longer term organizational context.

Although this thinking outside of the box and acting quickly could on one hand be perceived as a praiseworthy achievement, on the other hand it also involves a certain level risk and asks for cautiousness. The ISAF model showed that a mixture of flexible dynamic capabilities no longer directly contributed to organizational performance and was pushed to the background. The organization had, basically, put all its eggs in the basket of absorptive capacity to deliver useful answers quickly. Yet, by doing this on a regular basis the organization runs the risk of giving absorptive capacity too much a short-term status. If there is no plan on how to embed newly acquired technological systems or newly invented processes beyond the time-span of a running mission into the overarching organizational system their initial blessing can ultimately turn into an organizational nuisance. Especially the interview results address this issue. The fact that technological systems are sometimes bought without having really thought about, for example, firmly embedding them into the organization's supply chain, maintenance processes, or training programs, often leads to a series of ad-hoc organizational adjustments to reach a workable situation altogether. Most of the time, the end result is an organizational compromise that is constantly being questioned because of the remaining practical drawbacks.

The example makes clear that it is important for organizations to find the rest to take a step back to think about how the action taken could be fitted in the organization's existing dynamic capabilities mixture. Basically, the key goal should be to transfer the short-term advantage gained into a longer term organizational merit. In this respect, a pitfall that, apart form the Netherlands armed forces, all organizations should be careful of when confronted with environmental turbulence, is not to led the haze of the day take control. This may lead to situations in which organizations are unable to distance themselves from a certain situation or action, which ultimately

prevents them from learning in the long run. In this regard, the interviews, furthermore, point to the added value of a well structured organizational learning process. A number of interviewees expressed their concerns about the fact that the Netherlands armed forces' overall learning process is negatively being influenced by too much compartmentalization.

Modular organizing and preserving organizational stability

All in all, the empirical results on modular organizing have led to the conclusion that the Netherlands Armed Forces are confronted with two contradicting types of organizational flexibility demands. On one hand the armed forces need 'composition flexibility', because the organization has to be capable of deploying task forces of different sizes, composed of different units, to different part of the world in order to perform a variety of tasks. On the other hand, the armed forces need, what could be called, 'operational flexibility' for the deployed task force to cope with its dynamically complex task environment. That is to say, a task force is most likely to operate in an environment in which it is confronted with uncertain and ambiguous inputs, and with other intelligent actors actively trying to undermine its goals. Consequently, it should work as a well-oiled machine and be able to fluently adapt and remain adaptable to local condition. This, however, implies more than just efficiently 'clicking' together organizational building blocks. The real challenge lies in the fact that the clicking itself must also lead to what Weick (1993; 2001) would call 'heedful interrelating' between individuals.

The current effect-based approach strategy of the Netherlands armed forces strongly relates to the first type of organizational flexibility. Composition flexibility is deemed most important to give a rather small military power, such as the Netherlands, the ability to cover a broad spectrum of military operational tasks. Especially for Army Command this approach has stimulated a process of mixing and matching units to into tailored mixtures of different functionalities. The formation process to create tailor-made organizational modules often leads to situations in which the basic structure of the parent organization is abandoned. The empirical results point to the fact that this customized way of deploying units has an effect on organizational stability, which is threefold.

First, the organization has to invest heavily in all kinds of coordination mechanisms to transform the mixture of different functional units into a well working machine. For example, preceding actual deployment training programs and joint exercises have to take place; during deployment staff elements and liaison officers are needed for the effective integration of the different functional contributions; and at the technical level, extra time and effort goes into informal command and control consultation between the commanders of the different units to create an operational shared sense of meaning. It is questionable whether this energy consuming approach will ultimately lead to sufficient operational flexibility, meeting Weick's idea of heedful interrelating. After all, to interrelate heedfully a tight professional bond is deemed necessary to, for example, sense problems before they occur or to straightaway recognize deviations from normal routine. In this respect, it could be argued that a parent organization built upon a limited number of autonomous modules that could be deployed integrally will probably yields a better effect, because the level of inter-unit and inter-personal unfamiliarity will be considerably lower.

Second, in order to form tailored crisis response modules the Netherlands armed forces have to cut through existing organizational boundaries, stripping brigades, main operating bases and maritime taskforces that stay behind. As a result, the regular training programs of these units, in which a variety of military operational tasks have to be trained, suffer, because important organizational elements are being missed. In the medium and long run this may lead to organizational fatigue, because units never get the chance to train to their full potential and, therefore, probably never reach the military professional level they are supposed to reach. Moreover, knowing that the exercising and training cycle must lay the foundation for future deployments, it could even be argued that crisis response effectiveness in the long term is gradually being eroded.

Third, the process of mixing and matching that continuously takes place stimulates feelings of turmoil within the organization's workforce. The empirical results made clear that especially by suddenly withdrawing people from their daily jobs all kinds of peace-time administrative, functional, managerial, and educational processes were being frustrated. This situation has had a negative effect on organizational stability in several ways. For example, the organization was being forced to improvise

by temporarily filling-up crucial vacancies, creating new vacancies somewhere else; certain vocational training courses had to be postponed or even cancelled, developing queues and a higher workload further in time; and unintentionally the critical paths of all kinds of administrative procedures increased considerably. Moreover, all these indicators together stimulated a widely shared feeling of the organization being captured in an ongoing cycle of improvisation.

6.5   LIMITATIONS

During the research process a number of deliberate but also pragmatic choices have been made. On one hand these choices have structured the research process; on the other hand they have limited the validity of the empirical results in a number of ways. The limitations of this study can be related to the following issues: (1) the study's focus, (2) the methods used, (3) the sample population, and (4) the measurement scales. Below, this categorization will be used to address the study's main methodological problem areas.

The study's focus

The thesis has taken a strategic management perspective in finding out how the Netherlands armed forces organizationally deal with the turbulent security environment they encounter. This means that the organizational determinants and dynamic capabilities identified are of a strategic aggregation level. Therefore, all kinds of functional and micro-level resultants of the chosen transformation approach have not been discussed. In this respect, one could think of specific technological (weapon)systems that the organization has acquired, the leading philosophy of decentralized mission command, or the fixed career paths for commissioned and non-commissioned officers. Moreover, the thesis specifically focuses on the relationship between organizational determinants and the actual crisis response performance of the Netherlands armed forces. As a result, all kinds of 'peace-time' management developments to support the

organization's demand for greater flexibility, such as the implementation of SAP and Peoplesoft ERP packages, have not been taken into account.

The methods used

Both interviews and questionnaires are basically about self-evaluations, which has given the study a subjective trait. It must, however, also be said that the questions were posed to a very large, representative group of military incumbents who know what they are talking about and who have actual operational experience. It would, therefore, be too facile to disqualify their assessments as too subjective and therefore useless. In a general sense the thesis serves as a strategic diagnosis, which can give impetus to follow-up analyses, in which the results gathered from the surveys and interviews can be shared and discussed between the different communities within the Defence organisation.

Moreover, to somewhat counterbalance the subjective approach of analyzing how the Netherlands armed forces have transformed into a military crisis response organization, the findings were cross-checked with another study conducted by the 'Clingendael' research institute, in which the usability of a number of smaller European armed forces for expeditionary crisis response operations is being assessed (Van den Doel, 2004). The main conclusion is that, in comparison with the others, the Netherlands armed forces have transformed very successfully. Therefore, the positive sentiments coming out of this study do not seem to be standing on their own.

The sample population

Empirically the thesis is based on the opinion of the Netherlands armed forces' middle and senior management. This choice was driven by the fact that the questions asked, on the organization's crisis response performance, were of a strategic level, making it necessary for the respondents to have both operational military experience and knowledge of strategic organizational issues. A drawback of this choice is, first of all, that the specific views of junior staff members have not been taken into account.

This creates a noteworthy gap in the study's explanatory power, because the actual execution of concrete crisis response tasks increasingly takes place at the military technical and tactical level, where the lower ranks play the leading role. A second issue to mention is that since the mid-1990s it has become increasingly clear that modern crisis response operations require a multi-actor effort in which international and host-nation civil and military actors, at headquarters and field level, cooperate to achieve a common set of goals to benefit afflicted populations (Bollen & Rietjens, 2008). As such, complementing the research findings with the opinions of other actors involved in crisis response operations would have given a more balanced understanding of the Netherlands' armed forces overall performance.

The measurement scales

This study consciously used scales that had already been validated in earlier research contexts. Yet, originally all of these scales had been developed for research projects that focused on commercial businesses; meaning that for this study the individual scale-items had to be translated to a military setting. Regretfully, transforming the scales has resulted in a decreasing level of statistical power. Although, in most cases the Cronbach's alpha scores reached the minimum level of .70, their initial reliability values were much better. Volberda's (1996) scales for measuring operational, structural, and strategic flexible dynamic capabilities were the only ones that did not reach the required minimum level. To overcome this problem the scales were combined into one overall variable: dynamic capabilities mixture (DCM). Although it could be perceived as a pragmatic choice, from a conceptual and statistical point of view it is, of course, an admission of weakness.

The theoretical focus on the relatively new construct of absorptive capacity also raised a major measuring issue. The main problem that emerged was that no validated scale existed to measure absorptive capacity. A compromise was found in Volberda's (1996) scale for measuring metaflexibility. If the research would have taken place during these days this problem would not have occurred, because in the meanwhile Jansen et al. (2005) have developed a scale that actually measures the sequential

processes of knowledge acquisition, assimilation, transformation, and exploitation that make up the absorptive capacity construct.

6.6   GENERAL CONTRIBUTIONS TO EXISTING THEORY

In general, the study has contributed to improving the status of the Dynamic Capabilities Approach. More particular, the study has extended the existing theoretical knowledge base on absorptive capacity, modular organizing, and contemporary military organizations. Next, these theoretical contributions will separately be discussed.

Contributions to the Dynamic Capabilities Approach

Some interesting insights arise from this study's framework. To start with, prior research on dynamic capabilities has placed little emphasis on the underlying processes that an organization requires in order to move from its starting position to a new 'desired' state. In this respect, Helfat et al. (2007: 116) believe that the Dynamic Capabilities Approach would benefit from comprehensive empirical analyses that clarify the topic of asset orchestration. That is precisely what this study has aimed to do by introducing absorptive capacity, modular organizing, and lateral coordination as three basic underlying organizational processes that, in combination, influence the organization's search, selection, configuration, and deployment capabilities.

A second weak spot in dynamic capability research, so far, has been the element of performance measurement to find out how well or poorly certain dynamic capabilities have actually performed in practice. As a result, Helfat et al. (2007) propose to employ underutilized conceptual yardsticks for measuring performance. According to them one performance yardstick to investigate is *evolutionary fitness*, which should concentrate on indicators such as growth, survival, and value creation. By using Jaworski and Kohli's (1993) scale this study statistically measured whether the proposed organizational determinants did indeed offer added value to the Netherlands armed forces crisis response performance. The results have

shown that the organization's repetitive crisis response performance for a profound part relies on the variables absorptive capacity, modular organizing, and lateral coordination.

The relationship between path dependency and the reality of constrained change is a third important underexposed research topic that has been addressed in this study. The findings make clear that the transformation approach of the Netherlands armed forces was primarily based on investing in organizational capabilities that matched the existing resource base. With this rather incremental and conservative approach the organization was still capable of rather successfully changing from a large-scale, mechanized Cold War deterrence power into a small, flexible and versatile crisis response organization. This is a valuable theoretical contribution, because it supports the emerging idea that for an organization to renew itself, because of hypercompetitive pressures, it is not always necessary to aim for a one-off 'big bang'-like turnaround to shake of the competitors (Helfat, et al., 2007; Teece, et al., 1997). Moreover, it offers a practical view on the challenging situation that most organizations face of having to break out of their existing status-quo.

Contributions to the absorptive capacity construct

First, the study has uncovered that the four learning dimension (acquiring, assimilating, transforming, and exploiting) that make up absorptive capacity can not only be divided into the sub dimensions potential and realized absorptive capacity (Todorova & Durisin, 2007; Zahra & George, 2002), but can also have either a short-term or a long-term focus. The study has taught us that, when it comes to dealing with environmental turbulence, organizations should be aware of the fact that having a short-term focus and going for the "quick-win" could in the medium or long run work counterproductive. The key, to deal with this time dimension of absorptive capacity, can probably be found in the sequential processes of transforming and exploiting newly acquired knowledge. Within these processes the organization should concentrate on both the long-term and short-term consequences of the competitive alternatives that have been thought-out.

Second, in line with Todorova and Durisin's (2007) refined model of absorptive capacity this study has proven that social integration mechanisms indeed influence the sequential learning processes of acquiring, assimilating, transforming, and exploiting new knowledge. Moreover, the study has also demonstrated that power relations have a profound influence on the process of knowledge exploitation. Regarding the social integration mechanisms, the empirical results make clear that the way in which the organization internally has organized its learning processes especially influences long-term knowledge absorption. Regarding power relationships, could be argued that organizational will works as a catalytic agent for the knowledge exploitation process.

Third, Van den Bosch et al. (1999) argue that both coordination capabilities and the matrix form are important antecedents for absorptive capacity, because they have a positive influence on an organization's flexibility and scope of knowledge absorption. The empirical results of this study support this general idea, but also go one step further. By demonstrating that the relationship between modular organizing and absorptive capacity is stronger than the one between lateral coordination and absorptive capacity, a new dimension of knowledge absorption becomes apparent. It could be argued that rather autonomous organizational parts that have to work together in temporary organizational forms for a longer period to reach a common goal improve, what could be named, the *depth of knowledge absorption*. Whereas, coordination capabilities primarily relate to the rather swift exchange of knowledge and insights between individuals, modular organizing stimulates a more profound way of learning. The cooperation that takes place between different organizational groups, over a longer period of time, deepens the understanding of each other's ways of doing things. This leads to a situation in which not only new knowledge is acquired, but also more detailed insights are gathered about the translation of this new knowledge into concrete, usable routines and processes.

Contributions to modularity theory

The study also complements the existing stream of research on modularity. A general aspect that has remained underexposed in the academic debate on modularity is whether its foundations coming from modular product

design can also be applied in a context of social systems, such as project-based firms (Baldwin & Clark, 1997).

Some work already exists on the dynamics of recombining organizational units (Helfat & Eisenhardt, 2004; Karim, 2006). Yet, these contributions focus on the aggregation level of the business unit. Generally speaking, business units carry the overall responsibility over a single product-market combination. Because of this autonomous position, they are spared from all kinds of task related external interdependencies and, therefore, seem to comply with modularity's basic rule of near-decomposability. However, within the hypercompetitive business arena organizations increasingly rely on project-like temporary organizations to react quickly to changes in the environment. These intra and inter organizational cooperation structures are most of the times formed within the business unit level, directly addressing the competitive frontline. This study addresses this gap. The main conclusion drawn is that the repetitive reconfiguration of smaller organizational elements into varying constellations depends above all on dealing with ambiguous social processes.

The strong relationship between lateral coordination and modular organizing the study uncovers, demonstrates that the aspect of loose coupling that is being presented as one of the major advantages of a modular system is probably less applicable at these lower organizational levels. This result supports earlier work that says that the new reality of increased horizontal cooperation puts far more emphasis on "softer" coordination skills than before. After all, to motivate change and deal with task uncertainties within a team-based project-context, without having formal hierarchical authority, makes it more important to focus on relational aspects, such as negotiating with others, enhancing social bonds and building up trust (Hoegl & Gemuenden, 2001; Sinha & Van de Ven, 2005).

Contributions to military business science

As mentioned in chapter 1, the need to cope with the increasingly turbulent security environment is not a unique Dutch phenomenon, but part of a major trend influencing the entire transatlantic security community. The

buzz word of this new global security environment has become *uncertainty*. Uncertainty exists about the potential sources of military threats, their time and place of occurrence, and the form that threats and attacks will eventually take. Not surprisingly, among military business scholars a debate has emerged on the do's and don'ts of contemporary military deployment. In this respect, Evans (2003: 139-140) states that: "in an era when all security issues are interconnected and when the national security of Western States has become critically dependent on international security, single-scenario strategies and rigid military force structures have become anachronistic……Military analysts and force-structure specialists need to concentrate on the multifunctional use of force in highly complex operations……The task is to learn how to fight efficiently across the spectrum of conflict." Overall could be said that Western armed forces faced a similar challenge as many organizations in profit sector did: Creating an organization with enough built-in flexibility to generate and mobilize different organizational alternatives in order to counter the continuously changing security environment.

Dandeker (2003: 414) explains that the answer to this problem has been found in modular design: "Uncertainty as to the environment, objectives, and conditions of missions to come has lead the United States (through "building blocks"), the United Kingdom (through "force packages"), and France (through "a modular configuration of forces") to the idea of organizing military assets in advance into a series of coherent, self contained, mix-and-match sets of units borrowed from the various organic commands for a give mission. Such modules can be assembled at short notice to form a mix of force appropriate for the specific demands of an unforeseen crisis demanding the use of armed forces."

This study has added some useful insights to this discussion. Based on the modularity discussion larger countries have reinvented the army brigade for the new crisis response role. All Western land forces are hierarchically divided into standard sub-units. In terms of Mintzberg (1983) the configuration of these organizations is divisional, which means that they are built up of a number of 'smaller armies'. These 'smaller armies' come in different sizes. For example, a division consists of several brigades. Subsequently, a brigade can be sub-divided into battalions, and a battalion can be split up into companies. Important to mention, in this respect, is that

the smaller the unit becomes the smaller its manoeuvre, fire support, logistical support, and command elements will be. The brigade is known as the smallest organizational building block that possesses a sufficient combination of functional elements to conduct military operations autonomously for a longer period of time. With this characteristic the army brigade complies to modularity theory's rule of near-decomposability, and is, therefore, pre-eminently fit for force tailoring (Bonin & Telford, 2004).

Yet, for smaller countries, such as the Netherlands, a brigade is a rather large organizational part. To give an idea, the entire Netherlands armed forces' land component consists of only three manoeuvre brigades. Deploying a single brigade for each crisis response operation would be a too heavy operational burden for the organization to carry. Therefore, opposed to the larger countries, The Netherlands is abandoning the brigade as the Army's main combat structure and, instead, is primarily relying on battalion-size structures to conduct crisis response operations. As a result, modularity theory's mixing and matching philosophy is being executed with smaller organizational elements that do not have complete organizational autonomy. Consequently, the organization has to put extra energy into creating a well-working overall organizational system. Military business scholars can take advantage of the organizational dynamics this study has uncovered regarding the mixing and matching of units operating at the military tactical level.

6.7   AVENUES FOR FURTHER RESEARCH

The study has also uncovered ample research themes that deserve further academic attention. These future scholarly contributions have been categorized into the following four main research scopes: (1) Dynamic capabilities Approach, (2) absorptive capacity, (3) modular organizing, and (4) performance measurement. The concrete topics to address within these overarching scopes are discussed below.

Dynamic Capabilities Approach

Now that we know that absorptive capacity and modular organizing are two important organizational determinants for the activation of a mixture of strategic, structural and operational dynamic capabilities, an intriguing direction for further research would be to investigate if and how different organizations deliberately try to develop such a mixture. Within this discussion, it would, furthermore, be interesting to focus on the specific dynamic capabilities that organizations deploy to balance the strategic, structural, and operational flexibility demands. When this academic challenge is taken up, the result could also add to the issue of *industry evolution*, which Helfat et al.(2007) put forward as an interesting research theme to strengthen the scientific position of the Dynamic Capabilities Approach.

Absorptive capacity

Finding out how, within different organizations or organizational contexts, the absorptive capacity processes have been organized would be useful to colour the theoretical construct with more empirical insights. Following Lane et al.'s (2006) process model of absorptive capacity the focal point of this research should be the relationship between the organization's knowledge structures and the sequential learning processes of acquiring, assimilating, transforming, and exploiting new knowledge. Sub themes that could be addressed are for example how the learning processes separately are organized; how the sequential steps are interconnected; and how the transfer of short-term knowledge absorption into long-term absorption in practice is being dealt with.

Modular organizing

The relationship between lateral coordination and loose coupling is an interesting theme to focus on in future research. Based on existing theory this relationship could be typified as being curvilinear. In short, an increasing level of lateral coordination eventually leads to chaotic communication, which will then have a negative impact on the smoothness of cooperation. However, the Netherlands armed forces strongly rely on

training as a specific type of lateral coordination to ease inter-unit collaboration. It could be argued that the possibility for organizational elements to train within a safe and artificial context with each other will by definition be advantageous, because they can level and learn without the pressures of the real-time task environment. This makes it interesting to distinguish between different types of lateral coordination and to investigate how they separately influence the performance of modular organizational systems.

In addition to this theoretical debate on coordination capabilities, it also interesting to shift to a higher aggregation level and elaborate on the different interfaces that organizations can use to create a well-working system out of a mixture of smaller organizational elements. Kogut and Zander's (1992) subdivision of system, coordination, and social capabilities could be the starting point of a discussion on the relative power of these combinative capabilities within a modularly built organizational system.

A further exploration of the relation between the design of the parent organization and the temporary modular "project-organization" is also recommendable. The knowledge gained about the way in which the Netherlands armed forces organize their temporary task forces for crisis response missions could be expanded with insights coming from other organizations that frequently use inter-organizational project structures to achieve business goals. Especially organizations that contribute larger organizational elements, and not just individuals, to these kinds of structures will probably add value to this theoretical debate. In both the public and commercial sector organizations can be found that work in such a way. In the public sector, for example, the increased focus of many Western governments on homeland security and disaster relief capabilities has stimulated tighter project-like cooperation between public services at the operational level (Denning, 2006). In the commercial sector the construction and entertainment industry come to mind first, because large-scale infrastructural projects or major movie productions are organized in a way that semi-autonomous functional groups from different organizations have to work together (Ekstedt, Lundin, & Wirdenius, 1992; Genus, 1997; Hirsch, 1972).

Performance measurement

Apart from Likert-type scales the study used semi-structured interviews to qualitatively measure performance. The interview results touched upon the topic of performance measurement in situations or contexts where the output can only be defined in qualitative and vague terms (Hofstede, 1981: 195). To offer a brief review of the findings: a number of senior officers are hesitant about the usefulness of measuring the effectiveness and efficiency of crisis response operations, because according to them the context in which the operations are being executed is too complex. Others, however, are convinced that measuring effectiveness and efficiency is useful and should be improved. These military leaders express a strong need for criteria to assess their performance on the job. They feel the Netherlands armed forces, mainly in its reconstruction role, should use specific criteria to map its effectiveness.

These empirical findings may help to deepen the academic debate within the New Public Management (NPM) research stream on performance measurement in the public sector. NPM aims at 'lessening or removing differences between the public and the private sector and shifting the emphasis from process accountability towards a greater element of accountability in terms of results' (Hood, 1995: 94). This study has, however, stumbled upon a discussion on the added value of actually measuring performance within an ambiguous political setting. This concern may fuel an emerging theme within the NPM community on the disadvantages of measuring performance 'in settings of deficient output control' (Beeres, De Waard, & Bollen, 2010; Mol & Beeres, 2005).

6.8   CONCLUSION

Based on the study's empirical findings this chapter has started a discussion on the role that absorptive capacity and modular organizing play in repetitively activating adequate and quick organizational responses. This is a very interesting issue for commercial organizations as well, knowing that they, when confronted with hypercompetition, just like the Netherlands armed forces have to aim for winning consecutive, short-term, innovative 'competitive battles' instead of dealing with a strong known competitor in a once-only situation. The discussion makes clear that in essence absorptive capacity and modular organizing can be useful organizational determinants to invest in. What, however, organizations should be aware of is that absorptive capacity can have short-term and long-term focus. When organizations focus too much on the short-term dimension without taking the long-term consequences into account, they run the risk of becoming stuck into a continuous circle of improvisation. Another main point of concern is that when organizations rely heavily on fine-grained modularization, abandoning the principle of near-decomposability, they have to put a lot of extra time and energy into coordination capabilities to still create a well-working overall organizational system. As a result, the organization's capacity to quickly respond suffers.

CHAPTER 7   CONCLUSION

7.1   INTRODUCTION

This chapter will conclude the study. In order to answer the study's central research question, three sub-questions have been formulated. First, the answers found to these three questions will be summarized. Second, based on their combined information outcome the central research question will be answered. Third, the chapter will end with making recommendations to the Netherlands armed forces for improving their ability to adequately deal with and quickly respond to their unpredictable, complex and dynamic crisis response environment.

7.2   ANSWERING THE SUB-QUESTIONS

Recapitulating, in a step-wise approach to answer the study's central research question three sub-questions have been posed. The first question has been worked out in chapter 2. The chapters 4 and 5 have respectively discussed the second and third question. Below, their separate outcomes will be summarized.

Sub-question 1

Existing strategic management theory makes clear that three organizational determinants play an important role in the competitive challenge of realizing innovative organizational learning and architectural reconfiguration within hypercompetitive business circumstances. First, absorptive capacity has been identified as a determinant of great value because it steers the critical process of searching and selecting usable dynamic capabilities. Modular organizing has been presented as a second important determinant, because it supports the process of mixing and matching new or existing resources and capabilities into alternative system configurations. Lateral coordination is a third determinant of major importance that has been derived from the theoretical analysis. Lateral

coordination not only facilitates the knowledge absorption process needed for innovativeness, but it also positively influences the reconfiguration capabilities of a modular organizational system.

The main contribution of these three determinants is that together they are capable of activating a necessary mixture of strategic, structural and operational flexible dynamic capabilities**.** This mixture is deemed important to balance the organization's search and selection function with its configuration and deployment function. The crucial point is that too much emphasis on strategic change, innovation and renewal, without properly embedding the change strategies in the organization, may, on one hand, create chaos. On the other hand, a too strong focus on improving existing organizational routines stimulates conservatism and may lead to rigidity in the organization. Therefore, a general assumption is that organizations should aim for ambidexterity as the key to repetitive success. Existing strategic management theory has taught that in connection absorptive capacity, modular organizing, and lateral coordination contribute to achieving this goal of organizational ambidexterity. Moreover, absorptive capacity and modular organizing not only affect organizational performance by activating a mixture of dynamic capabilities; they can also exert a direct influence. This second outcome effect is determined by the fact that these two determinants can play a facilitating role when the organization has to convert from a prudent to a more ad hoc way of problem solving.

Sub-question 2

The contribution of these organizational determinants to the Netherlands armed forces' crisis response performance has been investigated by means of a large-scale survey among a large sample of Dutch officers. Based on the information coming out of this survey it can be concluded that absorptive capacity, modular organizing, and lateral coordination considerably contribute to the Netherlands armed forces crisis response performance. To be precise, 18% of the overall crisis response performance of the Netherlands armed forces is being accounted for by only these three variables. The results have also made clear that lateral coordination not only acts as a facilitator of absorptive capacity and modular organizing, but also has a direct effect on the organization's

operational dynamic capabilities. Moreover, these operational dynamic capabilities seem to be of crucial importance themselves. The empirical findings indicate that they, basically, lay the foundation for the activation of structural and strategic dynamic capabilities.

What the results also show is that when the level of environmental turbulence increases, the effects of modular organizing, and a mixture of dynamic capabilities, seem to become of marginal importance, whereas absorptive capacity remains the sole significant contributor to organizational performance. This probably has to do with the fact that within turbulent crisis situations the real difference can be made by thinking and acting beyond existing practices; basically making it a case of creatively exploiting what one has got.

Yet, when the level of environmental turbulence decreases the opposite occurs. In brief, absorptive capacity loses its significant role at the expense of the existing flexible dynamic capabilities mixture and the modular organizing approach. This probably has to do with the fact that creativity and innovativeness are of less importance when the level of unpredictability, dynamism, and complexity is negligible. In many cases, small-scale interventions that fit or complement the existing strategy, structure, and operating processes will do.

In addition to these two extreme mission contexts, the Netherlands armed forces can, of course, also encounter an average level of environmental turbulence. Under these circumstances modular organizing and absorptive capacity play an equally important role. Even more interesting is the fact that the available mixture of flexible dynamic capabilities seems to fulfil a crucial mediating role between the two determinants. Basically, it serves as a solid organizational platform, from which innovative and straightforward interventions alike can safely be activated and monitored. Generally speaking, it offers an organizational foundation that prevents everything from being put upside down over and over again in order to repetitively achieve temporary advantages.

Sub-question 3

Based on the qualitative interview results it could be concluded that the Netherlands armed forces' senior management is, on the whole, quite positive about the concrete choices that their predecessors have been made in transforming from a traditional Cold War large-scale military organization into a smaller, flexible crisis response organization. However, almost two decades of conducting crisis response operations has also resulted in some interesting policy implications regarding absorptive capacity, modular organizing, lateral coordination, and organizational performance.

First, regarding absorptive capacity the interviews make clear that the organization is perhaps too much focused on running missions. As a result, the process of knowledge absorption tends to have a short-term focus, which leads to improvisation and superficial learning; and prevents the organization from keeping track of important future developments.

Second, regarding modular organizing the interviews have pointed to the challenge of balancing organizational customization and operational effectiveness. It has also become clear that Navy and Air force Command can deal better with this dilemma than Army Command. The Air force and Navy are both technology-driven organizations and have rather fixed operational tasks, creating a natural fit between the design of their parent organizations and the structure of the units that they have to deploy. The Army, on the contrary, can depend less on the binding effect of its technological assets, and has encountered dramatic changes in its operational repertoire. Given the unpredictable task environment that has to be dealt with, Army Command has decided to stick to its existing organizational structure and focus on a process of mixing and matching existing smaller, functional sub-units into different configurations. As a result, the main organizational emphasis has been put on improving the cooperation capabilities of the work force. Hence, a search for alternative, useable, multi-task modules is not being pursued.

Third, regarding lateral coordination the interview results indeed show that this organizational mechanism is an important system integrator. Training

programs, especially, are deemed crucial to cope with the above mentioned dilemma of balancing organizational customization and operational effectiveness. At the same time, the interviews make clear that solely relying on lateral coordination is not enough. The organization also uses other, indispensable mechanisms to integrate, such as ICT systems, formalization and socialization.

Fourth, regarding organizational performance the feeling prevails that measuring the output of crisis response operations should be given more attention. A majority of the interviewed senior officials feels the need for meaningful indicators to grant their activities some transparency, especially when faced with reconstruction or humanitarian - parts of - missions. Compared to the overall mission objectives, often couched in vague language, reconstruction and humanitarian tasks usually are of enough substance to be operationalised into concrete targets or indicators. Over the past few years, the armed forces have made some progress in this respect, but the process will have to acquire more profundity of content.

7.3   ANSWERING THE CENTRAL RESEARCH QUESTION

The outcome of the three sub-questions discussed above has offered the information to give a balanced answer to the study's central research question. Recapitulating, this question sounds as follows:

How do organizational learning and reconfiguration determinants matter in quickly responding to and adequately dealing with environmental turbulence when taking a typical Western military crisis response organization as an example?

When answering this question, the study's empirical findings have, first of all, shown that the Netherlands armed forces indeed focus on organizational learning and reconfiguration to deal with environmental turbulence. At the corporate level, the organization has actively stretched its absorptive capacity to renew itself in order to keep pace with the continuously changing security environment. Furthermore, it has embarked

upon a modular deployment strategy to make its architectural framework more adaptable in response to the unpredictable and extremely varied task-setting.

Concerning the issue of repetitively coming up with adequate organizational responses, the organizational determinants absorptive capacity and modular organizing seem to play an important part. The Netherlands armed forces' overall crisis response environment can be typified as turbulent. Yet, the survey results also indicate that within this overarching context the separate mission circumstances can vary enormously when it comes to the level of turbulence. Therefore, just like in the commercial world, the Netherlands armed forces should possess the basic organizational skills to deal with a mishmash of environmental characteristics. Depending on the nature of the external forces encountered during a mission, the Netherlands armed forces rely either on absorptive capacity or on modular organizing to come up with an adequate response. When the external forces encountered are unequivocal and incorporated into the existing mixture of flexible dynamic capabilities, modular organizing seems to have the upper hand in supplying an adequate response. When, however, the environmental dynamics are ambiguous, urgent, and do not fit the existing dynamic capabilities mixture, absorptive capacity gets to play the leading role in offering an appropriate solution.

Concentrating on the organization's speed of reaction, the study has found that absorptive capacity and modular organizing also have had separate, yet clear, effects. The empirical results show that within highly turbulent mission contexts the Netherlands armed forces have the capacity to go through absorptive capacity's sub processes of knowledge acquisition, assimilation, transformation, and exploitation rather quickly. Settling the sequence from potential to realized absorptive capacity in a matter of weeks, instead of months, seems to depend to a large extent on the organizational will to do so. This will is most likely to depend upon the level of agreement that exists within the organization and the amount of time that it takes to reach this level. In short, when a broadly shared sense of urgency develops quickly within the organization its drive to do something innovative will certainly benefit.

Conclusion

At the same time the study makes clear that when the organization puts all its eggs in the basket of absorptive capacity to deliver useful answers quickly, it runs the risk of giving absorptive capacity too much a short-term status. If there is no plan on how to embed newly acquired technological systems or newly invented processes beyond the time-span of a running mission into the overarching organizational system their initial blessing can ultimately turn into an organizational nuisance.

The relationship between speed of reaction and modular organizing is also an interesting one. According to this study's findings modular organizing can both positively and negatively influence a quick organizational response. The positive role refers to the fact that the sum of all the partnerships in which the Dutch have participated serves as one extensive knowledge pool from which the organization can learn in all sorts of ways. In short, the organization's knowledge acquisition, assimilation, transformation, and exploitation processes all benefit from using partnership experiences as a sort of general database or as a concrete point of reference. Moreover, because the organization does not have to find everything out for itself, the sequential learning steps can also be taken at a higher pace.

The negative influence of modular organizing on the organization's speed of reaction relates to modularity theory's basic principle of near-decomposability. According to modularity theorists this is a crucial organizational property to strive for, because it creates autonomous sub-units that can easily be recombined into other configurations. The results have shown that especially for Army Command it is difficult to live up to the demand of near-decomposability, because it is virtually impossible for the organization to predict what kind of operational task-setting can be expected in the future. This situation makes it problematic to create fixed organizational modules within the parent organization that can be used for each crisis response operation imaginable. Mainly based on this aspect of uncertainty, Army Command has decided to pick smaller, functional organizational elements from its existing organizational structure and to group them into tailor-made crisis response modules. As a consequence, the organization has to invest heavily in joint exercises and training programs to transform these tailor-made mixtures of different functional units into well-oiled machines, before actual deployment takes place.

Although this choice seems logical, in the end this extra training effort contravenes the high-readiness, quick response ambitions of the Netherlands armed forces, since units cannot be deployed straightaway.

7.4   RECOMMENDATIONS

Two key recommendations are made that are directly derived from the study's main findings. One recommendation focuses on improving organizational learning, the other one on improving the organization's reconfiguration ability.

Improving organizational learning

This study has shown that an important question that needs to be addressed by the Netherlands armed forces is how to transfer short-term innovative organizational responses into long-term organizational benefits. It could be argued that, on one hand, the organization's so-called can-do mentality has been a crucial driver for the rather successful crisis response effort that started after the ending of the Cold War. On the other hand, this mentality has stimulated an ongoing organizational attitude of problem-solving that has left too little room for genuine reflection. It must, however, also be said that this has never been a question of unwillingness, but more a case of being pushed by a demanding organizational context. Nevertheless, the empirical results make clear that the time has come for the organization to break out of this cycle, to take a step back, and to really start exploiting the knowledge potential available.

One of the options to do this is by improving the way in which the organizational learning processes are structurally embedded within the organization. The modular deployment approach has created a huge knowledge pool. After all, the Dutch units participate in different constellations, with different partners, in different regions of the word, under different climatic circumstances, and within different military-operational task settings. Yet, so far the sequential processes of recognizing the most relevant learning experiences, assimilating,

transforming, and exploiting them to the organization's long-term advantage in many cases seem to have had an ad-hoc character. Moreover, their interrelationship is being hampered by too much compartmentalization between the different Operational Commands. What the Netherlands armed forces need to do is to make a detailed assessment of how the separate learning processes have currently been organized. The assessment should, furthermore, take into account how the processes are linked and where knowledge leaks occur. After this analysis has been done, possibilities for improvement can be investigated, and after that step a concrete reorganization process can be initiated.

Military exercises and training programs are a second issue to address when it comes to the improvement of organizational learning. The ability to practice safely within a framed context is quite unique to military organizations. After all, commercial organizations do not have the 'luxury' to rehearse their competitive moves in an artificial setting. To improve the processes of knowledge transformation and exploitation, the Netherlands armed forces should take more advantage of this unique learning vehicle. Knowing that training programs lay the foundation for actual deployment, the Netherlands armed forces, first of all, has to give training programs the same status as an actual deployment. In a practical sense this means to exercise restraint in departing from planned exercises and training programs due to all kinds of external pressures. Second, the training programs themselves have to be improved. They should not only focus on reaching different levels of organizational readiness (platoon, company, battalion, or brigade), but also pay more profound attention to the different task-environments that can be encountered. Moreover, within these different operational scenarios the aspect of combined and joint cooperation has to play a central role in order to allow units to become accustomed to working in different constellations.

Improving organizational reconfiguration

The study has uncovered that the Netherlands armed forces simultaneously have to secure two different types of flexibility: composition and operational flexibility. With a deployment strategy of mixing and matching different functional components into tailor-made task forces the

organization has placed the emphasis on composition flexibility. To limit the loss of operational flexibility extra time and energy is spent on joint exercises and training programs in preparation of a mission. What the study has, furthermore, found is that extra energy is not only needed for the operational flexibility of the crisis response formation that is being deployed, but also to safeguard the operational performance of the units that stay behind or to keep all sorts of 'peace-time' administrative, educational, and supporting processes running.

A possible step forward in better coping with the challenging situation of pursuing strategic and repetitive operational flexibility without becoming organizationally unstable, is the development of a new overarching organizational framework, especially for Army Command. Such a new framework becomes important all the more, because Sinno (2008) makes clear that within the current complex security environment, which is dominated by non-traditional conflicts such as guerrilla wars and insurgencies, organizational structure significantly contributes to the success of a military force deployed. The point is that organizational structures with inherent deficiencies due to the process of mixing and matching unfamiliar units into tailor made organizational systems will have a hard time coping with the resilient, fragmentized, and atomized structures of most of today's opponents.

Based on modularity theory the key assumption is that the new framework has to be made up of smaller basic building blocks that can largely function autonomously. Such a framework could bring more stability to the parent organization's functioning, ease the assembly process that has to take place before deployment, safeguard the operational autonomy, and thus effectiveness, of the units that stay behind, and improve the operational effectiveness of a temporary crisis response task force that is being deployed.

As yet, Army Command has been reluctant to make this move because of its unpredictable task environment. The main argument put forward is that this unpredictability aspect makes it impossible to compose fixed organizational units that are by nature capable of covering the vast array of crisis response operations. Although this way of reasoning sounds logical, there is also something to be said against it. Exploratory research has

uncovered that for every major crisis response operation the Netherlands armed forces have participated in, since the ending of the Cold War, Army Command has each time deployed a similar combination of functional components. To be precise, each formation consisted of a manoeuvre, fire-support, combat-support, logistical support, and command and control element. Moreover, within the vast majority of these missions a reinforced battalion determined the size of the tailor-made organizational module. So, the argumentation that everything is unclear and that the organization is, therefore, beforehand unable to predict what kind of constellation is needed seems a bit too easy.

Moreover, the challenge of combining customization with operational flexibility is not unique to the Dutch. Many smaller Western armed forces are facing the same dilemma. In fact, a number of them have already begun to experiment with creating more versatile organizational units below brigade level. Thus, practical experiences on this issue of modular restructuring are available, which means that the Netherlands armed forces do not have to invent everything for themselves, but can take advantage of the insights that already exist. For example, the Australian Defence Force (ADF) is also reconsidering its basic force structure in order to become better able to deal with today's wide range of crisis situations (A. Ryan, 2003). In this discussion the expeditionary task force (M. Ryan, 2003) and the motorized battle group (Hutcheson, 2003) are being introduced as possible organizational building blocks for the future.

Interestingly enough, the Australian basic assumptions are to a large extent applicable to the Netherlands armed forces as well. Michael Ryan puts it as follows (2003: 86-87): "given the small size of the ADF, the future Australian land force must achieve a combat effect that is disproportionate to its size. The central war fighting organisation of today's Army—the brigade—must be transformed into a smaller but more lethal and precise instrument of combat: the Expeditionary Task Force (ETF). An ETF needs to be adopted as the principal war fighting organisation for the Australian Army by 2020. This new combat organisation would, over the next fifteen years, replace the light infantry and light mechanised brigades around which the Army is currently structured. Such a taskforce formation would be smaller than a brigade, with approximately 2000 troops, but it would be structured and equipped to achieve combat effects greatly superior to the

Army's current combat structures. A proposed ETF would be designed in such a way that it could be employed across the spectrum of conflict in scenarios ranging from low- to mid-intensity conflict. The taskforce's organisation would be designed to be structurally flexible, and capable of being reorganised depending on the scale, intensity and duration of any given conflict. In addition, the proposed taskforce would be able to operate independently or as part of a larger joint or combined force".

7.5   CONCLUDING REMARKS

Balogun and Hope Haily (2004) make a distinction between organizational realignment and transformation. They explain that realignment applies to all changes occurring within the current paradigm of an organization. Only if a paradigm shift takes place it is, according to them, appropriate to speak of organizational transformation. Levy and Merry (1986: 5) support this view by defining an organizational transformation as "a multidimensional, multilevel, qualitative, discontinuous, radical organizational change involving a paradigmatic shift". Based on this definition and the results of this study it can be concluded that the Netherlands armed forces have undergone a transformational development after the ending of the Cold War.

First, the new crisis response course has indeed influenced most, if not all, functional areas. To name a few: conscription was abolished and the organization has started recruiting professional soldiers; the planning process changed from a threat-driven to a capacity-driven approach (De Wijk, 2004); the new slogan "quality over quantity" meant that the loss of troops and materiel had to be counterbalanced by the advanced performance of modern technologies, stimulating investments in high-tech weapon, information and communication systems; new functional capabilities, such as CIMIC (Civil Military Cooperation) had to be incorporated in the organization; military education and training programs had to be altered; a new fast-track procurement procedure had to make it possible to purchase extra equipment and materiel within a very short time span if needed; the routines of all the operational elements (e.g. manoeuvre, fire support, combat support, logistical support and command

and control) had to be changed to live up to the new multi-task environment and be brought in line with the organization's expeditionary ambitions.

Second, the change process has also had an effect on all organizational levels. At the strategic level multinational (combined) and multi-service (joint) cooperation has become the new standard. Just like the Dutch, most European countries have gone through major downsizing operations leading to a significant loss of national military capacity. Combined cooperation was seen as the best way to safeguard common security ambitions despite these reductions. This development has given most crisis response operations a multinational character. Furthermore, since embracing the crisis response role, joint cooperation has increased enormously. Every single Operational Command simply lacks the materiel and competences to execute a crisis response operation, from the planning until the redeployment, entirely on its own. Compared to the Cold War period the need for tighter joint cooperation is quite new, for the services used to have their own specific military tasks and there was no direct operational relationship between them (Cobelens & Gijsbers, 2004). At the military operational level, the Netherlands armed forces have started deploying 'tailor-made expeditionary task forces'. Given the fact that the composition of these task forces differs each mission and sometimes even changes during the mission itself, that the participating units do not always have enough the time to train and do the preparations together, and that they are from different nationalities and cultures, one can image that an open and co-operative mindset is expected from the strategic down to the individual level.

Third, the shift to crisis response operations has asked for values and norms different from the ones used during the Cold War period. In the new crisis response role a serviceman or woman has become more than a combat soldier. He or she also has to be a technologically skilled professional and a sort of 'diplomat' and 'aid worker' who is capable of cooperating with foreign military partners, non-governmental organizations, local authorities, as well as winning the hearts and minds of people in a crisis area.

Fourth, the organizational change has indeed been discontinuous and radical. Fifty years of deterrence and preparing for conflict suddenly changed into a situation of actual deployment, drastically increasing the operational utilization of the Netherlands armed forces. Furthermore, opposed to the traditional context of preparing for a large-scale, mechanized, well-known conflict, the new environment of unknown and asymmetrical threats has urged the Netherlands military to start conducting operations along a broad spectrum of conflict types, varying from high intensity conflict operations to reconstruction and humanitarian operations. Moreover, even within a specific mission the military organization has to be capable of switching between these different types of operations.

Finally, a paradigmatic shift seems quite apparent. During the days of the Cold War the organization precisely knew its opponent, military strategy, and area of operations. This predictable environment made it possible to calculate with almost scientific precision the necessary size and composition of the organization's resource base. Furthermore, it stimulated the use of bureaucratic principles, such as a strict functional grouping, hierarchical control, and formalization, to fine-tune the organization to its well-know task. In the new crisis response setting the operating context has become far more obscure. The organization has to be capable of deploying military taskforces of different sizes, composed of different units to different areas of the world in order to perform different kinds of tasks. What complicates this process even further is that – to a certain extent – future operations are impossible to predict, let alone the specific military configurations and competences that are needed. Optimizing the organization for this unpredictable task environment called for a new paradigm of organizational flexibility throughout the entire organization.

Over the past two decades the Netherlands armed forces have deployed numerous military formations, in the new crisis response role, to countries such as Cambodia, Bosnia, Kosovo, Eritrea, Iraq, and Afghanistan. Leaving the predictable path of the mass-mechanized military business model, and stepping, within a very short time-span, onto the new crisis response path of flexibility and adaptability has been a major accomplishment - especially for a type of organization that is normally perceived as bureaucratic, inert, closed, and traditional. All in all, the organization can be proud of this achievement.

Conclusion

Yet, what this study in the end makes clear is that there is no real time to celebrate. The situation as it is today is that the organization is actively engaged in a complex mission in Afghanistan and rumours about a stronger military commitment to the African continent are becoming stronger and stronger. So, the old slogan "the shop is not to be closed during repairs" still holds, and, given its main crisis response task the organization has to realize that this situation will probably never change. It is, therefore, of crucial importance to actively and deliberately find ways and to make time for reflection in order to keep making organizational progress. Continuously stretching the organization's flexibility potential to the maximum, without creating sufficient stability within the organization's underlying resource base, will hamper the organization in the long run. What, in this respect, must never be forgotten is that the line between improvisation and disaster can be a very thin one.

REFERENCES

Adner, R., & Helfat, C. E. (2003). Corporate Effects and Dynamic Managerial Capabilities. *Strategic Management Journal, 24*, 1011-1025.

Ahuja, G. (2000). Collaboration Networks, Structural Holes, and Innovation: A Longitudinal Study. *Administrative Science Quarterly, 45*(3), 425-455.

Anand, N., & Daft, R. L. (2007). What is the Right Organization Design. *Organizational Dynamics, 36*(4), 329-344.

Ancona, D. G., & Caldwell, D. F. (1992). Bridging the boundary: External activity and performance in organizational teams. *Administrative Science Quarterly, 37*, 634-665.

Andrews, K. R. (1971). *The Concept of Corporate Strategy*. Homewood: Dow Jones-Irwin.

Ansoff, H. I. (1965). *Corporate Strategy: An Analytic Approach to Business Policy for Growth and Expansion*. New York: McGraw-Hill.

Arbuckle, J. L. (2005). *Amos 6.0 User's Guide*. Chicago: SPSS.

Argyris, C. (1992). *On Organizational Learning*. Cambridge, MA: Blackwell Publishers.

Ashby, W. R. (1956). *An Introduction to Cybernetics*. London: Chapman.

Ashkenas, R., Ulrich, D., & Kerr, S. (1995). *The Boundaryless Organization*. San Francisco: Jossey-Bass.

Aupperle, K. E. (1996). Spontaneous Organizational Reconfiguration: A Historical Example Based on Xenophon's Anabis. *Organization Science, 7*(4), 445-460.

Baker, W. E. (1992). The Network Organization in Theory and Practice. In N. Nohria & R. G. Eccles (Eds.), *Networks and Organizations: Structure, Form, and Action*. Boston, Massachusetts: Harvard Business School Press.

Baldwin, C. Y., & Clark, K. B. (1997). Managing in an Age of Modularity. *Harvard Business Review*(September-October), 84-93.

Balogun, J., & Hope Hailey, V. (2004). *Exploring Strategic Change* (second edition ed.). Harlow: Pearson Education.

Barki, H., & Pinsonneault, A. (2005). A Model of Organizational Integration, Implementation Effort, and Performance. *Organization Science, 16*(2), 165-179.

References

Barney, J. B. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management, 17*(1), 99-120.

Beeres, R. J. M., De Waard, E. J., & Bollen, M. T. I. B. (2010). Ambitions and opportunities for assessing military performance in crisis response operations. *Financial Accountability and Management, Accepted for publication*.

Benner, M. J., & Tushman, M. L. (2003). Exploitation, Exploration, and Process Management: The Productivity Dilemma Revisited. *Academy of Management Review, 28*(2), 238-256.

Bentler, P. M. (1983). Some contributions to efficient statistics in structural models: Specifications and estimation of moment structures. *Psychometrika, 48*, 493-517.

Bentler, P. M. (1990). Comparative fir indexes in structural models. *Psychological Bulletin, 107*, 238-246.

Blumberg, B., Cooper, D. R., & Schindler, P. S. (2008). *Business Research Methods*. Maidenhead: McGraw- Hill Education.

Bollen, M. T. I. B., & Rietjens, S. J. H. (2008). Introduction to Approaching Civil-Military Cooperation. In S. J. H. Rietjens & M. T. I. B. Bollen (Eds.), *Managing Civil-Military Cooperation. A 24/7 Joint Effort for stability*. Aldershot: Ashgate.

Bonin, J. A., & Telford, E. C. J. (2004). The Modular Army. *Military Review, March-April*, 21-27.

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136-162). Newbury Park: Sage.

Brusoni, S. (2005). The Limits to Specialization: Problem Solving and Coordination in 'Modular Networks'. *Organization Studies, 26*(12), 1885-1907.

Brusoni, S., & Prencipe, A. (2006). Making Design Rules: A Multidomain Perspective. *Organization Science, 17*(2), 179-189.

Buenger, V., Daft, R. L., Conlon, E. J., & Austin, J. (1996). Competing Values in Organizations: Contextual Influences and Structural Consequences. *Organization Science, 7*(5), 557-576.

Builder, C. H. (1989). *The Masks of War*. Baltimore: The Johns Hopkins University Press.

Capron, L., Dussauge, P., & Mitchell, W. (1998). Resource redeployment following horizontal acquisitions in Europe and North America, 1988-1992. *Strategic Management Journal, 19*(7), 631-661.

References

Chin, W. W. (1998). Issues and Opinion on Structural Equation Modeling. *Management Information Systems Quarterly, 22*(1).

Ciborra, C. U. (1996). The Platform Organization: Recombining Strategies, Structures, and Surprises. *Organization Science, 7*(2), 103-118.

Cobelens, P. W. C. M., & Gijsbers, K. A. (2004). Gezamenlijk en gecombineerd optreden van de krijgsmacht. In E. R. Muller, D. Starink, J. M. J. Bosch & I. M. d. Jong (Eds.), *Krijgsmacht: Studies over de organisatie en het optreden*. Alphen aan den Rijn: Kluwer.

Codner, M. (2005). The Pursuit of Catalysis - A British View. In B. Schreer & E. Whitlock (Eds.), *Divergent Perspectives on Military Transformation* (pp. 12-19). Berlin: Stiftung Wissenschaft und Politik.

Cohen, W. M., & Levinthal, D. A. (1989). Innovating and Learning: The Two Faces of R&D. *The Economic Journal, 99*, 569-596.

Cohen, W. M., & Levinthal, D. A. (1990). Absorptive Capacity: A New Perspective on Learning and Innovation. *Administrative Science Quarterly, 35*, 128-152.

Combs, J. G., & Ketchen Jr, D. J. (1999). Explaining interfirm cooperation and performance: Toward a reconciliation of predictions from the resource-based view and organizational economics. *Strategic Management Journal, 20*(9), 867-888.

Cummings, J. N. (2004). Work Groups, Structural Diversity, and Knowledge Sharing in a Global Organization. *Management Science, 50*(3), 352-364.

Cusumano, M. A. (1991). *Japan's Software Factories: A Challenge to U.S. Management*. New York: Oxford University Press.

D'Aveni, R. A. (1994). *Hypercompetition: Managing the Dynamics of Strategic Maneuvering*. New York: The Free Press.

Daft, R. L., & Lewin, A. Y. (1993). Where are the theories for the "new" organizational forms? *Organization Science, 4*(4), i-iv.

Daft, R. L., & Weick, K. E. (1984). Toward a Model of Organizations as Interpretation Systems. *Academy of Management Review, 9*(2), 284-295.

Dandeker, C. (2003). Building Flexible Forces in the 21st Century. In G. Caforio (Ed.), *Handbook of the Sociology of the Military*. New York: Kluwer

References

De Groot, A. D. (1961). *Methodology: Principles of Research and Thinking in Behavioural Sciences* The Hague: Mouton.

De Waard, E. J., & Kramer, F. J. (2008). Tailored task forces: Temporary organizations and modularity. *International Journal of Project Management, 26*(5), 537-546.

De Waard, E. J., & Soeters, J. (2007). How the Military Can Profit from Management and Organization Science. In G. Caforio (Ed.), *Social Sciences and the Military; An Interdisciplinary Overview*. New York: Routledge.

De Wijk, R. (2004). Defensiebeleid in relatie tot veiligheidsbeleid. In E. R. Muller, D. Starink, J. M. J. Bosch & I. M. d. Jong (Eds.), *Krijgsmacht; Studies over de organisatie en het optreden*. Alphen aan den Rijn: Kluwer.

Deeds, D. L., DeCarolis, D., & Coombs, J. (1999). Dynamic Capabilities and New Product Development in High Technology Ventures: An Empirical Analysis of New Biotechnology Firms. *Journal of Business Venturing, 15*, 211-229.

Denning, P. J. (2006). Hastily Formed Networks. *Communication of the ACM, 49*(4), 15-20.

Dixit, A. (1980). The role of investment in entry deterrence. *Economic Journal, 90*, 95-106.

Draulans, J., De Man, A.-P., & Volberda, H. W. (2003). Building Alliance Capability: Management Techniques for Superior Alliance Performance. *Long Range Planning, 36*, 151-166.

Eisenhardt, K. M. (1993). High reliability organizations meet high velocity environments: Common dilemmas in nuclear power plants, aircraft carriers, and microcomputer firms. In K. H. Roberts (Ed.), *New Challenges to Understanding Organizations*. New York: Macmillan.

Eisenhardt, K. M., & Brown, S. L. (1999). Patching: restitching business portfolios in dynamic markets. *Harvard Business Review, 77*(3), 72-82.

Eisenhardt, K. M., & Martin, J. A. (2000). Dynamic capabilities: What are they? *Strategic Management Journal, 21*(10-11), 1105-1121.

Ekstedt, E., Lundin, R. A., & Wirdenius, H. (1992). Conceptions and Renewal in Swedish Construction Companies. *European Management Journal, 10*(2), 202-209.

Ethiraj, S. K., & Levinthal, D. A. (2004a). Bounded Rationality and the Search for Organizational Architecture: An Evolutionary

Perspective on the Design of Organizations and Their Evolvability. *Administrative Science Quarterly, 49*, 404-437.

Ethiraj, S. K., & Levinthal, D. A. (2004b). Modularity and Innovation in Complex Systems. *Management Science, 50*(2), 159-173.

Evans, M. (2003). From Kadesh to Kandahar; Military Theory and the Future of War. *Naval War College Review, LVI*(3), 132-150.

Field, A. (2005). *Discovering Statistics Using SPSS*. London: Sage Publications.

Galbraith, J. R. (1973). *Designing complex organizations*. Reading, Massachusetts: Addison-Wesley.

Galbraith, J. R. (1981). Organization Design: An Information Processing View. In M. Jelinek, J. A. Litterer & R. E. Miles (Eds.), *Organizations by Design: Theory and Practice*. Plano, Texas: Business Publications.

Galvin, P., & Morkel, A. (2001). The Effect of Product Modularity on Industry Structure: The Case of the World Bicycle Industry. *Industry and Innovation, 8*(1), 31-47.

Garud, R., Kumaraswamy, A., & Langlois, R. N. (2003). Managing in the Modular Age: Architectures, Networks, and Organizations. In R. Garud, A. Kumaraswamy & R. N. Langlois (Eds.), *Managing in the Modular Age*. Oxford: Blackwell Publishing.

Genus, A. (1997). Managing large-scale technology and inter-organizational relations: the case of the Channel Tunnel *Research Policy, 26*(2), 169-189.

Gerwin, D., & Ferris, J. S. (2004). Organizing New Product Development Projects in Strategic Alliances. *Organization Science, 15*(1).

Gilbert, R. J., & Newberry, D. M. G. (1982). Preemptive patenting and the persistence of monopoly. *American Economic Review, 72*, 514-526.

Gobeli, D. H., & Larson, E. W. (1987). Relative Effectiveness of Different Project Structures. *Project Management Journal, XVIII*(2), 81-85.

Grant, R. M. (1996). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration. *Organization Science, 7*(4), 375-387.

Greenbaum, J. (1997). Packaged Applications. *Software Magazine, 17*(7), 91-94.

Gupta, A. K., & Govindarajan, V. (2000). Knowledge Flows within Multinational Corporations. *Strategic Management Journal, 21*(4), 473-496.

References

Hambrick, D. C., & D'Aveni, R. A. (1988). Large Corporate Failures as Downward Spirals. *Administrative Science Quarterly, 33*, 1-23.

Hamel, G., & Prahalad, C. K. (1994). *Competing for the Future*. Harvard: Harvard Business School Press.

Hanssen-Bauer, J., & Snow, C. C. (1996). Responding to Hypercompetition: The Structure and Processes of a Regional Learning Network Organization. *Organization Science, 7*(4), 413-427.

He, Z. L., & Wong, P. K. (2004). Exploration vs. Exploitation: An Empirical Test of the Ambidexterity Hypothesis. *Organization Science, 15*(4), 481-494.

Helfat, C. E. (1997). Know-How and Asset Complementarity and Dynamic Capability Accumulation: The Case of R&D. *Strategic Management Journal, 18*(5), 339-360.

Helfat, C. E., & Eisenhardt, K. M. (2004). Inter-Temporal Economies of Scope, Organizational Modularity, and the Dynamics of Diversification. *Strategic Management Journal, 25*(13), 1217-1232.

Helfat, C. E., Finkelstein, S., Mitchell, W., Peteraf, M. A., Singh, H., Teece, D. J., et al. (2007). *Dynamic Capabilities; Understanding Strategic Change In Organizations*. Oxford: Blackwell Publishing.

Helfat, C. E., & Peteraf, M. A. (2003). The Dynamic Resource-Based View: Capability Lifecycles. *Strategic Management Journal, 24*, 997-1010.

Helfat, C. E., & Peteraf, M. A. (2009). Understanding dynamic capabilities: progress along a developmental path. *Strategic Organization, 7*(1), 91-102.

Hellström, M., & Wikström, K. (2005). Project Business Concepts Based on Modularity - Improved Manoeuvrability Through Unstable Structures. *International Journal of Project Management, 23*, 392-397.

Henderson, R., & Cockburn, I. (1994). Measuring Competence? Exploring Firm Effects in Pharmaceutical Research. *Strategic Management Journal, 15*, 63-84.

Hirsch, P. M. (1972). Processing Fads and Fashions: An Organization-set Analysis of Cultural Industry Systems *American Journal of Sociology, 77*(4), 639-659.

Hoegl, M., & Gemuenden, H. G. (2001). Teamwork Quality and the Success of Innovative Projects: A Theoretical Concept and Empirical Evidence *Organization Science, 12*(4), 435-449.

References

Hoegl, M., Weinkauf, K., & Gemuenden, H. G. (2004). Interteam Coordination, Project Commitment, and Teamwork in Multiteam R&D Projects: A Longitudinal Study. *Organization Science, 15*(1), 38-55.

Hofstede, G. (1981). Management Control of Public and Not-For Profit Activities. *Accounting Organizations and Society, 6*(3), 193-211.

Holmqvist, M. (2004). Experiential Learning Processes of Exploitation and Exploration Within and Between Organizations: An Empirical Study of Product Development. *Organization Science, 15*(1), 70-81.

Hood, C. (1995). The "New Public Management" in the 1980s: Variations on a Theme. *Accounting Organizations and Society, 20*(2), 93-109.

Hornby, A. S. (2005). *Oxford Advanced Learner's Dictionary*. Oxford: Oxford University Press.

Hu, L. T., & Bentler, P. M. (1999). Cutoff criteria for fit indices in covariance structure analysis: conventional criteria versus new alternatives. *Structural Equation Modeling, 6*, 1-55.

Hutcheson, J. (2003). A Shield for a Hardened Army: The Infantry Mobility Vehicle and the Concept of a Motorised Battle Group. *Australian Army Journal, 1*(2), 95-102.

Jansen, J. J. P., Tempelaar, M. P., Van den Bosch, F. A. J., & Volberda, H. W. (2009). Structural Differentiation and Ambidexterity: The Mediating Role of Integration Mechanisms. *Organization Science, 20*(4), 797-811.

Jansen, J. J. P., Van den Bosch, F. A. J., & Volberda, H. W. (2005). Managing Potential and Realized Absorptive Capacity: How Do Organizational Antecedents Matter? *Academy of Management Journal, 48*(6), 999-1015.

Jaworski, B. J., & Kohli, A. K. (1993). Market Orientation: Antecedents and Consequences. *Journal of Marketing, 57*(3), 53-70.

Johnson, G., Scholes, K., & Whittington, R. (2006). *Exploring Corporate Strategy* (Seventh Enhanced Media Edition ed.). Harlow: Pearson Education.

Jöreskog, K. G., & Sörbom, D. (1981). *LISREL V: Analysis of linear structural relationships by the method of maximum likelihood*. Chicago: National Education Resources.

Karim, S. (2006). Modularity in Organizational Structure: The Reconfiguration of Internally Developed and Acquired Business Units. *Strategic Management Journal, 27*, 799-823.

References

Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling*. New York: The Guilford Press.

Kogut, B., & Zander, U. (1992). Knowledge of the Firm, Combinative Capabilities and the Replication of Technology. *Organization Science, 3*(3), 383-397.

Kramer, F. J. (2007). *Organizing Doubt; Grounded Theory, Army Units and Dealing with Dynamic Complexity*. Copenhagen: Liber / Copenhagen Business School Press.

Krikke, H., Le Blanc, I., & Velde, S. v. d. (2004). Product Modularity and the Design of Closed-loop Supply Chains. *California Management Review, 46*(2), 23-39.

Lane, P. J., Koka, B. R., & Pathak, S. (2006). The Reification of Absorptive Capacity: A Critical Review and Rejuvenation of the Construct. *Academy of Management Review, 31*(4), 833-863.

Lane, P. J., & Lubatkin, M. (1998). Relative Absorptive Capacity and Interorganizational Learning. *Strategic Management Journal, 19*(5), 461-477.

Langlois, R. N. (2000). Capabilities and Vertical Disintegration in Process Technology: The Case of Semiconductor Fabrication Equipment. In N. J. Foss & P. L. Robertson (Eds.), *Resources, Technology, and Strategy*. London: Routledge.

Langlois, R. N. (2002). Modularity in Technology and Organization. *Journal of Economic Behavior & Organization, 49*, 19-37.

Langlois, R. N., & Robertson, P. L. (1992). Networks and Innovation in a Modular System: Lessons from the Microcomputer and Stereo Component Industries. *Research Policy, 21*, 297-313.

Lawrence, P. R., & Lorsch, J. W. (1967). *Organization and environment: Managing differentiation and integration*. Boston, MA: Harvard University Press.

Lei, D., Hitt, M. A., & Goldhar, J. D. (1996). Advanced Manufacturing Technology: Organizational Design and Strategic Flexibility. *Organization Studies, 17*(3), 501-523.

Levy, A., & Merry, U. (1986). *Organizational Transformation: Approaches, Strategies, Theories*. New York: Praeger Publishers.

Lima, E. P. (1997). VW's Revolutionary Idea. *Industry Week, 24*(6), 62-67.

Litz, R. A. (1996). A Resource-Based View of the Socially Responsible Firm: Stakeholder Interdependence, Ethical Awareness, and Issue Responsiveness as Strategic Options. *Journal of Business Ethics, 15*, 1355-1363.

References

Loch, C. H., Terwiesch, C., & Thomke, S. (2001). Parallel and Sequential Testing of Design Alternatives. *Management Science, 45*(5), 663-678.

López, S. V. (2005). Competitive Advantage and Strategy Formulation: The Key Role of Dynamic Capabilities. *Management Decision, 43*(5), 661-669.

Majumdar, S. K. (1997). Modularity and Productivity; Assessing the Impact of Digital Technology in the U.S. Telecommunications Industry. *Technological Forecasting and Social Change, 56*, 61-75.

Majumdar, S. K. (1999). Sluggish Giants, Sticky Cultures, and Dynamic Capability Transformation. *Journal of Business Venturing, 15*, 59-78.

Makadok, R. (2001). Towards a Synthesis of the Resource-Based and Dynamic-Capability Views of Rent Creation. *Strategic Management Journal, 22*, 387-401.

Marsh, S. J., & Stock, G. N. (2006). Creating Dynamic Capability: The Role of Intertemporal Integration, Knowledge Retention, and Interpretation. *Journal of Product Innovation Management, 23*, 422-436.

Marx, R., Zilbovicius, M., & Salerno, M. (1997). The Modular Consortium in a New VW Truck Plant in Brazil: New Forms of Assembler and Supplier Relationship. *Integrated Manufacturing Systems, 8*(5), 292-298.

Matusik, S. F. (2002). An Empirical Investigation of Firm Public and Private Knowledge. *Strategic Management Journal, 23*, 457-467.

McAllister Linn, B. (2005). Driving in Reverse: Perspectives on Military Transformation. In B. Schreer & E. Whitlock (Eds.), *Divergent Perspectives on Military Transformation* (pp. 7-11). Berlin: Stiftung Wissenschaft und Politik.

McDonald, R. P. (1996). Path Analysis with Composite Variables. *Multivariate Behavioral Research, 31*(2), 239-270.

McDonald, R. P., & Ho, M. R. (2002). Principles and Practice in Reporting Structural Equation Analyses. *Psychological Methods, 7*(1), 64-82.

Menguc, B., & Auh, S. (2006). Creating a Firm-Level Dynamic Capability through Capitalizing on Market Orientation and Innovativeness. *Journal of the Academy of Marketing Science, 34*(1), 63-73.

Mikkola, J. H. (2003). Modularity, Component Outsourcing, and Inter-Firm Learning. *R&D Management, 33*(4), 439-454.

References

Miles, M. B., & Huberman, A. M. (1994). *Qualitative Data Analysis: An Expanded Sourcebook* (2nd ed.). Thousand Oaks, CA: Sage.

Milgrom, P., & Roberts, J. (1982). Limit pricing and entry under incomplete information: An equilibrium analysis. *Econometrica, 50*, 443-459.

Mintzberg, H. (1979). *The Structuring of Organizations*. Englewood Cliffs, N.J.: Prentice-Hall.

Mintzberg, H. (1983). *Structure in fives: designing effective organizations*. Englewood Cliffs, N.J.: Prentice-Hall.

Mohrman, S. A., Cohen, S. G., & Mohrman, A. M. (1995). *Designing Team-Based Organizations: New Forms of Knowledge Work*. San Francisco: Jossey-Bass Publishers.

Mol, N. P., & Beeres, R. J. M. (2005). Performance Management in a Setting of Deficient Output Controls. *International Journal of Productivity and Performance Management, 52*(7), 533-550.

Morgan, G. (1986). *Images of Organization* (2nd ed.). Newbury Park, CA: Sage Publications.

Nevins, J. L., & Whitney, D. E. (1989). *Concurrent Design of Products and Processes: A Strategy for the Next Generation of Manufacturing*. New York: McGraw-Hill.

Nonaka, I., & Takeuchi, H. (1995). *The Knowledge-creating Company*: Oxford University Press.

O'Reilly, C. A., & Tushman, M. L. (2008). Ambidexterity as a dynamic capability: Resolving the innovator's dilemma. *Research in Organizational Behavior, 28*, 185-206.

Oliver, C., & Holzinger, I. (2008). The Effectiveness of Strategic Political Management: A Dynamic Capabilities Framework. *Academy of Management Review, 33*(2), 496-520.

Orton, J. D., & Weick, K. E. (1990). Loosely coupled systems: A reconceptualization. *Academy of Management Review, 15*(2), 203-223.

Pablo, A. L., Reay, T., Dewald, J. R., & Casebeer, A. L. (2007). Identifying, Enabling and Managing Dynamic Capabilities in the Public Sector. *Journal of Management Studies, 44*(5), 687-708.

Penrose, E. (1959). *The theory of the growth of the firm*. Oxford: Oxford University Press.

Perrow, C. (1984). *Normal Accidents*. New York: Basic Books.

Peters, T. J., & Waterman, R. H. (1982). *In Search of Excellence: Lessons From America's Best-Run Companies*. New York: HarperCollins.

References

Philips, B. S. (1971). *Social research: strategy and tactics*. New York: Macmillan.

Porter, M. E. (1980). *Competitive Strategy*. New York: Free Press.

Porter, M. E. (1998). *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. New York: Free Press.

Powell, T. C. (1992). Strategic Planning and Competitive Advantage. *Strategic Management Journal, 13*, 551-558.

Powell, W. W., Koput, K. W., & Smith-Doerr, L. (1996). Interorganizational collaboration and the locus of innovation: Networks of learning in biotechnology. *Administrative Science Quarterly, 41*(1), 116-145.

Priem, R. L., & Butler, J. E. (2001). Is the Resource-based "View" a Useful Perspective for Strategic Management Research? *Academy of Management Review, 26*(1), 22-40.

Quinn, J. B. (1980). *Strategies for Change - Logical Incrementalism*. Homewood, Ill.: Irwin.

Quinn, J. B. (1988). Strategies for change. In J. B. Quinn, H. Mintzberg & R. M. James (Eds.), *The strategy process: concepts, contexts, and cases*. Englewood Cliffs: Prentice-Hall International.

Remenyi, D., Williams, B., Money, A., & Swartz, E. (2002). *Doing Research in Business and Management; An Introduction to Process and Method*. London: Sage Publications.

Resteigne, D., & Soeters, J. (2009). Managing Militarily. *Armed Forces and Society, 35*(2), 307-332.

Rindova, V. P., & Fombrun, C. J. (1999). Constructing Competitive Advantage: The Role of Firm-Constituent Interactions. *Strategic Management Journal, 20*, 691-710.

Rindova, V. P., & Kotha, S. (2001). Continuous "Morphing": Competing Through Dynamic Capabilities, Form, and Function. *Academy of Management Journal, 44*(6), 1263-1280.

Rivkin, J. W., & Siggelkow, N. (2003). Balancing Search and Stability: Interdependencies Among Elements of Organizational Design. *Management Science, 49*(3), 290-311.

Roberts, K. H., Stout, S. K., & Halpern, J. J. (1994). Decision dynamics in two high reliability military organizations *Management Science, 40*(5), 614-624.

Rochlin, G. I., LaPorte, T. R., & Roberts, K. H. (1987). The Self-designing High-reliability Organization: Aircraft Carrier Flight Operations at Sea. *Naval War College Review, 40*(4), 76-90.

References

Rowley, T., Behrens, D., & Krackhardt, D. (2000). Redundant Governance Structures: An Analysis of Structural and Relational Embeddedness in the Steel and Semiconductor Industries. *Strategic Management Journal, 21*, 369-386.

Ryan, A. (2003). Putting Your Young Men in the Mud; Change Continuity and the Australian Infantry Battalion. Land Warfare Studies Centre Australia.

Ryan, M. (2003). Preparing for Complexity: The Case for an Expeditionary Task Force in the Australian Army of 2020. *Australian Army Journal, 1*(2), 83-94.

Sagan, S. D. (1993). *The Limits of Safety: Organizations, Accidents, and Nuclear Weapons*. Princeton, N.J.: Princeton University Press.

Sanchez, R. (1993). Strategic Flexibility, Firm Organization, and Managerial Work in Dynamic Markets: A Strategic Options Perspective. In P. Shrivastava, A. Huff & J. Dutton (Eds.), *Advances in Strategic Management* (Vol. 9, pp. 251-291). Greenwich: JAI Press.

Sanchez, R. (1995). Strategic flexibility in product competition. *Strategic Management Journal, 16*, 135-159.

Sanchez, R. (1996). Strategic Product Creation: Managing New Interactions of Technology, Markets, and Competition Organizations. *European Management Journal, 14*(2), 121-138.

Sanchez, R., & Mahoney, J. T. (1996). Modularity, flexibility, and knowledge management in product and organization design. *Strategic Management Journal, 17*(Winter), 77-91.

Schilling, M. A. (2000). Toward a General Modular Systems Theory and its Application to Interfirm Product Modularity. *Academy of Management Review, 25*(2), 312-334.

Schilling, M. A., & Steensma, H. K. (2001). The Use of Modular Organizational Forms: An Industry-Level Analysis. *Academy of Management Journal, 44*(6), 1149-1168.

Schmalensee, R. (1983). Advertising and entry deterrence: An exploratory model. *Journal of Political Economy, 91*(4), 636-653.

Sidhu, J. S., Commandeur, H. R., & Volberda, H. W. (2007). The Multifaceted Nature of Exploration and Exploitation: Value of Supply, Demand, and Spatial Search for Innovation. *Organization Science, 18*(1), 20-38.

Simon, H. A. (1962). The Architecture of Complexity *Proceedings of the American Philosophical Society* (Vol. 106, pp. 467-482).

References

Sinha, K. K., & Van de Ven, A. H. (2005). Designing Work Within and Between Organizations. *Organization Science, 16*(4), 389-408.

Sinno, A. H. (2008). *Organizations at War. In Afghanistan and beyond.* New York: Cornell University Press.

Sivadas, E., & Dwyer, F. R. (2000). An Examination of Organizational Factors Influencing New Product Success in Internal and Alliance-based Processes. *Journal of Marketing, 64*, 31-49.

Soeters, J., Van Fenema, P. C., & Beeres, R. (2010). Introducing Military Organizations. In J. Soeters, P. C. Van Fenema & R. Beeres (Eds.), *Managing Military Organizations: Theory and Practice.* London: Routledge.

Song, M., Droge, C., Hanvanich, S., & Calantone, R. (2005). Marketing and Technology Resource Complementarity: An Analysis of their Interaction Effect in Two Environmental Contexts. *Strategic Management Journal, 26*, 259-276.

Staber, U., & Sydow, S. (2002). Organizational Adaptive Capacity. *Journal of Management Inquiry, 11*(4), 408-424.

Steiger, J. H. (1990). Structural model evaluation and modification: An interval estimation approach *Multivariate Behavioral Research, 25*, 173-180.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (Fifth edition ed.). Boston: Pearson Education.

Tanaka, J. S., & Huba, G. J. (1989). A general coefficient of determination for covariance structure models under arbitrary GLS estimation. *British Journal of Mathematical and Statistical Psychology, 42*, 233-239.

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal, 28*(13), 1319-1350.

Teece, D. J. (2009). *Dynamic Capabilities & Strategic Management: Organizing for Innovation and Growth.* Oxford: Oxford University Press.

Teece, D. J., Pisano, G., & Shuen, A. (1997). Dynamic capabilities and strategic management. *Strategic Management Journal, 18*(7), 509-533.

Thompson, J. D. (1967). *Organizations in Action.* New York: McGraw-Hill.

References

Todorova, G., & Durisin, B. (2007). Absorptive Capacity: Valuing a Reconceptualization *Academy of Management Review, 32*(3), 774-786.

Tripsas, M. (1997). Surviving Radical Technological Change through Dynamic Capability: Evidence from the Typesetter Industry. *Industrial and Corporate Change, 6*(2), 341-377.

Tully, S. (1993). The Role of Architecture in the Manufacturing Firm. *Research Policy, 24*, 419-440.

Tushman, M. L. (1977). Special Boundary Roles in the Innovation Process. *Administrative Science Quarterly, 22*(December), 587-605.

Tushman, M. L., & O'Reilly, C. A. (1996). Ambidextrous Organizations: Managing Evolutionary and Revolutionary Change. *California Management Review, 38*(4), 8-30.

Ulrich, K. (1995). The Role of Product Architecture in the Manufacturing Firm. *Research Policy, 24*(3), 419-440.

Van de Ven, A. H. (1986). Central Problems in the Management of Innovation. *Management Science, 32*(5), 590-607.

Van den Bosch, F. A. J., Volberda, H. W., & De Boer, M. (1999). Coevolution of Firm Absorptive Capacity and Knowledge Environment: Organizational Forms and Combinative Capabilities. *Organization Science, 10*(5), 551-568.

Van den Doel, T. (2004). *The Usability of the European Armed Forces. Measuring Input and Output to Military Effectiveness*. The Hague: Netherlands Institute of International Relations 'Clingendael'.

Van der Velde, M., Jansen, P. G. W., & Anderson, N. (2004). *Guide to Management Research Methods*. Oxford: Blackwell.

Verschuren, P., & Doorewaard, H. (1999). *Designing a Research Project*. Utrecht: Lemma

Volberda, H. W. (1996). Toward the Flexible Form: How to Remain Vital in Hypercompetitive Environments. *Organization Science, 7*(4), 359-374.

Volberda, H. W. (1998). *Building the Flexible Firm; How to Remain Competitive*. Oxford: Oxford University Press.

Weick, K. E. (1976). Educational organizations as loosely coupled systems. *Administrative Science Quarterly, 21*, 1019.

Weick, K. E. (1979). *The Social Psychology of Organizing*. Reading, MA: Addison-Wesley.

Weick, K. E. (1982). Management of Organizational Change Among Loosely Coupled Elements. In P. S. Goodman & Associates (Eds.),

Change in Organizations: New Perspectives in Theory, Research, and Practice (pp. 375-408). San Francisco: Jossey-Bass.

Weick, K. E. (2001). Friendly Fire: The Accidental Shootdown of U.S. Black Hawks over Northern Iraq (book review). *Administrative Science Quarterly, 43*(March), 158.

Weick, K. E., & Roberts, K. (1993). Collective Mind in Organizations: Heedful Interrelating on Flight Decks. *Administrative Science Quarterly, 38*, 357-381.

Weick, K. E., & Sutcliffe, K. M. (2001). *Managing the unexpected*. San Francisco: Jossey-Bass.

Wernerfelt, B. (1984). A Resource-Based Theory of the Firm. *Strategic Management Journal, 5*(2), 171-180.

Wester, F., & Peters, V. (2004). *Kwalitatieve Analyse; Uitgangspunten en procedures*. Bussem: Coutinho.

Williamson, O. E. (1999). Strategy Research: Governance and Competence Perspectives. *Strategic Management Journal, 20*, 1087-1108.

Winter, S. G. (2003). Understanding Dynamic Capabilities. *Strategic Management Journal, 24*, 991-995.

Woolsey, J. P. (1994). 777. *Air Transport World*(April), 22-31.

Worley, D. R. (2006). *Shaping U.S. Military Forces*. Westport: Praeger Security International.

Worren, N., Moore, K., & Cardona, P. (2002). Modularity, Strategic Flexibility, and Firm Performance: A Study of the Home Appliance Industry. *Strategic Management Journal, 23*, 1123-1140.

Zahra, S. A., & George, G. (2002). Absorptive Capacity: A Review, Reconceptualization, and Extension. *Academy of Management Review, 27*(2), 185-203.

Zelenovic, D. M. (1982). Flexibility: A Condition for Effective Production Systems. *International Journal of Production Research, 20*(3), 319-337.

Zollo, M., & Winter, S. G. (2002). Deliberate learning and the evolution of dynamic capabilities. *Organization Science, 13*(3), 339-351.

Zott, C. (2003). Dynamic Capabilities and the Emergence of Intraindustry Differential Firm Performance: Insights from a Simulation Study. *Strategic Management Journal, 24*, 97-125.

EXECUTIVE SUMMARY

The increasing level of environmental turbulence has put a strain on organizations to become more innovative and proactive. Making sense of what the business environment is about and relating these ideas to one's own strategic position, paradigm, and way of doing things is an ongoing process for every organization. In a rather stable, simple, and predictable environment organizations probably have little trouble in mapping out their competitive moves. Under turbulent circumstances this process is less straightforward. Generally speaking, organizations then face the challenge of deliberately trying to shape the competitive landscape to their own advantage, and thus have to play an active interpretation role.

With this competitive challenge in mind, D'Aveni (1994) has introduced the term hypercompetition. He defines hypercompetitive behavior as a "process of continuously generating new competitive advantages and destroying, obsoleting, or neutralizing the opponent's competitive advantage, thereby creating disequilibrium, destroying perfect competition, and disrupting the status quo of the marketplace" (D'Aveni, 1994: 218). His general idea comes down to the fact that under turbulent circumstances organizations continuously and deliberately need to challenge the existing status quo with their environment, aiming for consecutive, short-term, competitive advantages (D'Aveni, 1994; Sanchez, 1995; Teece, et al., 1997; Tushman & O'Reilly, 1996).

In the following academic debate on temporary advantages survival or organizational success is being presented as a result of activating innovative, quick response, flexible capabilities (Volberda, 1996). Teece et al. (1997) use the term dynamic capabilities. So far, literature on dynamic capabilities has had a strong conceptual character; for the main concern has been to firmly position the concept within its academic field (Eisenhardt & Martin, 2000; Helfat & Peteraf, 2003; Makadok, 2001; Winter, 2003; Zollo & Winter, 2002; Zott, 2003). An aspect that, as yet, has remained rather underexposed in this academic debate refers to the underlying organizational determinants that may help to quickly and decisively render the activation of dynamic capabilities on a continuous basis.

The point is that on meta-level organizations, confronted with hypercompetition, need specific organizational determinants that can deal with the *paradox of duality* (Volberda, 1996). On one hand too much managerial emphasis on strategic renewal and innovation can create chaos. On the other hand a too strong focus on existing rules, routines, and procedures can lead to rigidity in the organization. The dilemma that organizations face is to balance these two contradictory requirements. In this respect, one important practical question left open, in the theoretical debate on dynamic capabilities, is which organizational determinants matter in the challenging process of quickly and repetitively initiating strategic changes and at the same time avoiding to become organizationally unstable.

This study aims to make progress on this issue by introducing the contemporary Western expeditionary military organization as a typical example of a quick response organization for commercial firms to learn from. Today's Western armed forces are facing the complex challenge of quickly and effectively responding to unforeseen threats or crisis situations (De Waard & Kramer, 2008; De Waard & Soeters, 2007). As a result they have been pushed to find ways to simultaneously deal with strategic and operational turbulence (Evans, 2003). First, Western armed forces are confronted with a highly changeable strategic security context, asking for organizational competences that support the generation and mobilization of different operational alternatives. Second, this demand of operational customization has to be combined with an effective military performance during each individual mission, over and over again. What makes it even more complex is that most missions have hypercompetitive-like characteristics themselves.

The Netherlands armed forces are selected as a typical example of a quick response Western military organization. The study's main assumption is that giving insight into the way in which the Netherlands armed forces apply commonly accepted organizational determinants to activate learning and reconfiguration abilities for combining strategic flexibility and continuous operational effectiveness, could serve as an interesting case for other organizations to take advantage of.

The reasoning above has resulted in the following central research question: *How do organizational learning and reconfiguration determinants matter in quickly responding to and adequately dealing with environmental turbulence when taking the Netherlands armed forces as a typical example of a quick response organization?*

Research approach

The thesis follows the eight general steps of the passive observation research method (Remenyi, et al., 2002). The study has started with a literature review on the theoretical concept of dynamic capabilities. This step has led to a twofold conclusion. First, the concept is still missing necessary empirical comprehensibility. Second, the organizational practicalities to facilitate the everyday functioning of dynamic capabilities over a longer period of time have remained largely untouched in the academic debate so far (phase 1). Next, a more focused assessment of existing strategic management theory has been set in motion to find out which organizational determinants specifically matter in dealing with the challenges of environmental turbulence. The key variables absorptive capacity, modular organizing, and lateral coordination have been derived from this analysis (phase 2). A deeper investigation into the outcome effects of these determinants has led to the conclusion that in combination they support the activation of a necessary mixture of operational, structural, and strategic dynamic capabilities. Together, these first two phases have resulted in a theoretical conjecture in the form of a research model that can be split up into eleven separate hypotheses (step 3 and 4). The next step has been to translate the research model into a questionnaire and an interview protocol (phase 5). The former has been distributed among a large group of officers to develop a broad understanding of the interrelationships between the determinants being studied. The latter has been developed to complement the large scale quantitative survey approach with more specific in-depth qualitative knowledge on whether or not the proposed determinants indeed support repetitive successful operational performance (phase 6). The data coming out of the questionnaire have been statistically analyzed, using SPSS and AMOS structural equation modeling techniques. The interview results have been analyzed by using first level and pattern coding techniques (phase 7). Finally, reflecting on the complete set of evidence gathered has led to a refinement of the dynamic capabilities theory, by explaining why and how

organizational determinants matter in challenging process of quickly responding to and adequately dealing with environmental turbulence (phase 8).

Findings

This study's empirical results offer some intriguing insights to further elaborate on the general organizational ability to repetitively and quickly activate adequate responses. The variables absorptive capacity and modular organizing, with lateral coordination being a crucial antecedent, seem to play a profound part in this matter. In general, the Netherlands armed forces' overall crisis response environment can be typified as turbulent. Yet, the survey results indicate that within this overarching context the separate mission circumstances can vary enormously when it comes to the level of turbulence. Therefore, the Netherlands armed forces need basic organizational skills that can deal with a mishmash of environmental characteristics. What this study has uncovered is that, depending on the external forces that have to be dealt with, the Netherlands armed forces rely either on absorptive capacity or on modular organizing to come up with an adequate response. When the external forces encountered are unequivocal and incorporated into the existing mixture of flexible dynamic capabilities modular organizing seems to have the upper hand in supplying an adequate response. When, however, the environmental dynamics are ambiguous, critical, and do not fit the existing dynamic capabilities mixture absorptive capacity gets to play the leading role in offering an appropriate solution.

Based on the empirical results it could, furthermore, be concluded that absorptive capacity and modular organizing have had separate, yet clear, effects on the Netherlands armed forces' speed of reaction. The interview results make clear that within a highly turbulent mission context the Netherlands armed forces have the capacity to go through absorptive capacity's sub processes rather quickly. There seems to be a sort of common organizational understanding that the organization has to do everything in its power to act quickly and decisively in support of a running mission, especially when the going gets tough and the external influences can not be sufficiently counterbalanced with the existing organizational resource base. Settling the sequence from potential to realized absorptive capacity in a matter of weeks instead of months seems

to depend to a large extent on the organizational will to do so. This will is most likely related to the level of agreement that exists within the organization and the amount of time that it takes to reach this level.

According to this study's findings modular organizing can both positively and negatively influence a quick organizational response. The positive influence of modular organizing can be related to the different dimensions of absorptive capacity. The Netherlands armed forces' modular deployment approach has led to an organizational situation in which the Dutch units quite intensively have to work together with other military and non military partners, coming from different national, professional, functional, and ideological backgrounds. The sum of all the partnerships in which the Dutch have participated serves as an extensive knowledge pool from which the organization can learn in all sorts of ways. In short, the organization's knowledge acquisition, assimilation, transformation, and exploitation processes all benefit from using partnership experiences as a sort of general database or as a concrete point of reference. Moreover, because the organization does not have to find everything out for itself, the sequential learning steps can also be taken a lot quicker.

For the negative influence of modular organizing on the organization's speed of reaction a national instead of a mission perspective has to be taken. The empirical results have made clear that, on a national level, differences occur between the Operational Commands in living up to modularity theory's basic principle of near-decomposability. It could be argued that Navy and Air force units to a large extent resemble what one might call 'proper modules'. Based on their rather fixed operational task-setting, which on top of that is dominated by the technological systems in use, they are able to function rather autonomously within larger troop formations. As a result of their largely modular character the process of assembly for crisis response deployment becomes rather straightforward. Units can be taken out of the parent organization quickly and easily and be added to a task force to perform a specific task in an autonomous way. Opposed to that, Army units are not what one would call 'proper modules'. It would be better to speak of components. They are distinguishable organizational parts that, given their functional character, are not made to function autonomously. For each mission Army Command picks its units from all over the organization and composes a mixture of organizational

functional parts that is capable of dealing with the specific operational demands of that particular deployment. Army Command, therefore, has to invest heavily in joint exercises and training programs to transform such tailor-made mixtures of different functional units into well-oiled machines, before actual deployment takes place. In the end this extra training effort contravenes the high-readiness, quick response ambitions of the Netherlands armed forces, since units cannot be deployed straightaway.

Concentrating on the issue of preserving organizational stability, the empirical findings also point to different roles for the organizational determinants absorptive capacity and modular organizing. The survey results have shown that within extremely turbulent mission contexts a balanced mixture of dynamic flexible capabilities no longer directly contributed to organizational performance. The organization, basically, puts all its eggs in the basket of absorptive capacity to deliver useful answers quickly. By doing this, however, the organization runs the risk of giving absorptive capacity too much a short-term status. If there is no plan on how to embed newly acquired technological systems or newly invented processes beyond the time-span of a running mission into the overarching organizational system, their initial blessing can ultimately turn into an organizational nuisance. Especially the interview results address this issue. The fact that technological systems are sometimes bought without having really thought about, for example, firmly embedding them into the organization's supply chain, maintenance processes, or training programs often leads to a series of ad-hoc organizational adjustments to reach a workable situation altogether. Most of the time, the end result is an organizational compromise that is constantly being questioned because of remaining practical drawbacks.

The empirical results on modular organizing have led to the overarching conclusion that the Netherlands Armed Forces are confronted with two contradicting types of organizational flexibility demands. On one hand the armed forces need 'composition flexibility', because the organization has to be capable of deploying task forces of different sizes, composed of different units, to different part of the world in order to perform a variety of tasks. On the other hand, the armed forces need, what could be called, 'operational flexibility' for the task force deployed to cope with its dynamically complex task environment. The current effect-based approach

strategy of the Netherlands armed forces strongly relates to the first type of organizational flexibility. Composition flexibility is deemed most important to give a rather small military power, such as the Netherlands, the ability to cover a broad spectrum of military operational tasks. Mainly for Army Command this approach has stimulated a process of mixing and matching units into tailored mixtures of different functionalities. The formation process to create tailor-made organizational modules often leads to situations in which the basic structure of the parent organization is abandoned.

The empirical results point to the fact that this customized way of deploying units has an effect on organizational stability, which is threefold. First, the organization has to invest heavily in all kinds of coordination mechanisms to transform the mixture of different functional units into a well working machine. It is questionable whether this energy consuming approach will ultimately lead to a high level of operational flexibility. Second, in order to create tailored crisis response modules the Netherlands armed forces have to cut through existing organizational boundaries, stripping brigades, main operating bases and maritime task forces that stay behind. As a result, the regular training programs of these units, in which a variety of military operational tasks has to be trained, suffer, because important organizational elements are being missed. In the medium and long run this could lead to organizational fatigue, because units never have gotten the chance to train to their full potential and, therefore, probably will never reach the military professional level they are supposed to reach. Moreover, knowing that the exercising and training cycle must lay the foundation for future deployments, it could even be argued that crisis response effectiveness in the long term is gradually being eroded. Third, the process of mixing and matching that continuously takes place stimulates feelings of turmoil within the organization's workforce. The research findings indicate that especially by suddenly withdrawing people from their daily jobs all kinds of peace-time administrative, functional, managerial, and educational processes are being frustrated. This situation has had a negative effect on organizational stability in several ways. For example, the organization was being forced to improvise by temporarily filling-up crucial vacancies, creating new vacancies somewhere else; certain vocational courses had to be postponed or even cancelled, developing queues and a higher workload further in time; and unintentionally the critical paths of all kinds of administrative procedures

increased considerably. Moreover, all these indicators together have stimulated a feeling of the organization being captured in an ongoing cycle of improvisation.

Recommendations

Based on these findings two recommendations are made. First the Netherlands armed forces have to increase their long-term organizational learning ability by: (a) improving the internal organization of the sequential learning processes of knowledge acquisition, assimilation, transformation, and exploitation, and (b) recognizing military exercises as unique learning vehicles and giving them a more prominent role in the organization's ability to learn. Second, the Netherlands armed forces should start developing a new overarching organizational framework that better complies with modularity's general rule of near-decomposability. Such a framework could bring more stability to the parent organization's functioning, ease the assembly process that has to take place before deployment, safeguard that operational autonomy of the units that stay behind, and improve the operational effectiveness of the military unit that is being deployed. For this second recommendation, the study suggests that the Netherlands armed forces can take advantage of countries that are already working on a similar organizational challenge, such as Australia with its Expeditionary Task Force design.

SAMENVATTING (SUMMARY IN DUTCH)

De toegenomen omgevingsturbulentie heeft organisaties gedwongen tot meer proactief en innovatief handelen. D'Aveni (1994) heeft in dit kader de term hyperconcurrentie geïntroduceerd. Hij stelt dat om te overleven organisaties in staat moeten zijn om herhaaldelijk en doelbewust de heersende concurrentie status-quo te doorbreken. In de daaropvolgende theoretische discussie over het behalen van deze tijdelijke concurrentievoordelen wordt gewezen op het belang van zogenaamde flexibele dynamische vaardigheden (Teece, et al., 1997; Volberda, 1996). Tot op heden heeft het academische debat over dynamische vaardigheden een nogal conceptueel karakter gekend. De belangrijkste doelstelling was om het concept wetenschappelijk goed te positioneren binnen het strategisch management domein.

Een belangrijk praktisch aspect dat vooralsnog onaangeraakt is gebleven, betreft de onderliggende organisatorische determinanten om snel en doelbewust dynamische vaardigheden te activeren. Het overkoepelend gedachtegoed in deze is dat organisaties tweeledig moeten kunnen zijn. Enerzijds is er behoefte aan innovatief vermogen, anderzijds is ook organisatorische stabiliteit gewenst om de innovatiedrang niet te laten doorslaan in chaos. De veronderstelling is dat organisatorische determinanten benodigd zijn die dit duale karakter van organisaties kunnen ondersteunen.

Naar aanleiding van bovenstaand vraagstuk introduceert deze studie de huidige Westerse krijgsmacht als een typisch voorbeeld van een *quick response* organisatie, waar commerciële organisaties mogelijk iets van kunnen leren. Westerse krijgsmachten zien zich namelijk vandaag de dag geconfronteerd met een zeer turbulente veiligheidsomgeving, waarin verschillende soorten crises zich heel snel kunnen aandienen en steeds weer kunnen vragen om nieuwe en andersoortige organisatorische reacties. Naast de roep om strategische flexibiliteit en organisatorisch maatwerk moeten de krijgsmachten tijdens elke afzonderlijke missie in staat blijven om hun operationele effectiviteit te waarborgen. Het feit dat de meeste missiecontexten op zichzelf ook een hoge mate van turbulentie kennen, maakt het hele krachtenspel nog complexer. Kortom, de eis van dualiteit

die gesteld wordt aan commerciële organisaties om te kunnen overleven in een hypercompetitieve concurrentieomgeving is in de kern vergelijkbaar met het organisatorische dilemma waar Westerse krijgsmachten zich mee geconfronteerd zien. In deze studie wordt de Nederlandse krijgsmacht gebruikt als een representatief voorbeeld van een moderne Westerse krijgsmacht met een crisisbeheersingstaak. De bovenstaande redenering heeft geleid tot de volgende centrale onderzoeksvraag: *Welke rol spelen organisatorische leer- en configuratiedeterminanten binnen de Nederlandse krijgsmacht bij het snel reageren op en het adequaat omgaan met omgevingsturbulentie?*

In antwoord op deze vraag heeft het onderzoek uitgewezen dat de organisatorische determinanten absorptievermogen en modulair organiseren, met laterale coördinatie als antecedent, een sleutelrol spelen. Het onderzoek laat zien dat de algemene veiligheidsomgeving waarbinnen de krijgsmacht moet functioneren, getypeerd kan worden als turbulent. Wanneer, echter, gefocust wordt op de individuele missiecontexten blijken er verschillen te zijn in de mate van omgevingsturbulentie. Deze gevarieerdheid maakt het noodzakelijk voor de krijgsmacht om zowel onder hoog als laag turbulente missieomstandigheden effectief te kunnen optreden. Het onderzoek wijst uit dat, afhankelijk van de mate van turbulentie, hetzij absorptievermogen hetzij modulair organiseren een dominante rol vervult in het initiëren van een adequate organisatorische reactie. Als de omgevingskrachten eenduidig zijn en te ondervangen zijn met de bestaande mix van dynamische vaardigheden, biedt het modulaire organisatievermogen voldoende flexibiliteit om tot een passende reactie te komen. Wanneer de omgevingsdynamiek ambigu, vluchtig en kritisch is, en ook niet aansluit bij de dynamische vaardigheden mix, speelt juist absorptievermogen de hoofdrol.

Als het gaat om de reactiesnelheid toont het onderzoek aan dat absorptievermogen en modulair organiseren een afzonderlijk maar wel duidelijk effect uitoefenen. Ten eerste blijkt dat de organisatie heel snel kan handelen als de situatie daarom vraagt. Vooral tijdens gevaarlijke missies is de organisatie heel slagvaardig in het aanpakken van veranderingen in de lokale veiligheidsituatie. De druk om slachtoffers te voorkomen, zorgt voor een bepaalde eensgezindheid binnen de organisatie, waardoor de opeenvolgende leerprocessen (kennisacquisitie, -assimilatie, -

transformatie en –exploitatie) van absorptievermogen heel snel en bewust worden doorlopen. Ten tweede, blijkt ook modulair organiseren een positieve invloed te hebben op de snelheid van kennisabsorptie en uiteindelijk dus op een snelle organisatorische reactie. De modulaire inzet van Nederlandse eenheden in multinationale militaire troepenmachten heeft namelijk geleid tot een uitgebreide kennispool, waar op een versnelde manier uit geleerd kan worden.

Naast deze positieve invloed kan modulair organiseren eveneens een negatief effect hebben op de snelheid van handelen. De belangrijkste reden hiervoor is gelegen in het feit dat voor het creëren van maatwerkmodules de organisatie, in het bijzonder de landmacht, menigmaal door bestaande organisatiegrenzen heen moet snijden. Om een dergelijke niet organieke militaire *task force* voldoende ingespeeld te laten zijn, investeert de organisatie in oefen- en trainingsprogramma's voorafgaand aan de daadwerkelijke inzet. De extra tijd die hiermee gemoeid is, verlaagt natuurlijk de reactiesnelheid van de organisatie.

Ten aanzien van het waarborgen van de organisatiestabiliteit laat het onderzoek zien dat de determinanten absorptievermogen en modulair organiseren wederom een belangrijke rol spelen. Het survey-onderzoek heeft getoond dat binnen hoog turbulente missiecontexten de bestaande mix van dynamische vaardigheden niet langer direct bijdraagt aan de prestatie van de organisatie. Het absorptievermogen moet primair leiden tot een hele snelle bruikbare respons. De tijd om de gemaakte keuze af te zetten tegen en te verankeren in de bredere mix van dynamische vaardigheden ontbreekt of wordt niet genomen. Hoewel deze handelswijze begrijpelijk is, gezien de fysieke gevaren van crisisoperaties, kleeft er ook een nadeel aan. Een punt van zorg is namelijk dat het leervermogen van de organisatie te veel een korte termijn focus krijgt doordat het voornamelijk gericht is op de lopende missie.

De empirische resultaten over modulair organiseren hebben duidelijk gemaakt dat de Nederlandse krijgsmacht zich geconfronteerd ziet met twee tegenstrijdige vormen van flexibiliteit. Enerzijds heeft de organisatie samenstellingsflexibiliteit nodig om maatwerk oplossingen te generen, om zo het gevarieerde takenpakket aan te kunnen. Anderzijds heeft de uit te zenden militaire formatie behoefte aan operationele flexibiliteit om

adequaat in te kunnen spelen op de locale omgevingsdynamiek van de afzonderlijke missiecontexten. Met de *Effect-Based-Approach* strategie heeft de organisatie primair ingezet op samenstellingsflexibiliteit. Het gevolg hiervan is dat voor de meeste uitzendingen een complex samenstellingsproces moet plaatsvinden om de juiste eenheden bij elkaar te brengen.

Uit de interviewresultaten blijkt dat deze manier van inzet een drietal gevolgen heeft voor de organisatiestabiliteit. Ten eerste moet de organisatie extra investeren in allerlei coördinatiemechanismen om de samengestelde eenheid samen te smeden tot een goed geoliede machine. Het valt te betwijfelen of al deze pogingen leiden tot de hoge mate van operationele flexibiliteit die benodigd is om te kunnen excelleren binnen complex dynamische missiecontexten. Ten tweede moet door de maatwerkstrategie de organisatie ook extra energie stoppen in de achterblijvende eenheden. Veelal moeten brigades, squadrons, en maritieme task forces eenheden af staan in verband met een uitzending. Het gevolg hiervan is dat deze grotere organieke verbanden essentiële eenheden missen om hun oefen- en trainingsprogramma naar behoren te kunnen uitvoeren. Op middellange en lange termijn kan dit schadelijk zijn voor de organisatiestabiliteit. Op middellange termijn doet zich het probleem voor dat de grotere eenheden hun gewenste professionele niveau niet kunnen bereiken, waardoor ze eigenlijk minder bruikbaar worden. Op lange termijn kan het ook gevolgen hebben voor crisisbeheersingsinzet van de krijgsmacht in het algemeen, bijvoorbeeld doordat bepaalde taakgebieden in de breedte van de organisatie niet voldoende beoefend zijn. Ten slotte ontstaan door de continue samenstellingsperikelen gevoelens van onrust binnen de organisatie. Het gevoel dreigt te ontstaan dat de organisatie gevangen zit in een vicieuze cirkel van improvisatie.

Op basis van deze bevindingen wordt een tweetal aanbevelingen gedaan. Ten eerste moet de Nederlandse krijgsmacht proberen het lange termijn leervermogen te verbeteren. Ze kan dit doen door de wijze waarop de verschillende leerprocessen zijn gestructureerd en ingebed in de organisatie te reorganiseren. Daarnaast kan de organisatie meer leervoordeel halen uit haar oefen- en trainingsprogramma's. Ten tweede verdient het de voorkeur om een nieuw organisatorisch raamwerk te ontwikkelen dat beter tegemoet komt aan de autonomie-eis van modulair ontwerp, zodat er minder

vergaand gemixt hoeft te worden met eenheden. Een dergelijk raamwerk zou meer stabiliteit kunnen opleveren voor de moederorganisatie omdat bedrijfsvoerings- en onderwijsprocessen niet worden doorkruist, voorafgaand aan een missie een minder complex samenstellingsproces nodig is, de eenheden die achterblijven niet worden aangetast in hun operationele zelfstandigheid en de uitgezonden eenheid een beter ingewerkt systeem vormt. Hierbij wijst de studie op het feit dat voor deze ingrijpende organisatorische verandering de krijgsmacht kan terugvallen op de aanpak en ervaringen van landen die zich geconfronteerd zien met een gelijksoortig probleem. Heel concreet valt hierbij te denken aan de Australische krijgsmacht.

APPENDIX I: OVERVIEW OF INTERVIEWEES

No.	Rank	Organizational Part
1	Colonel	Representative DOBBP
2	Lieutenant colonel	Representative DOPS
3	General	Representative OPS Army Command
4	Lieutenant colonel	Representative OPS Royal Marechaussee
5	General	Representative DAOG
6	Colonel	Representative DOBBP
7	Civilian	Representative DOBBP
8	General	Representative DAOG
9	General	Representative DOBBP
10	General	Representative CDS
11	General	Representative DOPS
12	General	Representative OPS Army Command
13	General	Representative OPS Navy Command
14	General	Representative OPS Navy Command
15	Civilian	Representative CDS
16	General	Representative OPS Air force Command
17	Colonel	Representative OPS Royal Marechaussee
18	Lieutenant colonel	Staff officer Task force Uruzgan

APPENDIX II: MEASUREMENT SCALES

MODULAR ORGANIZING (MO)		
1	To execute crisis response operations the Netherlands armed forces merge units, parts of units, and individuals into tailor-made formations.	
2	The composition of Dutch crisis response formations depends primarily upon the task that has to be executed.	
3	Dutch crisis response formations mostly participate in larger multinational task forces.	
4	During crisis response operations the composition of a Dutch formation can be altered if the operational circumstances require this.	
5	During crisis response operations standardized work processes, such as doctrines, SOP's, and drills make it possible to co-operate with units from other services and countries.	
6	During crisis response operations our Dutch tailor-made formations rely on structured systems for planning and command & control.	
7	During crisis response operations the division of work within our Dutch tailor-made formations is defined in detailed descriptions of jobs and tasks.	$\alpha = .70$
8	During crisis response operations everything in our Dutch tailor-made formations has been laid down in rules.	
9	During crisis response operations consulting takes place between different organizational levels within the Netherlands armed forces.	
10	Dutch servicemen and women master multiple tasks, SOP's, drills, skills, and techniques.	
11	Dutch servicemen and women are up to date regarding technology and necessary know-how.	
12	Dutch technological assets can be used for different types of missions and tasks.	
13	The technological assets of the Netherlands armed forces are to a large extent compatible.	
14	Dutch technological assets are to a large extent compatible with the equipment of partnering countries.	

ABSORPTIVE CAPACITY (AC)		
1	The Netherlands armed forces regularly analyze how partnering countries conduct crisis response operations.	
2	Armed forces from partnering countries have no major secrets for the Netherlands armed forces regarding their organizational strengths and weaknesses.	
3	The Netherlands armed forces systematically keep track of technological developments that could influence operational tasks and performance.	α = .74
4	The lessons learned during actual deployment are systematically being registered within the Netherlands armed forces.	
5	The lessons learned during actual deployed are systematically being internalized by the Netherlands armed forces.	
6	The Netherlands armed forces belong to the trendsetters in the international military sector.	

LATERAL COORDINATION (LC)		
1	During crisis response operations interrelated processes, tasks, and activities are well coordinated with units from other services.	
2	During crisis response operations interrelated processes, tasks, and activities are well coordinated with units from other countries.	
3	During crisis response operations duplicated and overlapping activities amongst our own participating services are avoided.	
4	During crisis response operations duplicated and overlapping activities amongst participating countries are avoided.	
5	During crisis response operations Dutch units have no problems in coordinating with each other.	α = .74
6	During crisis response operations Dutch units have no problems in coordinating with units from other countries.	
7	During crisis response operations conflicts amongst our own Dutch units are settled quickly.	
8	During crisis response operations conflicts between Dutch units and units of participating countries are settled quickly.	
9	During crisis response operations discussions between our own Dutch units are conducted constructively.	
10	During crisis response operations discussions between Dutch units and units of participating countries are conducted constructively.	

DYNAMIC CAPABILITEIS MIXTURE (DCM)			
1	During crisis response operations Dutch units can easily divide essential operational activities amongst each other.	**OP DC (α = .61)**	**α = .70**
2	During crisis response operations Dutch units can easily leave certain essential operational activities to units from other countries.		
3	During crisis response operations Dutch units can easily adjust to changing operational circumstances.		
4	During crisis response operations Dutch tailor-made formations possess a certain amount of slack that can be used to handle fluctuating operational demands.		
5	Whatever service Dutch units belong to, they co-operate easily with one another during crisis response operations.		
6	During crisis response operations Dutch units co-operate easily with units from other countries.		
7	The Netherlands armed forces have the capacity to easily shift functions and tasks in case a crisis response operation requires this.	**STRUC DC (α = .55)**	
8	Dutch servicemen and women can easily take on alternative roles and tasks in case a crisis response operation requires this.		
9	From its permanent structure the Netherlands armed forces are capable of repetitively adjusting to changing mission contexts.		
10	If needed the Netherlands armed forces can add new types of missions to its existing operational product portfolio.	**STRAT DC (α = .52)**	
11	The Netherlands armed forces regularly implements new technologies.		
12	The Netherlands armed forces are pro-active in seeking a fit between what they can offer and what our politicians are expecting.		
13	The Netherlands armed forces try to secure their added value by being capable of dealing with all kinds of crisis situations.		

PERFORMANCE (P)		
1	The Netherlands armed forces perform well during crisis response operations.	
2	Compared to other national armed forces the Netherlands armed forces perform well during crisis response operations.	**α = .80**
3	Other armed forces are positive about the Netherlands armed forces' operational achievements during crisis response operations.	

| ENVIRONMENTAL TURBULENCE (ET)		
1	Changes in the area of operation were very intense.	
2	Our crisis response formation was frequently asked by partnering countries and/or other parties in the area of operation to start conducting completely new tasks.	
3	In the area of operation changes happened continuously.	
4	Our national contribution of tasks/services to partners and other parties in the area of operation changed continuously.	
5	Fluctuation in the number of troops and materiel frequently took place in the area of operation.	
6	Everyday something important changed in the area of operation.	
7	In the area of operation many factors had to be taken into account when making a decision.	**α = .84**
8	In the area of operation new developments could come from various directions.	
9	In the area of operation everything was interrelated.	
10	In the area of operation a decision taken effected numerous other aspects.	
11	In the area of operation it was hard to make decisions based on reliable information.	
12	In the area of operation operational and tactical information was present, but not always available.	
13	It was very hard to predict what was going to happen in the area of operation.	

APPENDIX III: INTERVIEW PROTOCOL

INTERVIEW PROTOCOL				
Date / time				
Location				
Name / Rank		No.: ………………….		
Function				
Opertional Command	☐Army	☐Air force	☐Navy	☐ Marech.

A.	ABSORPTIVE CAPACITY: JUDGING THE OUTCOME
1	Do you think it is a wise strategy of the Netherlands armed forces to pick organizational units from the parent organization and form them into tailor-made constellations that can then be deployed in multinational settings?
2	Does the Netherlands armed forces' technological resource base meet the demands of being modern, multifunctional, and interoperable?
3	Can the Netherlands armed forces rely on a workforce with a cooperative mindset?

B	ABSORPTIVE CAPACITY: ASSESSING THE PROCESS
4	How have the Netherlands armed forces transformed over the last two decades in response to the new crisis response role?
5	Where do you see room for improvement?

C	MODULAR ORGANIZING
6	On which architectural principles are Dutch crisis response formations built?
7	What are the advantages and disadvantages of this approach?

D	LATERAL COORDINATION
8	Which role does lateral coordination play in transforming a Dutch crisis response formation into a well-working system?
9	Which role does formalization play in transforming a Dutch crisis response formation into a well-working system?
10	Which role does socialization play in transforming a Dutch crisis response formation into a well-working system?
11	Which of these combinative capabilities has the upper hand?

E	BALANCING STRATEGY, STRUCTURE, AND OPERATIONS
12	Is the actual execution of crisis response tasks in a mission area negatively being influenced by the fact that the Netherlands armed forces on a continuous basis pick units from the permanent organization and group them into tailor-made crisis response formations?

F	PERFORMANCE
13	Has the Netherlands armed forces' crisis response effort been successful so far?
	13a. Is it possible to measure crisis response performance?
	13b. Is measuring crisis response performance desirable?

APPENDIX IV: CHECKLIST MATRIX AND CODING

	1. Zelfevaluatie
	Het feit dat we succesvol zijn is veel meer gebaseerd op een breed gedragen, gezamenlijke, Nederlandse zelfevaluatie en -beoordeling van ons optreden.

	a. Eigen uitzendervaringen / eigen standaarden
7	Voor een operationele commandant is een missie succesvol als: je een bijdrage hebt kunnen leveren aan het creëren/handhaven van stabiliteit in een crisisgebied. je een bijdrage hebt kunnen leveren aan de wederopbouw van een land of gebied. als je eigen mensen weer heelhuids terugkeren naar huis.
9	Ik betrek succes meer op de concrete verbeteringen die ik heb zien ontstaan tijdens mijn verblijf in een inzetgebied: sociaal leven op straat, het aantal bedrijfjes dat werd opgezet
13	Als ik succes afzet tegen mijn eigen standaarden, dan zeg ik ja we zijn succesvol: het aantal doden en gewonden is vooralsnog beperkt gebleven We doen ons werk goed We hebben goede kerels We voldoen aan de wensen van de politiek.

	b. oordeel over missies
3	Over het algemeen vinden we bijdrage succesvol als we de periode uitdienen, niet te veel slachtoffers hebben en kunnen bijdragen aan een stukje verbetering. In bijna alle missies is dit bereikt.
6	Het succes blijkt uit de concrete resultaten van de grofweg 50 operaties waaraan we de laatste 10 jaar hebben deelgenomen.
9	We behalen de doelen die gesteld zijn, ondanks het feit dat die doelen niet altijd duidelijk afgebakend zijn,

225

ABOUT THE AUTHOR

After graduating in 1994 from the Royal Netherlands Military Academy **drs. E.J. (Erik) de Waard** became a platoon commander in the Air Mobile Brigade. He subsequently studied business administration at Radboud University Nijmegen and fulfilled a number of operational executive functions in the world of business. Since 2001 he has worked as an assistant professor at the Netherlands Defense Academy, where he teaches strategic management and organization design. On these topics he has published in both national and international books and journals.

Contact information:

Erik J. de Waard
Netherlands Defense Academy
Faculty of Military Sciences
Department of Military Business Science
Section Management, Organization, and Defense Economics
Room 154, P.O. Box 90002, NL-4800 PA Breda, The Netherlands

Email: ej.d.waard.01@nlda.nl
Phone: +31 (0)76 527 32 32
Fax: +31 (0)76 527 32 55

ERASMUS RESEARCH INSTITUTE OF MANAGEMENT (ERIM)

ERIM PH.D. SERIES
RESEARCH IN MANAGEMENT

ERIM Electronic Series Portal: http://hdl.handle.net/1765/1

Agatz, N.A.H., *Demand Management in E-Fulfillment*, Promotor: Prof.dr.ir. J.A.E.E. van Nunen, EPS-2009-163-LIS, ISBN: 978-90-5892-200-7, http://hdl.handle.net/1765/15425

Althuizen, N.A.P., *Analogical Reasoning as a Decision Support Principle for Weakly Structured Marketing Problems*, Promotor: Prof.dr.ir. B. Wierenga, EPS-2006-095-MKT, ISBN: 90-5892-129-8, http://hdl.handle.net/1765/8190

Alvarez, H.L., *Distributed Collaborative Learning Communities Enabled by Information Communication Technology*, Promotor: Prof.dr. K. Kumar, EPS-2006-080-LIS, ISBN: 90-5892-112-3, http://hdl.handle.net/1765/7830

Appelman, J.H., *Governance of Global Interorganizational Tourism Networks: Changing Forms of Co-ordination between the Travel Agency and Aviation Sector*, Promotors: Prof.dr. F.M. Go & Prof.dr. B. Nooteboom, EPS-2004-036-MKT, ISBN: 90-5892-060-7, http://hdl.handle.net/1765/1199

Assem, M.J. van den, *Deal or No Deal? Decision Making under Risk in a Large-Stake TV Game Show and Related Experiments*, Promotor: Prof.dr. J. Spronk, EPS-2008-138-F&A, ISBN: 978-90-5892-173-4, http://hdl.handle.net/1765/13566

Baquero, G, *On Hedge Fund Performance, Capital Flows and Investor Psychology*, Promotor: Prof.dr. M.J.C.M. Verbeek, EPS-2006-094-F&A, ISBN: 90-5892-131-X, http://hdl.handle.net/1765/8192

Berens, G., *Corporate Branding: The Development of Corporate Associations and their Influence on Stakeholder Reactions*, Promotor: Prof.dr. C.B.M. van Riel, EPS-2004-039-ORG, ISBN: 90-5892-065-8, http://hdl.handle.net/1765/1273

Berghe, D.A.F. van den, *Working Across Borders: Multinational Enterprises and the Internationalization of Employment*, Promotors: Prof.dr. R.J.M. van Tulder & Prof.dr. E.J.J. Schenk, EPS-2003-029-ORG, ISBN: 90-5892-05-34, http://hdl.handle.net/1765/1041

Berghman, L.A., *Strategic Innovation Capacity: A Mixed Method Study on Deliberate Strategic Learning Mechanisms*, Promotor: Prof.dr. P. Mattyssens, EPS-2006-087-MKT, ISBN: 90-5892-120-4, http://hdl.handle.net/1765/7991

Bijman, W.J.J., *Essays on Agricultural Co-operatives: Governance Structure in Fruit and Vegetable Chains*, Promotor: Prof.dr. G.W.J. Hendrikse, EPS-2002-015-ORG, ISBN: 90-5892-024-0, http://hdl.handle.net/1765/867

Bispo, A., *Labour Market Segmentation: An investigation into the Dutch hospitality industry*, Promotors: Prof.dr. G.H.M. Evers & Prof.dr. A.R. Thurik, EPS-2007-108-ORG, ISBN: 90-5892-136-9, http://hdl.handle.net/1765/10283

Blindenbach-Driessen, F., *Innovation Management in Project-Based Firms*, Promotor: Prof.dr. S.L. van de Velde, EPS-2006-082-LIS, ISBN: 90-5892-110-7, http://hdl.handle.net/1765/7828

Boer, C.A., *Distributed Simulation in Industry,* Promotors: Prof.dr. A. de Bruin & Prof.dr.ir. A. Verbraeck, EPS-2005-065-LIS, ISBN: 90-5892-093-3, http://hdl.handle.net/1765/6925

Boer, N.I., *Knowledge Sharing within Organizations: A situated and Relational Perspective,* Promotor: Prof.dr. K. Kumar, EPS-2005-060-LIS, ISBN: 90-5892-086-0, http://hdl.handle.net/1765/6770

Boer-Sorbán, K., *Agent-Based Simulation of Financial Markets: A modular, Continuous-Time Approach,* Promotor: Prof.dr. A. de Bruin, EPS-2008-119-LIS, ISBN: 90-5892-155-0, http://hdl.handle.net/1765/10870

Boon, C.T., *HRM and Fit: Survival of the Fittest!?,* Promotors: Prof.dr. J. Paauwe & Prof.dr. D.N. den Hartog, EPS-2008-129-ORG, ISBN: 978-90-5892-162-8, http://hdl.handle.net/1765/12606

Braun, E., *City Marketing: Towards an Integrated Approach,* Promotor: Prof.dr. L. van den Berg, EPS-2008-142-MKT, ISBN: 978-90-5892-180-2, http://hdl.handle.net/1765/13694

Brito, M.P. de, *Managing Reverse Logistics or Reversing Logistics Management?* Promotors: Prof.dr.ir. R. Dekker & Prof.dr. M. B. M. de Koster, EPS-2004-035-LIS, ISBN: 90-5892-058-5, http://hdl.handle.net/1765/1132

Brohm, R., *Polycentric Order in Organizations: A Dialogue between Michael Polanyi and IT-Consultants on Knowledge, Morality, and Organization,* Promotors: Prof.dr. G. W. J. Hendrikse & Prof.dr. H. K. Letiche, EPS-2005-063-ORG, ISBN: 90-5892-095-X, http://hdl.handle.net/1765/6911

Brumme, W.-H., *Manufacturing Capability Switching in the High-Tech Electronics Technology Life Cycle,* Promotors: Prof.dr.ir. J.A.E.E. van Nunen & Prof.dr.ir. L.N. Van Wassenhove, EPS-2008-126-LIS, ISBN: 978-90-5892-150-5, http://hdl.handle.net/1765/12103

Burgers, J.H., *Managing Corporate Venturing: Multilevel Studies on Project Autonomy, Integration, Knowledge Relatedness, and Phases in the New Business Development Process,* Promotors: Prof.dr.ir. F.A.J. Van den Bosch & Prof.dr. H.W. Volberda, EPS-2008-136-STR, ISBN: 978-90-5892-174-1, http://hdl.handle.net/1765/13484

Campbell, R.A.J., *Rethinking Risk in International Financial Markets*, Promotor: Prof.dr. C.G. Koedijk, EPS-2001-005-F&A, ISBN: 90-5892-008-9, http://hdl.handle.net/1765/306

Chen, C.-M., *Evaluation and Design of Supply Chain Operations Using DEA*, Promotor: Prof.dr. J.A.E.E. van Nunen, EPS-2009-172-LIS, ISBN: 978-90-5892-209-0, http://hdl.handle.net/1765/1

Chen, H., *Individual Mobile Communication Services and Tariffs*, Promotor: Prof.dr. L.F.J.M. Pau, EPS-2008-123-LIS, ISBN: 90-5892-158-1, http://hdl.handle.net/1765/11141

Chen, Y., *Labour Flexibility in China's Companies: An Empirical Study*, Promotors: Prof.dr. A. Buitendam & Prof.dr. B. Krug, EPS-2001-006-ORG, ISBN: 90-5892-012-7, http://hdl.handle.net/1765/307

Damen, F.J.A., *Taking the Lead: The Role of Affect in Leadership Effectiveness*, Promotor: Prof.dr. D.L. van Knippenberg, EPS-2007-107-ORG, http://hdl.handle.net/1765/10282

Daniševská, P., *Empirical Studies on Financial Intermediation and Corporate Policies*, Promotor: Prof.dr. C.G. Koedijk, EPS-2004-044-F&A, ISBN: 90-5892-070-4, http://hdl.handle.net/1765/1518

Delporte-Vermeiren, D.J.E., *Improving the Flexibility and Profitability of ICT-enabled Business Networks: An Assessment Method and Tool*, Promotors: Prof. mr. dr. P.H.M. Vervest & Prof.dr.ir. H.W.G.M. van Heck, EPS-2003-020-LIS, ISBN: 90-5892-040-2, http://hdl.handle.net/1765/359

Derwall, J.M.M., *The Economic Virtues of SRI and CSR*, Promotor: Prof.dr. C.G. Koedijk, EPS-2007-101-F&A, ISBN: 90-5892-132-8, http://hdl.handle.net/1765/8986

Diepen, M. van, *Dynamics and Competition in Charitable Giving*, Promotor: Prof.dr. Ph.H.B.F. Franses, EPS-2009-159-MKT, ISBN: 978-90-5892-188-8, http://hdl.handle.net/1765/14526

Dietz, H.M.S., *Managing (Sales)People towards Perfomance: HR Strategy, Leadership & Teamwork*, Promotor: Prof.dr. G.W.J. Hendrikse, EPS-2009-168-ORG, ISBN: 978-90-5892-210-6, http://hdl.handle.net/1765/1

Dijksterhuis, M., *Organizational Dynamics of Cognition and Action in the Changing Dutch and US Banking Industries*, Promotors: Prof.dr.ir. F.A.J. van den Bosch & Prof.dr. H.W. Volberda, EPS-2003-026-STR, ISBN: 90-5892-048-8, http://hdl.handle.net/1765/1037

Eijk, A.R. van der, *Behind Networks: Knowledge Transfer, Favor Exchange and Performance*, Promotors: Prof.dr. S.L. van de Velde & Prof.dr.drs. W.A. Dolfsma, EPS-2009-161-LIS, ISBN: 978-90-5892-190-1, http://hdl.handle.net/1765/14613

Elstak, M.N., *Flipping the Identity Coin: The Comparative Effect of Perceived, Projected and Desired Organizational Identity on Organizational Identification and Desired Behavior*, Promotor: Prof.dr. C.B.M. van Riel, EPS-2008-117-ORG, ISBN: 90-5892-148-2, http://hdl.handle.net/1765/10723

Erken, H.P.G., *Productivity, R&D and Entrepreneurship*, Promotor: Prof.dr. A.R. Thurik, EPS-2008-147-ORG, ISBN: 978-90-5892-179-6, http://hdl.handle.net/1765/14004

Fenema, P.C. van, *Coordination and Control of Globally Distributed Software Projects*, Promotor: Prof.dr. K. Kumar, EPS-2002-019-LIS, ISBN: 90-5892-030-5, http://hdl.handle.net/1765/360

Fleischmann, M., *Quantitative Models for Reverse Logistics*, Promotors: Prof.dr.ir. J.A.E.E. van Nunen & Prof.dr.ir. R. Dekker, EPS-2000-002-LIS, ISBN: 35-4041-711-7, http://hdl.handle.net/1765/1044

Flier, B., *Strategic Renewal of European Financial Incumbents: Coevolution of Environmental Selection, Institutional Effects, and Managerial Intentionality*, Promotors: Prof.dr.ir. F.A.J. van den Bosch & Prof.dr. H.W. Volberda, EPS-2003-033-STR, ISBN: 90-5892-055-0, http://hdl.handle.net/1765/1071

Fok, D., *Advanced Econometric Marketing Models*, Promotor: Prof.dr. Ph.H.B.F. Franses, EPS-2003-027-MKT, ISBN: 90-5892-049-6, http://hdl.handle.net/1765/1035

Ganzaroli, A., *Creating Trust between Local and Global Systems*, Promotors: Prof.dr. K. Kumar & Prof.dr. R.M. Lee, EPS-2002-018-LIS, ISBN: 90-5892-031-3, http://hdl.handle.net/1765/361

Gertsen, H.F.M., *Riding a Tiger without Being Eaten: How Companies and Analysts Tame Financial Restatements and Influence Corporate Reputation*, Promotor: Prof.dr. C.B.M. van Riel, EPS-2009-171-ORG, ISBN: 90-5892-214-4, http://hdl.handle.net/1765/1

Gilsing, V.A., *Exploration, Exploitation and Co-evolution in Innovation Networks*, Promotors: Prof.dr. B. Nooteboom & Prof.dr. J.P.M. Groenewegen, EPS-2003-032-ORG, ISBN: 90-5892-054-2, http://hdl.handle.net/1765/1040

Gijsbers, G.W., *Agricultural Innovation in Asia: Drivers, Paradigms and Performance,* Promotor: Prof.dr. R.J.M. van Tulder, EPS-2009-156-ORG, ISBN: 978-90-5892-191-8, http://hdl.handle.net/1765/14524

Gong, Y., *Stochastic Modelling and Analysis of Warehouse Operations*, Promotors: Prof.dr. M.B.M. de Koster & Prof.dr. S.L. van de Velde, EPS-2009-180-LIS, ISBN: 978-90-5892-219-9, http://hdl.handle.net/1765/1

Govers, R., *Virtual Tourism Destination Image: Glocal Identities Constructed, Perceived and Experienced*, Promotors: Prof.dr. F.M. Go & Prof.dr. K. Kumar, EPS-2005-069-MKT, ISBN: 90-5892-107-7, http://hdl.handle.net/1765/6981

Graaf, G. de, *Tractable Morality: Customer Discourses of Bankers, Veterinarians and Charity Workers*, Promotors: Prof.dr. F. Leijnse & Prof.dr. T. van Willigenburg, EPS-2003-031-ORG, ISBN: 90-5892-051-8, http://hdl.handle.net/1765/1038

Greeven, M.J., *Innovation in an Uncertain Institutional Environment: Private Software Entrepreneurs in Hangzhou, China*, Promotor: Prof.dr. B. Krug, EPS-2009-164-ORG, ISBN: 978-90-5892-202-1, http://hdl.handle.net/1765/15426

Groot, E.A. de, *Essays on Economic Cycles*, Promotors: Prof.dr. Ph.H.B.F. Franses & Prof.dr. H.R. Commandeur, EPS-2006-091-MKT, ISBN: 90-5892-123-9, http://hdl.handle.net/1765/8216

Guenster, N.K., *Investment Strategies Based on Social Responsibility and Bubbles*, Promotor: Prof.dr. C.G. Koedijk, EPS-2008-175-F&A, ISBN: 978-90-5892-206-9, http://hdl.handle.net/1765/1

Gutkowska, A.B., *Essays on the Dynamic Portfolio Choice*, Promotor: Prof.dr. A.C.F. Vorst, EPS-2006-085-F&A, ISBN: 90-5892-118-2, http://hdl.handle.net/1765/7994

Hagemeijer, R.E., *The Unmasking of the Other*, Promotors: Prof.dr. S.J. Magala & Prof.dr. H.K. Letiche, EPS-2005-068-ORG, ISBN: 90-5892-097-6, http://hdl.handle.net/1765/6963

Halderen, M.D. van, *Organizational Identity Expressiveness and Perception Management: Principles for Expressing the Organizational Identity in Order to Manage the Perceptions and Behavioral Reactions of External Stakeholders*, Promotor: Prof.dr. S.B.M. van Riel, EPS-2008-122-ORG, ISBN: 90-5892-153-6, http://hdl.handle.net/1765/10872

Hartigh, E. den, *Increasing Returns and Firm Performance: An Empirical Study*, Promotor: Prof.dr. H.R. Commandeur, EPS-2005-067-STR, ISBN: 90-5892-098-4, http://hdl.handle.net/1765/6939

Hermans. J.M., *ICT in Information Services; Use and Deployment of the Dutch Securities Trade, 1860-1970,* Promotor: Prof.dr. drs. F.H.A. Janszen, EPS-2004-046-ORG, ISBN 90-5892-072-0, http://hdl.handle.net/1765/1793

Hessels, S.J.A., *International Entrepreneurship: Value Creation Across National Borders*, Promotor: Prof.dr. A.R. Thurik, EPS-2008-144-ORG, ISBN: 978-90-5892-181-9, http://hdl.handle.net/1765/13942

Heugens, P.P.M.A.R., *Strategic Issues Management: Implications for Corporate Performance*, Promotors: Prof.dr.ir. F.A.J. van den Bosch & Prof.dr. C.B.M. van Riel, EPS-2001-007-STR, ISBN: 90-5892-009-9, http://hdl.handle.net/1765/358

Heuvel, W. van den, *The Economic Lot-Sizing Problem: New Results and Extensions*, Promotor: Prof.dr. A.P.L. Wagelmans, EPS-2006-093-LIS, ISBN: 90-5892-124-7, http://hdl.handle.net/1765/1805

Hoedemaekers, C.M.W., *Performance, Pinned down: A Lacanian Analysis of Subjectivity at Work*, Promotors: Prof.dr. S. Magala & Prof.dr. D.H. den Hartog, EPS-2008-121-ORG, ISBN: 90-5892-156-7, http://hdl.handle.net/1765/10871

Hooghiemstra, R., *The Construction of Reality: Cultural Differences in Self-serving Behaviour in Accounting Narratives*, Promotors: Prof.dr. L.G. van der Tas RA & Prof.dr. A.Th.H. Pruyn, EPS-2003-025-F&A, ISBN: 90-5892-047-X, http://hdl.handle.net/1765/871

Hu, Y., *Essays on the Governance of Agricultural Products: Cooperatives and Contract Farming*, Promotors: Prof.dr. G.W.J. Hendrkse & Prof.dr. B. Krug, EPS-2007-113-ORG, ISBN: 90-5892-145-1, http://hdl.handle.net/1765/10535

Huij, J.J., *New Insights into Mutual Funds: Performance and Family Strategies*, Promotor: Prof.dr. M.C.J.M. Verbeek, EPS-2007-099-F&A, ISBN: 90-5892-134-4, http://hdl.handle.net/1765/9398

Huurman, C.I., *Dealing with Electricity Prices*, Promotor: Prof.dr. C.D. Koedijk, EPS-2007-098-F&A, ISBN: 90-5892-130-1, http://hdl.handle.net/1765/9399

Iastrebova, K, *Manager's Information Overload: The Impact of Coping Strategies on Decision-Making Performance*, Promotor: Prof.dr. H.G. van Dissel, EPS-2006-077-LIS, ISBN: 90-5892-111-5, http://hdl.handle.net/1765/7329

Iwaarden, J.D. van, *Changing Quality Controls: The Effects of Increasing Product Variety and Shortening Product Life Cycles,* Promotors: Prof.dr. B.G. Dale & Prof.dr. A.R.T. Williams, EPS-2006-084-ORG, ISBN: 90-5892-117-4, http://hdl.handle.net/1765/7992

Jansen, J.J.P., *Ambidextrous Organizations*, Promotors: Prof.dr.ir. F.A.J. Van den Bosch & Prof.dr. H.W. Volberda, EPS-2005-055-STR, ISBN: 90-5892-081-X, http://hdl.handle.net/1765/6774

Jaspers, F.P.H., *Organizing Systemic Innovation*, Promotor: Prof.dr.ir. J.C.M. van den Ende, EPS-2009-160-ORG, ISBN: 978-90-5892-197-), http://hdl.handle.net/1765/14974

Jennen, M.G.J., *Empirical Essays on Office Market Dynamics*, Promotors: Prof.dr. C.G. Koedijk & Prof.dr. D. Brounen, EPS-2008-140-F&A, ISBN: 978-90-5892-176-5, http://hdl.handle.net/1765/13692

Jiang, T., *Capital Structure Determinants and Governance Structure Variety in Franchising*, Promotors: Prof.dr. G. Hendrikse & Prof.dr. A. de Jong, EPS-2009-158-F&A, ISBN: 978-90-5892-199-4, http://hdl.handle.net/1765/14975

Jiao, T., *Essays in Financial Accounting*, Promotor: Prof.dr. G.M.H. Mertens, EPS-2009-176-F&A, ISBN: 978-90-5892-211-3, http://hdl.handle.net/1765/1

Jong, C. de, *Dealing with Derivatives: Studies on the Role, Informational Content and Pricing of Financial Derivatives*, Promotor: Prof.dr. C.G. Koedijk, EPS-2003-023-F&A, ISBN: 90-5892-043-7, http://hdl.handle.net/1765/1043

Kaa, G. van, *Standard Battles for Complex Systems: Empirical Research on the Home Network,* Promotors: Prof.dr.ir. J. van den Ende & Prof.dr.ir. H.W.G.M. van Heck, EPS-2009-166-ORG, ISBN: 978-90-5892-205-2, http://hdl.handle.net/1765/1

Keizer, A.B., *The Changing Logic of Japanese Employment Practices: A Firm-Level Analysis of Four Industries,* Promotors: Prof.dr. J.A. Stam & Prof.dr. J.P.M. Groenewegen, EPS-2005-057-ORG, ISBN: 90-5892-087-9, http://hdl.handle.net/1765/6667

Kijkuit, R.C., *Social Networks in the Front End: The Organizational Life of an Idea,* Promotor: Prof.dr. B. Nooteboom, EPS-2007-104-ORG, ISBN: 90-5892-137-6, http://hdl.handle.net/1765/10074

Kippers, J., *Empirical Studies on Cash Payments,* Promotor: Prof.dr. Ph.H.B.F. Franses, EPS-2004-043-F&A, ISBN: 90-5892-069-0, http://hdl.handle.net/1765/1520

Klein, M.H., *Poverty Alleviation through Sustainable Strategic Business Models: Essays on Poverty Alleviation as a Business Strategy,* Promotor: Prof.dr. H.R. Commandeur, EPS-2008-135-STR, ISBN: 978-90-5892-168-0, http://hdl.handle.net/1765/13482

Knapp, S., *The Econometrics of Maritime Safety: Recommendations to Enhance Safety at Sea*, Promotor: Prof.dr. Ph.H.B.F. Franses, EPS-2007-096-ORG, ISBN: 90-5892-127-1, http://hdl.handle.net/1765/7913

Kole, E., *On Crises, Crashes and Comovements*, Promotors: Prof.dr. C.G. Koedijk & Prof.dr. M.J.C.M. Verbeek, EPS-2006-083-F&A, ISBN: 90-5892-114-X, http://hdl.handle.net/1765/7829

Kooij-de Bode, J.M., *Distributed Information and Group Decision-Making: Effects of Diversity and Affect*, Promotor: Prof.dr. D.L. van Knippenberg, EPS-2007-115-ORG, http://hdl.handle.net/1765/10722

Koppius, O.R., *Information Architecture and Electronic Market Performance*, Promotors: Prof.dr. P.H.M. Vervest & Prof.dr.ir. H.W.G.M. van Heck, EPS-2002-013-LIS, ISBN: 90-5892-023-2, http://hdl.handle.net/1765/921

Kotlarsky, J., *Management of Globally Distributed Component-Based Software Development Projects,* Promotor: Prof.dr. K. Kumar, EPS-2005-059-LIS, ISBN: 90-5892-088-7, http://hdl.handle.net/1765/6772

Krauth, E.I., *Real-Time Planning Support: A Task-Technology Fit Perspective,* Promotors: Prof.dr. S.L. van de Velde & Prof.dr. J. van Hillegersberg, EPS-2008-155-LIS, ISBN: 978-90-5892-193-2, http://hdl.handle.net/1765/14521

Kuilman, J., *The Re-Emergence of Foreign Banks in Shanghai: An Ecological Analysis,* Promotor: Prof.dr. B. Krug, EPS-2005-066-ORG, ISBN: 90-5892-096-8, http://hdl.handle.net/1765/6926

Kwee, Z., *Investigating Three Key Principles of Sustained Strategic Renewal: A Longitudinal Study of Long-Lived Firms,* Promotors: Prof.dr.ir. F.A.J. Van den Bosch & Prof.dr. H.W. Volberda, EPS-2009-174-STR, ISBN: 90-5892-212-0, http://hdl.handle.net/1765/1

Langen, P.W. de, *The Performance of Seaport Clusters: A Framework to Analyze Cluster Performance and an Application to the Seaport Clusters of Durban, Rotterdam and the Lower Mississippi*, Promotors: Prof.dr. B. Nooteboom & Prof. drs. H.W.H. Welters, EPS-2004-034-LIS, ISBN: 90-5892-056-9, http://hdl.handle.net/1765/1133

Le Anh, T., *Intelligent Control of Vehicle-Based Internal Transport Systems*, Promotors: Prof.dr. M.B.M. de Koster & Prof.dr.ir. R. Dekker, EPS-2005-051-LIS, ISBN: 90-5892-079-8, http://hdl.handle.net/1765/6554

Le-Duc, T., *Design and Control of Efficient Order Picking Processes*, Promotor: Prof.dr. M.B.M. de Koster, EPS-2005-064-LIS, ISBN: 90-5892-094-1, http://hdl.handle.net/1765/6910

Leeuwen, E.P. van, *Recovered-Resource Dependent Industries and the Strategic Renewal of Incumbent Firm: A Multi-Level Study of Recovered Resource Dependence Management and Strategic Renewal in the European Paper and Board Industry*, Promotors: Prof.dr.ir. F.A.J. Van den Bosch & Prof.dr. H.W. Volberda, EPS-2007-109-STR, ISBN: 90-5892-140-6, http://hdl.handle.net/1765/10183

Lentink, R.M., *Algorithmic Decision Support for Shunt Planning*, Promotors: Prof.dr. L.G. Kroon & Prof.dr.ir. J.A.E.E. van Nunen, EPS-2006-073-LIS, ISBN: 90-5892-104-2, http://hdl.handle.net/1765/7328

Li, T., *Informedness and Customer-Centric Revenue Management,* Promotors: Prof.dr. P.H.M. Vervest & Prof.dr.ir. H.W.G.M. van Heck, EPS-2009-146-LIS, ISBN: 978-90-5892-195-6, http://hdl.handle.net/1765/14525

Liang, G., *New Competition: Foreign Direct Investment and Industrial Development in China,* Promotor: Prof.dr. R.J.M. van Tulder, EPS-2004-047-ORG, ISBN: 90-5892-073-9, http://hdl.handle.net/1765/1795

Liere, D.W. van, *Network Horizon and the Dynamics of Network Positions: A Multi-Method Multi-Level Longitudinal Study of Interfirm Networks,* Promotor: Prof.dr. P.H.M. Vervest, EPS-2007-105-LIS, ISBN: 90-5892-139-0, http://hdl.handle.net/1765/10181

Loef, J., *Incongruity between Ads and Consumer Expectations of Advertising*, Promotors: Prof.dr. W.F. van Raaij & Prof.dr. G. Antonides, EPS-2002-017-MKT, ISBN: 90-5892-028-3, http://hdl.handle.net/1765/869

Maeseneire, W., de, *Essays on Firm Valuation and Value Appropriation,* Promotor: Prof.dr. J.T.J. Smit, EPS-2005-053-F&A, ISBN: 90-5892-082-8, http://hdl.handle.net/1765/6768

Londoño, M. del Pilar, *Institutional Arrangements that Affect Free Trade Agreements: Economic Rationality Versus Interest Groups*, Promotors: Prof.dr. H.E. Haralambides & Prof.dr. J.F. Francois, EPS-2006-078-LIS, ISBN: 90-5892-108-5, http://hdl.handle.net/1765/7578

Maas, A.A., van der, *Strategy Implementation in a Small Island Context: An Integrative Framework,* Promotor: Prof.dr. H.G. van Dissel, EPS-2008-127-LIS, ISBN: 978-90-5892-160-4, http://hdl.handle.net/1765/12278

Maeseneire, W., de, *Essays on Firm Valuation and Value Appropriation,* Promotor: Prof.dr. J.T.J. Smit, EPS-2005-053-F&A, ISBN: 90-5892-082-8, http://hdl.handle.net/1765/6768

Mandele, L.M., van der, *Leadership and the Inflection Point: A Longitudinal Perspective*, Promotors: Prof.dr. H.W. Volberda & Prof.dr. H.R. Commandeur, EPS-2004-042-STR, ISBN: 90-5892-067-4, http://hdl.handle.net/1765/1302

Meer, J.R. van der, *Operational Control of Internal Transport*, Promotors: Prof.dr. M.B.M. de Koster & Prof.dr.ir. R. Dekker, EPS-2000-001-LIS, ISBN: 90-5892-004-6, http://hdl.handle.net/1765/859

Mentink, A., *Essays on Corporate Bonds*, Promotor: Prof.dr. A.C.F. Vorst, EPS-2005-070-F&A, ISBN: 90-5892-100-X, http://hdl.handle.net/1765/7121

Meyer, R.J.H., *Mapping the Mind of the Strategist: A Quantitative Methodology for Measuring the Strategic Beliefs of Executives*, Promotor: Prof.dr. R.J.M. van Tulder, EPS-2007-106-ORG, ISBN: 978-90-5892-141-3, http://hdl.handle.net/1765/10182

Miltenburg, P.R., *Effects of Modular Sourcing on Manufacturing Flexibility in the Automotive Industry: A Study among German OEMs*, Promotors: Prof.dr. J. Paauwe & Prof.dr. H.R. Commandeur, EPS-2003-030-ORG, ISBN: 90-5892-052-6, http://hdl.handle.net/1765/1039

Moerman, G.A., *Empirical Studies on Asset Pricing and Banking in the Euro Area,* Promotor: Prof.dr. C.G. Koedijk, EPS-2005-058-F&A, ISBN: 90-5892-090-9, http://hdl.handle.net/1765/6666

Moitra, D., *Globalization of R&D: Leveraging Offshoring for Innovative Capability and Organizational Flexibility,* Promotor: Prof.dr. K. Kumar, EPS-2008-150-LIS, ISBN: 978-90-5892-184-0, http://hdl.handle.net/1765/14081

Mol, M.M., *Outsourcing, Supplier-relations and Internationalisation: Global Source Strategy as a Chinese Puzzle*, Promotor: Prof.dr. R.J.M. van Tulder, EPS-2001-010-ORG, ISBN: 90-5892-014-3, http://hdl.handle.net/1765/355

Mom, T.J.M., *Managers' Exploration and Exploitation Activities: The Influence of Organizational Factors and Knowledge Inflows*, Promotors: Prof.dr.ir. F.A.J. Van den Bosch & Prof.dr. H.W. Volberda, EPS-2006-079-STR, ISBN: 90-5892-116-6, http://hdl.handle.net/1765

Moonen, J.M., *Multi-Agent Systems for Transportation Planning and Coordination*, Promotors: Prof.dr. J. van Hillegersberg & Prof.dr. S.L. van de Velde, EPS-2009-177-LIS, ISBN: 978-90-5892-216-8, http://hdl.handle.net/1

Mulder, A., *Government Dilemmas in the Private Provision of Public Goods*, Promotor: Prof.dr. R.J.M. van Tulder, EPS-2004-045-ORG, ISBN: 90-5892-071-2, http://hdl.handle.net/1765/1790

Muller, A.R., *The Rise of Regionalism: Core Company Strategies Under The Second Wave of Integration*, Promotor: Prof.dr. R.J.M. van Tulder, EPS-2004-038-ORG, ISBN: 90-5892-062-3, http://hdl.handle.net/1765/1272

Nalbantov G.I., *Essays on Some Recent Penalization Methods with Applications in Finance and Marketing*, Promotor: Prof. dr P.J.F. Groenen, EPS-2008-132-F&A, ISBN: 978-90-5892-166-6, http://hdl.handle.net/1765/13319

Nederveen Pieterse, A., *Goal Orientation in Teams: The Role of Diversity*, Promotor: Prof.dr. D.L. van Knippenberg, EPS-2009-162-ORG, http://hdl.handle.net/1765/15240

Nguyen, T.T., *Capital Structure, Strategic Competition, and Governance*, Promotor: Prof.dr. A. de Jong, EPS-2008-148-F&A, ISBN: 90-5892-178-9, http://hdl.handle.net/1765/14005

Niesten, E.M.M.I., *Regulation, Governance and Adaptation: Governance Transformations in the Dutch and French Liberalizing Electricity Industries*, Promotors: Prof.dr. A. Jolink & Prof.dr. J.P.M. Groenewegen, EPS-2009-170-ORG, ISBN: 978-90-5892-208-3, http://hdl.handle.net/1765/1

Nieuwenboer, N.A. den, *Seeing the Shadow of the Self*, Promotor: Prof.dr. S.P. Kaptein, EPS-2008-151-ORG, ISBN: 978-90-5892-182-6, http://hdl.handle.net/1765/14223

Ning, H., *Hierarchical Portfolio Management: Theory and Applications*, Promotor: Prof.dr. J. Spronk, EPS-2007-118-F&A, ISBN: 90-5892-152-9, http://hdl.handle.net/1765/10868

Noeverman, J., *Management Control Systems, Evaluative Style, and Behaviour: Exploring the Concept and Behavioural Consequences of Evaluative Style*, Promotors: Prof.dr. E.G.J. Vosselman & Prof.dr. A.R.T. Williams, EPS-2007-120-F&A, ISBN: 90-5892-151-2, http://hdl.handle.net/1765/10869

Oosterhout, J., van, *The Quest for Legitimacy: On Authority and Responsibility in Governance*, Promotors: Prof.dr. T. van Willigenburg & Prof.mr. H.R. van Gunsteren, EPS-2002-012-ORG, ISBN: 90-5892-022-4, http://hdl.handle.net/1765/362

Oostrum, J.M., van, *Applying Mathematical Models to Surgical Patient Planning*, Promotor: Prof.dr. A.P.M. Wagelmans, EPS-2009-179-LIS, ISBN: 978-90-5892-217-5, http://hdl.handle.net/1765/1

Paape, L., *Corporate Governance: The Impact on the Role, Position, and Scope of Services of the Internal Audit Function*, Promotors: Prof.dr. G.J. van der Pijl & Prof.dr. H. Commandeur, EPS-2007-111-MKT, ISBN: 90-5892-143-7, http://hdl.handle.net/1765/10417

Pak, K., *Revenue Management: New Features and Models*, Promotor: Prof.dr.ir. R. Dekker, EPS-2005-061-LIS, ISBN: 90-5892-092-5, http://hdl.handle.net/1765/362/6771

Pattikawa, L.H, *Innovation in the Pharmaceutical Industry: Evidence from Drug Introduction in the U.S.*, Promotors: Prof.dr. H.R.Commandeur, EPS-2007-102-MKT, ISBN: 90-5892-135-2, http://hdl.handle.net/1765/9626

Peeters, L.W.P., *Cyclic Railway Timetable Optimization*, Promotors: Prof.dr. L.G. Kroon & Prof.dr.ir. J.A.E.E. van Nunen, EPS-2003-022-LIS, ISBN: 90-5892-042-9, http://hdl.handle.net/1765/429

Pietersz, R., *Pricing Models for Bermudan-style Interest Rate Derivatives*, Promotors: Prof.dr. A.A.J. Pelsser & Prof.dr. A.C.F. Vorst, EPS-2005-071-F&A, ISBN: 90-5892-099-2, http://hdl.handle.net/1765/7122

Poel, A.M. van der, *Empirical Essays in Corporate Finance and Financial Reporting*, Promotors: Prof.dr. A. de Jong & Prof.dr. G.M.H. Mertens, EPS-2007-133-F&A, ISBN: 978-90-5892-165-9, http://hdl.handle.net/1765/13320

Popova, V., *Knowledge Discovery and Monotonicity*, Promotor: Prof.dr. A. de Bruin, EPS-2004-037-LIS, ISBN: 90-5892-061-5, http://hdl.handle.net/1765/1201

Pouchkarev, I., *Performance Evaluation of Constrained Portfolios*, Promotors: Prof.dr. J. Spronk & Dr. W.G.P.M. Hallerbach, EPS-2005-052-F&A, ISBN: 90-5892-083-6, http://hdl.handle.net/1765/6731

Prins, R., *Modeling Consumer Adoption and Usage of Value-Added Mobile Services*, Promotors: Prof.dr. Ph.H.B.F. Franses & Prof.dr. P.C. Verhoef, EPS-2008-128-MKT, ISBN: 978/90-5892-161-1, http://hdl.handle.net/1765/12461

Puvanasvari Ratnasingam, P., *Interorganizational Trust in Business to Business E-Commerce*, Promotors: Prof.dr. K. Kumar & Prof.dr. H.G. van Dissel, EPS-2001-009-LIS, ISBN: 90-5892-017-8, http://hdl.handle.net/1765/356

Quak, H.J., *Sustainability of Urban Freight Transport: Retail Distribution and Local Regulation in Cities*, Promotor: Prof.dr. M.B.M. de Koster, EPS-2008-124-LIS, ISBN: 978-90-5892-154-3, http://hdl.handle.net/1765/11990

Quariguasi Frota Neto, J., *Eco-efficient Supply Chains for Electrical and Electronic Products*, Promotors: Prof.dr.ir. J.A.E.E. van Nunen & Prof.dr.ir. H.W.G.M. van Heck, EPS-2008-152-LIS, ISBN: 978-90-5892-192-5, http://hdl.handle.net/1765/14785

Radkevitch, U.L, *Online Reverse Auction for Procurement of Services*, Promotor: Prof.dr.ir. H.W.G.M. van Heck, EPS-2008-137-LIS, ISBN: 978-90-5892-171-0, http://hdl.handle.net/1765/13497

Rinsum, M. van, *Performance Measurement and Managerial Time Orientation*, Promotor: Prof.dr. F.G.H. Hartmann, EPS-2006-088-F&A, ISBN: 90-5892-121-2, http://hdl.handle.net/1765/7993

Romero Morales, D., *Optimization Problems in Supply Chain Management*, Promotors: Prof.dr.ir. J.A.E.E. van Nunen & Dr. H.E. Romeijn, EPS-2000-003-LIS, ISBN: 90-9014078-6, http://hdl.handle.net/1765/865

Roodbergen, K.J., *Layout and Routing Methods for Warehouses*, Promotors: Prof.dr. M.B.M. de Koster & Prof.dr.ir. J.A.E.E. van Nunen, EPS-2001-004-LIS, ISBN: 90-5892-005-4, http://hdl.handle.net/1765/861

Rook, L., *Imitation in Creative Task Performance*, Promotor: Prof.dr. D.L. van Knippenberg, EPS-2008-125-ORG, http://hdl.handle.net/1765/11555

Rosmalen, J. van, *Segmentation and Dimension Reduction: Exploratory and Model-Based Approaches*, Promotor: Prof.dr. P.J.F. Groenen, EPS-2009-165-MKT, ISBN: 978-90-5892-201-4, http://hdl.handle.net/1765/15536

Rus, D., *The Dark Side of Leadership: Exploring the Psychology of Leader Self-serving Behavior*, Promotor: Prof.dr. D.L. van Knippenberg, EPS-2009-178-ORG, http://hdl.handle.net/1765/1

Samii, R., *Leveraging Logistics Partnerships: Lessons from Humanitarian Organizations,* Promotors: Prof.dr.ir. J.A.E.E. van Nunen & Prof.dr.ir. L.N. Van Wassenhove, EPS-2008-153-LIS, ISBN: 978-90-5892-186-4, http://hdl.handle.net/1765/14519

Schaik, D. van, *M&A in Japan: An Analysis of Merger Waves and Hostile Takeovers,* Promotors: Prof.dr. J. Spronk & Prof.dr. J.P.M. Groenewegen, EPS-2008-141-F&A, ISBN: 978-90-5892-169-7, http://hdl.handle.net/1765/13693

Schauten, M.B.J., *Valuation, Capital Structure Decisions and the Cost of Capital,* Promotors: Prof.dr. J. Spronk & Prof.dr. D. van Dijk, EPS-2008-134-F&A, ISBN: 978-90-5892-172-7, http://hdl.handle.net/1765/13480

Schramade, W.L.J., *Corporate Bonds Issuers,* Promotor: Prof.dr. A. De Jong, EPS-2006-092-F&A, ISBN: 90-5892-125-5, http://hdl.handle.net/1765/8191

Schweizer, T.S., *An Individual Psychology of Novelty-Seeking, Creativity and Innovation,* Promotor: Prof.dr. R.J.M. van Tulder, EPS-2004-048-ORG, ISBN: 90-5892-077-1, http://hdl.handle.net/1765/1818

Six, F.E., *Trust and Trouble: Building Interpersonal Trust Within Organizations*, Promotors: Prof.dr. B. Nooteboom & Prof.dr. A.M. Sorge, EPS-2004-040-ORG, ISBN: 90-5892-064-X, http://hdl.handle.net/1765/1271

Slager, A.M.H., *Banking across Borders*, Promotors: Prof.dr. R.J.M. van Tulder & Prof.dr. D.M.N. van Wensveen, EPS-2004-041-ORG, ISBN: 90-5892-066–6, http://hdl.handle.net/1765/1301

Sloot, L., *Understanding Consumer Reactions to Assortment Unavailability*, Promotors: Prof.dr. H.R. Commandeur, Prof.dr. E. Peelen & Prof.dr. P.C. Verhoef, EPS-2006-074-MKT, ISBN: 90-5892-102-6, http://hdl.handle.net/1765/7438

Smit, W., *Market Information Sharing in Channel Relationships: Its Nature, Antecedents and Consequences*, Promotors: Prof.dr.ir. G.H. van Bruggen & Prof.dr.ir. B. Wierenga, EPS-2006-076-MKT, ISBN: 90-5892-106-9, http://hdl.handle.net/1765/7327

Sonnenberg, M., *The Signalling Effect of HRM on Psychological Contracts of Employees: A Multi-level Perspective*, Promotor: Prof.dr. J. Paauwe, EPS-2006-086-ORG, ISBN: 90-5892-119-0, http://hdl.handle.net/1765/7995

Speklé, R.F., *Beyond Generics: A closer Look at Hybrid and Hierarchical Governance*, Promotor: Prof.dr. M.A. van Hoepen RA, EPS-2001-008-F&A, ISBN: 90-5892-011-9, http://hdl.handle.net/1765/357

Stam, D.A., *Managing Dreams and Ambitions: A Psychological Analysis of Vision Communication*, Promotor: Prof.dr. D.L. van Knippenberg, EPS-2008-149-ORG, http://hdl.handle.net/1765/14080

Stienstra, M., *Strategic Renewal in Regulatory Environments: How Inter- and Intra-organisational Institutional Forces Influence European Energy Incumbent Firms,* Promotors: Prof.dr.ir. F.A.J. Van den Bosch & Prof.dr. H.W. Volberda, EPS-2008-145-STR, ISBN: 978-90-5892-184-0, http://hdl.handle.net/1765/13943

Sweldens, S.T.L.R., *Evaluative Conditioning 2.0: Direct versus Associative Transfer of Affect to Brands,* Promotor: Prof.dr. S.M.J. van Osselaer, EPS-2009-167-MKT, ISBN: 978-90-5892-204-5, http://hdl.handle.net/1765/1

Szkudlarek, B.A., *Spinning the Web of Reentry: [Re]connecting reentry training theory and practice*, Promotor: Prof.dr. S.J. Magala, EPS-2008-143-ORG, ISBN: 978-90-5892-177-2, http://hdl.handle.net/1765/13695

Teunter, L.H., *Analysis of Sales Promotion Effects on Household Purchase Behavior*, Promotors: Prof.dr.ir. B. Wierenga & Prof.dr. T. Kloek, EPS-2002-016-MKT, ISBN: 90-5892-029-1, http://hdl.handle.net/1765/868

Tims, B., *Empirical Studies on Exchange Rate Puzzles and Volatility*, Promotor: Prof.dr. C.G. Koedijk, EPS-2006-089-F&A, ISBN: 90-5892-113-1, http://hdl.handle.net/1765/8066

Tuk, M.A., *Is Friendship Silent When Money Talks? How Consumers Respond to Word-of-Mouth Marketing*, Promotors: Prof.dr.ir. A. Smidts & Prof.dr. D.H.J. Wigboldus, EPS-2008-130-MKT, ISBN: 978-90-5892-164-2, http://hdl.handle.net/1765/12702

Valck, K. de, *Virtual Communities of Consumption: Networks of Consumer Knowledge and Companionship*, Promotors: Prof.dr.ir. G.H. van Bruggen & Prof.dr.ir. B. Wierenga, EPS-2005-050-MKT, ISBN: 90-5892-078-X, http://hdl.handle.net/1765/6663

Valk, W. van der, *Buyer-Seller Interaction Patterns During Ongoing Service Exchange*, Promotors: Prof.dr. J.Y.F. Wynstra & Prof.dr.ir. B. Axelsson, EPS-2007-116-MKT, ISBN: 90-5892-146-8, http://hdl.handle.net/1765/10856

Verheul, I., *Is There a (Fe)male Approach? Understanding Gender Differences in Entrepreneurship*, Prof.dr. A.R. Thurik, EPS-2005-054-ORG, ISBN: 90-5892-080-1, http://hdl.handle.net/1765/2005

Verwijmeren, P., *Empirical Essays on Debt, Equity, and Convertible Securities*, Promotors: Prof.dr. A. de Jong & Prof.dr. M.J.C.M. Verbeek, EPS-2009-154-F&A, ISBN: 978-90-5892-187-1, http://hdl.handle.net/1765/14312

Vis, I.F.A., *Planning and Control Concepts for Material Handling Systems*, Promotors: Prof.dr. M.B.M. de Koster & Prof.dr.ir. R. Dekker, EPS-2002-014-LIS, ISBN: 90-5892-021-6, http://hdl.handle.net/1765/866

Vlaar, P.W.L., *Making Sense of Formalization in Interorganizational Relationships: Beyond Coordination and Control,* Promotors: Prof.dr.ir. F.A.J. Van den Bosch & Prof.dr. H.W. Volberda, EPS-2006-075-STR, ISBN 90-5892-103-4, http://hdl.handle.net/1765/7326

Vliet, P. van, *Downside Risk and Empirical Asset Pricing*, Promotor: Prof.dr. G.T. Post, EPS-2004-049-F&A, ISBN: 90-5892-07-55, http://hdl.handle.net/1765/1819

Vlist, P. van der, *Synchronizing the Retail Supply Chain*, Promotors: Prof.dr.ir. J.A.E.E. van Nunen & Prof.dr. A.G. de Kok, EPS-2007-110-LIS, ISBN: 90-5892-142-0, http://hdl.handle.net/1765/10418

Vries-van Ketel E. de, *How Assortment Variety Affects Assortment Attractiveness: A Consumer Perspective*, Promotors: Prof.dr. G.H. van Bruggen & Prof.dr.ir. A. Smidts, EPS-2006-072-MKT, ISBN: 90-5892-101-8, http://hdl.handle.net/1765/7193

Vromans, M.J.C.M., *Reliability of Railway Systems*, Promotors: Prof.dr. L.G. Kroon, Prof.dr.ir. R. Dekker & Prof.dr.ir. J.A.E.E. van Nunen, EPS-2005-062-LIS, ISBN: 90-5892-089-5, http://hdl.handle.net/1765/6773

Vroomen, B.L.K., *The Effects of the Internet, Recommendation Quality and Decision Strategies on Consumer Choice*, Promotor: Prof.dr. Ph.H.B.F. Franses, EPS-2006-090-MKT, ISBN: 90-5892-122-0, http://hdl.handle.net/1765/8067

Waal, T. de, *Processing of Erroneous and Unsafe Data*, Promotor: Prof.dr.ir. R. Dekker, EPS-2003-024-LIS, ISBN: 90-5892-045-3, http://hdl.handle.net/1765/870

Wall, R.S., *Netscape: Cities and Global Corporate Networks,* Promotor: Prof.dr. G.A. van der Knaap, EPS-2009-169-ORG, ISBN: 978-90-5892-207-6, http://hdl.handle.net/1765/1

Watkins Fassler, K., *Macroeconomic Crisis and Firm Performance,* Promotors: Prof.dr. J. Spronk & Prof.dr. D.J. van Dijk, EPS-2007-103-F&A, ISBN: 90-5892-138-3, http://hdl.handle.net/1765/10065

Weerdt, N.P. van der, *Organizational Flexibility for Hypercompetitive Markets: Empirical Evidence of the Composition and Context Specificity of Dynamic Capabilities and Organization Design Parameters,* Promotor: Prof.dr. H.W. Volberda, EPS-2009-173-STR, ISBN: 978-90-5892-215-1, http://hdl.handle.net/1765/1

Wennekers, A.R.M., *Entrepreneurship at Country Level: Economic and Non-Economic Determinants,* Promotor: Prof.dr. A.R. Thurik, EPS-2006-81-ORG, ISBN: 90-5892-115-8, http://hdl.handle.net/1765/7982

Wielemaker, M.W., *Managing Initiatives: A Synthesis of the Conditioning and Knowledge-Creating View*, Promotors: Prof.dr. H.W. Volberda & Prof.dr. C.W.F. Baden-Fuller, EPS-2003-28-STR, ISBN: 90-5892-050-X, http://hdl.handle.net/1765/1042

Wijk, R.A.J.L. van, *Organizing Knowledge in Internal Networks: A Multilevel Study*, Promotor: Prof.dr.ir. F.A.J. van den Bosch, EPS-2003-021-STR, ISBN: 90-5892-039-9, http://hdl.handle.net/1765/347

Wolters, M.J.J., *The Business of Modularity and the Modularity of Business*, Promotors: Prof. mr. dr. P.H.M. Vervest & Prof. dr. ir. H.W.G.M. van Heck, EPS-2002-011-LIS, ISBN: 90-5892-020-8, http://hdl.handle.net/1765/920

Yang, J., *Towards the Restructuring and Co-ordination Mechanisms for the Architecture of Chinese Transport Logistics*, Promotor: Prof.dr. H.E. Harlambides, EPS-2009-157-LIS, ISBN: 978-90-5892-198-7, http://hdl.handle.net/1765/14527

Yu, M., *Enhancing Warehouse Perfromance by Efficient Order Picking*, Promotor: Prof.dr. M.B.M. de Koster, EPS-2008-139-LIS, ISBN: 978-90-5892-167-3, http://hdl.handle.net/1765/13691

Zhang, X., *Strategizing of Foreign Firms in China: An Institution-based Perspective*, Promotor: Prof.dr. B. Krug, EPS-2007-114-ORG, ISBN: 90-5892-147-5, http://hdl.handle.net/1765/10721

Zhu, Z., *Essays on China's Tax System*, Promotors: Prof.dr. B. Krug & Prof.dr. G.W.J. Hendrikse, EPS-2007-112-ORG, ISBN: 90-5892-144-4, http://hdl.handle.net/1765/10502

Zwart, G.J. de, *Empirical Studies on Financial Markets: Private Equity, Corporate Bonds and Emerging Markets*, Promotors: Prof.dr. M.J.C.M. Verbeek & Prof.dr. D.J.C. van Dijk, EPS-2008-131-F&A, ISBN: 978-90-5892-163-5, http://hdl.handle.net/1765/12703

ENGAGING ENVIRONMENTAL TURBULENCE
ORGANIZATIONAL DETERMINANTS FOR REPETITIVE, QUICK AND ADEQUATE RESPONSES

A common challenge organizations face is how to remain successful in a competitive arena that is becoming increasingly turbulent. Resourcefulness and adaptability are presented as crucial organizational abilities to strive for. This study introduces the contemporary military organization as a typical example from which commercial organizations could learn. After all, in order to repetitively conduct crisis response missions all over the globe, under all kinds of climatic and operational circumstances, resourcefulness and adaptability have become basic elements for successful expeditionary deployment. The study assumes that giving insight into the way in which military crisis response organizations apply commonly accepted organizational determinants to activate learning and reconfiguration abilities, could serve as an interesting case for commercial organizations to take advantage of. For most contemporary military organizations modular organizing has become an important approach to increase operational adaptability. The cover photo presents a typical outcome of this approach. It shows a combined arms team, from the Netherlands armed forces, on its way to the village of Ferocia to search for improvised explosive devices.

ERIM

The Erasmus Research Institute of Management (ERIM) is the Research School (Onderzoekschool) in the field of management of the Erasmus University Rotterdam. The founding participants of ERIM are Rotterdam School of Management (RSM), and the Erasmus School of Economics (ESE). ERIM was founded in 1999 and is officially accredited by the Royal Netherlands Academy of Arts and Sciences (KNAW). The research undertaken by ERIM is focused on the management of the firm in its environment, its intra- and interfirm relations, and its business processes in their interdependent connections.

The objective of ERIM is to carry out first rate research in management, and to offer an advanced doctoral programme in Research in Management. Within ERIM, over three hundred senior researchers and PhD candidates are active in the different research programmes. From a variety of academic backgrounds and expertises, the ERIM community is united in striving for excellence and working at the forefront of creating new business knowledge.

Erasmus Research Institute of Management - **ERIM**

ERIM PhD Series
Research in Management